

The astronomy and songline connections of the Saltwater Aboriginal peoples of the New South Wales coast

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The astronomy and songline connections of the saltwater Aboriginal peoples of the New South Wales coast

Robert S. Fuller

A thesis in fulfilment of the requirements for the degree of
Doctor of Philosophy



School of Humanities and Languages

Faculty of Arts and Social Sciences

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Australian Aboriginal peoples, who arrived in what is now the Australian continent approximately 65,000 years ago, are now accepted as the modern peoples with the longest continuous culture on Earth. Their culture, which includes observational astronomy, has a strong connection to the night sky, which is represented in Aboriginal stories and traditional knowledge. The Aboriginal belief in 'Country', their connection to the land they have lived upon, extends to the songlines that crisscross Australia, and these songlines may be a means to encode memory of stories and resource management. Recent evidence points to the remarkable accuracy in such stories describing sea level rise from over 7000 years ago.

In this study I examined the stories and knowledge of the Aboriginal peoples of the New South Wales coast ('Saltwater' peoples) through a historical archival study of available literature, and through ethnographic fieldwork with knowledge holders from over 20 communities. The resulting database included more than 200 literature and 300 ethnographic items, including stories, vocabulary and cultural knowledge. I analysed the data using a number of anthropological theoretical approaches, including a thematic analysis resulting in a 'thick description', and in a structuralist approach to create 'mythemes' which were subsequently analysed using a phylogenetic technique to determine connections between cultural stories and their possible transmission along songlines.

Included in the study is a review of the history of the arrival of Australian Aboriginal peoples to Australia and what is known about their settling of the NSW coast. I further studied the history of Western knowledge of songlines and defined them for the purpose of this study, then described many local, and several long-distance songlines encountered in the area of the study.

In this study, I have used a multi-disciplinary approach including anthropology, cultural astronomy, and the Western sciences of astronomy, archaeology and geography to describe the culture of the Aboriginal peoples of the area of this study. The results have shown a strong connection in culture up and down the NSW coast, and suggested connections which may point to the transmission of stories along the songlines described.

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DEDICATION

This thesis is dedicated to Leslie William (Les) Bursill (OAM) (1945-2019), Dharawal historian, archaeologist, anthropologist, and publisher. Les, who started as a participant in this study, became a friend, and through his research into the Aboriginal rock art of the Royal National Park, a major contributor to the study of the Black Duck songline.

This thesis is also dedicated to the generations of Aboriginal Australians of the New South Wales coast whose cultures, land, and lives were damaged by European colonisation.

I would also like to acknowledge and pay respect to the traditional owners of the land upon which UNSW stands; the Bedegal People of the Eora Nation. I also acknowledge Bedegal Elders past, present and into the future.

Note to Aboriginal and Torres Strait Islander Readers

This thesis contains the names of people that have passed away.

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Table of contents	Page
1.....	1
1 Introduction	1
1.1 Hypotheses.....	1
1.2 Songlines	5
1.3 The Dreaming and Aboriginal spirituality.....	7
1.4 Aims.....	12
1.5 Objectives.....	14
1.6 Structure.....	15
2.....	19
2 Discipline, Theory, and Methodology.....	19
2.1 Anthropology and Cultural Astronomy Disciplines	19
2.2 Theory	20
2.2.1 Anthropology	20
2.2.2 Cultural Astronomy	25
2.2.3 Indigenous Knowledge and Science	29
2.2.4 Critical Assessment of the Integration of Theories	32
2.3 Methodology	34
2.3.1 Data/Knowledge Acquisition	34
2.3.1.1 Community Participation	34
2.3.1.2 Participant Association	38
2.3.1.3 Ethics.....	40
2.3.1.4 Literature Review.....	40
2.3.1.5 Literature Source Critical Review.....	43
2.3.1.6 Ethnography.....	48
2.3.1.7 Ethnography Critical Review	51
2.3.2 Analysis	53
2.3.2.1 Thematic Analysis	53
2.3.2.2 Mythological Analysis	55
2.3.2.3 Decolonizing Methodologies	58
2.3.2.4 Indigenous vs. European view	60
3.....	63
3 Background to the area of study	63
3.1 Introduction.....	63
3.2 Geography and environment	64
3.2.1 South Coast	67
3.2.2 Sydney Basin	67
3.2.3 North Coast.....	67
3.3 Deep history of the Aboriginal peoples of Australia	68
3.3.1 Context of the environment of the Australian continent	68
3.3.1.1 The Pleistocene	68
3.3.1.2 The Holocene	69
3.3.2 The Aboriginal Migration to Australia.....	69
3.3.2.1 Origins	69
3.3.2.2 Archaeology	72

3.3.2.3 Mitogenomic and phylogenetic evidence	72
3.3.2.4 Current state of the origin question	73
3.3.2.5 Aboriginal population of Australia.....	74
3.3.3 The Aboriginal Settling of NSW	74
3.3.3.1 Arrival in NSW.....	74
3.3.3.2 Origin Stories	78
3.4 Recent history of the Aboriginal peoples of the NSW coast	79
3.4.1 Background.....	79
3.4.2 1788 and European colonisation.....	81
3.5 Giving meaning to the data.....	83
4.....	85
4 The Astronomy of the Sydney Basin.....	85
4.1 Introduction	85
4.2 Language groups and uncertainties.....	87
4.3 Methods and theory	89
4.3.1 Literature survey	89
4.3.2 Material survey.....	89
4.3.3 Ethnography	90
4.4 Results.....	90
4.4.1 Results by type and theme	90
4.4.2 Thematic analysis ‘starting’ codes.....	90
4.4.3 Combining codes into themes	93
4.5 Thematic connections by language group	102
4.5 Sydney Basin rock art and astronomy.....	103
4.6 Discussion specific to the Sydney Basin	104
5.....	107
5 The Astronomy of the NSW North Coast	107
5.1 Introduction/language groups	107
5.2 Methods and theory	109
5.2.1 Literature survey	109
5.2.2 Material survey.....	109
5.2.3. Ethnography	110
5.3 Results.....	111
5.3.1 Results by type and theme	111
5.3.2 Combining codes into themes	112
5.4 Thematic connections on the North Coast	125
5.5 Significant landscape features	125
5.6 Discussion specific to the North Coast.....	130
6.....	131
6 The Astronomy of the NSW South Coast	131
6.1 Introduction	131
6.2 Language groups	132
6.3 Methods and theory	133
6.3.1 Literature survey	133
6.3.2 Material survey.....	133

6.4 Results	135
6.4.1 Results by type and theme.....	135
6.4.2 Thematic analysis ‘starting codes’	135
6.4.3 Combining codes into themes	136
6.4.4 Thematic connections on the South Coast	142
6.5 Significant Landscape Features	143
6.6 Discussion specific to the South Coast	146
 7.....	 147
7 Themes and the NSW Coast.....	147
7.1 Background.....	147
7.2 Themes in cultural stories of the Saltwater peoples.....	147
7.2.1 Three Brothers stories	147
7.2.1.1 Bundjalung, Gumbayngirr and Yaegl Three Brothers	149
7.2.1.2 Birpai Three Brothers.....	151
7.2.1.3 Gai-mariagal Three Brothers.....	153
7.2.1.4 Yuin Three Brothers	153
7.2.1.5 Wangkumara Three Brothers.....	153
7.2.1.6 Yolŋu Three Brothers	154
7.2.2 The Seven Sisters stories.....	154
7.2.2.1 Bundjalung Seven Sisters	156
7.2.2.2 Dharawal Seven Sisters	157
7.2.2.3 Dharug Seven Sisters.....	159
7.2.2.4 Gai-mariagal Seven Sisters.....	159
7.2.2.5 Gumbayngirr Seven Sisters	159
7.2.2.6 Gundungurra Seven Sisters.....	160
7.2.2.7 Guringai Seven Sisters.....	160
7.2.2.8 Worimi Seven Sisters	161
7.2.2.9 Yaegl Seven Sisters.....	162
7.2.2.10 Yuin Seven Sisters.....	162
7.2.3 Whale stories.....	163
7.2.3.1 South Coast Whales	166
7.2.3.2 North Coast Whales	171
7.2.4 Dolphin stories	172
7.2.4.1 Sydney Basin dolphins.....	172
7.2.4.2 North Coast dolphins	173
7.2.4.3 South Coast dolphins	176
7.3 Summary	177
 8.....	 179
8 Songlines and the NSW Coast	179
8.1 Background.....	179
8.1.1 History.....	179
8.1.2 The Dreaming and songlines.....	182
8.1.3 Songlines defined.....	185
8.1.4 Songspirals	186
8.1.5 The significance of songlines.....	186
8.1.6 Some significant songlines	188
8.2 Finding songlines and Dreaming tracks.....	192

8.3 Songlines of the NSW coast	194
8.3.1 Local songlines.....	194
8.3.1.1 North Coast	195
8.3.1.2 Sydney basin.....	198
8.3.1.3 South Coast.....	203
8.3.2 Long-distance songlines	212
8.3.2.1 Black Duck songline	214
8.3.2.2. Black Swan songline	238
8.4 Summary	245
9.....	247
9 Archaeoastronomy in Australia.....	247
9.1 Introduction	247
9.2 Horizon© and other archaeoastronomical tools.....	248
9.2.1 Horizon ©	248
9.2.2 Stellarium	250
9.2.3 Other tools.....	251
9.3 The Burragorang Eclipse, an example of archaeoastronomy	252
9.3.1 Introduction.....	252
9.3.2 The story.....	253
9.3.3 Methods	255
9.3.4 Analysis.....	260
9.3.5 Discussion	266
9.3.6 Conclusions.....	268
10.....	269
10 Analysis.....	269
10.1 Introduction	269
10.2 Research questions.....	269
10.3 Thematic analysis.....	270
10.3.1 Analysis process.....	270
10.3.2 Theme analysis	273
10.3.3 Which theory?	276
10.3.4 Theoretical construct.....	277
10.3.5 Writing a thick description	277
10.3.6 The Thick Description - background	281
10.3.7 The Thick Description	282
10.3.8 A thin description	283
10.4 Mythological analysis.....	284
11.....	291
11 Discussion and Conclusions.....	291
11.1 Discussion	291
11.1.1 Major findings	291
11.1.2 Meaning of the major findings	291
11.1.3 How findings relate to previous research.....	294
11.1.4 Limitations of findings	295
11.1.5 Unexpected results.....	300

11.1.6 Suggestions for further research	302
11.1.7 Giving back.....	304
11.2 Final Conclusions.....	305
Bibliography	306
Appendix 1 NSW Coast Astronomy Literature Database	334
Appendix 2 NSW Coast Ethnographic Database.....	390
Appendix 3 NSW Coast Astronomy Vocabulary	434
Appendix 4 Total Coding List for the NSW Coast	448
Appendix 5 Theme List for NSW Coast.....	451

TABLE OF FIGURES

PAGE

FIGURE 1.1 BAIAME CAVE (AUTHOR'S IMAGE)	10
FIGURE 2.1 AREA OF COMMUNITY PARTICIPATION (AIATSIS LANGUAGE MAP)	37
FIGURE 3.1 ABORIGINAL LANGUAGE GROUPS OF THE NSW COAST (AIATSIS LANGUAGE MAP)	66
FIGURE 4.1 THE SYDNEY BASIN SHOWING THE EXTENT OF HAWKESBURY SANDSTONE, CITIES AND MAJOR RIVERS (MCDONALD 2008:2)	86
FIGURE 4.2 THE SYDNEY BASIN LANGUAGE GROUPS (AIATSIS LANGUAGE MAP)	88
FIGURE 4.3 YENGO IS TO THE SANDSTONE COUNTRY WHAT ULURU IS TO CENTRAL AUSTRALIA (JONES 1993: N.P)	96
FIGURE 4.4 THE CULTURAL EMU IN THE SKY, AND THE MATCHING ENGRAVING AT KU-RING-GAI NATIONAL PARK	100
FIGURE 4.5 THEMES SYDNEY BASIN	103
FIGURE 4.6 BAIAME FIGURE WITH SUN AND MOON AND PADDLE (PANKHURST 2016)	104
FIGURE 5.1 NORTH COAST ABORIGINAL COMMUNITIES (AIATSIS LANGUAGE MAP)	108
FIGURE 5.2 TUCKI TUCKI BORA RING LOOKING TOWARDS THE PATHWAY (© JEFF LICENSE)	110
FIGURE 5.3 THE HORNS OF TAURUS (CROSSED YAM STICKS OF THE TWO SISTERS (STARRY NIGHT PRO © 2009 SIMULATION CURRICULUM CORPORATION)	121
FIGURE 5.4 THEMES NORTH COAST	125
FIGURE 5.5 POSSIBLE 'ARROW STONE' (POINTING WEST) IAN FOX	127
FIGURE 5.6 HORIZON PROFILE FROM 'ARROW STONE' (LOOKING WEST) (HORIZON©)	127
FIGURE 5.7 SUNRISE EQUINOX OVER MT. CORAMBA (RED MARKS ARE THE SOLSTICES)	128
FIGURE 5.8 SERPENTINE RIVER STONE ARRANGEMENT SITE (MCBRYDE 1963 PLATE 1) (COURTESY OF JSTOR)	129
FIGURE 6.1 YUIN DIALECT GROUP BOUNDARIES (FROM TINDALE 1974)	132
FIGURE 6.2 THEMES SOUTH COAST	143
FIGURE 6.3 HORIZON FROM SOUTH TO NORTHEAST FROM BERMAGUI (HORIZON©)	144
FIGURE 6.4 BERMAGUI HORIZON WITH SOLAR SOLSTICES AND EQUINOX (HORIZON©)	145
FIGURE 6.5 TRACK OF THE SEVEN SISTERS OVER GULAGA MT. (HORIZON©)	145
FIGURE 7.1 THREE BROTHERS MOUNTAINS; LEFT TO RIGHT: SOUTH, MIDDLE, NORTH (IMAGE COURTESY OF PAUL MA) ..	153
FIGURE 7.2 JOSEPH LYCETT PAINTING (CA. 1820) OF AWABAKAL PEOPLE CUTTING UP A BEACHED WHALE (NATIONAL LIBRARY OF AUSTRALIA)	164
FIGURE 7.3 WHALE AND CALF ON GULAGA MT. (NPWS NSW)	170
FIGURE 8.1 'AUSTRALIA CRISSCROSSED BY MYTHOLOGICAL TRACKS' (MOWALJARLAI AND MALNIC 1993)	189
FIGURE 8.2 TWO DOG DREAMING TRACK (KERWIN 2010, MAP 5)	190
FIGURE 8.3 CAPE YORK TO VICTORIA COASTAL DREAMING TRACK (KERWIN 2010, MAP 8)	194
FIGURE 8.4 PELICAN SONGLINE FROM NORTH HEAD, SYDNEY (GOOGLE EARTH)	200
FIGURE 8.5 BARRENJOEY HEADLAND (EMU FACING RIGHT) (GOOGLE EARTH)	202
FIGURE 8.6 POSSIBLE EMU SONGLINE FROM MT. YENGO TO BARRENJOEY HEADLAND (GOOGLE EARTH)	203
FIGURE 8.7 SONGLINE 1 GUDOO/SEA (GOOGLE EARTH)	205
FIGURE 8.8 SONGLINE 2 GULAGA TO BIAMANGA; SONGLINE 3 BIAMANGA TO GREAT DIVIDE (GOOGLE EARTH)	206
FIGURE 8.9 SONGLINE 4 BULGIN, SONGLINE 5 TUROSS RIVER, SONGLINE 6 CORN TRAIL, SONGLINE 7 BODALLA TO KOSCIUSZKO, SONGLINE 8 GULAGA TO SHOALHAVEN, SONGLINE 9 BUCKENBOWRA TO MCGREGOR'S CREEK (GOOGLE EARTH)	207
FIGURE 8.10 SONGLINE 10 SHALLOW CROSSING (CLYDE RIVER) TO MONGA (GOOGLE EARTH)	209
FIGURE 8.11 SONGLINE 12 MORUYA TO BINGIE, SONGLINE 13 CONGO TO BINGIE BINGIE POINT (GOOGLE EARTH)	210
FIGURE 8.12 BINGI DREAMING TRACK	211
FIGURE 8.13 DHARAWAL SONGLINE 14 JERVIS BAY TO APPIN (GOOGLE EARTH)	212
FIGURE 8.14 TWO WOMEN AND CHILD (BURSILL 2013)	218
FIGURE 8.15 MEN DANCING (BURSILL 2013)	219
FIGURE 8.16 AXE-GRINDING POOL (BURSILL 2013)	219
FIGURE 8.17 TWO MEN 'TUMBLING' (BURSILL 2013)	220
FIGURE 8.18 SERPENT (BURSILL 2013)	221
FIGURE 8.19 WAGALAG SISTERS AND CHILD	224
FIGURE 8.20 SEVEN SISTERS, INCLUDING BOALIRI AND GARANGAL (BURSILL 2013)	225

FIGURE 8.21 WAGALAG SISTERS STORY, ROCK ART PANELS IN ROYAL NATIONAL PARK (BURSILL 2013)	226
FIGURE 8.22 TWO SISTERS AT WHITTAKERS CREEK (L. THOMAS)	228
FIGURE 8.23 BLACK DUCK SONGLINE FROM GREAT LAKES TO SYDNEY (GOOGLE EARTH)	230
FIGURE 8.24 POSSIBLE BLACK DUCK SONGLINE NARRAN LAKES TO GREAT LAKES (ALTERNATIVE VIA TUMUT AND TALBINGO IN YELLOW) (GOOGLE EARTH)	234
FIGURE 8.25 NGUTHUNGULLI SONGLINE FROM BYRON BAY (ROSSETTO ET AL. 2017; CREATIVE COMMONS)	235
FIGURE 8.26 MULLIYAN-GA/EAGLEHAWK SONGLINE BYRON BAY TO EMILY GAP, NT (GOOGLE EARTH)	236
FIGURE 8.27 BLACK DUCK SONGLINE, FULL CIRCLE FROM WALAGA LAKE TO SYDNEY, BYRON BAY, DIRRANBANDI, NARRAN LAKE, BRAIDWOOD, SNOWY MOUNTAINS (ALTERNATIVE VIA TUMUT AND TALBINGO IN YELLOW), SNOWY RIVER, GIPPSLAND LAKES, WALAGA LAKE (GOOGLE EARTH)	237
FIGURE 8.28 GINEEVIE AND THE SOUTHERN CROSS	239
FIGURE 8.29 BLACK SWAN DISTRIBUTION SOUTH-EAST AUSTRALIA (BRAITHWAITE 1970)	240
FIGURE 8.30 POSSIBLE BLACK SWAN SONGLINE (GOOGLE EARTH)	244
FIGURE 9.1 CULTURAL HORIZON FROM BERMAGUI (HORIZON©)	249
FIGURE 9.2 GAWARRGAY, THE EMU IN THE SKY, IN STELLARIUM	251
FIGURE 9.3 GUNDUNGURRA LANGUAGE GROUP LOCATION (COMMONWEALTH OF AUSTRALIA, NNTT) ⁴	253
FIGURE 9.4 MAP OF SOUTH-EASTERN NEW SOUTH WALES, THE AUSTRALIAN CAPITAL TERRITORY, AND NORTH-EASTERN VICTORIA, FEATURING PLACES MENTIONED IN THE ORAL TRADITION FROM WHERE THE EVENT WAS VISIBLE. THE STORY IS CENTRED ON THE BURRAGORANG VALLEY (GOOGLE MAPS)	255
FIGURE 9.5 (A) NACREOUS CLOUD (WIKIPEDIA COMMONS: FOOBABZ), (B) LIGHT PILLARS (WIKIPEDIA COMMONS: CHRISTOPH GEISLER), (C) PARHELIA/SOLAR HALO PHENOMENON (WIKIPEDIA COMMONS: BROCKEN INAGLORY), (D) LIGHTNING SPRITES (UNIVERSITY OF ALASKA: JASON ARHENS, CREATIVE COMMONS)	257
FIGURE 9.6 STRONG DISPLAYS OF THE AURORA BOREALIS OVER NORWAY. DISPLAYS LIKE THIS COULD POTENTIALLY BE VISIBLE OVER THE SYDNEY REGION DURING A POWERFUL GEOMAGNETIC SOLAR STORM (TELEGRAPH.CO.UK: TOMMY ELIASSEN)	258
FIGURE 9.7 A LINEAR PLOT FITTING DATA OF SKY BRIGHTNESS (MAG/ARCSEC ²) VERSUS AURORAL PHOTON FLUX (KILO9-RAYLEIGHS) USING DATA FROM CRUMLEY (2014) AND STROBEL (2010)	259
FIGURE 9.8 THE PATHS OF THE THREE ECLIPSES THAT MEET THE FIRST CRITERION: (A) 189 CE, (B) 196 CE, AND (C) 764 CE. THE BOX WEST OF SYDNEY DENOTES THE BURRAGORANG VALLEY. THE TRIANGLE IN THE BOTTOM-CENTRE DENOTES MT. KOSCIUSKO (CREATED WITH ALCYONE ECLIPSE CALCULATOR)	262
FIGURE 9.9 (A) SUPERCELL THUNDERSTORM, LISMORE, NSW (JASON PATERSON), (B) TORNADO AT BATHURST, NSW ON 16 DECEMBER 2015 (RAY PICKARD)	268
FIGURE 10.1 THEMES BY NSW COAST REGION	271
FIGURE 10.2 THEMES NSW COAST	272
FIGURE 10.3 THE COMMONALITY OF STORIES VS TOTAL ON THE NSW COAST	278
FIGURE 10.4 MESQUITE© VER. 3.6 MATRIX TABLE OF SEVEN SISTERS COMMUNITIES AND CHARACTERISTICS	287
FIGURE 10.5 MESQUITE© VER. 3.6 CONSENSUS TREE SEVEN SISTERS STORIES	287

TABLE OF TABLES

PAGE

TABLE 2.1 SIGNIFICANT LITERATURE SOURCES	44
TABLE 3.1 DATES OF ABORIGINAL OCCUPATION IN AUSTRALIA (SMITH AND BURKE 2007, WITH ADDITIONS).....	72
TABLE 3.2 DATES OF ABORIGINAL OCCUPATION IN NSW (RADIOCARBON DATES).....	75
TABLE 9-1 INTERNATIONAL BRIGHTNESS COEFFICIENT, AFTER THOMSON 2016	260
TABLE 9-2 DATA FOR THE FIVE TOTAL ECLIPSES VISIBLE FROM THE BURRAGORANG VALLEY BETWEEN 1500 BCE AND 1900 CE.	261
TABLE 10.1. 'STAR(S)' WORD NSW COAST BY LANGUAGE GROUPS	280
TABLE 10.2 MESQUITE© CHARACTERISTICS LIST FOR SEVEN SISTERS STORIES	286

1

1 Introduction

1.1 Hypotheses

Australian Aboriginal peoples, who arrived in the Sahul supercontinent of Australia and New Guinea approximately 65,000 years ago (Clarkson et al. 2017: 309), are arguably the modern peoples with the longest continuous culture on Earth. Those cultures, challenged and marginalised over the past 230 years by the dominant colonising European society, nonetheless has survived and has the potential to add to contemporary scientific knowledge through the observational knowledge acquired through millennia of prehistory on the Australian continent. This knowledge, which is defined as being accumulated by systematic study, extends to the observation of the night sky, which is astronomy, the field of knowledge on which this study is based. Astronomy is a deep part of Aboriginal cultures and is strongly represented in their stories, which is one of the means how their cultures were so successfully maintained over such a long time. This study will use the collection and analysis of astronomical stories to examine the origin and relevance of those stories to important cultural elements, such as social rules and resource management.

Recently, mitogenomic DNA research (Tobler et al. 2017: 3) has shown that Aboriginal peoples rapidly dispersed across Australia after arrival and were in their now traditional Countries within a few thousand years. Aboriginal peoples have a strong attachment to

Country, so it is possible to explore Aboriginal cultures on a regional basis, where traditional Country and languages have meant that many of the original Aboriginal groups arriving in Australia still maintain traditional knowledge as developed over the intervening time. “Country” should be capitalised, as it has a similar meaning to Aboriginal peoples as “Australia” has to the rest of us. An additional element of this study will be an analysis of the transmission of astronomical stories over the landscape of Aboriginal Countries, with an emphasis on if the transmission was by songlines and Dreaming tracks. In this study, the Aboriginal peoples of the East Coast region of Australia were chosen for investigation because there is some evidence of multiple songlines up and down the coast. Specifically, the ‘Saltwater’ peoples (peoples whose traditional Country included the seaboard) of the New South Wales (NSW) coast were investigated, both to limit the practical area of the study, and because there was evidence of similarities in cultures. ‘Saltwater’ is commonly used by Aboriginal peoples to describe their connection to the coast and the sea, and the anthropologist, Nonie Sharp, described them as the ‘sea people of the coasts and islands’ (of Australia) (Sharp 2002: Preface). “Saltwater’ is also recognised in Native Title, and indeed, during the course of this study, the Yaegl people of the North Coast of NSW were granted Native Title to a stretch of the coast/beaches in their Country.

Why did I do such a study? As a retired person, and not a career academic, I could be out playing golf (which is not an innate skill as it turns out, to the benefit of academia). It is often claimed that Australian Aboriginal peoples are the most over-researched peoples on Earth, so what value does one more study add? In the next section, 1.2, Aims, I will explain the academic and subjective values that I feel this study addresses, and those in themselves are strong reasons for such a study as this. Even stronger is the need for studies such as this that demonstrate the remarkable features of Aboriginal cultures, confirming their importance as a successful, continent-spanning people with the cultural evolutionary skills to ensure their survival over the long run. One of these features was their scientific use of astronomy and its role in culture and survival.

Aboriginal cultures have a strong connection to astronomical practices, which are centred around their observation of the night sky. This knowledge is woven into oral storytelling traditions and is quite different from the Western conceptualisation of science. Langton (2018: 34) describes Aboriginal storytelling:

Storytelling is the original classroom where history, morality and knowledge about people, places and the world are relayed to each new generation.

Western scientific astronomy also practices observation of the night sky but is more focused on specific objects, such as stars, planets, and deep space objects that are visible only with enhanced capabilities using optical and radio telescopes. Without enhancements such as telescopes, do Aboriginal peoples practice scientific astronomy? Following Pingree, science can be defined as ‘a systematic explanation of perceived or imaginary phenomena, or else is based on such an explanation’ (Pingree 1992: 559). As will be seen in this study, Aboriginal people certainly used this approach when explaining the cosmos around them. However, modern Indigenous peoples themselves are also well aware of the dichotomy between Western science and Indigenous knowledge. Nakata (2010: 56) said: ‘science extends what we know, or reveals both the limits of our knowledge and the limits of scientific knowledge’, when describing the use of Indigenous knowledge and Western science in the ‘interface between the two’ (ibid.).

In their practice of astronomy, Aboriginal peoples are searching for the answers to the oldest questions known to humanity: what is the Universe that we see around us, and how does it influence our lives? This search for meaning includes a search for the origin or creation of the Universe and people (Cosmogony), the role of people in the Universe (Cosmology), and the fate of people and individual persons. The results of this process are encoded in Aboriginal stories, which form much of the knowledge that is passed from generation to generation through teaching, initiation, and ceremonies. This study is structured on known gaps in the knowledge about Aboriginal cultures regarding stories, particularly those related to the sky and cosmology, and how these have been created and transmitted geographically in the past. The literature is quite full of cultural stories from most of the language groups and communities that have shared their cultures with researchers and interested persons. While determining details of the creation of stories (at least determining the original creation) is impossible in most cases due to the antiquity of the creation, modern mythological analysis methods may allow the determination of how stories are transmitted and changed from the original version. The first hypothesis of this study is that Aboriginal stories were transmitted geographically from community to community, and in the process retained the major theme of the story but may have incorporated changes which will demonstrate that the story underwent modifications during travel. The second hypothesis concerns the routes of transmission of the stories.

As will be described, songlines are routes of travel for trade, including trade in stories and culture. The hypothesis is that in the geographical area of the study, songlines would have been the major routes of transmittal of stories, and it will be attempted to identify the likely routes of transmission in stories studied. In both hypotheses, the stories that were studied were related to the sky, as this will be proposed as a link between stories and songlines.

This thesis builds on the foundations of academic study and reporting of Australian Aboriginal astronomy. As Norris demonstrates (2016: 1), the study of Aboriginal knowledge of the night sky started with Lt. William Dawes, an officer in the First Fleet that settled Sydney, and an astronomer who noted the astronomical lore of the local Dharug people. Later, a farmer in Victoria (VIC), William Stanbridge, published the first scientific article about Aboriginal astronomy in 1857 (Stanbridge 1857). Many of the early linguists and ethnographers studying Aboriginal cultures, including William Ridley, R.H. Mathews, A.R. Radcliffe-Brown, and A.P. Elkin, included Aboriginal astronomical knowledge in their publications, but, it wasn't until the 1980s that research published by Cairns and Branagan (1992), Clarke (1990), and Haynes (1996) focused more specifically on Aboriginal astronomy. Haynes (1996: 7) was possibly the first person to suggest that Australian Aboriginal peoples were the 'world's first astronomers', arguing that Aboriginal cultures in Australia, then dated from around 40,000 years Before Present (BP), had a significant component of knowledge about the night sky, and unlike early cultures in the Middle East, had relatively unchanged cultures up until the present. This is noteworthy, considering the amount of publicity given to other, much younger, cultures, such as the Egyptians, where astronomical knowledge only dates to as early as 7,000 years BP (Wendorf and Schild 2013: 51-53). Norris (2016: 2) further described the explosion in interest and research from 2005 to 2016, which included Cairns and Harney's *Dark Sparklers* (2003), and starting in 2009, an 'explosion' of publications and theses from Clarke, Fuller, Goldsmith, Hamacher, Johnson, Leaman and Norris. Since 2016, a majority of research outputs are authored or co-authored by Aboriginal and Torres Strait Islander researchers and elders. It shows the shift from white academics driving outputs to Indigenous academics. Names include Karlie Noon, Kirsten Banks, Krystal De Napoli, John Barsa, Segar Passi, Alo Tapim, Elsie Passi, Martin Nakata, and Ghillar Michael Anderson.

As one of the contributors to the ‘explosion’ (in my case a study of the astronomy of the Gamilaroi and Euahlayi communities of Northern NSW), I was fortunate enough to work with Aboriginal cultural people whose insight into their culture extended well beyond stories to a specific interest in astronomy. One of those cultural persons, Ghillar (Michael Anderson), shared his knowledge of the astronomy of his Euahlayi language group that he had learned from his family. Besides being the cornerstone of my study of the astronomy of these communities, his contribution led to an understanding of the connections between songlines and Aboriginal astronomy.

1.2 Songlines

Aboriginal songlines, or Dreaming tracks as they are sometimes called, are oral representations of landscapes that were created by the culture heroes of that geographical region and can extend into the night sky. Langton (2019: 101) has also described them as ‘song series’.

Many of these totemic ancestors did not merely emerge from the earth but moved across it, forming places that are thereby linked with each other in tracks, or through underground connections likened to the sinews and nerves that bind a living body beneath the skin. There is a kind of temporal paradox to the track, in that while they form an ordered series established by the totemic beings’ movement from one place to the next, the totemic being is nonetheless simultaneously present in all of them (Rumsey 2001: 23)

Songlines are sometimes called ‘ancestral tracks’ (Clarke 2014: 309) because of their connection to the totemic ancestors.

Long before European colonization the Australian deserts were crisscrossed by a network of these routes established by Aboriginal creation beings or *Tjukurpa*.....(James 2013: 31).

Songlines also inform navigational skills for persons who are travelling outside their own Country, and the routes of travel along songlines are taught using the mnemonic qualities of song (Fuller et al. 2014). Ellis (1985: 83) said ‘music is the central repository of Aboriginal knowledge’.

People did travel outside their own Countries for many reasons, including trade, ceremonies, and to share resources (Kerwin 2010). Besides the ceremonial aspects of

songlines, these were often trading routes and pathways to ceremonies (ibid.: 119). These trading centres and ceremonial places were where people came together, not only to trade material objects, but ideas, stories, and songs. Morrison (2015: 129) said ‘the trade route is the songline, because songs, not things, are the principle medium of exchange’. The recognition that songlines have a connection to trade in stories became the catalyst for one of the major hypotheses of this study, the geographical transmission of stories. In this study, the stories examined will be those mainly linked to the night sky and Aboriginal peoples’ astronomy and cosmology, as previous research has shown that many significant cultural stories come from their understanding of the night sky (Fredrick 2008; Fuller 2014; Hamacher 2012).

Understanding Aboriginal songlines and stories also means understanding the Dreaming. This is often erroneously described as the ‘Dreamtime’, but the Dreaming is not based in time in the Western sense of ‘when?’. William Stanner, in his essay *The Dreaming*, said that ‘a central meaning of the Dreaming is that of a sacred, heroic time long ago when man and nature came to be as they are; but neither ‘time’ nor ‘history’ as we understand them is involved in this meaning’ (Stanner 2009: 57). He went on to say that we cannot fix the Dreaming in time: ‘it was, and is, everywhen’ (ibid.: 58). Understanding this concept is important when working with Aboriginal stories, and particularly, how they may be tied to songlines and localities. Also important is an understanding of ‘deep time’. This phrase is technically a reference to geological time, but Aboriginal cultures extend much earlier than any other surviving cultures, and it is this time which can be considered as ‘deep’. Glowczewski (1999: 6) said: ‘I personally defined the Dreaming as a ‘permanence in movement’, a ‘space-time’ in the astrophysical sense, a ‘perpendicular’ direction where present, past and future co-habit..’. I personally like the connection between the Dreaming and ‘space-time’, which is a physics and astronomy concept, and connects to the theme of this study. Many of the stories collected in this study concern creation heroes and other individuals whose deeds may be assumed to have taken place in the Dreaming, and they often have connections to the night sky, such as ending up in the night sky as an object that can be seen today. The possible link between these stories, the objects in the night sky related to those stories, and the link between the stories and songlines, is a major component of this study.

1.3 The Dreaming and Aboriginal spirituality

No background to a study of Aboriginal knowledge is complete without an understanding of Aboriginal spirituality, which encompasses the Dreaming (or ‘Dreamings’, as is often used for multiple Dreaming stories), a philosophical foundation of Aboriginal thought about their creation, origins, and spiritual obligations. The Dreaming is intricately linked to both the cosmology and cosmogony of Aboriginal peoples. Stanner, in *The Dreaming* (1965), described his understanding of Aboriginal spirituality through their cosmogenic and cosmologic beliefs, represented in their oral tradition of stories, which Western people would call ‘myth’. To describe this philosophy as ‘religion’, as so many anthropologists and religious scholars had attempted since the European settlement of Australia, is problematic. As Stanner said, (ibid.: 273) ‘the blacks¹ have no gods, just or unjust, to adjudicate the world.’ This issue was the source of literary discussion from the time of the first European settlement of Australia. Captain John Hunter of the First Fleet said: ‘With respect to religion, we have not been able yet to discover that they have any thing like an object of adoration; neither the Sun, Moon, nor stars seem to take up, or occupy more of their attention, than they do that of any other of the animals which inhabit this immense country’ (Hunter 1793: 62). He also said: ‘no signs of any religion have been observed among them’ (ibid: 299). While there was no doubt continuing curiosity in the new colony about Aboriginal religion, it wasn’t until the 1830’s that we have some further discussion on the subject in print. An early traveller to the Wellington region of western NSW, John Henderson, remarked that ‘Piame is the name of the god of the black peoples of New South Wales.’ (Henderson 1832: 147). Lancelot Threlkeld, a missionary to the Awabakal people of the Lake Macquarie region north of Sydney in the 1830s, was able to discern in his working with Biraban, an Awabakal elder, that there was a belief in a supreme being, *Koen* (Keary 2009). In the latter part of the 19th century, religious scholars and the first anthropologists kept up an active discussion about Aboriginal religion. Mircea Eliade, in his definitive series *Australian Religions: An Introduction Part I* (1966: 116-117), has described the various schools of thought as follows:

- Evolutionists – Herbert Spencer, James Frazer, and E.S. Hartland who believed there was no high religious concept among Aboriginal peoples

¹ Apologies to any First Nations readers for Stanner’s use of the word ‘blacks’.

- Rationalists – Andrew Lang and Karl Schmidt who believed that there were High Gods in Aboriginal religion (but Lang did not believe it was a ‘high ethical religion’)

Other scholars contributing to the discussion included E.B. Tylor, the anthropologist who described various *Baiaame* High Gods in southeast Australia (1892: 292-299); A.P. Elkin, the early 20th century Australian anthropologist who described Sky Heroes and Totemic Heroes (Elkin 1940: 490), and T.G.H. Strehlow, the Central Australian anthropologist who said that sky beings didn’t exert any influence on things on the Earth (Strehlow 1978).

It appears that religious scholars are continuing to attempt to classify Aboriginal spirituality as a religion. Sutherland (2011: 100-101) has said:

....a working definition of religion as based on belief and relations with alternate realities (spirits, deities, other realms and so on) outside ordinary time and space, which cannot be falsified by empirical evidence. The traditional Aboriginal religions clearly qualify as religions under this definition.

‘Spirituality’, in my definition, involves relations with, or belief in, alternate realities that are internalised in the individual and without institutional support. It is an aspect of religion that has drifted outside the confines of structure. Further, ‘spirituality’ as it is often used, is usually more experiential and not based on systematic beliefs.

Sutherland seems to be suggesting that because Aboriginal spirituality has ‘drifted outside the confines of structure’, it is a religion that does not show systematic beliefs. A reading of modern Aboriginal writers suggests otherwise, and this will be explored further in this Section.

Among the discussion about the forms of Aboriginal religion, there were suggestions that the Aboriginal religious features in southeast Australia after colonisation may have been heavily influenced by European missionary teaching and proselytising of Aboriginal people from the 1830s. This eventually led to Tony Swain’s *A new sky hero from a conquered land* (1990: 195-232), where he looks at the effects of dispossession and dispersal of the Aboriginal peoples of the southeast on their religious beliefs, which, as he suggests, led to the possible belief that their Law on Earth had ‘become impoverished’

and that power now resided in the sky. Swain further suggests that this resulted in a lack of balance in their previous religious and cultural beliefs and a belief in a possible dark future. Eventually, an eschatology was formed that featured a future event where all the invading Europeans would die.

Another aspect of Aboriginal spirituality has been examined by Stanner (in Berndt and Berndt 1965: 236), who quotes A.P. Elkin (1933: 131):

Totemism then is our key to the understanding of the aboriginal philosophy and the universe - a philosophy which regards man and nature as one corporate whole for social, ceremonial and religious purposes, a philosophy which from one aspect is preanimistic, but from another is animistic, a philosophy which is historical, being formed on the heroic acts of the past which provide the sanctions for the present, a philosophy which, indeed, passes into the realm of religion and provides that faith, hope and courage in the face of his daily needs which man must have if he is to persevere and persist, both as an individual and as a social being.

Stanner goes on to say (1965: 237): 'Students with the patience to look beyond the symbol to the symbolized will find that the end of Aboriginal religion was in Confucian terms "to unite hearts and establish order". Understood in that way, a "totemic" system shows itself as a link between cosmogony, cosmology, and ontology; between Aboriginal intuitions of the beginnings of things, the resulting relevances for men's individual and social being, and a continuously meaningful life.'

Coming back to the theme of spirituality, Grieves (2009: 9) describes the creators in Southeast Australia:

Another powerful creator, who is also one among many who all play a part, is Baiame, sometimes referred to as a Sky God or a Supreme Being. Any apparent similarity to Christian beliefs assumed by the use of these English terms is misplaced. Baiame is important for creating people themselves and when he completed his creative work he returned to the sky behind the Milky Way. Fellow creator spirits can be seen in the night sky where they, too, returned. The peoples of south-east Australia—including but not restricted to Kamilaroi, Eora, Darkinjung, Wonnaruah, Awabakal, Worimi and Wiradjuri, and also into north-western New South Wales for the Nhunggabarra people (Sveiby & Scuthorpe

2006:3)—commemorate places particularly associated with Baiame. One such place is a famous rock painting near Singleton in the Hunter Valley, the Baiame Cave, where he is depicted with large staring eyes and enormously long arms that hold representations of the seven ‘tribes’² of the Hunter region under his arms (Matthews 1893). For the Nhunggabarra he is the first initiated man and the ‘lawmaker’ (Sveiby & Scuthorpe 2006: 3). The town of Byrock in the north west of New South Wales also takes its name from his presence there. The stories of the sky gods, including Baiame, have different names for these creation ancestors in different areas, and sometimes the stories differ according to the beliefs of people in specific places. For the peoples on the adjoining mid-north coast—Biripi, Ngaku, Daingatti, and Gambangirr—it is Ulidarra who made the ‘tribes’ and their boundaries and whose son, Birrigun, made marriage Law.



Figure 1.1 Baiame Cave (Author's image)

Grieves further describes Aboriginal spirituality (ibid: 8):

Aboriginal Spirituality derives from a philosophy that establishes the wholistic notion of the interconnectedness of the elements of the earth and the universe,

² ‘Tribe’ is used in this thesis only in quoted sources, but is considered an incorrect description today. ‘Mob’ would be more acceptable in most cases.

animate and inanimate, whereby people, the plants and animals, landforms and celestial bodies are interrelated. These relations and the knowledge of how they are interconnected are expressed, and why it is important to keep all things in healthy interdependence is encoded, in sacred stories or myths. These creation stories describe the shaping and developing of the world as people know and experience it through the activities of powerful creator ancestors. These ancestors created order out of chaos, form out of formlessness, life out of lifelessness, and, as they did so, they established the ways in which all things should live in interconnectedness so as to maintain order and sustainability. The creation ancestors thus laid down not only the foundations of all life, but also what people had to do to maintain their part of this interdependence—the Law. The Law ensures that each person knows his or her connectedness and responsibilities for other people (their kin), for Country (including watercourses, landforms, the species and the universe), and for their ongoing relationship with the ancestor spirits themselves.

Watson (2000:3) explored the Law as the ‘raw law’, which was ‘born with the ancestors out of the land with the first sunrise’. The ‘ancestors connect us to law and Kaldowinyeri’ (Kaldowinyeri means ‘Dreaming’ in the Nagarrindjeri languages from the Coorong area of South Australia). The beings of Kaldowinyeri were called Ngaitji (totems), and ‘represent spiritual attachment to ancestral beings’ and ‘tell us who we are and the relationship to the natural world’ (ibid: 6). The ‘raw law’ is ‘undressed of rules and regulations in modern legal systems. The basis of law is respect, honour, sharing, caring and love.’ (ibid: 13). Watson (1998:3) also said: ‘Clothed by colonialism, the naked body (law, land and peoples) is subjected under the layers of the colonists’ rules and regulations’.

Grieves and Watson link the Law, land, and spirituality through the giving of the Law by the ancestors and the spiritual link to the ancestors (people or animals) through the system of totemism. Even Aboriginal art fits into the links between Law and the landscape. Langton (2000:12), when describing Emily Kame Ngwarray’s paintings of landscapes, said:

Ngwarray’s work depicts her homeland. The meaning of land most critical to understanding the sacred visions in the classical Aboriginal genre is the inherent meaning of native title – landscapes humanised over tens of thousands of years and

subject to a system of laws and religious conventions which bind particular people to particular places. People and places are transformed from a mere species and a mere geography into sacred landscape.

Aboriginal spirituality and the Dreaming are intertwined, just as Aboriginal culture is wholistic in its inclusion of Nature, the Universe, and humans. While many Aboriginal peoples today have similar religious (or non-religious) beliefs as the European settler culture, it is still quite common to hear references to Mother Earth as a part of someone's belief system. One can only imagine the strength of the complete belief system, which may or may not be described as 'religion', of which enough remnants remain to allow researchers such as myself to examine the cosmology of Aboriginal Australia.

Stanner said (1965: 274, emphasis in original) Aboriginal people have an 'unusually rich development... (of) social structure, the network of enduring relations recognised between people', which 'has become *the source of the dominant mode of aboriginal thinking*.' As a result, 'The blacks do not fight over land. There are no wars or invasions to seize territory. They do not enslave each other. There is no master-servant relation. There is no class division. There is no property or income inequality. The result is a homeostasis, far-reaching and stable.' (ibid.: 277)

1.4 Aims

The aims of this study are both academic and subjective.

Academically, it will fill a gap in the knowledge about Aboriginal cultures in respect to stories, and how they were traded and transmitted around Australia. While stories form a significant part of the academic literature on Aboriginal cultures, the connection between them, and songlines and Dreaming tracks, has been little studied. In reference to the developing field of cultural astronomy in Australia, since the study will require a significant survey of the astronomical knowledge of the Aboriginal communities of the geographical area of the study, it will also 'fill in' the current database of astronomical observations and related stories for those communities included in the study. That knowledge could form a foundation for further study with different Aboriginal peoples in Australia.

Subjectively, this study will allow me to continue with my personal goal of assisting in the appropriate dissemination the knowledge of Aboriginal astronomy to the interested

public in Australia. Like many of my colleagues, I admire a culture that has been able to survive and maintain this lore for up to 65,000 years while living on the Australian continent through many of the major climatic and ecological changes of the Pleistocene era. I am a strong believer in the power that the recognition of this aspect of Aboriginal culture gives in the current Reconciliation arguments, and that a popular subject such as Aboriginal astronomy can be an important component of this recognition. This belief was reinforced to me by the positive effects of the ‘giving back’ component of the study of the astronomy of the Gamilaroi and Euahlayi peoples. ‘Giving back’ is a term that means many things for traditional cultures around the world but has come to mean in Australia a way of thanking a community for its generosity, in this case from me as a researcher. When planning that study, the intention was always to create with the information developed a tool for the relevant communities to educate their children in their own cultures, and to provide a form of community pride in the achievements of their cultures. As it happened, I applied for and received a Higher Education Participation and Partnerships Program (HEPPP) grant from the Federal Government through Macquarie University’s Widening Participation Office. While the intention of the HEPPP grant was to encourage Aboriginal young people to consider going on to tertiary education, the Night Sky Project, as the HEPPP grant was called, was used to create educational tools with a wider appeal. On the suggestion of Ghillar (Michael Anderson), I contacted Eleanor Gilbert, an activist filmmaker working with various Aboriginal groups, and funded a documentary on Euahlayi astronomy. This was with Ghillar as the principal narrator, and Ray Norris, a radio astronomer with the CSIRO, as a Western astronomy counterpoint to Ghillar (Ray was also one of my Supervisors on the study at Macquarie University). That documentary, *Star Stories of the Dreaming*, was bought by National Indigenous TV (NITV), which has shown it nationally multiple times. Accompanying the documentary when shown in schools, a study guide with the same title was created with the help of a specialist, aimed at the Indigenous Science syllabus item of the NSW (then) Board of Studies syllabus for primary school children Kindergarten to Year 7. The package of the documentary and study guide was trialled in four schools in the Northwest region of NSW. At the same time, the filmmaker on her account extended the documentary to film-length and upgraded the sound and music so that it could be shown to adult audiences around Australia. It has since been shown in most of the capital cities, and many regional cities, and remains a valuable tool for outreach to non-Aboriginal and

Aboriginal audiences, who have been uniformly engaged by the knowledge it displays. As recently as the ABC TV *Stargazing Live* program in 2017, the modified study guide was made available nationally to viewers and teachers.

The circulation of *Star Stories of the Dreaming* has also contributed to making Ghillar a public figure who is often in demand for seminars and programs on Aboriginal science and knowledge. This notice, in turn, has allowed him to continue to make known his strong beliefs about Aboriginal rights and reconciliation with the dominant European culture.

This study of the astronomy and transmission of stories of the Saltwater peoples of the NSW Coast is also intended to be a tool for education of Aboriginal communities, as well as the basis for an outreach program to the wider, non-Aboriginal public. Presently, this wider public, as well as the politicians, both State and Federal, have a view of Aboriginal people as a collective problem, a drain on resources, and an intractable problem regarding health, education, incarceration, and many other issues. These problems do exist, but Aboriginal cultures are also a national treasure that needs to be looked after so that future generations of both Aboriginal and non-Aboriginal people will be able to see them for the remarkable body of knowledge that has survived through many adverse events. Additionally, the benefits for tourism, both domestically and from overseas, are just now being recognised, both by Aboriginal communities and governments.

1.5 Objectives

To achieve the aims of this study, some questions will have to be answered:

- What are the major cultural stories of the Aboriginal peoples of the Saltwater area of the NSW coast?
- How do these stories reflect the astronomical knowledge of these peoples, and are there specific examples that can show the relationship between the astronomical lore and the cultural stories?
- Does a thematic analysis of the major cultural stories and the stories related to astronomy provide a structural basis for further analysis of stories into ‘mythemes’ (à la Lévi-Strauss)?

- Can the identified mythemes be analysed using geospatial techniques, such as phylogenetic analysis, to identify the likely origin locations and paths taken by the variants to the themes?
- Are there identified songlines or Dreaming tracks that present themselves as possible routes of travel for mythemes along the NSW Coast area studied? If so, is there information on the songline theme to connect to the mytheme?
- Does the knowledge gained from this study regarding cultural stories and possible origin and transmission along songlines provide the basis for further study of Aboriginal cultural astronomy and the foundation of the cosmology of the Aboriginal peoples of the Saltwater region of the NSW Coast?

1.6 Structure

This thesis is developed with eleven chapters, five appendices, and a reference section. The first three chapters form the background to the data and analysis and present the argument, the aims, and the objectives of the study, as well as the information about the disciplines, theory, and methodologies used, and the geographical and historical background. Each chapter is described as follows:

- Chapter 1 is the Introduction, and describes the hypotheses or arguments of the study, along with the aims, both academic and subjective, that I hoped would be achieved. Objectives of the study are then listed and will be later used in the analysis.
- Chapter 2 explains the two disciplines that make up the background to the methodologies used in the study. These are cultural astronomy, itself a multidisciplinary field, and ethnography, which is the main anthropological research method for acquiring the data in the study. The main theories of both disciplines are next described, and the theoretical basis for certain decisions made during the study will be identified so that the reader can understand the methodologies used. Those methodologies are then related to the acquisition and analysis of the data.
- Chapter 3 provides the background to the geographical boundaries of the study, the history of the Aboriginal peoples studied, and historical effects which may

relate to the knowledge gained. The geographical area is described both from an ecological and geological viewpoint, as well as the basis for selection for the study. A deep history of the area and its Aboriginal peoples is provided as background, as well as recent history, in particular, of the effect of European invasion/colonisation.

- The data part of the thesis comprises three regional chapters of astronomical and cultural story knowledge obtained during the study. The three regions are the Sydney Basin, the North Coast (of NSW), and the South Coast (Chapters 4 to 6). Each of these chapters covers the communities/language groups in the region, the stories and knowledge obtained specifically to that region, a breakdown of those into thematic categories, and any 'local' issues to that region. Chapter 7 examines major themes and linking stories, and Chapter 8 is a specific study of songlines and Dreaming tracks, both as an attempt to understand them and to identify specific songlines in the geographical area of the study. Chapter 9 describes Archaeoastronomy and its role in Australia, the Horizon tool, and an example of a project.
- Chapter 10 is the analysis of the data presented in Chapters 4 to 8. It will identify common cultural story themes across the entire area of the study, based on the initial thematic analysis in the three regions, and will present an overall thematic analysis leading to a selection of promising mythemes. Those mythemes will be examined using phylogenetic mytheme analysis.
- Chapter 11 is the discussion of the results of the analysis. It is expected that there will be several areas of interest in the results. These include the general topic of cultural stories and their connection to the astronomy/cosmology of the Aboriginal people in specific locations, and cultural stories not necessarily relating to astronomical themes that have geographical connections in the area of the study, as well as cultural stories, both astronomically-connected and not, that have been analysed using mythological techniques to show their origin and travel, which were then identified with specific songlines. Finally, there is an examination of the reflexive cultural position of the researcher in working with Aboriginal peoples and cultures, particularly regarding the crossing of disciplinary boundaries, which this study frequently does.

- Chapter 11 also includes the conclusions of the study about the original aims and objectives of the study. This will include a discussion of the academic implications of the results, as well as an examination of the subjective results and the likely implications of the release of the study to the relevant Aboriginal communities and the wider public. Within the conclusions will be a discussion about the results and how they can be used in the wider objectives of Reconciliation and outreach to the Australian public.
- Appendices: Appendices 1 and 2 are the astronomical story and knowledge databases compiled from the literature study and the ethnography. Appendix 3 is a language database with a wordlist relevant to the study in all the Aboriginal languages within the area of the study. Appendices 4 and 5 are the theme and coding lists used for thematic analysis.
- References consist of the Bibliography.

2 Discipline, Theory, and Methodology

2.1 Anthropology and Cultural Astronomy Disciplines

The academic disciplinary approach to this study is multi-disciplinary. The two main disciplines employed were anthropology and cultural astronomy. Anthropology, in this study, was mainly ethnography in the collection of stories and knowledge from contemporary Aboriginal peoples in the geographical area of the study. This ethnography was supplemented by a historical archival study (literature study) of the relevant literature since European colonisation. The other discipline, cultural astronomy, is described as ‘the interdisciplinary study of ancient, prehistoric, and traditional astronomy and its cultural context’ (Krupp 1994: ix). Cultural astronomy is interdisciplinary in that it includes ethnoastronomy (the study of current or historic societies) and archaeoastronomy (the study of prehistoric societies). Both cultural astronomy disciplines were used in this study. Platt (1991: S82) further complicates the interdisciplinary aspects by calling cultural astronomy ‘the anthropology of astronomy’.

Anthropology, and its data-gathering tool, ethnography, is a discipline well understood, and the theoretical basis used in this study will be examined in section 2.2 of this chapter. Cultural astronomy, however, is not so often discussed or described outside academia. To understand its relevance to cultural studies of Aboriginal peoples, one must examine the meaning of ‘cosmology’ in this circumstance. The word cosmology comes from the Greek word, *kosmos*, which means ‘the universe’, and cosmology is used to describe the worldview or understanding of the apparent universe of a person or group of persons. In the case of groups of persons who were, for the most part, isolated cultures such as Aboriginal peoples pre-European colonisation, their cosmology was how they saw the world around them, including the night sky, under which they lived every night.

Cosmology is not just how they saw the world around them but included their explanations for how things worked. The daytime world around them was explained through their understanding of how the Earth was formed as they saw it, and how the plants and animals came to be and behaved.

Similarly, the night sky and its movements and events needed explanations, and this is the heart of the knowledge that cultural astronomers seek. In this study, I am a cultural astronomer using the techniques of anthropology and cultural astronomy to answer the questions forming the hypotheses. Ruggles (2011: 2) has said that regarding cultural astronomy, 'it is a science (in the broadest sense) asking social questions'. This description is particularly apt in describing some of the conflicts I encountered in carrying out this study and reporting its results, as I was often torn between a desire to seek and report a purely astronomical scientific approach to the knowledge acquired, and the need to place and analyse the knowledge according to the approach by the social sciences.

2.2 Theory

2.2.1 Anthropology

As the questions that formed the hypotheses of this study began to take shape, I realised that while anthropology was one of the two disciplines to be used in the study, anthropology itself has multiple disciplines. Either Boas or Haddon (Hicks 2013: 755) had developed the original 'four-fold approach' to anthropology, which included archaeology, linguistics, physical anthropology, and cultural anthropology. In the case of this study, I concentrated on cultural anthropology, which itself has several sub-disciplines, these being ethnography and mythology.

Ethnography was the major data-gathering tool for this study, as it is for much anthropological research (fieldwork took up approximately 30% of the working time during the three data-gathering years of this study). Ethnography means 'to write about people' and is a research tool used in the study of human culture. Geertz (1973: 6) said 'it is an elaborate venture, to borrow a notion from Gilbert Ryle, in "thick description" (more about thick description later). When it is used to research a cultural group in total, there are clear procedures and methodologies, which include identifying the themes that will be studied, the cultural theory that will be used in the approach, and the method of analysis of the data. Ethnography is usually based on fieldwork and is a personal approach by the researcher. Data collection techniques vary, but the interview is a

common feature unless the researcher is conducting a ‘full-immersion’ study where they live within the cultures and gather data in the form of field notes. There are some theories of ethnography that have developed alongside cultural anthropology. Bronislaw Malinowski (1926) and Margaret Mead (1928) were two pioneers in the field whose ethnographies included the themes of the history of the culture, the physical aspect of the geography (‘Country’ in Aboriginal terms), social structure, language, kinship, and religion. This approach to ethnography is described as *etic*, where the researcher is the outsider and is a ‘culture-free’ approach to the description of features. As ethnography developed, variations to these themes were introduced, including reflexive ethnography, where the researcher is part of the narrative. Clifford Geertz’s description of cultural elements (Geertz 1973: 126), which he called ‘*ethos*’, and various postmodern or poststructuralist approaches that incorporated the changes in cultural anthropology, recognised the viewpoint or perspective of the researcher in the resulting ethnographic narrative. One result of these changes in theory, was the introduction of the collaborative ethnography, where the cultural participant collaborates with the researcher in developing the ethnography. These approaches, when the researcher is part of the narrative, are described as *emic*, where the researcher is an insider, and the culture is described in these terms.

The other sub-discipline of anthropology is mythology, which is the study of myths³ (from the Greek, *mythos* – story). While it is part of the toolkit of cultural anthropologists in understanding cultures, it also is a field of academic research on its own and has had a long history of scholarship as a separate field of study. Some of the well-known social theorists, including James Frazer, Carl Jung, and Sigmund Freud, have used myths in their social theories. Cultural anthropologists, such as Claude Lévi-Strauss (1955) and Malinowski (1926), have used the analysis of myth as part of their description of culture. Many of the early specialists in this discipline, such as Edward Tylor, focused on ancient Greek and Roman myths in the form of heroic stories as a means of showing the progression of human cultures from savagery to ‘civilisation’. This approach was well developed in the description of Aboriginal cultures in the latter part of the 1800s in Australia, with Lorimer Fison and Alfred Howitt (Samson 2017: 47), the founders of

³ Again apologies to First Peoples readers: I am more or less forced to use the term “myth” when talking about knowledge and stories, but that does not mean that I subscribe to the notion that they are ‘fairy tales’. As you will see in further reading, stories reported and collected in this study are given the value placed on them by their sources.

Australian anthropology, corresponding with Tylor in Great Britain and Lewis Morgan in the U.S., both proponents of the Darwinist theory of culture, where cultures progress from barbarism to civilization. It is called the 'progression theory' today, and was described by Tylor (1871). Howitt (1904: 6, 143, 480, 482, 506) used myth in his description of *The Native Tribes of South-east Australia*, and Howitt's contemporary, R.H. Mathews, also featured mythology in *Ethnological Notes on the Aboriginal Tribes of New South Wales and Victoria* (1904: 337-376). If we leave out the use of mythology for supporting out-dated theories of culture, the discipline has several functional elements used in explaining culture:

- Myths are used in explaining cosmologies of people and groups, and are also used in explaining a cosmogony (the group's theory of the origin of everything),
- Myths are used for teaching and reinforcing social orders or rules within the group,
- Myths can be sacred (or religious, depending on definition) for use in establishing and maintaining spiritual beliefs,
- Myths can be used for explaining natural things, such as plants and animals, and the behaviour of the environment, and
- Myths often include stories of creation heroes and supernatural beings.

Theoretic approaches to mythology are many and varied, but all fall into either of two schools of thought: that myths are either literal or symbolic. That does not mean that myths cannot have elements of both, but theories of mythology generally either assume an external source for the myth or that the myth is an expression of human thought. In either case, theory tends to fall into either the functionalist or structuralist schools of thought.

Functionalism, as a theory of anthropology and culture, was developed by Malinowski to show the difference between cultural norms and the actions of people, but it also applies to myths in that they establish norms and what he called 'the sociological charter' (Malinowski 1926: 89). Along with other functionalists like A.R. Radcliffe-Brown, he was taking the discipline of anthropology beyond the outdated concepts of Darwinism

and ‘progression theory’ and avoiding the pitfalls of ‘pseudo-history’ developed for societies that were oral cultures and which were thought could not have accurate histories.

Structuralism, as developed by Lévi-Strauss and applied to myths, suggested that myths contain contradictions in their structure that no person or group can resolve in a normal way. An example would be nature versus culture. No-one person or culture can resolve the difference between these two elements of life on Earth, so a myth is used to resolve the difference. Lévi-Strauss also said that myth should be approached in the same way as language, with the myth broken down into constituent parts, but unlike language, these parts can be understood as ‘mythemes’, which are ‘bundles of relations’ (Lévi-Strauss 1963: 211).

There are further distinctions in mythology which will be examined as a part of the analysis of stories in this study. Realism is related to Malinowski’s functionalism, Jung’s symbolism is related to the psychoanalytical approach, and Mircea Eliade’s approach (as in everything else) is related to the sacred (Eliade 1966: 262). These are by no means the only theoretical approaches to mythology. A survey of some of the literature came up with 19 different theoretical approaches, from Folklore Studies and Anthropology to Gender Theory/Queer Theory. In this study, I will stick to the anthropological school of structuralism, as mythemes appear to be an excellent approach to the analysis of origin and dispersion of thematic relations between versions of stories.

Finally, it would be unwise to discuss the theory used in this study without examining the overall theories relating to anthropology.

As this study will be limited to the field of cultural anthropology, some examination of the theories is necessary. Cultural anthropology is a discipline developed relatively recently in the nineteenth and twentieth centuries, and there are numerous schools or theories, which are covered in brief as follows (from Diah et al. 2014: 155-163):

- Evolutionism, which I discussed before, was developed by Herbert Spencer (1891: 4-7) and Charles Darwin (1859) and was actively promoted by Tylor (1871) and Morgan (1877). As discussed, it was a theory based on the idea of culture being a progression from a so-called ‘primitive’ state to the ‘civilised’ state found at the time in Europe and the West. It is largely discredited today (Sanderson 2006: 435-436).

- Diffusionism is described as ‘the spread of certain ideas, customs, or practices from one culture to another’ (Ember et al. 2011: 20). Egyptologists in Britain developed this theory, and it was based on the idea that people were un inventive and were more likely to borrow ideas from other cultures rather than invent them. Diffusionism is probably still alive today in Australia, with some persons refusing to accept that Aboriginal people were capable of independent invention and citing often dubious evidence of Egyptian presence in Australia, such as ‘hieroglyphic’ (Kmtesh 2012) rock engravings on the NSW Central Coast. The tendency of diffusionists to explain the lack of evidence of outside origins in culture as being caused by ‘becoming degenerate’ has led to no current interest in this theory (Smith et al. 1927).
- Historical Particularism was developed by Franz Boas (1920), who was considered the father of American anthropology. His theory was based on extensive fieldwork, and he criticised ‘armchair anthropologists’ and evolutionism as being ethnocentric. He introduced ‘cultural relativism’ to avoid categorisation of cultures as ‘savage’ or ‘civilised’. The ‘Noble Savage’ idea was revived by Lovejoy and Boas (1935) after a long history dating back to the Roman general, Tacitus (in writing about the Germanic peoples). Rowland (2004) has said that the idea of the ‘noble savage/ecological noble savage’ in respect to Indigenous peoples ‘freezes them into the past’.
- Functionalism is one of the major influences on anthropology. It is based on the idea that the function of an aspect of a culture is to maintain that culture. Radcliffe-Brown (1931) and Malinowski (1926) are recognised as important functionalists in their anthropological research. A criticism of functionalism is that it paid too little attention to the need for change in cultures.
- The Culture and Personality School was developed by Ruth Benedict (1935) and Margaret Mead (1928) in their practices as ethnographers; Benedict with Native Americans, and Mead with Samoan people. Their theory was that personality patterns in their participants were a function of the socialisation practices of the culture. This theory suggests that personality traits are not biologically-derived but culturally established.

- Structuralism is a major influence on anthropology. This school of thought says that no feature or function of culture can be understood in isolation to the larger structure of which they are a part. Lévi-Strauss (1963) is the most important scholar who worked in structuralism, and his structural approach to myths is one of the methodological approaches to stories in this study.

There are other theories of culture used in anthropology, including Cultural Ecology and Neo-evolutionism, Cultural Materialism and Marxist Anthropology, Symbolic and Interpretive Anthropology, and Feminist Anthropology. These have their place in anthropological theory, but none appear to have any relevance to this study. Of the theories I have described, structuralism, as applied to mythology, may be the most relevant to the analysis of the stories collected. Structuralism can be considered to be an interactive approach, which now dominates social sciences like anthropology and human geography. In this study, structuralism will be applied by the use of Lévi-Strauss' mythemes, which will develop themes that can be used in thematic analysis (to be described in Methodology). Pettit (1977: 81) describes Lévi-Strauss' idea of themes in myth:

Lévi-Strauss' idea seems to be that the significance of a piece of music does not lie in the sequence of sounds which it represents but in the structure of sounds, the contrasting intervals, tonalities, phrases and so on, that it presupposes and puts into play. Similarly the significance of a myth lies in the structure, the contrasting themes, which it puts into play. It is not just that the myth could have no dramatic value without that structure already existing in the native's mind and world. The whole value of the myth seems to be that it presents that structure to the native and allows him, albeit unconsciously, to come to terms with it-even gives him the feeling that the polarisation of the structure can be overcome, that it is not something absolute.

It is interesting that Pettit brings Lévi-Strauss' ideas of music into this description, as music has been described as the 'repository of Aboriginal knowledge' (Ellis 1985: 5).

2.2.2 Cultural Astronomy

Clive Ruggles, as quoted previously (2011: 2), has said that cultural astronomy is a science asking social questions. If that is the case, should cultural astronomy be considered as a sub-discipline of anthropology, and subject to the same theoretical

approaches, or, as he further asked, should it ‘be viewed more like a set of specialist techniques that should be applied by anthropologists, archaeologists or historians at large whenever they encounter a cultural issue that involves some reference to the sky?’ (Ruggles 2011: 2). If either of these is the case, can cultural astronomy have theories, or is it dependent on the theories of cultural anthropology or history? A review of the history of archaeoastronomy, the branch of cultural astronomy working with ancient peoples’ interpretation of the night sky, may help to answer this question.

Depending on the source, either Hans Nissen (mid-19th century archaeologist) (Ruggles 2005: 312-313), Norman Lockyer (late-19th century astronomer) (Krupp 2015: 269), or Alexander Thom (20th-century engineer) (Salt 2015: 214-215) was the person to introduce archaeoastronomy as a separate field of study. Before this, study and speculation into ancient peoples’ knowledge of the sky was considered a part of history. More recently, Edwin Krupp has popularised the field (Krupp 1978). Krupp, and Ruggles, who is both an astronomer and an archaeologist, have worked to establish it as an academic field of research. Based on the background of its founders, archaeoastronomy and the overarching discipline of cultural astronomy appears to be the child of several disciplines, with the trend towards archaeology as the father. One person who has attempted to answer the question of theory is Stanislaw Iwaniszewski (another archaeologist), who has developed the theory of the sky being a ‘social field’. In this theory, he argues that it is appropriate that cultural astronomers, rather than astrophysicists or historians, should study the role of celestial culture in human populations (Iwaniszewski 2011: 30). He says that understanding of the sky is culturally relevant to the social sphere, rather than the modern astronomical sphere because the ‘social field’ of the sky contains objects that are relevant to humans as having the potential to mediate between humans and the immortal supernatural beings. The social field approach postulated by Iwaniszewski is based on concepts of Pierre Bourdieu’s social theory, which is ‘a system of positions structured internally in terms of power relationships’ (ibid.: 32). Bourdieu was concerned with power and social order:

The ‘field of power’ is thus a key concept for understanding the structure of specific fields. In contrast to other fields, whose content can in a sense be grasped intuitively, the field of power has a more abstract character. It is not linked to a specific activity; it is ‘the space of relations of force between agents or between

institutions having in common the possession of the capital necessary to occupy dominant positions in the different fields (Hilger and Mangez 2015: 1-36).

Iwaniszewski has co-opted this and applied it to the power relationship between humans on Earth and the powerful beings represented in the sky by celestial objects. While Bourdieu was a sociologist and an anthropologist, the idea of a ‘social field’ seems to suit structuralist anthropological theory, on which this study is based.

Ruggles, in his review of cultural astronomy for the Oxford IX International Symposium on Archaeoastronomy in 2011 (Ruggles 2011), looked back 30 years to the first Oxford Symposium (convened by the International Astronomical Union) to see whether archaeoastronomy had progressed in that time in finding a theoretical basis for the discipline. While he found that many of the old arguments about placing the discipline within the scientific community continued, he felt that there had been advances made in developing and using critical methodologies within the discipline. It was also important that social theory was used and incorporated into the discipline, and in summing up the need for cultural astronomy, he said:

The sky is of universal importance. Cultural perceptions of the sky are vital in fulfilling humankind’s most basic need to comprehend the universe it inhabits, both from a modern scientific perspective and from countless other cultural standpoints, extending right back into prehistory. They form a fundamental aspect of people’s conceptions of their own cultural identity. Developing an understanding of these perceptions is a crucial component of Western anthropologists’, archaeologists’, and historians’ efforts to comprehend human conceptions and actions both in the past and in the present. (Ruggles 2011: 15)

This *raison d’être* also applies to cultural astronomers, whatever discipline they feel attached to, be it anthropology or astronomy. In this study of Australian Aboriginal cultures, the different theories of cultural anthropology, ethnography, mythology, and cultural astronomy will be applied as they suit, along with a scientific approach to astronomical data that forms part of the knowledge collected.

Archaeoastronomy, of the two subdisciplines of cultural astronomy, has been long associated with archaeology, and Iwaniszewski (2015: 317) said (in describing it):

.....archaeoastronomy can easily be categorized as a type of a thematic archaeology or as a part of symbolic and cognitive archaeologies.

Further (ibid.: 316):

For the vast period before the emergence of written sources, archaeoastronomy is our *only* means of producing knowledge about the human attitude to the sky.

Left out of much of the history of cultural astronomy is the newer discipline of ethnoastronomy, which was considered the ‘stepchild’ of archaeoastronomy. Lopez (2015: 343) defines it: ‘In this perspective, ethnoastronomy must be understood as the study of practices and representations about the sky in any culture, using the methodological tools of anthropology.’ ‘any culture’, in this respect, means existing cultures and cultures where we have sufficient historical records to reconstruct the culture.

The important aspect of Lopez’ definition is the use of ‘the methodological tools of anthropology’, one of which is ethnography. This study of the cultural astronomy of one group of Aboriginal peoples will use ethnography as one of the two major methodologies, and as Australian Aboriginal peoples are considered to be the oldest continuous culture on Earth (Malaspinas et al. 2016), a combination of ethnography and historical-archival research of the written record since colonisation will hopefully be able to record some of that long cultural astronomy history.

In the last few decades, a number of cultural astronomers have embraced the ethnoastronomical discipline as a means of approaching the cosmologies of existing and surviving First Peoples cultures. I have previously mentioned Ray Norris (working with Yolngu peoples), Duane Hamacher (Torres Strait Islanders), and Trevor Leaman (Wiradjuri peoples), all working in Australia. To them I can add Jarita Holbrook (African, Fijian, and Hawaiian peoples), Clive Ruggles (Hawaiian peoples), Noni Sharp (Torres Strait Islanders), John Goldsmith (Jarú peoples, Kimberley), Hugh Cairns (Wardaman), Javier Mejuto (Basque, Maya, Mosquito), Pauline Harris (Maori), John MacDonald (Inuit), Alejandro Martin-Lopez (Moquoit), Annette Lee (Lakota/Ojibwe), Akira Goto (Ainu), Nancy Maryboy (Navajo), and Wilfred Buck (Opaskwayak Cree).

These modern ethnoastronomers, working in a culturally competent manner (see Section 2.3.1.2), will hopefully do much to recover many First Peoples’ cultural astronomy

knowledge where it has not been completely lost due to colonisation and other impacts on traditional knowledge.

2.2.3 Indigenous Knowledge and Science

In the previous section, there was a mention of ‘scientific approach’. In that context, the phrase was used in a European/Western sense of the use of the scientific method, of which the development has been attributed to the Greeks, Arabs, Galileo, and Bacon (probably all of whom contributed). On the other hand, this study will examine, among other things, the Aboriginal knowledge of the night sky, and how that is related to Aboriginal identity, stories, and other aspects of their cultures.

Practically since its inception as a discipline, anthropology has interested itself in the knowledge systems of [I]ndigenous peoples.....Within the past two decades, however, the object of this interest has been redefined and reified as ‘[I]ndigenous knowing’. (Dove 2003: 213)

Some definitions of ‘science’, ‘Indigenous knowledge’, and ‘Indigenous science’ are necessary, and a project hosted by ANU, ‘The Living Knowledge Project (2008 n.p)’ has the clearest definitions that I have found in my reading:

What is Science?

Science or Western science is the system of knowledge which relies on certain laws that have been established through the application of the scientific method to phenomena in the world around us. The process of the scientific method begins with an observation followed by a prediction or hypothesis which is then tested. Depending on the test results, the hypothesis can become a scientific theory or ‘truth’ about the world.

The history of the development of Western science demonstrates that it developed in Europe, in particular over the last 150 years. Its ‘truth’ relates to certain values and ideas and is not necessarily objective. Although scientists may admit that there are many ways of understanding the natural world, they believe that science is the best way because it is testable knowledge.

What is Indigenous science?

Indigenous science is the science that Indigenous peoples developed independently of Western science. If we understand ‘Indigenous’⁴ to relate to people who have a long-standing and complex relationship with a local area and ‘science’ to mean a systematic approach to acquiring knowledge of the natural world, then Indigenous science is the process by which Indigenous peoples build their empirical knowledge of their natural environment. As is the case with Western science, Indigenous science is the practical application of theories of knowledge about the nature of the world and increasingly Indigenous peoples are incorporating Western scientific knowledge into their practices.

What is the relationship between Indigenous Knowledge and science?

Scientists generally distinguish between scientific knowledge and Indigenous Knowledge by claiming science is universal whereas Indigenous Knowledge relates only to particular people and their understanding of the world.

There are occasions when science takes on board some aspect of Indigenous knowledge but only when it meets the criteria of Western science. Generally, however, Indigenous Knowledge does not fit the criteria for science and therefore is classed as a different kind of knowledge.

Another approach is that science and Indigenous Knowledge represent two different views of the world around us: science focuses on the component parts whereas Indigenous Knowledge presents information about the world in a holistic way. With this analysis, it is possible to see how one system can complement the other. Finally, it is important to remember that in today’s world there is no isolated system of knowledge and that the knowledge systems of all people are constantly changing in response to new knowledge. (The Living Knowledge Project 2008: n.p)

There has been a significant discussion within relevant areas of academia, including cultural astronomy, about the meaning of Indigenous Knowledge (as often used, ‘IK’)

⁴ The original or earliest known inhabitants of an area ([Wikipedia.org/wiki/indigenous_peoples](https://en.wikipedia.org/wiki/indigenous_peoples))

and its relationship to the Western Scientific Method. Agrawal has also introduced the concept of Indigenous Technical Knowledge (ITK) for comparison. He describes the Western Scientific Method as ‘breaking down data and reassembling it’, compared to the ITK method ‘which relies on intuition and observation’. Western science is also an ‘open’ system with alternatives available, where ITK is closed, with one explanation or story (Agrawal 1995: 415-213) .

From the standpoint of education and the Canadian First Peoples, Battiste (2008: 1-4) has described IK as ‘always existing’, and the recognition and intellectual activism of IK today is ‘empowering Indigenous people’ and leading to ‘Indigenous academics developing new analyses and decolonizing methodologies’.

Green (2008: 150-157), who uses cultural astronomies in his discussion on Indigenous Knowledge and Science, has argued that IK and Western Science are not necessarily in opposition. He describes the two theories of Epistemology and Consensualism as they relate to IK and Western Science. Descartes founded the former as a school of universal laws for the production of knowledge (Western Science) (Nolan 1997), and Consensualism (Kusch 2002: 116-117) says that knowledge is the product of social consensus (in this case, IK). Green also brings in the idea of the ‘true enough’ model in physics and IK and looks at Secularism versus IK as a means of explaining phenomena. Cultural astronomy is used as the example, as IK in this field often is beyond the realistic domain of Secularism, but still should be respected because Western Science cannot explain every phenomenon.

Nakata (2010: 56) uses an example of the interface between IK and Western Science in the Torres Strait: ‘A very old wise man from Mer once described it this way: “we no change our ways we plus them in ours”’.

Specifically, on the subject of cultural astronomy, and more to the point of this study, in the context of ethnoastronomy, Ruggles (2009: 7) has discussed the subject of Indigenous astronomies, or ‘cosmologies’. A cosmology is the view of a person or culture of the world around them, including the wider observable Universe. ‘Observable’ may mean different things to a Western astronomer, with their ability to use their instruments to study almost to the Big Bang, whereas an Indigenous person may be limited in their observation only to what they can see with their naked eyes. Ruggles says that Western cosmologies are based on the ‘physical laws’ of Western Science. Indigenous peoples,

with their cosmologies, have developed ‘rich and complex systems to assign meaning and significance’ (ibid.: 7). Their cosmologies have led to the development of social actions and seasonal activities based on observation. Ruggles (ibid.: 11-12) has suggested that ethnoastronomers, in their examination of Indigenous astronomies, use the principles of Neutrality, Participation, and Reflexivity while exploring those cosmologies.

This study is working with IK almost exclusively, only venturing into Western Science when an explanation of a phenomenon is needed in that sense to clarify the observation(s) that led to the IK in point. Whether the IK reported in this study can be considered as Indigenous science will depend on how the knowledge is reported and used in the relevant Indigenous cultures.

2.2.4 Critical Assessment of the Integration of Theories

Grant and Osanloo (2015: 12) said: ‘The theoretical framework is one of the most important aspects of the research, and a component that is often minimally covered in doctoral coursework.’ In my case, there was no doctoral coursework, other than support from my supervisors, and reference to Murray’s *How to Write a Thesis* (2002), which was not overly informative on this aspect. Further complicating a theoretical framework was the cross-disciplinary nature of this study, which included anthropology and its two subdisciplines, ethnography and mythology; cultural astronomy and its two subdisciplines, archaeoastronomy and ethnoastronomy; and Indigenous knowledge systems and science.

Given the complexity of the theoretical framework, this study could have resulted in data approximating a ‘dog’s breakfast’⁵. Hopefully, I have navigated the complexity of theories and settled on the appropriate ones that have led to meaningful results.

The actual theoretical framework used in this study, to review the previous sections, is:

- Anthropology
 - Structuralism using etic ethnography
 - Structuralist mythemes
- Cultural Astronomy

⁵ A ‘dog’s breakfast’, for non-Australians, is colloquial language for ‘a mess’.

- Ethnoastronomy
- Historical-archival research
- Indigenous Knowledge
 - Ruggles' (2009) approach to examining Indigenous astronomies

I have used Grant and Osanloo's checklist (2015: 23-24) to examine how my theoretical framework and the actual study agreed (answers in italics):

1. Which discipline will the theory be applied to?
Anthropology-subdiscipline of ethnography and Cultural Astronomy.
2. Is the theory an appropriate fit with the methodological plan?
The methodological plan was based on the theories.
3. Does the study's methodology draw from the principles, concepts, and tenants of the theoretical framework?
As much as is possible with the cross-disciplinary basis of the study.
4. How big is the theory? Is it well developed, with many theoretical constructs that require investigation or too small in scope to fit with the topic? Have specific concepts and theoretical principles been selected to meet the objectives of the study?
Anthropological theory in general is too large for this study, so I have used the subdiscipline approach. Concepts within those subdisciplines were used to create the methodology and analysis to meet the objectives.
5. Do the problem, purpose, and significance of your study align well with the theoretical framework?
As well as possible given the multiple disciplines.
6. Can the theory be used in conjunction with the research questions being developed? Or do research questions need to be modified to incorporate and reflect theory defined a priori?

The research questions were based on known lack of academic knowledge in the cultural astronomy discipline for a specific geographical area.

7. How does the theoretical framework inform your literature review?

The literature review (historical-archival research) was informed mainly by the lack of existing data in the geographical area, but the theoretical framework was used to prioritise the search.

8. Does the data analysis plan utilize codes determined a priori based on the selected theoretical framework? Or does the data analysis plan allow for the development of grounded, a posteriori codes that can be connected to a new, evolving theoretical framework?

Coding in regard to the thematic analysis was determined as much as possible using the Structuralist mytheme framework. All codes were determined as the data was added, not a posteriori.

9. Does your theoretical framework undergird your conclusions, implications, and recommendations based on the data analysis?

The conclusions and recommendations for future research are based on the theoretical framework as it played out through the data analysis.

2.3 Methodology

2.3.1 Data/Knowledge Acquisition

2.3.1.1 Community Participation

Community participation, once the geographical area of the study was decided, came down to using existing contacts to find new contacts in the communities of the study area. This was done by asking the existing contacts (which were from my previous research during my MPhil, and through colleagues and supervisors) if they had any points of entry to the coastal NSW language groups and communities. This usually led to at least some phone numbers and suggestions of local Aboriginal organisations. In most cases, these contacts led to a local Elders organisation, such as the Yaegl Native Title Claimants group (which was made up mainly of Elders with family history and connections to the area, and were then the core Native Title claimants). Another source of contacts were local language recovery groups, which often had many Elders and community leaders

involved. The last resort was phoning Local Area Land Councils (LALC) and other Government-sanctioned community organisations, and asking for help from them and contacts with neighbouring communities. Usually by this point, the community in question had some ideas of whom I was, what I was doing, and whom in the community might be interested in my study. This resulted in a ‘snowball’ effect where often I was known even before I first approached a particular community (in some cases, I was identified as the ‘star man’, and this became my nickname in the community).

A project information package was developed, containing the Project Description used in proposing the study to the Faculty of Arts and Social Sciences (FASS) at the University of New South Wales (UNSW). It included a description of the research process to be used, and some reference materials to my Gamilaroi and Euahlayi project, including school education materials, academic articles written, and a copy of the *Star Stories of the Dreaming* DVD. These were popular once they reached the communities, and I was continually producing more copies. After some months of research and contact, the organisation of Aboriginal communities in the project area became somewhat clear. Leaving out the Sydney Basin for the moment, starting from the QLD border (and slightly over into Southeast QLD) and moving south, the Aboriginal language groups were: Bundjalung, Yaegl, Gumbayngirr, Dunghatti, Biripi, and Worimi north of the Sydney Basin, and Dharawal and Yuin to the south. The Sydney Basin consists of the following language groups who could be considered as having a connection to saltwater: Awabakal, Darkinjung, Guringai, Gai-mariagal, Gundungurra, and Dharug. Dharawal could also be considered a Sydney language group, and complicating the issue is the Eora People, the name for the peoples of the Sydney Harbour area, which probably incorporated the Guringai, Gai-mariagal, Dharug, and the northern part of the Dharawal peoples. Further complicating this is the suggestion that the Dharug language was the basis of all the Sydney languages, including Dharawal. The issues of boundaries and languages will be taken up in the research.

Many language groups were geographically large enough that there were multiple communities within the group. Before European invasion, these could probably be thought of as dialect groups, but with my research during this project, these communities were broadly based in towns or localities, so rather than get into the contested area of names, I assigned these communities to those towns or localities. As contacts spread from the language groups listed, I eventually ended up with a target list of 25

communities, each of which required individual promotion and visitation. Participation from communities meant convincing the relevant organisation, such as various elders' groups/Native Title corporations or LALCs, to support the project. Support took the form of a simple support letter from an organisation representing the community, which then allowed me to talk to the community and find participants for the project. Often, I had a list of desired participants before I had support from the community, based on advice from others about who were the knowledge holders in the communities. Finding participants was a matter of trying to meet up with people or even groups like elders' groups.

Community participation was, without a doubt, the most frustrating aspect of this study. Most Aboriginal language groups or communities in the NSW East Coast are represented by many organisations. In many cases, all of these organisations operated in one community, and some of the organisations, such as LALCs, were a hangover from Colonial-era Aboriginal structures in NSW such as the Aboriginal Welfare Board (AWB), and still represented a 'top down' approach to communities. The AWB was abolished in 1969, and the *The NSW Aboriginal Land Rights Act 1983* brought in the LALCs (Egin 2012: 216, 237). Unfortunately, community politics being what they are, there were often antagonistic relations between either individuals or entire organisations and trying to weave oneself between community issues while promoting the study to one or more organisation called for patience and diplomacy. Often months would go by after approaching an organisation, only to find that the relevant meeting where the issue was on the agenda was postponed, or that it had been forgotten. I always attempted to meet someone from the organisation to explain the study in detail, but this was not always possible, and it was a case of trying to find someone to act as my supporter on the matter.

In some cases, I spent over a year trying to get a simple letter of support, only to find out that someone had objected in the end. On the positive side, there were some cases where someone in the community took up the cause and supported my proposal successfully. In the end, I could get 21 community letters of support against three outright refusals, and three cases where no decision was made by the end of the study.

Of the 14 target language groups, three (Awabakal, Gundungurra, and Guringai) did not participate in the study (no support letter), and two (Darkinjung and Worimi) did not contribute to the ethnography. Of those five, all were subject to the literature review.

The actual ethnographic fieldwork, over the three years it took place, comprised 24 field trips, totalling 111 days (including travel). These are only that fieldwork covered by the UNSW TR-1 Travel Approval forms. In addition, I estimate that there were at least another 10 or 15 one-day trips around the Sydney Basin to meet communities and participants.

At this point, it will be useful to show the area of the study, which is also the area of community participation (some of the language groups/communities on the map are not part of the study):



Figure 2.1 Area of community participation (AIATSIS Language Map)

In Chapter 3, I will describe the area of the study, including the various language groups and communities contained, but following on to the discussion about Colonial-era organisations, there needs to be a discussion about the connections between the various communities up and down the NSW coast, often as a result of those Colonial-era policies. Starting with the *Aborigines Protection Act (1909)* NSW began to actively control the

lives and locations of Aboriginal peoples in the State under the auspices of the Aboriginal Protection Board (APB), establishing over 30 ‘stations’ in various parts of NSW to control the movement of Aboriginal people (Egin 2012: 110-117). Shortly thereafter (1915), children began to be ‘removed’ from these stations and their parents, and placed into children’s Homes and other institutions around the State, often with no geographical connection to their Country or even the ‘stations’ where they had been living. These were ‘training’ homes where the young Aboriginal boys and girls would be prepared for a life as a domestic servant or labourer. Robert Donaldson, a member of the APB, had been instrumental in crafting the *Aborigines Protection Act (1909)*, where Aboriginal children could be removed without court involvement as a result of an amendment in 1915 (ibid: 117-125). This amendment was also the basis for the removal of Aboriginal children and adoption by white Australians which became the Stolen Generation.

Over 100 years later, in my discussion with community participants, I was often told of their family history, which might include their original Country and language group, followed by a description of one or both of their parents being removed and placed into a ‘training’ home far away from that original Country (in some cases at the opposite ends of NSW). One participant, whose family came from the Eden, NSW area (Yuin cultural group) had been removed to the infamous Kinchela Boys’ Home in the McClay Valley near the North Coast. As a result of these removals, and the subsequent tendency for the removed children to remain in the local area and marry into the local Aboriginal community, it was very common to hear that the family heritage of a participant included two or more cultural groupings (depending on intermarriages, up to four or more). It is, as I have been told, quite common these days for young Aboriginal people, when searching for a partner, to use these connections around NSW to look for a partner whose family might be one of the other, distant, cultural groups in their family heritage. For this reason, I was quite often aware of not only the family connections up and down the NSW coast, but cultural connections where a participant might have cultural knowledge of a number of language groups and communities.

2.3.1.2 Participant Association

Association with individual participants in the study was one of the more enjoyable parts of the process. During nearly three years of fieldwork, I met many wonderful and charismatic Aboriginal people, and some remain friends. Once the hurdle of community participation was overcome, it was a matter of seeking advice from contacts in the

community about who was known to have the cultural knowledge I was seeking. One of my strategies used from the beginning was to participate in community activities, such as reconciliation events like Harmony Day, or voluntarily run presentations on cultural astronomy to interested community members. In some communities, I presented the full theatre version of *Star Stories of the Dreaming* in cooperation with community cultural groups. These resulted in useful suggestions about possible participants, which then often led to complicated approaches through intermediaries until I could meet with the candidates. My experience with potential candidates was quite positive, and many of them were extremely generous in sharing their knowledge. In respect to that knowledge, it was always made clear from the beginning of any discussion with a participant that the knowledge I was seeking was public knowledge, not ceremonial or sacred knowledge, the use of which would be against all my self-imposed guides of cultural competence. Cultural competence, as defined by the small group of cultural astronomers with which I associate, means that we have a set of rules, ethical behaviours, and methodologies which allow us to work within a cross-cultural environment such as Aboriginal Australia.

Cultural competence is more than just ‘doing the right thing’. It is one of the basic tools of doing decolonising research, which should be the aim of any researcher working in with Aboriginal peoples in the modern environment. Linda Tuhiwai Smith advises (2005:88):

Research is not just a highly moral and civilized search for knowledge; it is a set of very human activities that reproduce particular social relations of power. Decolonizing research, then, is not simply about challenging or making refinements to qualitative research. It is a much broader but still purposeful agenda for transforming the institution of research, the deep underlying structures and taken-for-granted ways of organizing, conducting, and disseminating research and knowledge.

I will explore decolonising research further at the end of this chapter, but it should be clear that qualitative research of the type undertaken in this study is part of the significant changes in research with First Peoples worldwide which support the decolonisation process. Howitt and Stevens (2005: 32), in describing the difference between colonial and postcolonial research, said that: ‘decolonising research goes further. Inclusionary research is helping to empower others’.

By the end of the ethnographic phase of the study, I had worked with 37 participants, however, due to various reasons, including inability to match schedules for interviews, a decision by the participant that their knowledge did not qualify them to be interviewed, and various excuses, eight of the 37 did not continue to the interview phase.

2.3.1.3 Ethics

All research conducted with Aboriginal peoples during this study was conducted under the UNSW Human Research Ethics Committee (HREC) approval of the Risk Assessment and Application Form submitted in May 2016 and approved in June 2016. The main operating documents of the Ethics process were the community Support Letter, and the Participant Information Statement and Consent Form (PISC). The latter was the document used in the official relationship with participants.

The ethics process itself created some conflict with the aim of conducting the research in a culturally competent and decolonised manner. Howitt (2002: 5) described this inconsistency:

Rather than disciplining our research to conform to the procedural ethics of the University, we need to discipline the university processes to engage with the ethics of cross-cultural research by taking seriously questions of skills transfers, intellectual property rights of research participants, and the social responsibilities that go with the work of producing and using ideas.

I was satisfied that Howitt's concern about intellectual property rights were well-supported by the PISC form, but the other aspects would have to be done without reference to the official Ethics process. The social responsibilities of decolonised research were undertaken with the intention to use the Giving Back process described in Chapter 1 to fulfill these. This process is further described in Chapter 11. Skills transfers were not a specific feature of my research, but in working with some of the participants, I was able to transfer some skills in the field of cultural astronomy, particularly related to solar observing and searching for Aboriginal solar observatories, to several interested participants.

2.3.1.4 Literature Review

A literature review is a standard approach to pre-existing knowledge in a field of study. Usually, this consists of a deep study of published information available in libraries, and

more recently, online. In either case, the material is previously published or written information. In working with Australian Aboriginal cultures, which were oral cultures until European settlement, the only published information was that of non-Aboriginal writers and researchers up until the 1920s. It was then that the polymath Ngarrindjeri man, David McCar, began to write stories about Aboriginal mythology, first in newspapers, and then the book *Myths and Legends of the Australian Aborigines* in 1930 (it's a sad statement of the times that the book was published under the name of his anthropologist collaborator, William Ramsey Smith). Since Unaipon, there are increasing numbers of Aboriginal writers adding to both research and literature. The antithesis of this is a known problem in the literature from areas of Australia that were subject to early colonisation and destruction of culture, resulting in a limited knowledge of culture, and the consequent paucity of such literature. I have detailed this in Chapter 3 (4.2). Gale (2000: 49) says:

However, Indigenous groups in Australia, who have lost their land, their language and much of their mythology, yet strive to assert their own unique cultural identity that contrasts with mainstream Australians, have little option but to draw on early colonial texts.

Because of this limitation on published information, researchers working in Aboriginal studies often refer to their literature study as a 'historical archival' review, the distinction is that the study would include original manuscripts, documents, and records, as well as electronic records such as sound recordings and audio-visual materials, many of which were the products of early ethnographic research. This in itself is one of the basic limitations to the historical archival review, as Roche (2005: 139) explained in 'The Historian's Standard Question of Documents (after Kitson Clarke 1969)':

1. What was the writer's bias?
2. What was the writer's situation and intention at the time of writing?
3. What were the writer's opportunities for knowledge?
4. What were the writer's general standards of truthfulness?
5. What powers of observation did the writer usually bring to bear (was the writer credulous?)
6. What was the writer's framework of ideas and why did certain words mean when used by the writer?

In the case of most of literature described in the 2.3.1.5 Literature Critical Source Review, particularly the Ethnographers, the sources were generally white researchers from many different educational backgrounds with different biases, intentions, and opportunities for knowledge (as Roche categorises). All sources used in the historical archival literature review were evaluated according to the flowchart in 2.3.1.5, and there were some sources excluded.

The literature review (including the historical archival component) done as a part of this study benefited from several developments in the field of library and archival practices that may not have been available until relatively recently. One of these is the Internet, where, increasingly, anything that can be documented, is documented, at least as a reference. Many publications, both books and journal articles, are available as PDF downloads, once one finds out their location. Working as a researcher within the university environment, the university library is now just as important as a way to access journal articles through the university subscription services to the online databases, as it is a source of hard-copy books. It is increasingly unlikely that a journal series once considered rare is not available in this way. In my case, being a recent alumnus of Macquarie University, and a current student at UNSW, I had access to both libraries, both to hard copy publications and the book and journal database. Other developments in the literature review field include Google® web search and, in particular, Google Scholar®, the latter restricting searches to mainly academic journal articles.

For a researcher working in Aboriginal studies, the heart of available literary and archival material is found at the Library of the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) located in Canberra. From experience, a high percentage of literary references found in this field can be found in hard copy at the AIATSIS library, including many rare books and manuscripts that exist nowhere else. The library is open only to researchers and people working on family history, so it is a quiet environment for research. The Mura® database allows extensive searching of the library, and the combination of the AUSTLANG Australian Indigenous languages database and the Language and Peoples Bibliographies makes searching the library for publications relevant to specific Aboriginal language groups relatively simple. Much of the collection is held in reserve, so having a good relationship with the library staff is essential, and my experience over the past five years has been uniformly positive, as the staff are both

professional and encouraging. For these reasons, much of the literature study was carried out in a series of two or three-day visits to AIATSIS.

Other libraries were sources of material that was not held at AIATSIS, much of it either State or regional material that was rare and kept in special collections. The State Library of NSW is one such library and holds in its collections rare documents related to the settlement of NSW and early language studies. The library of the University of Queensland (Brisbane campus) holds some materials relevant to the very North of the NSW coast. In the Hunter River region, where five Aboriginal language groups are based, the University of Newcastle Auchmuty Library holds a large collection of publications relevant to the region, including the Virtual Sourcebook for Aboriginal Studies in the Hunter Region, which was a particularly useful source of digitised publications. The National Library of Australia in Canberra holds some publications not available elsewhere, including some of the largest collections of early photography of Aboriginal peoples and their cultures, an example being the Charles Kerry collection from the late 1800s. The National Library's Trove database, which is available online, lists all publications with National Library numbers, as well as many specialised databases, including a database of digitised newspapers from all over Australia, going back to the earliest days of newspaper publication. Trove was particularly useful in finding early newspaper articles written by the public about Aboriginal cultures and stories.

The literature review for this study (Appendix 1) covered a broad subject field of Aboriginal cultures relevant to the geographical area of the study. Stories, cultural information regarding ceremonies, songlines, language (mainly vocabulary), and history were the main items sought. From the reference material information was extracted and entered into the study database, and if not relevant to the database, stored for possible relevance during the analysis phase of the study. All the hard-copy photocopies and notes were stored for later reference, and all PDF publications were kept in databases relevant to language group or geographical location.

2.3.1.5 Literature Source Critical Review

Since early reporters on Aboriginal culture and the first ethnographers make up a significant proportion of the literature used in the literature study part of this study, it would be prudent to critically review these sources. Table 2.1 lists all the significant literature sources by the type of source.

<u>Ethnographers</u>
Threlkeld (in Maynard 2004 and Gunson 1974) – missionary (Awabakal)
Needham 1981 – independent researcher (Darkinjung)
Haslam 1979 – University researcher (Worimi, Birpai)
Curr 1887 – early researcher
Enright 1932, 1937, 1939, 1946 – University researcher (North Coast)
Livingston – early researcher (Bundjalung)
Mathews 1897, 1899, 1902, 1904, 1908 – early researcher (Gumbayngirr, Gundungurra, Dharawal)
Norledge 1968 – independent researcher/writer (Bundjalung)
Manning 1882 – early researcher
Ridley 1875 – early researcher/linguist (Kamilaroi)
Howitt (and Clive) 1881 – early researcher (Yuin)
Brothers 1897 – early researcher (Yuin)
McDougall 1901 – early researcher (Gumbayngirr)
Laves 1929 – University researcher (Gumbayngirr)
Morelli 2016 – independent researcher/writer (Gumbayngirr)
Palmer 1884 – early researcher
Gilmore 1935 – early researcher/writer (Yaegl, Bundjalung)
<u>Culturally-connected writers and researchers⁶</u>
Heath 2007 – PhD candidate (Birpai)*
Naputa – culturally connected*
Robinson 1963, 1965 – story collector/writer (NSW)
Peck 1925, 1933 – story collector/writer (Dharawal, Gundungurra)
Roberts 1991 – cultural organiser (Bundjalung)*
Bursill 2014 – cultural researcher (Dharawal)*
Bodkin 2006 – cultural researcher (Dharawal)*
Pankhurst – cultural researcher (Guringai)
Mansell 1953 – culturally connected*
Paulson 2017 - cultural researcher (Gumbayngirr)*
Thomas 1981, 1997 – culture person (Yuin)*
Harrison – culture person/writer (Yuin)*
<u>Researchers</u>
Moore 1981 (Hunter Valley)
Ryan 1964 (Bundjalung)
Organ 1990, 1997 – writer (Dharawal)
Turner 2014 – source Bursill, Honours study (Dharawal, Yuin)
Illert 2003 – linguist (Dharawal, Gundungurra)
Troy 1993 (Sydney)
Willey 1979 – writer (Sydney)
<u>Writers</u>
Hulley 1996
Shepard 2003 (Gundungurra)
Smith 1992, 2003 (Gundungurra)
Hoskins 2013

Table 2.1 Significant Literature Sources

⁶ ‘*’ indicates person identifies as Indigenous

Due to the categorisation of the study of cultures as ‘Ethnography’ in the late 19th century, it is somewhat difficult to classify earlier researchers and writers on Aboriginal culture, but I have included them in the ‘Ethnographers’ category based on their research and writing, which in most cases could be described as ethnographic in approach. ‘Culturally-connected researchers and writers’ are either persons who have Aboriginal heritage or have close personal connections to Aboriginal culture. ‘Researchers’ are generally non-Aboriginal academic researchers, and ‘Writers’ are non-Aboriginal writers/collectors of Aboriginal cultural stories.

All the literature sources were the result of a process of selection and evaluation. Many were known to me as a result of earlier research into Aboriginal culture before this current study, and further sources were identified through the initial literature search described in Section 2.3.1.4. As the literature study progressed, cross-references and other links provided further sources. All sources were evaluated according to a simple flowchart method:

1. Is the source a recognisable ‘serious’ source of knowledge about Aboriginal culture, i.e., more than just ‘children’s stories’?
2. Is the knowledge from the source connected to the area of the study (New South Wales coast)?
3. Does the knowledge fit into the broad classification of ‘cultural stories that connect to cultural astronomy, trade routes and songlines, and connections between the two’?

Once a source passed the flowchart method, the ‘data’, in the form of stories, history, and cultural knowledge, was collected and included in the research database, categorised either by language group, community, geographic location, or where these were not clear, in categories more related to the cultural astronomy aspects. This database was then used when researching the relevant communities included in the study.

One of the more difficult aspects of a study such as this one, based on a geographical and cultural area, is how to evaluate the ‘authenticity’ of literature sources. Firstly, ‘authenticity’ itself has to be defined in relation to the aims of this study. As the literature sources date from as early as 1834 and as recently as 2017, there will necessarily be varying ‘distances’ from the Aboriginal culture where the knowledge originated. Even in

1834 the source of knowledge reported would have been substantially affected by invasion and colonialism, and the later the source, the more layers and levels of repetition and possible modifications could be added (an example being Lancelot Threlkeld 1834). In my literature research and study, I tried as much as possible to use the reputations of the earlier sources as a guideline as to how much I could depend on them for accuracy. In this, I was able to use some reviews/biographies of a few of the earlier sources to establish a level of confidence in their reporting. In the case of R.H. Mathews, who, with Alfred Howitt, is considered one of the first professional ethnographers in Australia, *The Many Worlds of R.H. Mathews* (Thomas, 2011), a study of his life and work, was able to provide me with sufficient confidence to use his work extensively. Howitt, however, seems to have suffered with biographers who only documented his exploring achievements (he led the search for Bourke and Wills), and not his ethnographic achievements, so in his case, I had to make do with some more recent commentary on his work with the Yuin people of the South Coast.

The rest of the ‘Ethnographers’ mainly fall into the categories of ‘independent researcher/writer’, which is the case with many of the sources from the 19th century, and ‘University researcher’, which is more often the case with sources since 1900. In evaluating the stories and knowledge from these sources, it was often possible to cross-reference either sources from the same category or in some cases, more recent sources, which in some cases provided some degree of support for the knowledge reported. There is a risk in this, however, as it is quite possible some of the later sources may have used the earlier sources without proper referencing, thereby reinforcing incorrect information.

The ‘Culturally-connected researchers and writers’ are generally, as mentioned, persons with either relevant Aboriginal heritage, or close connections, and most of these sources are relatively recent. In some cases, I was personally acquainted with the source and have made my judgements about their authenticity based on that, and in other cases, the knowledge has been published and reviewed/commented upon by contemporaries, which has given me some confidence in the source. In the case of C.W. Peck, who collected stories from the Dharawal and Gundungurra peoples in the 1920s, one of the ‘Researchers’, Michael Organ, has written a study of Peck, his sources, and stories (Organ 2014), which was useful in evaluating Peck’s stories.

The ‘Researchers’ are mostly recent (since 1964) sources and are mostly academic researchers working in areas such as linguistics and cultural astronomy. Most of the sources are academic journal articles (one is a book), and most of them have been peer-reviewed, so I have been confident in their use as sources.

Finally, the ‘Writers’ don’t fit into the other categories. Two of the sources are known experts on the Aboriginal stories of their region, and of the other two, one has published a story collection and the other a history of the NSW coast.

In the end, whether the literature sources are sufficiently accurate enough to use them as the background to an ethnographic study depends on several factors:

1. Did the source record the knowledge accurately, or was it filtered through the ‘colonisation’ filter so prevalent up until even the early 20th century?
2. Has the current ethnography from this study either confirmed the original source knowledge or has the ethnographic source been influenced by the literature source(s)?

In regard to the first question, there is no absolute answer, and I have tried to factor this uncertainty into the use of literature sources in this study, discarding some stories and knowledge items where I felt the literature had not clearly shown the source. This is a common problem when accessing the broad field of writing about Aboriginal culture. There were many sources that would have made interesting connections to the stories and knowledge used in this study, but came from literature sources that were either unidentified, or even identified with known inauthentic sources. Within some of the communities in the area of the study, there were also ongoing arguments about authenticity and even the Aboriginality of the sources.

Regarding the second question, this was one of the more difficult aspects of the ethnographic process, as it was extremely difficult to distinguish between ‘original’ cultural knowledge of the type passed down from generation to generation, and cultural knowledge that was obtained from the same historical archival sources that I used in the literature study (or a combination of both). In some cases my relationship with the ethnographic participant was such that I could ask this question, but I suspect in many cases where the knowledge was a combination of sources, the participant themselves may not have known the source of their knowledge. For this reason, much of the results of the

ethnographic study could be considered to result in ‘post-colonial’ knowledge, in itself not necessarily inauthentic, but just a mixed source.

2.3.1.6 Ethnography

As a candidature for a degree in Ethnography, this study had at its core a requirement that ethnographic knowledge would form a significant part of the study. In reality, the ethnography would be used to tie together the knowledge acquired over the whole of the study, and in a few cases, provide some of the kernels of knowledge that would confirm or refute the hypotheses. Most importantly, the Ethnography would recognise the importance of respecting the Indigenous voice in regard to the results of this study. As mentioned in the previous sections, much of the literature examined, after the in-authentic sources were eliminated, still were white, and often, colonial sources. These sources spanned the breadth of disciplines interested in Indigenous knowledge and culture, including professional and amateur anthropologists, historians, and collectors/publishers. The risk of using some of this literature without careful consideration would be to conflate this with some results of the Ethnography where the two sources may have been the same (i.e., the ethnographic participant obtained the knowledge from the same literature source). In some cases this would be acceptable, as the participant knowledge would be sought to get a modern perspective, but this needed careful consideration.

The ethnographic approach taken during this study was that of an etic researcher, an outsider to the relevant community, and the data obtained would be treated in this manner, as well. This did not mean that I was not involved in the communities and with certain individuals, and that aspect of the study will be covered in more reflexive parts of this thesis. The actual ethnographic process I proposed to use is known as Participatory Action Research (PAR), which emphasises that research should have an action for change (in the case of this study, Reconciliation), and participation of both the researchers and the participants/communities. In the reality of the study, PAR in its proper methodology, which requires deep relationships with the participants and communities, preferably Memorandums of Understanding (MOUs), and cycles of action/reflection (Kindon 2005: 210-211), was just not suitable for working with 25 communities spread over 1000 km of the NSW coast. While I formed some lasting relationships with some communities and many participants, there was neither the time nor the resources to carry out the study using the PAR methodology.

The ethnographic process, as a result of my recognising early that PAR would not be possible, changed into a methodology that I had previously used in my research with the Euahlayi (Fuller 2014). This methodology, which I really did not have a name for in the beginning, has turned out to be a combination of the *Talanoa* methodology used in Pacific and Oceania research, and the ‘yarning’ methodology now being promoted by some Australian researchers. *Talanoa*, which is now the most prominent research method across the Pacific (Farrelly and Nabobo-Baba 2014), uses private, informal chats between researchers and participants. ‘This is because these forms of *Talanoa* provide opportunities to (at least in my participants words) talk “straight”, not otherwise afforded in formal *Talanoa*. “Talking straight from the heart” opens up space for greater empathic understanding – this is the *emic* perspective sought by all good ethnographic researchers.’ (ibid.: 3). This would seem ideal for an *emic* researcher, and it is clear that *Talanoa* requires long periods of participant-observation, which, once again, does not suit my many communities, participants, and long distances.

‘Yarning’, which is a method of Aboriginal discourse known throughout Australia,

..enables Indigenous people to talk freely about their experiences, thoughts and ideas, and enables the researcher to explore the topic in more depth, which results in information emerging that more formal research processes may not facilitate. (Bessarab and Ng’andu 2010: 47)

Fredricks et al. (2011: 13) describe ‘yarning as an action research process’, while Geia et al. (2013: 16) say that ‘yarning helps facilitate in-depth discussion that result in thick description’ (which is one of my desired research outcomes). Of particular interest to me, based on my previous experience with ‘yarning’, was the comment (ibid.: 14) that, ‘in some respects within research, Indigenous people are now becoming the teachers and the Western researchers are becoming the learners....’. This was very much my previous experience ‘yarning’ with culturally knowledgeable participants, and one which I welcomed on occasions during this study.

The contrast between my *etic* approach, and the *emic* methodologies of *Talanoa* and ‘yarning’ is not such a gulf as it would appear. While *Talanoa* clearly required an *emic* approach, ‘yarning’ can be done without necessarily embedding the researcher in the community. This is seen throughout Australia whenever Aboriginal people from different communities sit down to ‘have a yarn’.

The ethnography was done with the participating persons through interviews. In every case, the participants were modern, educated individuals, and treating the ethnography as some attempt to record some 'primitive' culture would be both insulting and highly unproductive. Just because a participant was knowledgeable about their Aboriginal culture did not mean that they were not sophisticated in working with researchers into that culture. The interviews were face-to-face, often after some months of introduction to the community and the participant, and the location was usually at the choice of the participant. Some participants wanted to do the interview in comfortable surroundings, such as their home or a cafe, and others wanted to have nature in the background. My approach to the interview was to ensure that the participant understood the basis of the study, and that the main interest was in the astronomy of the community's culture, and that I was interested in the possible connections between stories and songlines. I normally took notes, and on occasion asked permission also to record the interview on my iPhone, allowing me to transcribe it later. This was the case when some of the interviews took place at night. The interviews were interactive, with questions often directing the participant towards information that I was seeking, but it was in an open format, not a question and answer approach. I tried to limit the interview to an hour or two, often with a break, and this depended on whether there was a possibility of a further interview at a later date. Participants were not rewarded monetarily, but if possible, I tried to include a lunch or afternoon tea in the process.

Once the interview had been done, I transcribed my notes (and recording, if applicable) on to a form that I had developed as part of my MPhil project at Macquarie University. This form was titled 'Story Collection Review Form', and lists the participant and researcher's names, the date of the meeting, and the date of the PISC form. The transcribed notes are entered on the form (readability is ensured through the form being digital and then printed out). There is a place for the participant to sign their approval of the notes. The form is then emailed or delivered to the participant for review, along with a stamped envelope to return one copy to the researcher. Once approved, the data (stories and knowledge) could be used in the study. The purpose of this approach was to ensure that (1) the participant was satisfied that what the researcher recorded was what they said, and (2) that sensitive cultural or ceremonial knowledge had not accidentally been included.

To ensure integrity and security of the data, particularly from the ethnography, a Research Data Management Plan (RDMP), H0234544, has been developed through UNSW ResData, and all data from the study will be deposited for seven years after completion.

One of the most important aspects of research into Australian Aboriginal cultures is the understanding of Intellectual Property (IP) rights of the participants. I, as the researcher, and UNSW (as I understand the relevant policies) have a clear understanding that stories and knowledge identified as belonging to a person or community are the IP of the persons or communities. Stories are part of the cultural heritage of Aboriginal peoples, along with song and art, all of which are fundamental to their spirituality. As a part of this issue, participants in this study had the option to be acknowledged by name as a part of this thesis, or to remain anonymous. Where it was necessary to identify the source of a story or knowledge of a participant in any publication, that person was identified by their 'P' number, which is the Participant number used internally in the study to identify ethnographic sources. In this thesis, where it is necessary to identify a participant, the "P" number will be used, but no other means of identifying the source. In Appendix 2, which is the Ethnographic Database, the Language Group of the participant source is used, but not the "P" number, as this might provide too much identification information. In two cases, participants were identified with their stories and knowledge; Les Bursill, who was Dharawal, and specifically instructed that he be identified, and Robert Pankhurst, who is not Aboriginal, but received his knowledge from the Guringai community.

I am aware of the Aboriginal practice of using levels of access to meaning in stories, where the meaning and detail in a cultural story are different depending on the level of initiation, gender, and age of the person learning the story. In the case of this study, I attempted, with the help of the participants, to limit the level of the stories and knowledge recorded to that of a non-initiated person, and to the best of my ability, ensured that the stories reported did not have gender restrictions. The Story Collection Review Form was part of the process to try and filter out knowledge that was not appropriate to the general public.

2.3.1.7 Ethnography Critical Review

Like the Literature Study, the Ethnographic Methodology and process used in this study should be critically reviewed. Unlike a 'classic' observational ethnographic study where (1) 'observation should take place in a natural setting', and (2) 'researchers must

understand how an event is perceived and interpreted' (Nurani 2008: 442), this study is not observation-based. Also unlike a 'classic' ethnographic study where non-specific research questions are used (ibid.: 447), I formulated two hypotheses prior to the research to ensure that the research would at least attempt to prove them, and focus on the purpose of the research.

Ethnographic methodology is a broad church, as described by Wolcott (1990: 47):

Because ethnography undergoes the constant buffering of critical analysis, it can appear not only remarkably adaptable but maddeningly ambiguous, except that *in its discipline of origin* the underlying rationale for doing ethnography is understood to be cultural interpretation.

Which (cultural interpretation) is the aim of this study, focused on the interpretation of cultural astronomy through, partially, the ethnographic method.

As described in the Ethnographic Methodology, the research would be as much as possible based on an etic approach, but it was intended that there would be a clear reflexive communication model with the participants. I have since seen this described by Bergman and Lindgren (2018: 479) as incorporating 'reflexive discussions with participants'. They also described this approach as a 'complex collaborative process' which should not 'blur the role of researcher and participant'. Their five step process clearly reflects most of my model, as well (ibid: 480):

- establishing contact with key participants,
- discussions with the representatives,
- sharing reflections with the participants,
- communicating results, and
- pointing out alternatives.

In the case of this study, the 'key participants' were the actual knowledge holders, the 'representatives' were the community organisations supporting the study, and the 'sharing' and 'communicating' was the actual process of 'yarning' and going back and forth over the stories and knowledge provided by the participants. The 'alternatives' were the possible other interpretations of those stories and knowledge.

In collecting, analysing, and reporting the ethnographic data, I very much tried to follow Mansvelt and Berg's suggestion (2005: 257):

Because the practise of writing is not neutral, the voices of qualitative researchers do not need to hide behind the detached 'scientific' model of writing. Reflexivity is the term often used for writing self into the text.

What I clearly did not want to replicate in this study was the traditional ethnographic process which had often taken place in Australia since the late 1800's , and which Nakata (2007: 101) described as (in respect to ethnography in the Torres Strait):

Ethnology and early anthropological practice in a way that not only framed the snapshot but also provided a background against which Islander society itself became in reality little more than an offstage presence imagined into being by a scientific audience.

I believe the Ethnographic Methodology approach to this study has been successful in avoiding the pitfalls and cultural incompetence of some 'classic' ethnography, and through the use of the reflexive communication model, has created a working relationship with the communities studied which shows potential for future collaborative work in this field.

I have also carefully reviewed the results of this study in respect to the risk of conflation of white, colonial voices with the Indigenous voices of the ethnographic process, and I believe I have been successful in avoiding any cases. In the case of the most significant finding, the Black Duck songline, I believe the Indigenous voice is strongly represented in the knowledge.

2.3.2 Analysis

2.3.2.1 Thematic Analysis

Dunn (2005: 100), in respect to analysing interview data, proposes 'latent content analysis', which involves searching the data for themes. A coding system should be used to sort and retrieve the data. I conducted a thematic analysis of the stories and knowledge collected, both from the ethnography and from the literature study, to search for patterns and used them to create codes. I then combined the codes into themes, defined each theme, and used the major themes to create a 'thick description' (Geertz 1973: 2-30). This approach was used, but only in a gross manner, to create themes for comparative

analysis. The description of the themes from the analysis can be broken down into the following:

- the explanation for natural events, including meteors, the phases of the Moon, and where light and heat come from,
- the origin, behaviour, and eventual location of the creator hero(es), which seem to universally come from the night sky and return there after the creation of the Earth's features and providing Law,
- the explanation for how individual night sky objects, such as stars and asterisms (such as the Pleiades) came to be in the sky, and what caused some of their properties (such as colour),
- moral messages relating to the breaking of Law,
- a connection between the night sky and resource management, and
- descriptions of the physical features of the night sky, and relationship with the country on Earth.

The themes were used for creating a comparative analysis between language groups and communities, as part of the initial attempt to find common themes in the coastal communities, and as an indicator of the depth of available knowledge about stories from differing locations along the coast.

Thick descriptions are a tool used in symbolic or interpretive anthropology, which are studies of the way people understand their surroundings, including other peoples' descriptions of such (Des Chene 1996: 1274). They also study symbols and processes, such as myth and ritual (Spencer 1996: 535). In the context of cultural astronomy, symbolic or interpretive anthropology examines the cosmology created by each of these peoples, who are attempting to put meaning to their universe as they see it, in this case, their universe is the night sky and their Country, which reflects the night sky. The interpretation of stories and myths using thick descriptions is more suited for emic ethnography, where the researcher participates in the culture, but also has some utility to identify the cultural context attached to this knowledge.

Hamacher (2018: 89), in describing Aboriginal knowledge and interpretation of variable stars, said:

Multifaceted and multi-layered Indigenous Knowledge Systems contain *a priori* and *a posteriori* forms of knowledge. These explain the origin of natural features, the dynamics of natural processes, and various natural phenomena through deduction, observation, experimentation, and experience. This has application to ecology (Prober et al. 2011), astronomy (Cairns and Harney 2003), meteorology (Green et al. 2010), geological events (Hamacher and Norris 2009), and physical geography (Nunn and Reid 2016). An anthropological understanding of this knowledge can help us gain a better understanding of the development of Aboriginal cultures, how Aboriginal people understand their worldview, and the myriad ways in which Western academia can learn from these traditional Knowledge Systems for mutual benefit.

2.3.2.2 Mythological Analysis

When this study was proposed to UNSW for a PhD candidature, I had recently completed an MPhil degree in Indigenous Studies where the research project was a study of the cultural astronomy of a specific Aboriginal community (or two communities, as it turned out). Much of the knowledge gained was in the form of stories and their link to culture and landscape. The word ‘myth’ was something of an offence to the people I was working with, as myth in the Aboriginal cultural context had become a somewhat pejorative word, having been used by non-Aboriginal collectors and publishers of Aboriginal stories to convey an idea of ‘primitivity’. More recently, myth has been used interchangeably with ‘stories’ in a more respectful manner. As a result, my self-education into the ancillary field of mythology was quite limited until I began working out how I was going to analyse the knowledge from this PhD study and use it to examine the hypotheses. What followed was an intensive self-education in the mythology discipline, one which is still on-going and has become a separate interest.

As mentioned in the Theory section, Lévi-Strauss’ school of Structuralism appealed to me due to its tenet that components of cultures cannot be understood in isolation. My fieldwork experience had shown me that this applied to Aboriginal cultures, particularly the cultural astronomy of Aboriginal peoples, where an entire belief system about the cosmology of the community or language group was formed from knowledge of the night sky. Taking this a further step, the application of structuralism to mythology by Lévi-Strauss led to his theory of mythemes (1963: 211), which fits well with my approach to the thematic analysis of stories and knowledge. In my case, thematic analysis is the very

rough first approximation of mythemes, and the actual definition and analysis of mythemes could lead to some answers to questions such as origin and transmission of Aboriginal myths and stories.

Lévi-Strauss, as the developer of the theory of mythemes, also developed some analytical approaches to myth. He said that mythemes were the subcomponents of myth, in that each myth has many mythemes (he called them ‘bundles’ (1955: 431) – Latour (2005) calls them ‘assemblages’) which make up the myth. These can be analysed for use in comparison to other versions of the myth, which is exactly what this study will attempt to do, as finding the origin and transmission of Aboriginal stories along the NSW Coast will be part of determining the means of transmission across the landscape, and whether this was by way of songlines and Dreaming tracks. Other structuralist analysers of myth, such as Vladimir Propp, treated myth as language, and the mythemes as the components of language, which have well-known analysis methods used to find connections between languages, and plot their geographical connections. Lévi-Strauss used the language component, the phoneme (Lévi-Strauss 1963: 20) (which is a sound), as the equivalent to the mytheme (that is no doubt how Lévi-Strauss came up with ‘mytheme’).

While this is interesting, I am not a linguist or a trained mythologist, so a means to isolate and analyse mythemes would be necessary if I were to use the mytheme approach to analysis in this study. There are many ways to analyse myths, but most of these are directed to understanding the underlying human thought and purpose behind the myth, not so much the origin and transmission. One of my colleagues mentioned a method developed by Julian d’Huy, a French researcher in this area, so I read most of his publications in English (there are many still in original French). He has developed a research method he calls the ‘phylogenetic approach’. Phylogenetics is a method of examining the evolutionary relationship between different groups of animals and plants on Earth (these groups are referred to as ‘taxa’). It uses heritage established by genetics to create a relationship between taxa, which is a phylogenetic tree. Most people are familiar with the evolutionary tree of life on Earth (from slime mould to humans, as an example). A phylogenetic tree is the same type of tree but applied to a much more limited range of groups or taxa. So, what does this have to do with mythology? d’Huy has cleverly treated mythemes, as developed by Lévi-Strauss, as the individual genetic characteristics of the myth, just as genetics describes the genetic characteristics of organisms. According to d’Huy, the myths that he has analysed have many components

(mythemes), which are determined from multiple versions of the myth found in different cultures. These mythemes are listed in a table against the cultures (language groups in my analysis), and each mytheme is given the property of 'No = 0' 'Yes = 1' against each language group. This data can then be analysed by several phylogenetic software programs (an example being Mesquite) to create a phylogenetic tree of the myth and its relationship to cultures/language groups. d'Huy appears to have shown a high level of confidence in the ability of this analytical approach to determine the origin and transmission of myths.

I originally seized on this analytic method like a drowning man to a life ring, but further investigation has shown that the process is not quite so simple as I have described. d'Huy has many subroutines to the apparently simple process of breaking myths down to their mythemes and running them through a software process, but the underlying process does show promise for the analysis of the stories in this study.

I also heard some criticism of the d'Huy phylogenetic research method, which d'Huy himself answered (2016: 6) (translated from the French):

However, the fact that a similar organization can be found, produced from a completely different database of the previous ones, may be enough to prove to sceptics that the phylogenetics of myths meets the scientific guarantees of reproducibility and repeatability.

D'Huy was referring here to his work with the myths of the hunters pursuing a bear which becomes the eponym of the constellation (*ibid.*: 1-2) (in this case, Ursa Major in the northern sky).

Further researching the phylogenetic method, I found that there were significant numbers of other researchers using variations of the phylogenetic mytheme analysis methodology in working with folklore origins, including da Silva and Tehrani (2016: 9) who said:

Comparative phylogenetic methods provide a powerful set of tools with which to investigate these hypotheses more scientifically. We anticipate that future studies in this area will not only shed new light on the origins of fairy tales, myths, legends and other types of traditional narrative, but also offer novel and complementary perspectives on archaeological, genetic and linguistic reconstructions of the past.

I also contacted Dr Lionel Sims, a respected cultural astronomer and folklorist, and Emeritus Head, Department of Anthropology, Development and Politics, East London University. I had met Lionel at a conference in 2017, and asked him his opinion of d'Huy's work (pers. comm. June 5, 2020). He felt that d'Huy's work was good, although in a field with a lot of debate, and suggested that I follow his references to see the extent of the scholarly network that 'he and others are immersed in'.

Even if phylogenetic analysis is not the answer, some form of analysis of the mythemes in the stories collected in this study will be required to answer the questions about the origin, transmission, and routes of transmission.

2.3.2.3 Decolonising Methodologies

When I was commencing the MPhil in Indigenous Studies at Macquarie University in 2012, the first thing my Supervisor said was: 'find a copy of Linda Tuhiwai Smith's *Decolonizing Methodologies* and read it before you do anything else in this field'. I proceeded to do so, and as a researcher, and an anthropologist returning to the field after a 40-year break from an undergraduate degree, the first things I encountered in reading was 'research' is probably one of the dirtiest words in the [I]ndigenous world's vocabulary' (Smith 2012: 1) and, 'many [I]ndigenous writers would nominate anthropology as representative of all that is truly bad about research' (ibid.: 11). I wondered what in the world had happened in the intervening 40 years since I had been reading about Margaret Mead and '*Coming of Age in Samoa*'? An audited undergraduate course on 'Doing Ethnography' undertaken soon after disabused me of any romantic notions of the intervening 40 years in the field of anthropology. There appeared to have been several culture wars in the field, and worse, some major scandals involving ethnography, including paedophilia!

In any case, *Decolonizing Methodologies* gave me the heads up that if I were going to do ethnography, I had better learn how to do it right, and in the correct interests of the Indigenous peoples I was going to study. Along the way, during that study of the cultural astronomy of the Gamilaroi and Euahlayi peoples of Northern NSW, I had plenty of opportunities to counter the almost automatic response of people I approached to dismiss 'research' as something they did not want to be involved in. I obviously learned the correct lessons from Smith and others, as, in the end, I was able to complete that research project without incident, and eventually returned the knowledge gained to the

communities involved in the form of educational material and a documentary production that was shown on National Indigenous TV (NITV).

In preparing for this study, I became aware that Smith had since published a second edition of *Decolonizing Methodologies, Research and Indigenous Peoples*. I have reviewed this edition, which has added some chapters expanding the theme of the original publication to include an agenda for the development of Indigenous researchers (the researchers themselves are Indigenous). As I am not Indigenous and come to this study as the almost classical non-Indigenous researcher that Smith has painstakingly described as the problem, what can I take from this and other commentary on the process of decolonising the methodology of Indigenous research?

- As I learned from my reading of the first edition of *Decolonizing Methodologies*, Smith has produced almost a checklist of what not to do when conducting research with Indigenous peoples, and that has provided a near-checklist of how my research methodologies and practices should be structured.
- I am probably what was termed in my native U.S.A. as a ‘bleeding-heart liberal’. I couldn’t imagine that I could fall into the practices of Imperialism and Colonialism in my research, but these terms cover a broad swath of personal views, some of which I had no idea I might have developed over my life of interaction with many peoples and cultures. Reviewing all of my attitudes to the cultures I was studying showed that I had not quite divested myself of all the negative ideas about Indigenous peoples that I thought were gone.
- Smith became a useful review of some of the issues in my research that had to be correct and developed before I commenced my fieldwork. These included ethics, intellectual property, personal codes of conduct, and correct development of research questions.
- For the last point, research questions, Smith (2012: 175-176) created a useful checklist for her theoretical Indigenous researcher:
 1. Who defined the research problem?
 2. For whom is the study relevant?
 3. What knowledge will the community gain?
 4. What knowledge will the researcher gain?
 5. Likely positive outcomes?

6. Possible negative outcomes?
7. How to eliminate the negatives.
8. To whom is the research accountable?
9. What processes are in place to support the research, the researched, and the researcher?

Most of Smith's points apply to my research. One of the important tasks in the latter stages of the fieldwork for this study will be to look at possible outcomes and accentuate the positives while eliminating the negatives as much as possible. Once the results of this study have been submitted for review, the stories and knowledge from this study will be further developed for use by the communities from which it came, and in keeping with the spirit of *Decolonizing Methodologies*, the story must be right.

2.3.2.4 Indigenous vs. European view

In my research, as will be seen by the data and results, one thing does seem to be lacking – that of an Indigenous view of all the theories, findings, and speculation about Aboriginal cultures. The view of such is pretty much focused on the outsider/European view when it comes to making sense of the data. I have searched the literature pretty thoroughly for such an Indigenous view of the main subjects of this study, cultural astronomy and songlines. While there have been a few Aboriginal persons, such as David Mowaljarlai (Mowaljarlai and Malnic 2001) and Bill Harney (Cairns and Harney 2003) who have commented on matters related to these subjects, neither they nor anyone else with Indigenous heritage appears to have addressed the whole concepts. In the Bibliography for this study, there are only 18 authors or co-authors with Indigenous heritage in nearly 400 listed sources, and only the two mentioned were authors or co-authors of publications with any relevance to the cultural astronomy aspects of this study.

I do not have a sufficient background in Indigenous studies to understand this lack of a voice, much less the underlying reasons, but I suspect it is a matter of priorities. While there have been a number of Indigenous writers covering the subject of culture, the two specific aspects of those cultures that this study investigates may be too 'fringe' for popular works, and may also tread a bit too close to 'secret/sacred' knowledge, something that I have been required to keep in mind during my research. The other priority of many Indigenous writers is that of social justice and informing the dominant society in Australia of the injustices and needs of Indigenous peoples, which is an understandable priority when one looks at the gap between the Indigenous and dominant populations in Australia

(so much so that the Australian Government runs a ‘Closing the Gap’ program). A recent example of a successful Indigenous writer whose work has positively changed attitudes in the dominant society is Bruce Pascoe, whose work, *Dark Emu* (2014) , has shown that Aboriginal people, at the time of colonisation, were well established agriculturalists, and both his research for *Dark Emu*, and previous archaeological research into Aboriginal grindstones (Field and Fullagar 1997) have combined to recently promote the knowledge (ABC Education 2019) that Aboriginal people were the first bread bakers, possibly around 30,000 years B.P.

In writing the results of a study of this kind, where the knowledge is drawn much from the literature, it is difficult to find a good example of such research using the colonial and later sources. One such study that has used only the literature sources is *Aboriginal Biocultural Knowledge in South-eastern Australia* (Cahir, Clarke, and Clarke 2018). While mainly reporting on biocultural knowledge, and being primarily based on sources from VIC, this is a good model for a literature study based on the European voice. Fortunately, my study has been able to combine both the European and Aboriginal voices (through the ethnography).

3

3 Background to the area of study

3.1 Introduction

A background to a study usually sets the scene and provides the conditions of the geographical area of the study. In the case of Aboriginal cultures, the ‘scene’ and the ‘conditions’ are the descriptions of the Aboriginal Countries where this study will take place. As the reader will see (if they don’t already know this), ‘Country’ is everything to Aboriginal cultures, whether it is cultural astronomy or any other aspect of culture. Some researchers have even made Country the lead author on journal articles (Country, B. 2013: 185):

Country is a word in Aboriginal English which includes not just the territorial, land-based notion of a home land, but encompasses humans as well as waters, seas and all that is tangible and non-tangible and which become together in a mutually caring and multidirectional manner to create and nurture a homeland.

(ibid.: 149) expressed the Yolŋu belief:

We don’t have an identity without Country. We are all connected. Every contour on the land, every rock, every water, is connected to us. They are bigger than us, we are just a little thing. There is another big thing under us.

This chapter will look at the geography, environment, deep history, and recent history of the study area as it relates the individual language groups and communities (in Countries) that form this study.

3.2 Geography and environment

Australia is the sixth largest country in the world by landmass, but the smallest of the continents. With no land borders, it has a coastline of 35,877km (adding coastal islands brings this to nearly 60,000km) (Coastline of Australia, Wikipedia: n.p). The East Coast, where this study is based, has a length of over 4,500km, not including islands, and as this study concerns the knowledge of Saltwater Aboriginal peoples, there are currently identified 43 Aboriginal language groups whose traditional country joins the East Coast. For practical reasons, this study was limited to the NSW coast, which is over 1000km in length (without islands). There are 11 Aboriginal language groups whose Countries join the NSW coast, but many more communities within those 11 groups, and more language groups and communities who, while not Saltwater, had access to the coast. The 11 Saltwater language groups represented in this study are:

Yuin, Dharawal (Thurawal), Dharug, Gai-mariagal, Guringai, Awabakal, Worimi, Birpai, Dunghutti, Gumbayngirr, Yaegl, Bundjalung.

The additional language groups with access to the coast, and included in this study, are:

Gundungurra, Darkinjung, and Ngarigo (the last being part of the Yuin language group).

Fig. 3.1 shows (with a blue border) the location of these language groups:

Beyond the obvious physical connection to the saltwater coast, is there anything which links the culture of these Saltwater Aboriginal peoples of the NSW Coast? In the popular understanding of Aboriginal culture in Australia, if they are not nomadic Central Australian desert peoples, then their culture tended to be homogenised into a great ‘cultural muddle’ by which many Colonial and even modern white Australians characterised Aboriginal culture. It has taken generations of historians, archaeologists, ecologists, and anthropologists to show that Aboriginal culture, at least since the Holocene, evolved into a regional nature, very much dependent on the climate and resources of the regions. Johnson (2014: 140-148) has shown that the Holocene led to ‘major transformations of in the Aboriginal economies, with new resources that required specialist skills and knowledge’. These transformations were regional, such as the eel farms developed in southwestern VIC, fish traps in regional rivers and on the coast of NSW, and the bunya pine harvest in southeast QLD.

Cahir, Clarke, and Clarke (2018) have used early colonist and settler accounts of travel in south-eastern Australia as a historical ethnographic source for their study of Aboriginal biocultural knowledge, which details many of these regional Indigenous Biocultural Knowledge (ITK) clusters, but while a change from other descriptive approaches, was not overly useful in this study, as it primarily addressed sources from VIC.

In contrast, the early professional archaeologists of Australia, led by the first of the prehistoric archaeologists, John Mulvaney, looked at the overall changes in Aboriginal prehistory continent-wide as represented by stone tool technology (Griffiths 2018: 32-33).

Later archaeologists, working in regional areas and looking at a wider range of cultural and technological features of Aboriginal culture, were able to describe regional differences. Isabel McBryde, one of Mulvaney's students, studied the archaeology of the North Coast Bundjalung Country and found that there was 'a clear cultural distinction between the societies that lived in the coastal river valleys and those who roamed the tablelands and western slopes over the last 9000 years' (ibid.: 46). This makes sense in the context of the various Countries within Bundjalung Country. This study hopefully reinforces the connections between the coastal/Saltwater communities.

In talking about Countries, Saltwater Aboriginal peoples also described their Country as being made up of not only their land Country, but the Sea Country to which they were connected, and the Sky Country to which all Aboriginal peoples connected.

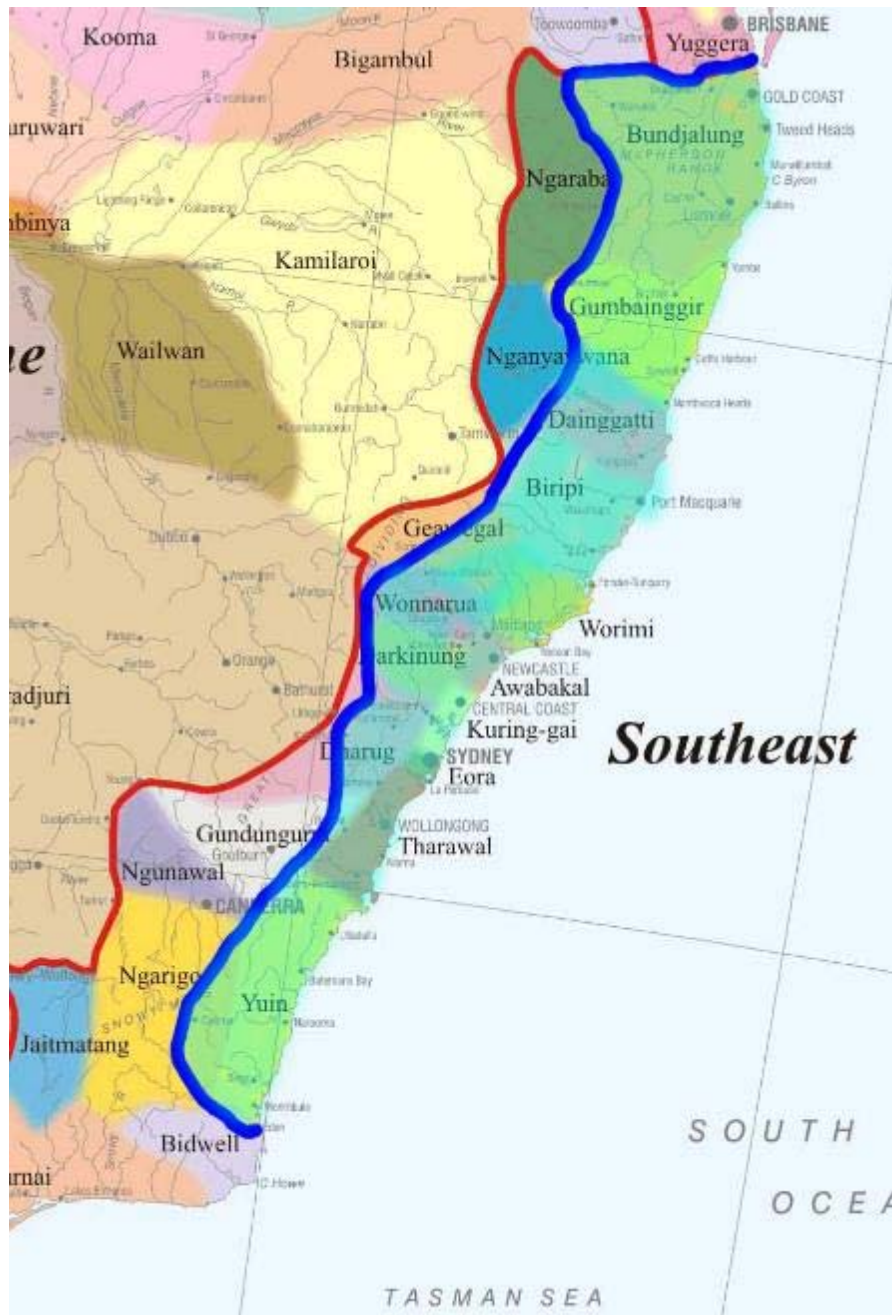


Figure 3.1 Aboriginal language groups of the NSW coast (AIATSIS Language Map)

The NSW coast is a coastal strip with climate varying from cool, temperate in the South to subtropical at the QLD border to the north. The regional names, running from the southern border with VIC, are the South Coast, Shoalhaven, Illawarra, Sydney, Central Coast and Newcastle, Mid-north Coast, and Northern Rivers. At varying distances from the coast, the Great Dividing Range (Great Divide), which runs north-south, forms a natural divide between the coastal peoples and those of the Inland. The coastal strip is broken at intervals by rivers running from the Great Divide to the sea, the rivers becoming larger towards the north of NSW.

While Australia is the aridest continent, Aboriginal peoples lived and thrived in most of the different environments, including the NSW coast. NSW east of the Great Divide has a wide variety of soil types, from sandy coastal soils to deep loams in the river valleys.

National Parks and Wildlife Services (NSW) (NPWS) has described three bioregions adjacent to the NSW coast: the Southeast Corner, the Sydney Basin, and the North Coast. These happen to coincide with the separation of the NSW coast used in this study into the same three regions (the Southeast Corner is called the 'South Coast' in this study). The NPWS report on the bioregions of NSW (National Parks and Wildlife Services (NSW) 2003) provides a concise description of the environments of these three regions, as follows:

3.2.1 South Coast

The area runs from the VIC border to the Sydney Basin and includes the Great Escarpment, which is the eastern front of the Great Divide. It has a temperate climate with warm summers and a mean annual rainfall of 507-1523mm. The plant communities include coastal heathland, and vegetation of sclerophyll forest (mostly species of *Eucalyptus*) varying with altitude up the coastal face of the Great Divide. Europeans occupied this region from the 1820s (cattlemen), and in the 1830s and 1840s, they introduced agriculture. Whaling was an industry from the 1830s to the 1920s (*ibid.*: 229-232).

3.2.2 Sydney Basin

The area runs from the north of Bateman's Bay to Nelson Bay in the north and includes the Great Escarpment and the Blue Mountains. It has a temperate climate with warm summers and a mean annual rainfall of 522-2395mm. The plant communities include coastal communities on dunes and some coastal forest. Lowland forest, dominated by sclerophyll *Eucalyptus* species, vary with altitude up the Great Escarpment. There are riparian and swamp vegetation communities, as well as rainforest and tall forest. Europeans occupied this region from 1788 (see 3.3 Recent history) (*ibid.*: 185-189).

3.2.3 North Coast

The area runs from Newcastle to the Queensland (QLD) border and includes the Great Divide. It has a sub-tropical climate on the coast with hot summers and mean annual rainfall of 607-2912mm. The geology includes extensive Tertiary Basalt eruptions, including the Tweed volcano and the Mt. Warning caldera. The plant communities

include subtropical and temperate rainforest in the north part of the region, cool temperate forest, and rainforest in the south part of the region, as well as coastal dune and wetland communities. Europeans (Oxley) explored the region from 1818, and a penal settlement was established at Port Macquarie in 1823. Cedar (tree) cutters opened up the Macleay River in 1837, the Clarence River in 1838, and the Richmond River in 1842. The agricultural settlement started from the 1830s (ibid.: 171-174).

3.3 Deep history of the Aboriginal peoples of Australia

3.3.1 Context of the environment of the Australian continent

3.3.1.1 The Pleistocene

The geological periods relevant to this deep history encompass the Pleistocene epoch (2.588 MYA to 11,700 years BP), and the Holocene epoch (11,700 years BP to the present⁷).

The Pleistocene was marked by 19 climate cycles of glaciation and interglacial periods, with the last glacial phase commencing around 120,000 years BP. During the glacial periods, continental Australia was connected to New Guinea and Tasmania by dry land, and the combined continent is known as Sahul. Ocean levels varied from the present depth during some interglacial periods, while during the glacial period 60,000 years BP it was 30 metres lower (Mulvaney and Kamminga 1999: 103). Ocean levels were an important factor in the migration to Australia, and the habitation of the coastal regions.

Sahul during the later glacial maximums was a cooler place than today's Australia, and very dry, except for a tendency for inland lakes to maintain high levels. The Sahul east coast 18,000 years BP was continuous from Tasmania to New Guinea, with a lower tree line on the highlands, and a permanent snow line some 700 metres below present. The climate was cold and windy (ibid.: 117).

Just before the Holocene epoch, there was a final period of low sea levels, dropping to about 120 metres below the present around 14,000 years BP (Lewis et al. 2013: 9). Along the NSW coast, this was -130 metres at 18,000 years BP, with a surge of 16 metres positive centred around 14,400 years BP. The sea level rose to a maximum of 1.5 to 2.0 metres above present around 7,500 years BP, falling back to the present 2,000 years BP

⁷ There is a current project to declare the period from either the early 1800's or 1950's the Anthropocene

(ibid.: 9; Sloss et al. 2007). The consequences of these changes to Aboriginal peoples living in the coastal plains, and in particular, the Arafura Shelf north of the present Australian continent, must have been drastic, as they saw their Country shrinking almost daily (Mulvaney & Kamminga 1999: 73-74).

3.3.1.2 The Holocene

We have seen that the Holocene epoch was also marked by large fluctuations in sea level, resulting in the present sea level around 2000 years BP. At the end of the Pleistocene there was a change in climate to a warmer period, with increased rain, but not enough runoff to recharge the freshwater lakes. Eucalypt forests replaced grasslands, and the steady sea level rise resulted in the loss of coastal plains and the drowning of riparian valleys (ibid.: 119-120).

Once the coastline stabilised in the mid-Holocene, there appears from the archaeological record that there was ‘increase in coastal exploitation’ (ibid.: 274), and Aboriginal peoples increased their use of coastal resources, particularly in the last 2 or 3000 years. That is particularly the case for the Sydney Basin, which is one of the richest archaeological regions in Australia and shows evidence of increasing use by Aboriginal peoples after the sea level rises created the waterways of Sydney. This increase also seems to be a feature of habitation on the South Coast of NSW (ibid.: 289), and presumably, the North Coast, as well.

3.3.2 The Aboriginal Migration to Australia

3.3.2.1 Origins

The subject of the arrival of the Aboriginal peoples on the continent of Australia, both where and when, pervades any reading of the history of Australia, whether written by historians, archaeologists, or anthropologists.

David Collins, who was Judge Advocate and Secretary of the NSW Colony, published in 1798 a remarkably detailed description of the Aboriginal peoples of the Sydney Harbour area, but never speculated about their origins.

John Henderson (1832), with connections to Baptist missionaries in Calcutta, India, visited Van Diemen’s Land (Tasmania) and then the Colony of NSW, travelling as far west as Wellington in the Central West of the Colony. He was the first visitor to NSW

who published comments that the Aboriginal people appeared to have similar customs to that of people in India.

In 1845, Edward Eyre (1845) published two volumes of a report of his travels into the centre of Australia and to the southwest of what is now Western Australia (WA). In his comments about Aboriginal people, he made a remarkably prescient suggestion that Aboriginal people had come to Australia via the northwest coast, between the latitudes 12°S and 16°S. They perhaps broke into three branches, one proceeding to the west and colonising the West Coast and around to the Great Australian Bight, the second proceeding towards the centre and colonising the centre of the continent, and the third proceeding eastwards to the Gulf of Carpentaria, eventually colonising the East Coast. Almost the entirety of Vol. 1 of Eyre's report concentrated on the 'Manner and Customs of the Aborigines of Australia', and for the time, was a relatively scientific examination of Aboriginal society and customs. Eyre does not suggest any possible time of arrival of the Aboriginal people to Australia.

Edward Curr (1886) in his *'The Australian Race, It's Origin, Languages, Customs, Place of Landing in Australia, and the Routes by which it Spread Itself over that Continent'* advances his theory that Australian Aboriginal people are African [Blacks]⁸ 'crossed by some other race' (ibid.: 152). The entirety of Chapter VI is used to 'prove' African roots, including language roots. Regarding when Aboriginal people came to Australia, he says that it occurred 'many ages back' on the northern shore (ibid.: 183). He did speculate on the spread of the Aboriginal people around Australia and followed Eyre's Western, Central, and Eastern divisions. He speculated that arrival was at 'the dawn of history' (ibid.: 204) and based on changes from African languages; it was 'in great antiquity' (ibid.: 207).

John Fraser (1889) wrote in *'The Aborigines of Australia, their Ethnic Position and Relations'* about Aboriginal religion. He also suggested an African origin with a connection to the aboriginal races of India. There is also a suggestion of a connection to Druidism (ibid.: 13), as the Druids created stone rings like the Aboriginal people created for their Bora ceremonies.

⁸ Curr used the Colonial term, 'Negros', which I have removed for reader sensitivities in this thesis.

John Mathew (1899), in *'Eaglehawk and Crow, A Study of the Australian Aborigines'*, looked at the previous theories and suggested three waves of emigration, Papuans (New Guinea), then Dravidians from India, and finally, Malays. As Johnson (2014: 91-92) commented on this theory; it was one of the first to consider stories from the Aboriginal people themselves as a basis for theories.

While Eyre certainly observed Aboriginal peoples and their customs and scientifically reported this, the first observer of Aboriginal peoples who is considered to have worked in the anthropological approach is Robert Mathews. The majority of his many publications were specifically reports of Aboriginal customs, and he rarely speculated about the deeper story of Aboriginal Australia. In *'The origin, organisation and ceremonies of the Australian Aborigines'* (Mathews 1900: 557) he said that the Aboriginal people came from Africa via Lemuria, a suggested 'lost continent' that connected Madagascar to India, Southeast Asia, and Australia. He said (ibid.: 558) that they then spread over Australia, Tasmania, and New Guinea. He also said there were two migrations, one after another (ibid.: 559). Lemuria was one of the 'land bridge' theories, eventually superseded by plate tectonics and the Pangea supercontinent.

One of Mathews contemporaries (more a rival) was Alfred Howitt, who published *'The Native Tribes of Southeast Australia'* in 1904. This in-depth study of the tribal boundaries and customs in the Southeast of Australia dedicated the first chapter to the origins of Aboriginal Australians. In it, Howitt quoted Robert Prichard as suggesting that Aboriginal Australians were 'Oceanic [Blacks]' (from the Malay peninsula, before the current Malaysian population arrived from India), and entered Australia via New Guinea (Howitt 1904: 2). After reviewing the many views on this subject (including some that I have reported), Howitt suggests an origin in the Deccan peoples of India and later accepts that they could have entered Australia from the Northwest. He goes on to take on the issue of Tasmanian Aboriginal people and their relationship with the rest of Australia. Howitt uses Edward Tylor's argument that while both Tasmanian and mainland Aboriginal peoples were Stone Age, Tasmanians were Palaeolithic in culture, while mainland Aboriginal peoples 'stood on a somewhat higher level' (ibid.: 8), more typical of the Neolithic age. Howitt looked at the use of watercraft around Australia and concluded that it was unlikely that they arrived in Tasmania by boat. He then examined newly developed theories on sea level rise around Australia and concluded that the Tasmania Aboriginal people crossed into Tasmania when there was a land bridge between the mainland and

Tasmania. Howitt then examined the many forms of evidence regarding the antiquity of Aboriginal migration to Australia, including likely origins, languages, sea level changes, and some early archaeological records, and concluded that arrival would ‘demand vast antiquity on the Australian continent’ (ibid.: 33).

3.3.2.2 Archaeology

From the time of Mathews and Howitt at the turn of the 20th century, there followed a lack of speculation as to the arrival dates of Aboriginal peoples in Australia. The field of anthropology was by then established in Australia, and both their contemporaries, such as Taplin, and later, the modern practitioners, including Elkin, Spencer, Gillen, Radcliffe-Brown, Mountford, and the Berndts, never speculated to any degree in their publications on this subject. It was not until the rise of archaeology as a professional discipline in Australia that speculation was replaced by scientific dating of archaeological sites. Archaeology came quite late to Australia, expanding in the 1960s and 1970s, as the following table of dated occupation sites shows:

Occupation date	Source	Date of publication	Site and location
>5,000 years BP	Hale and Tindale	1930	Devon Downs, SA
9,000 years BP	Mulvaney	1961	Cape Martin, SA
16,000 years BP	Mulvaney	1965	Kenniff Cave, QLD
31,000 years BP	Barbetti and Allan	1972	Lake Mungo NSW
35,000 years BP	Balme et al.	1978	Devil’s Lair, WA
39,000 years BP	Pearce and Barbetti	1981	Upper Swan, WA
50,000 years BP	Roberts et al.	1999	Malakununja II, NT
46,000 – 50,000 years BP	Bowler et al.	2003	Lake Mungo, NSW
65,000 years BP	Clarkson et al.	2017	Madjedbebe, NT (Malakununja II)

Table 3.1 Dates of Aboriginal occupation in Australia (Smith and Burke 2007, with additions)

Of course, the dating of archaeological sites only became scientifically possible as first, radiocarbon (carbon-14), then OSL (optically stimulated luminescence) and TL (thermoluminescence), dating methods became available, starting in the 1950s.

3.3.2.3 Mitogenomic and phylogenetic evidence

In the last 15 years, the use of phylogenetic and genomic sequencing technology has introduced another tool in the study of the migration to Australia. Kumar et al. (2009) found phylogenetic links between modern Aboriginal mitochondrial DNA (mtDNA) and that of some relic peoples of India. Those links indicated that Aboriginal peoples

followed the ‘Southern route’ through India on their migration to Australia, which also confirmed the theories of Fraser and Howitt. Later, Rassmussen et al. (2011) sequenced the mtDNA of hair from a Western Australian Aboriginal man collected over 100 years ago. They found that Aboriginal Australians split from Eurasian and non-African humans 62,000 – 75,000 years BP, which would support the position that they are the oldest continuous human cultures surviving. More recently, Tobler et al. (2017) sequenced the mtDNA of 111 historical hair samples from regional Aboriginal peoples in Australia. Their results supported an early regionalism within Australia, indicating arrival around 50,000 years BP (via New Guinea), with a rapid spread around the East and West Coasts of Australia, and settlement into the same geographic locations where the study found the sampled population, within an average of 5,000 years after arrival.

3.3.2.4 Current state of the origin question

While the results published by Tobler et al. (2017) show a later arrival than Clarkson et al. (2017) at Madjedbebe in Northern Australia, there has been a steady pushing back of the arrival time of Aboriginal peoples into Australia to at least 65,000 years BP. At the same time, genomic research has established that the ancestors of Aboriginal peoples left the Middle East as early as 75,000 years BP and split from non-African humans shortly after. Remarkably, Tobler et al. (2017) have been able to show that Aboriginal peoples quickly dispersed to their current/historical Countries within Australia and have remained there until historic times. This connection to Country confirms experience with Aboriginal community and Country attachment expressed by individuals in this study.

A recent report on archaeological work at Moyjil (Point Ritchie) near Warrnambool, VIC (Bowler et al. 2018) may throw the proverbial cat among the pigeons on the origin questions. Thermal luminescence data of fire-affected calcrete stones in what appears to be a coastal midden has brought up a date of 100,000-130,000 years BP, which has raised the question of whether the fire was a natural bushfire or a human campfire.

It should be noted that some individuals have a strong belief that ‘we were always here’ regarding the migration to Australia by Aboriginal peoples, and that their stories and cultural beliefs confirm this. There has been some suggestion in the past that the argument for two distinct Aboriginal phenotypes in the archaeological record (gracile and robust), which itself is not proven, could be a result of earlier migration to Australia, but to date, there is no valid evidence of such multiple migrations.

3.3.2.5 Aboriginal population of Australia

The population of Australia before European colonisation in 1788 has been subject to many different estimates over the years since. Radcliffe-Brown, the anthropologist, estimated that it could have been around 300,000 (Australian Bureau of Statistics 1301.0-yearbook Australia 2002: n.p). As Aboriginal peoples were not included in the Australian census until 1971, the population of persons claiming Aboriginal origin was known only in fragmented colonial and state records until that date. Some estimates have put the number of people with Aboriginal origins as low as 60,000 in the early 1900s. The most recent attempt to estimate the precolonial population of Australia (Williams 2013) used a founding population of 1000-2000 at 50,000 years BP and calculated a range of 770,000 to 1.1 million in 1788. As the date of Aboriginal arrival in Australia has currently been pushed back to 65,000 years BP, this may be on the low side. With the population of persons claiming Aboriginal and Torres Strait origin being 649,200 in the 2016 Australia Census (ABS Aboriginal and Torres Strait Islanders Population 2017: n.p), it is quite possible that the Aboriginal population has not yet recovered to the pre-1788 level.

The reasons for the steep reduction in Aboriginal population after 1788 and at least to the early 20th century is a clear, if contested, history. Aboriginal peoples after 1788 suffered the usually introduced diseases of European people, particularly smallpox, of which the introduction to the Aboriginal peoples of the Sydney area is a contested history itself, with some historians pointing to the deliberate introduction (Willey 1979: 77). Dispossession of land and destruction of culture were the other main operators in the demography of the Aboriginal population. The Frontier Wars so clearly described by Reynolds (1981; 2000; 2013) probably resulted in the death of around 20,000 Aboriginal people, which would have its effect on the population.

3.3.3 The Aboriginal Settling of NSW

3.3.3.1 Arrival in NSW

There are theories of the arrival of Aboriginal peoples to Australia that are documented by archaeological evidence, and more recently, genomic research that indicates the movement of those peoples around Australia, but there is only limited evidence of how Aboriginal peoples came to NSW and spread across the landscape. Of course, there were

no state boundaries until millennia later, so the use of the NSW borders is only relevant to the area of study for this project.

Archaeological data show that until recently, the oldest dated human burial site in Australia happened to fall into the NSW region at Lake Mungo, and the human remains known as Mungo III, dated using OSL to 34,000 - 43,000 years BP (Oyston 1996), is still the oldest dated burial. At Cranebrook Terrace, in the west of the Sydney Basin, stone tools found in river gravels have been proposed (with some controversy as to their dating by TL) to be as old as 50,000 years BP (Stockton and Nanson 2004: 59-60). Given Tobler et al.'s (2017) findings of the movement of Aboriginal peoples after arrival in Australia, these dates are possible, and the Lake Mungo ones are certainly accepted. Elsewhere in NSW, dates of archaeological sites show considerable variation, as could be expected if there was a gradual change in the exploitation of resources, particularly after the sea level stabilised during the mid-Holocene.

Occupation date	Source	Site and location
26,300 years BP	Mulvaney and Kamminga 1999	Menindee Lakes
22,300 years BP	Stockton and Merriman 2009	Kings Tableland
20,760 years BP	Mulvaney and Kamminga 1999	Burrill Lake
17,010 years BP	Flood 1988	Bass Point
12,550 years BP	Flood 1988	Lyrebird Dell
7360 years BP	Flood 1988	Capertee
5,450 years BP	Flood 1988	Graman (B1)
3,239 years BP	Flood 1988	Wombah
840 years BP	Flood 1988	Wattamolla

Table 3.2 Dates of Aboriginal occupation in NSW (Radiocarbon dates)

An interesting aspect to Table 3.2 is that Aboriginal people occupied the coastal part of NSW both before and after the late Pleistocene/early Holocene sea level rise (Burrill Lake and Bass Point were occupied during the Pleistocene, and Wattamolla during the recent Holocene). There would have been significant coastal regression during the sea level rise which would have required any Aboriginal peoples exploiting the coastal plan to move inland gradually. Nunn and Reid (2015) examined 21 Aboriginal cultural stories from communities around the Australian coastline that described sea level rise. They were able

to fit most of these stories to the local geography in regards to known sea level rise during the late Pleistocene and early Holocene epochs. One example (ibid.: 10-11) relevant to this study is a Dharawal story of the inundation of *Kamay*/Botany Bay in southern Sydney, which could have occurred in the period 9,000 to 7,000 years BP. This research has also been significant in adding weight to the accumulating scientific evidence that Aboriginal cultural stories can be transmitted faithfully for many thousands of years. On the other hand, Clarke (2019: 151, 171), in describing the stories and use connected to australites (also known as tektites, and believed to have been created by a meteorite strike in Southeast Asia about 793,000 years ago) suggests that the stories may have been handed down, but may also have changed over the time that the australites were known to Aboriginal peoples.

What was the environment on the NSW coast that Aboriginal peoples found when they began to settle into their respective communities?

- North Coast – due to the many larger rivers traversing the North Coast, estuarine and river resources would have been a significant focus of resource exploitation. Because of the higher rainfall and more subtropical climate, there would have been significantly more flora and fauna than further south. Like the rest of the NSW coast, the coastal plain that was drowned during sea level rise was relatively narrow compared to the QLD and north coasts of Australia, so there would have been less disruption to communities either living on or depending on the coastal plain. The archaeological record is limited, but McBryde used the excavations at Seelands to report on a slow change in tool use from 2000 years BCE, but only a limited connection to Bondaian and Eloueran tool development in the Sydney area (McBryde 1974: 253-259). Coleman (1982: 1-10) suggests that there was a ‘particularly high’ population of Aboriginal people on the North Coast in the last 6000 years when the sea level stabilised. She also casts doubt on the seasonal movement theory that people moved from the coast to the inland, depending on the season, and shows that local group boundaries were relatively small and limited to the coast and coastal plains. She also provides evidence that most movements outside of boundaries were up and down the coast, for ceremonies and resources (trading). Another feature of the North Coast was the prevalence of stone-built fish traps, some of which still exist. The language

groups/communities in this study are the Bundjalung, Yaegl, Gumbayngirr, Dunghutti, Birpai, and Worimi.

- Sydney Basin – this part of the NSW coast would have had a similar environment to the North Coast, but more temperate. Due to the Hunter, *Dyarubbin*/Hawkesbury, Parramatta, and Georges Rivers that flowed through the coastal plains, there was a large increase in estuarine river resources when sea level rise occurred, and the river valleys were drowned, forming Broken Bay, Sydney Harbour, and *Kamay*/Botany Bay. While the post-sea level rise coast provided similar resources to other typical NSW coasts, with headlands and beaches, the Cumberland Plain to the west of the coast had a different environment with different resources, resulting in a clear distinction between coastal peoples and inland peoples of this area. Irish (2017: 25) said the Aboriginal peoples of the coastal plain in the Sydney basin lived in an area he calls the ‘affiliated coastal zone’ with family ties and cultural connections. The archaeological record in the Sydney Basin is divided between the archaeology of the Blue Mountains and the Cumberland Plain/coast, with the dated occupation of the former back to 41,000 years BP, and the Cumberland Plain/coast to 30,000 years BP (Attenbrow 2010: 18). Radiometric dating of both areas is quite comprehensive right up until several centuries before the European invasion, showing that there was sporadic occupation up until the most recent sea level rise when it became more intensive. The Sydney Basin is also home to one of the clearest sequences of tool and weapons that we have in Australia, and the Bondaian and Eloueran stone tool sequences were first identified in Sydney (ibid.: 85-102). The language groups/communities in this are the Awabakal, Darkinjung, Guringai, Dharug, Gai-mariagal, and Gundungurra.
- South Coast – the South Coast has been the site of some major archaeological surveys in the past, resulting in a somewhat better understanding of the precolonial history of this area, unlike the North Coast, and Sydney, which suffered significant destruction of archaeological sites due to European colonisation. Like the rest of the coast, Aboriginal peoples tended to concentrate settlement on the larger rivers, including the Shoalhaven, Clyde, Tuross, Endrick, and Bega Rivers (Mulvaney and Kamminga 1999: 290). The oldest coastal archaeological site in NSW, Burrill Lake, is typical of the saltwater inlets and

tidal lakes that are a frequent feature of the South Coast. It also appeared that communities made use of both the coastal margins and forested hinterlands, depending on the season and that coastal headlands, such as Bass Point, were favoured sites for settlement. Hughes and Lampert (1982: 16-28) have looked at prehistoric populations along the South coast, and determined that the older sites, such as Burrill Lake, were only lightly populated during the Pleistocene and early Holocene, with site occupation increasing from about 7000 years BP as the sea level rose, with some sites declining after 2000 years BP, and others staying in use. They conclude that there was a significant population increase on the coast, and that may have coincided with changes in stone tool use. The language groups/communities in this area are the Dharawal and the Yuin.

3.3.3.2 Origin Stories

Given the clear connection to Country expressed by Aboriginal people in general, and specifically along the NSW coast by the different language groups and communities studied, it was interesting to find, during both the literature study and the ethnographic fieldwork, that there were often clear origin stories belonging to these different groups, notwithstanding the widespread belief that ‘we were always here’. The following is a summary of such origin stories, which are reported elsewhere in this thesis:

- North Coast: one of the strongest origin stories found during this study was that of the Three Brothers, which is known by the Bundjalung, Yaegl, and Gumbayngirr language groups. Two versions of many versions are found on p. 116-117 and 149-150, and describe a family of three brothers and a mother coming to the North Coast, by sea, and variously being the founders of different language groups in those Countries. While not specifically claiming that the brothers were the origin of all Aboriginal peoples in these Countries, the stories certainly suggest that the current language groups came from this source. The other North Coast language groups, the Dunghutti, Birpai, and Worimi, do not appear to have the same story, but the Birpai do have a different Three Brothers story, which is not necessarily significant, as I have reported on different Three Brothers stories in many language groups in NSW.
- Sydney Basin: as with much other knowledge in the Sydney Basin, there is a paucity of stories that are connected to origin in Country. There are some very

general references to *Baiame* as the Creator, but this could apply to almost all communities on the NSW Coast, and only one story, which is an interpretation of the rock art in the Guringai community (p. 103-104), which is described as telling the story of when *Baiame* was sent to Earth by his mother to create the landscape/Country. These stories, however, do not address the arrival in Country of the communities that live or lived in those Countries.

- South Coast: like many other cultural themes in the Countries of the South Coast, whales seem to feature strongly in the origin stories. For the Dharawal peoples, they clearly arrived in their Country on the back of a whale, as described in the ‘Arrival of the Thurrawal Tribe in Australia’ (p. 166-168), which, like the Bundjalung story, describes a clear geographical place of arrival. For the rest of the South Coast, the Yuin peoples probably consider themselves as being in their Countries because of whales. In the story told to me by P2 (p. 169), the people who became the Yuin travelled from Tasmania over the land bridge with the guidance of the whale elders, and some of the Yuin people joined the whales, to become elders.

Everyone likes to know how they came to be where they were born, or at least to the cultural group that they acknowledge as theirs. Aboriginal people, as shown by Tobler et al. (2017) probably have the longest connection to Country of any cultural group on Earth, so it is not surprising that there are strong origin stories throughout Aboriginal Australia. Macquarie University is currently running a project to collect such stories (Big History Institute, n.d.). I have no doubt that there are origin stories for each of the Countries of the NSW Coast, but colonisation has probably erased many of those closest to the Sydney Basin.

3.4 Recent history of the Aboriginal peoples of the NSW coast

3.4.1 Background

Aboriginal cultures in Australia in 1788 possessed several universal features. Some of these include:

- A spiritual association with the land (Country) on which their kin group resided, so strong, in fact, that they believed that they belonged to the Country, not vice-versa,
- A system of Law handed down by the creator heroes, that governed their relationship with each other, their Country, and everything contained in it. The Law, unlike European law, could not be changed or re-interpreted,
- A relationship with the resources upon which they lived that was controlled and sustainable,
- And a cosmology, or understanding of their universe, that was consistent with their belief system.

Aboriginal peoples on the NSW Coast lived in their respective Countries, lived off the resources of their Country, and travelled outside their Country for trade, to share resources, and for ceremony. Strangers looked similar, had a shared Law and cultures, and understood that other groups belonged to their own Countries. War for the conquest of land as Europeans knew it did not exist (Broome 2002: 14), and violence was only used as a cultural means of redressing wrongs. Karskens (2009: 29-30), in describing Sydney before European colonisation, said:

Traditional and ancient Aboriginal life is so often portrayed as static, as if Aborigines passively occupied a ‘timeless land’, making no impact on it.

And, describing (ibid.: 33) that colonisation:

The year 1788 is the fatal turning point, where black ‘prehistory’ is neatly sheared off so that the ‘white’ history of city-making can begin.

That ‘prehistory’ described by Karskens should be described as an ‘oral history’, as Aboriginal people knew their own history, and celebrated it in the Law, in stories, and in the rock art so prevalent in the Sydney Basin. For Europeans, however, that history can only be dimly perceived by the material records of archaeology, and the limited white understanding of Aboriginal people’s own knowledge of their history.

The European history of Australia began when the First Fleet arrived in 1788, first in *Kamay*/Botany Bay, then in Sydney Cove, with over 1000 convicts, soldiers, and government personnel, all appearing, according to Aboriginal cultural belief, to be

ancestors of Aboriginal peoples, who came back from the dead appearing white. Europeans had visited Australia before 1788, such as the Dutch navigator Jan Carstensz in 1623 (Willey 1979: 18), and James Cook, who visited *Kamay*/Botany Bay briefly in 1770, and no doubt stories of these visits had spread around Aboriginal Australia via the excellent routes of communication. However, the large number of new arrivals and their aggressive flouting of Aboriginal customs would have sent shockwaves throughout the Sydney Basin, and eventually, the East Coast of Australia and inland. Massola (1968: 105-106) told of a Victorian Aboriginal belief, which is believed to be fairly universal across Australia, that the sky was held up by wooden props at the extreme edges of the Earth. The eastern prop was supposed to be in the charge of an old man of the Yarra 'tribe', and a message was passed to the Aboriginal peoples of eastern Australia that if presents were not sent to the old man, he would not repair the prop, and the sky would fall, killing everyone. Willey (1979: 55) says that the inference was that the danger was coming from the east, the direction from which the invaders came to Sydney, and because the eastern prop had fallen, the sky had fallen down, and the ghosts or reincarnations of all the Aboriginal people who had lived had broken through from the spirit world to take over the land.

3.4.2 1788 and European colonisation

Whether called colonisation or invasion, the arrival of the First Fleet in Sydney and the subsequent 230 years of dispossession, disease, resistance, massacre, marginalisation, paternalism, and all the other horrors visited on the First Peoples of Australia, have had a devastating effect on their cultures. The fight for political and land rights in the 20th century continues into the 21st, with many wins, but with the aims of reconciliation and treaty still just out of reach.

This study has neither the room nor the purpose of detailing the history of the Aboriginal peoples of the NSW coast as it occurred since 1788. It has been detailed by historians such as Henry Reynolds (*The Other Side of the Frontier, Why Weren't We Told, Forgotten War*), and Richard Broome (*Aboriginal Australians, A history since 1788; Aboriginal Australians: Black Response to White Dominance 1788-2001*).

What does need some detail is the effect of those 230 years on the cultures of the Aboriginal peoples of the NSW coast studied here. By now, the reader, if not already aware of this aspect of Aboriginal culture, should have gained the understanding of the

importance of Country to Aboriginal peoples. Tobler et al.'s (2017) genomic study showed the significance of Aboriginal migration to specific Countries in Australia shortly after entering the Sahul continent, and the apparent cultural attachment to those Countries up until historic times. Aboriginal elder Pat Dodson has said (Grieves 2009: 13):

To understand our law, our culture and our relationship to the physical and spiritual world, you must begin with the land. Everything about Aboriginal society is inextricably woven with, and connected to, the land. Culture is the land, the land and spirituality of Aboriginal people, our cultural beliefs or reason for existence is the land. You take that away, and you take away our reason for existence. We have grown the land up. We are dancing, singing and painting for the land. We are celebrating the land. Removed from our lands, we are literally removed from ourselves.

Bill Yidumduma Harney, a Wardaman elder from the Northern Territory (NT), has connected the Dreaming stories with the land (earth):

Many spiritual creators are on top but with their songs under the earth. All the Dreaming stories come down, the Dreaming songlines, everybody's song goes off to the salt water and back, to start again. Our land is on top, down there; it's buried but we'll use it again. The track we follow, we drew it from the sky and left it down on the right (Cairns and Harney 2003: 9).

Harney's description not only connects Dreaming stories to the earth (land) but shows that the stories are connected between the sky and the earth. In this study, those links will be critical to understanding the astronomy of the Aboriginal peoples of the NSW coast.

To understand the effects of colonisation and all the other disasters that befell the Aboriginal peoples in the area of study, the effect most critical is the dispossession from their land and the forced movement away from home Country. Dodson and Harney have shown that everything to do with Aboriginal cultures is 'inextricably woven with, and connected to, the land'. If an Aboriginal person is removed from that Country for a significant time, then the stories which are a part of the Country will be lost. Stories are a critical part of cultures, which is linked to Country. Once the Country is lost, the stories can no longer be told and performed in the Country to which they belong. Of course, the elders and cultural people who are responsible for the stories will make every effort to

maintain the stories, and pass them on to following generations, but without the Country to which the stories belong, there will be a lack of connection and an eventual loss of the stories themselves.

For the Aboriginal peoples of Australia, a combination of introduced diseases, dispossession of land, and cultural destruction resulted in a vast silence about the rich cultures of the First Peoples of Australia. That silence is shown in the confusion and argumentation about languages and boundaries of Aboriginal peoples of the Sydney Basin, and in the cultural gaps that are revealed in the lack of understanding of such aspects of culture as rock art. Similarly, there is a dearth of material for cultural astronomers, a situation which this study hopes to amend. Clarke (2015: 2224) has described this in reference to cultural astronomy:

The records of Aboriginal tradition concerning the heavens are incomplete for most regions, with the most significant gap being in the temperate Australia where British colonization began and has been most intense.

The loss of Country and the resultant loss of culture expressed in stories was the main impediment to recording and understanding the astronomical knowledge of the Aboriginal peoples of the NSW coast. It was also a major reason that this region was chosen for such a study, as it has been apparent that knowledge has been lost, and may continue to be lost as elders and cultural persons pass on.

3.5 Giving meaning to the data

The ‘data’ in the context of this study are the stories, language, and other items of knowledge obtained through the literature review and the ethnological process. In themselves, they represent either known (in the case of the literature review) or previously unknown (to researchers in the framework of cultural astronomy) items of knowledge about the cultural stories and beliefs of the Aboriginal peoples of the NSW Coast. In many cases, this data is fragmented, particularly in the case of published stories, which were often collected by non-Aboriginal people for commercial use.

Using this data for this study required a thoughtful approach. Just ‘dumping’ the data into the relevant geographical sections (Countries) of the study would have resulted in a jumble of stories and bits of knowledge, with the thematic and possible phylogenetic analysis taking place in subsequent chapters. The appendices contain the raw data in

tabular format, which will be useful to other scholars, but to understand the cultural astronomy of the different Aboriginal peoples of the NSW coast required a more organised and sensitive approach. The approach I took regarding the data was to try and thoughtfully (with cultural competence in mind) allocate the stories and knowledge to specific cultural groupings, along with the connection to that particular Country, and then analyse the relationship between the data and the individual cultures of those groupings. This approach, I believe, has led to a clearer understanding of the cosmologies of some of the groups individually, rather than a broad-brush approach to the whole Saltwater peoples of the NSW Coast.

The background in this chapter, both environmental and historical, will have shown the reader that not only was the Aboriginal settlement of Australia a complex and inspiring story, but the subsequent history until 1788 was one of enlightened understanding of the environment. There was also an extremely successful stewardship of the continent, eventually leading to the beginnings of agriculture and the movement away from the hunter-gatherer existence to a more sedentary one (see Gammage 2012 and Pascoe 2014). The further history of Aboriginal Australia after the invasion in 1788 made clear two trends in the cultures of the Aboriginal peoples of the NSW coast:

- the effect of invasion and the resultant cultural destruction, and its effect on Aboriginal cultures and the retention of the knowledge of those cultures, and
- the attempt by some of the colonisers to understand and record Aboriginal cultures, with the eventual development of ethnology in Australia, followed by archaeology, resulting in the professional literature on Aboriginal cultures.

The approach of this study will be to understand the context in which the collected cultural knowledge was developed before it is collated and analysed concerning the hypotheses set out in the Introduction. The background information in this chapter will be important in understanding this context through the rest of the study process.

4 The Astronomy of the Sydney Basin

4.1 Introduction

This study of the Saltwater Aboriginal peoples of the NSW Coast and their astronomical knowledge aims to understand the many ways in which Aboriginal people utilised the Sun, Moon, and stars, and how this is incorporated into songlines and Dreaming tracks that extend along the NSW coast. This chapter, focusing on the Sydney Basin from Newcastle to Wollongong and West to include the Blue Mountains, represented a starting point for the project. It is in the Sydney Basin that Aboriginal peoples interacted with the first European colonisers, and the first written records of Aboriginal language and traditions are found in the historical literature. With the damaging effects of colonisation in the Sydney Basin extending back to 1788, one can also get a sense of the astronomical knowledge that has survived since then, with applications to cultural identity, education, public outreach, and reconstruction of fragmented traditions. In comparison with the knowledge surviving on the North and South Coasts of NSW as found by this study, there appear to be massive gaps in the surviving knowledge in the Sydney Basin.

This chapter is focused primarily on the historical archival information, material culture, and the ethnographic work done in the Sydney Basin for this study. The geological definition of the Sydney Basin as the area of the Hawkesbury sandstone formation is used to define the area of study (Fig. 4.1). This definition is extended to the coastal cities of Newcastle and Wollongong for this study. This area (with the extensions) is also the modern definition of the Greater Sydney Basin. The Sydney Basin is an important part of the NSW coast Saltwater Aboriginal history.

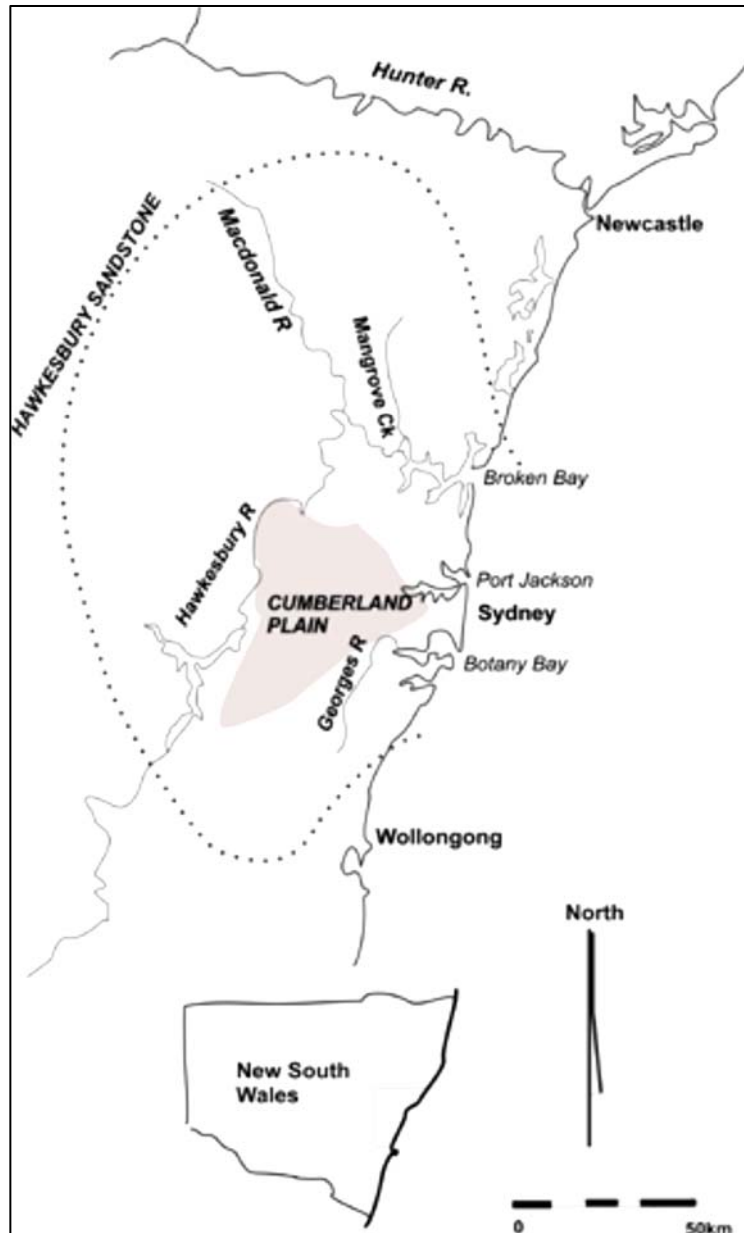


Figure 4.1 The Sydney Basin showing the extent of Hawkesbury sandstone, cities and major rivers (McDonald 2008:2)

For the Aboriginal peoples of the Sydney Basin, a combination of introduced diseases, dispossession of land, and cultural destruction described in Chapter 3 resulted in a vast silence about the rich cultures of the peoples in this region. That silence is shown in the confusion and argumentation about languages and boundaries of Aboriginal peoples of the Sydney Basin, and in the cultural gaps that are revealed in the lack of understanding of such aspects of culture as rock art. Similarly, there is a dearth of material for cultural astronomers, a situation which this study hoped to amend.

4.2 Language groups and uncertainties

Who are the Aboriginal peoples of the Sydney Basin? Archaeological evidence from sites in the Sydney Basin show occupation for at least 18,000 years BP (Attenbrow 2002: 3). There are some earlier dates from Western Sydney and the Blue Mountains (see 3.2.3.1) which are contested, but in any case, this region has a long history of settlement by Aboriginal peoples. As we saw in Chapter 3, the organisation of the Aboriginal settlers into their respective Countries would have been early and resulted in linguistic differences.

McDonald (2008: 20-2) surveyed the often chaotic and controversial scholarly writing on the languages encountered on the arrival of the First Fleet in 1788. From William Dawes (1790), John Hunter (1793), Watkin Tench (1793), and David Collins (1798), there were some reports of knowledge of languages and word lists of the Sydney ‘language’ (which we now know was more than one). Lancelot Threlkeld recorded details of a language ‘to the northward of Sydney’ which Capell (1970: 23) suggests is the Guringai language, later confirmed by Fraser (1892). The ethnographer, Robert Mathews, reported on the Dharawal language to the south of Sydney Cove (Mathews 1901a), the Gundungurra language to the west and south of the Cumberland Plain area of Sydney (Mathews 1901b), and the Darkinjung language to the north of the *Dyarubbin*/Hawkesbury River and to the west of the Guringai and Awabakal language areas (Mathews 1897). Mathews originally defined the Dharug language as a dialect of Gundungurra (Mathews and Everitt 1900), but Capell (1970: 21) re-defined Dharruk (Dharug) as a separate language group between the coastal Guringai and Dharawal, and (presumably) the Gundungurra to the West.

Based on these sources, including McDonald (2008) and Capell (1970), I decided to include seven language groups in the Sydney Basin part of the study: Awabakal, Darkinjung, Dharug, Gai-mariagal, Gundungurra, Guringai, and Dharawal. The boundaries of the Guringai, the Dharawal, and the Dharug are disputed (Capell 1970; Eades 1976; Kohen and Lampert 1987; Troy 1993; Smith 2004; and Steele 2005), and the spelling of the name of each language group varies. Dharawal have been included in the Sydney Basin for this chapter on Astronomy, but their Country extends down to possibly Jervis Bay, NSW, and as their culture has strong connections to the Yuin culture to the south, it has been included as a South Coast community when studying songlines and themes in Chapters 7 and 8.

I assigned knowledge from this study to the respective language groups to the best of my ability, but due to the complex and sometimes controversial issue of languages, dialects, and geographical boundaries, I acknowledge the uncertainties in this aspect of the study. Fig. 4.2 shows the language groups in the Sydney Basin, as shown on the language map in common usage.



Figure 4.2 The Sydney Basin Language groups (AIATSIS Language Map)

Further compounding the uncertainties is an ongoing debate among Sydney Basin Aboriginal communities regarding the ‘Eora’ language, the Dharug community boundaries, and whether Dharawal is the coastal Dharug language.

Collins (1798), Dawes (1790), Ridley (1875), and even Mathews (in Troy 1993) refer to the Sydney language as ‘Eora’, which, as it appears, means ‘here’, ‘of this place’, or simply, ‘people’ in the Dharug language. In any case, the name ‘Eora’ seems to have been assigned to the Aboriginal peoples of the Sydney Harbour region, but the language recorded by Dawes in his research with a Cadigal woman of the South shore of Sydney Harbour, *Patyegarang*, is clearly Dharug (The Notebooks of William Dawes on the Aboriginal Language of Sydney). In order to resolve these issues with language, the Aboriginal peoples of the Cumberland Plain between Sydney Harbour and the Blue Mountains maintain the Dharug language as it has been recovered by linguists. In the region South of *Kamay*/Botany Bay and to the East of the Escarpment the Dharawal

language has been recovered and maintained, so the language of the Sydney Harbour region is either a coastal version of Dharug or, controversially, Dharawal is the coastal version of Dharug.

4.3 Methods and theory

4.3.1 Literature survey

Much of the information published about Aboriginal astronomical knowledge and traditions from the Sydney basin is fragmented and scattered throughout the literature, libraries, and museum archives. I conducted a detailed survey to collect all records or accounts of astronomical objects and phenomena from the Sydney region and the language groups mentioned above. I also drew from material culture sites and artefacts, such as rock art. Most of the survey draws upon the literature of the early colonists and travellers from the period between 1850–1900, and from the 1880s by professionals who would later be considered ethnographers. Interested individuals had various concerns, from folklore to linguistics (William Ridley being one of the latter), and the early ethnographers, such as Mathews, were in regular contact with Aboriginal people. Threlkeld, while establishing his religious mission to Lake Macquarie in 1834, was the first colonist to thoroughly explore the culture and language of one language group (the Awabakal) and record it. It wouldn't be until 1897 and 1901 when Mathews published articles on the cultures of some Sydney Basin Aboriginal peoples (Darkinjung, Dharawal, and Dharug), and by this time, he was presumably limited to the knowledge of elders from communities which had undergone much change since 1788.

4.3.2 Material survey

The Sydney Basin is considered to be one of the most significant regions for petroglyphs (rock engravings) in the world, probably due to the nature of the very Hawkesbury sandstone that defines the Sydney Basin. Much of the art consists of the 'simple figurative' style that came into use around 5,000 years BP (Stanbury and Clegg 1990: 9), and some are clearly post-invasion, showing European ships and people. There are several examples of this rock art which may refer to themes of cultural astronomy, and, unlike ethnography, none of the creators of the rock art is available to discuss the purpose and meanings of their work. For this, I was limited to the interpretations of rock art specialists like McCarthy, Stanbury, Clegg, and McDonald, as well as a few non-academic interpreters of rock art who had gained knowledge from local Aboriginal

people. While rock art is found along most of the NSW coast, it is not as prevalent as in the Sydney Basin, and often is of another period and style, so comparisons are limited. Because of the very limited ability to interpret rock art in the area of this study, it will not form a significant part of the data and analysis.

4.3.3 Ethnography

Of the three regions of the NSW coast studied, the Sydney Basin has proven to be the most difficult region in which to carry out ethnographic work. Of the seven identified communities for this study, one has proved elusive regarding contact, two have declined to participate, one appears to be such a small community that they have no resources to participate, one seems to have lost its knowledge of its own culture to the extent that there is no-one to participate, and the remaining two communities are represented by a limited number of persons with relatively extensive knowledge of their culture. For these reasons, considerable effort was exerted to find ethnographic sources within participating communities to fill out the results, which are mainly from the literature survey.

4.4 Results

4.4.1 Results by type and theme

I conducted a thematic analysis of the information collected to search for patterns and use them to create codes. I then combined the codes into themes, defined each theme, and used the major themes to create a ‘thick description’ (Geertz 1973: 3-30). This approach is used, but only in a gross manner, to create themes for comparative analysis.

My survey of the Sydney Basin identified 84 literature sources containing 22 stories and 101 vocabulary items, and the ethnography identified 4 participants with 17 stories and eight vocabulary items. Stories are cultural stories. The 14 items of astronomical knowledge are information found related to astronomy, but not in story form. A vocabulary of words from the seven language groups defined for this study, and related to astronomical terminology, was developed and is found in Appendix 3.

4.4.2 Thematic analysis ‘starting’ codes

The thematic analysis of the stories resulted in 47 separate ‘starting’ codes, as follows:

1. Something falling out of the sky
2. Culture hero angry about roasting lice in the fire

3. Moon – male
4. Sun – female
5. Culture hero ascends back into the sky
6. Killing a large number of people
7. Moon jealous of Sun
8. Tears of Moon fall as rain
9. Ceremony to honour Moon-man
10. Eaglehawk/All-father
11. Eaglehawk – Altair
12. Crow subservient to Eaglehawk
13. Baiame created man and woman
14. The first man to die climbs a tree to Heaven
15. Mundos are Baiame's footprints
16. Baiame stepped off a flat-top mountain back to the sky
17. Quartz crystal associated with Baiame in Bullima
18. Carvings in ground
19. Sun looking at buried dead
20. A young man desires the wrong woman
21. Wrong use of resources
22. Moon origin is a woman who wants the wrong marriage
23. A young man desiring a woman in (22) turns into a brown snake
24. Moon who was wrong woman group, with child, water breaks, no water – brown snake
25. Sisters pursued by the wrong person

26. Sisters climb, jump, thrown into the sky
27. Moon man swells due to various reasons
28. Bad people eat human flesh
29. Burn out bad people
30. Venus was a bad person
31. Milky Way is a giant turtle
32. Holes/tunnels often lead to places like Bullima
33. The story explains the marking/nature of animal
34. Spirit with red glow floats up and becomes Betelgeuse
35. Seven Sisters controlled cold, ice, and snow
36. Seven Sisters created creeks and rivers
37. Spirit (burned) becomes Aldebaran
38. Earth is flat plain with Sun, Moon, and stars revolving around
39. Sun produces light only (no heat)
40. Seven Sisters produce heat
41. Lightning Brothers and Alpha/Beta Centauri
42. Baiame created Country and Law
43. Sun is male
44. Moon is female
45. Moon was boomerang
46. Resource connection to objects in the sky
47. Baiame travelled with a canoe

4.4.3 Combining codes into themes

Combining the codes into themes resulted in the following 14 themes. The number of codes connected to a theme is only an indicator of the complexity of a theme, not of any relative importance.

1. Something falling from the sky (2 codes)

The first theme is that of something falling from the sky, usually described as a falling star (meteor) or rock. It is often ascribed to an omen and is consistent with Aboriginal perceptions of meteors across Australia (Hamacher and Norris 2009). Most Aboriginal descriptions of meteors have negative connotations and are perceived as bad omens. A Darkinjung tradition describes a meteor as a portent of something good happening. A similar view is held by the Lardil of Mornington Island, who see a white meteor as a good omen, but a coloured meteor as a bad omen.

Another thread within this theme is that of objects falling from the sky as a punishment for breaking traditional laws and taboos. An example from this study is from Awabakal traditions regarding the formation of unusual rocks (Threlkeld in Turbet 1989: 121). In this tradition, people were roasting lice over an open fire, which was forbidden. As punishment, a sky goanna cast down a fiery stone which struck the land and killed the people. Remnants of the stone can be found at Kurran Kurran on Lake Macquarie, which has been identified as petrified wood. A similar tradition was found from near Toowoomba, QLD in which a woman accidentally cast head lice into a fire. As punishment, a star fell to earth and killed the people, creating a spring called Woonarrajimmi (Hamacher 2013b: 107). Aboriginal traditions from across Australia describe a fiery stone cast to earth as punishment (Hamacher and Norris, 2009: 75). The Awabakal tradition links with the theme ‘consequences for breaking traditional law’, which will be described later.

2. Culture heroes (5 codes)

Stories about culture heroes, such as *Baiame*, were often connected to the sky, as he is believed to have come from the sky, and eventually returned there after creating Country on the Earth. *Baiame* was also known by other names, such as the Awabakal ‘*Boyma*’, and the Yuin ‘*Dhurramoolun*’. *Dhurramoolun* (also spelled ‘*Daramulan*’) was variously described by other language groups as a son or associate of *Baiame*. Research with the

Euahlayi and Gamilaroi communities has indicated that Orion can be *Baiame* for ceremony (Fuller 2014: 110). Love (1987: 3-4) has quoted Winterbotham's interviews with the Jinibara man, Gaiarbau, from Southeast QLD, that the *bora* initiation ceremony is done 'for *Baiame*', with the direct intervention of his son/nephew, *Daramulan*. This was confirmed by the Euahlayi people (Fuller 2014: 19).

Early writers about Aboriginal cultures in Southeast Australia commented on the use of the word 'Father' for a higher being (Manning 1882: 160). Manning was reporting on a visit in 1844-5. Howitt (1904: 507), reported on the wide belief in an 'all-Father' in Southeast Australia, and Parker and Lang (1905: 4) confirmed that *Baiame* was 'all-Father' for the Euahlayi people. The culture hero and creator, *Baiame*, was common to many language groups in Southeast Australia (Fraser 1889: 10). *Baiame's* son, *Daramulan*, visits the people at the *bora* initiation ceremony, and it is through *Daramulan* that *Baiame* 'sees all' (Fraser 1882: 208; Howitt 1884: 458). The *bora* is a ceremony common to southeast Australia (*bora* is a Gamilaroi/Euahlayi name, and other communities use different names for the ceremony). The *bora* ground commonly consists of two circles on the ground, either earth or stone. *Baiame* is celebrated at the *bora* ceremony (Ridley, 1873: 269), and *Daramulan* is believed to come back to the Earth by a pathway from the sky (Fraser 1882: 212). Eliade (1996: 41) reports that *Baiame* 'dwells in the sky, beside a great stream of water (Milky Way)'. Fuller et al. (2013) tested the hypothesis that the orientation of *bora* ceremonial grounds, which are a large and a small circle connected by a pathway, was aligned with the Milky Way, which is vertical in the South-Southwest sky early evening in August and September. The results of testing the alignment of 68 *bora* sites using a Monte Carlo simulation confirmed that the alignment was not by chance. There is also speculation from Love (1987: 3), and evidence from Gaiarbau in Winterbotham (1957: 3-4) that the cultural Emu in the Milky Way may be the connection between the *bora* alignment and the sky at this time of the year. Another connection between *Baiame* and the Sydney Basin occurs in Darkinjung Country at Mt Yengo, west of Wollombi, NSW. According to Aboriginal peoples from the Hunter River to Port Jackson (Sydney), Mt Yengo (Fig. 4.3) is where *Baiame* stepped off the sandstone country and into the sky when he had completed giving his Law (Jones 1993: 4).

3. The Moon (11 codes)

The Moon, being visible most nights, has many stories connected to it regarding gender, creation, behaviour, and connection to Law. He/she (the Moon has different genders according to different language groups) is often a common theme in more detailed stories. For the Awabakal people, the Moon was used to illustrate jealousy (of the Sun), and also to explain natural features, such as Belmont Lagoon (Threlkeld in Maynard 2004: 49-50).

The Gai-mariagal people used the Moon in a story illustrating the effects of breaking marriage Law (Foley 2001: 44-47). This story is that of a young woman who was ready to marry an important person and a young man who was to marry a widow. The young woman rejected the marriage plans and proclaimed her love for the young man, who then broke the Law by over-fishing. For causing this, the young woman was cast out of her Country and wandered until she found some clever people who caused her to go into the sky where she became the Moon. As the Moon, she becomes pregnant to the brown snake, who is the young man who was similarly cast out, and she grows fat until her water breaks, and there is rain on the Earth. The child comes to Earth as a shooting star. The Gundungurra had a story that explained the phases of the Moon, and the Dharawal described the Moon as a person who chased the Seven Sisters into the sky. The Moon in other areas of Southeast Australia is used variously in stories, such as the Euahlayi *Bahloo*, who with *Wahn*, the crow, is responsible for girl babies, but is also used for weather forecasting (Fuller 2014: 63-65).

4. The Sun (5 codes)

The Sun, which is in most cases, a female (except for the Yuin; to one participant (P2) it is Grandfather Sun), has a less common connection to stories and is often just a backdrop to a story. Interestingly, there is a Dharawal belief that only light, not heat, comes from the Sun and that the Seven Sisters, who arrive with Spring, are the source of the summer heat. For the Darkinjung, the Sun was a symbol used in ceremonial ground sculptures, and burials were made in such a way that the Sun could look at them each day.

5. Ascent of a culture hero to the sky (3 codes)

There is a common belief that *Baiame* had ascended into the sky when he was done with creation and giving Law and that he ascended/jumped off from a flat-topped mountain, which was made flat when he ascended (Needham 1981: 10). Mt. Yengo in the Hunter

Valley is probably the most well-known jumping-off spot in the Sydney Basin. The Darkinjung story of Mt. Yengo (which is on their Country) connects to the Southern Cross, and the story of the first man to die. *Baiame* created two men and a woman, and one man refused to eat his totem animal, so he began to die. He travelled into the sky via a tree which is now used by the spirits of the dead. The footsteps he used to climb the tree are now the stars of the Southern Cross and are now called *mundoes* (ibid: 71). The *mundoes* of *Baiame* when he jumped back to the sky at Mt. Yengo can still be seen on the surrounding rocks.



Figure 4.3 Yengo is to the sandstone country what Uluru is to central Australia (Jones 1993: n.p)

6. Ceremony (3 codes)

There are only a few references to ceremony connected to the sky, but previous research has shown a strong connection between the *bora* initiation ceremony, and certain objects in the sky, such as the celestial Emu (Fuller et al.: 2013). In the Sydney Basin stories here, the Awabakal and the Darkinjung both have references to ceremony.

In the Awabakal story of the Moon and Belmont Lagoon, the Moon is jealous of Sun's beauty and cried tears for days until they formed a large lagoon. He was pleased that the Aboriginal people would be able to see him reflected in the Lagoon when he was full and

became happy. The Awabakal afterwards hold a corroboree at the Lagoon to celebrate the Moon man (Threlkeld in Maynard 2004: 49-50).

There are many other connections between the night sky and ceremony by language groups in the Sydney Basin, but most are of a sacred nature, and not for discussion in this study. Some examples which can be discussed are that of Orion, the human stick-figure, which can represent *Baiame* when it is setting on the western horizon (Fuller 2014: 109-110), and Venus and Mars, who are variously the eyes of *Baiame*, and are related to the lighting and dousing of the Sacred Fire, and possibly to the Morning Star ceremony (ibid.: 107). These latter examples may have also occurred during ceremony in the Sydney Basin, but this has not been confirmed.

7. Characteristics of Individual Stars (6 codes)

There are some stories that explain how a particular star came to be, such as through an important person or animal. Often, there is a characteristic of the star, such as colour, which is connected with the story of how the star came to be. There was rarely any specification of difference between stars and planets, except in their motion, so any stories, such as the Gundungurra one about Venus, are included in the category as ‘star’ (Mathews 1908b: 203-206).

The Guringai people had a story about a young warrior who was in love with one of seven sisters who lived in the forests of Ourimbah. He kidnapped her, and her sisters managed to rescue her by freezing the warrior. Due to his continued attempts to capture her, the sisters decided to go into the sky, where they became the Seven Sisters. The warrior, after he had thawed out, kidnapped another young woman, but she was married, and her husband tracked her down and chased the warrior into a tall tree. The husband started a fire, and the warrior was burned, where he drifted into the sky and came to rest as the red star, Aldebaran (R. Pankhurst pers. comm. 2016).

8. Creation stories (6 codes)

There are creation stories connected to the sky, as the creator heroes are universally believed to come from the sky and returned there. The Darkinjung and the Dharawal have stories about the creation of Man, and the creation of everything, including the Earth and Country. As Deb Lennis (Bursill and Jacobs 2007: 10) explains about Dharawal creation:

Long before there were any people, plants or animals on their land, *Baiame*, the spirit of our Ancestral Being, lived in the sky. He came down to what was a formless void and formed and shaped this land. It is he who gave the laws of life. *Baiame* returned to the sky and is known as the Sky Hero. When he had returned, he had left some parts unformed. These parts were formed by the activities of other creation spirits such as *Yullangur/gul*, the creation serpent.

9. Breaking Law has consequences (9 codes)

Many cultural stories have a ‘moral’ to them, and Aboriginal cultural stories are no different. The Law was not to be ignored, in particular, that of marriage, and these stories have a strong message that there will be negative consequences for ignoring Law. In the case of this study, every community has one or more stories of the consequences for breaking Law, in many cases the marriage Law. The Seven Sisters move to the sky is universally a result of a man breaking Law, and the Gai-mariagal story of the Moon and Brown Snake is a detailed story of the consequences to both parties of ignoring marriage Law. The Guringai story of the warrior and the Seven Sisters where the warrior ends up dying and becoming the star, Aldebaran, is a strong message of the consequences of breaking Law, and in this case, there is a star in the sky that can be used to illustrate the message.

10. Seven Sisters (3 codes)

The Seven Sisters, or the Pleiades, are a nearly universal meme around the world, and they have a particularly strong presence in Aboriginal cultural astronomy. The stories, which usually begin with a male breaking Law regarding marriage or relationship with unmarried women, result universally in the young women climbing or jumping into the sky, where they become the Seven Sisters, often still pursued by the wrong man/men. The Gundungurra have some stories showing how the Seven Sisters came to be, an example being the story of Karrugang and the Seven Sisters, where a magpie, Karrugang, chases seven sisters until one is drowned. Karrugang saves her and makes her his wife, forcing her to do all the work. The woman and her sisters pulled bark from a stringy-bark tree and sung the tree into the sky. They then climbed the bark into the sky, becoming the Seven Sisters (Mathews 1908a: 203-206).

11. Description of physical features and the environment (7 codes)

These stories describe the physical features of the night sky, such as the Milky Way, and the Sun, Moon, and stars in their relationship to the land. Environmentally, they describe such matters as the Seven Sisters being responsible for heat (not the Sun), and ice and snow. The Dharawal ascribed to '*Boyma*' (*Baiame*) the creation of all the heavenly bodies, including the Earth, which was a flat plane, around which the Sun, Moon, and stars revolved (Manning 1882: 159).

12. Resources (2 codes)

These stories, which are more like 'rules' rather than stories, describe the relationship between resources in Country and related night sky objects which may act as indicators of the availability of those resources. Outside of the Sydney Basin, the Euahlayi people used the position and appearance of the Emu in the sky to determine the availability of the emu bird resource (Fuller 2014: 85-86).

Wherever Aboriginal knowledge of the night sky has been studied, there are links between this and aspects of resources management. The cultural Emu in the sky was reported by Ridley as early as 1872 (Ridley 1872: 274). The importance of the cultural Emu in resource management wasn't commented upon until Norris (2007: 3) pointed out that the alignment of the engraved emu at the Elvina Track site in Ku-ring-gai National Park matched that of the cultural Emu in the sky in April-May, when emu birds were laying their eggs (Fig. 4.4).

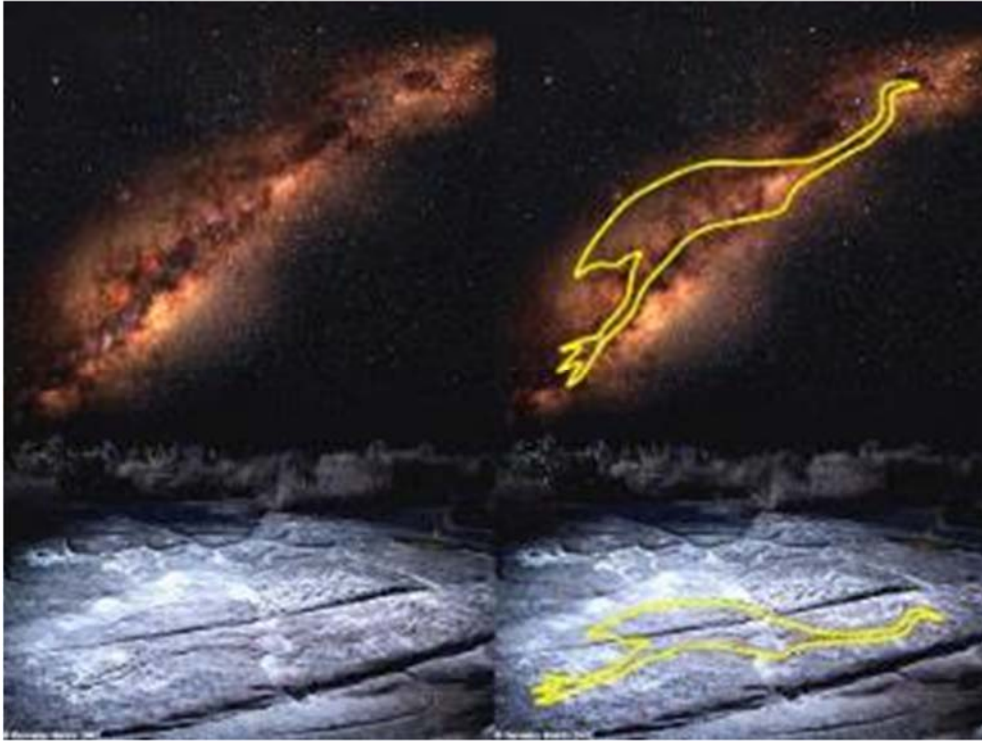


Figure 4.4 The cultural Emu in the Sky, and the matching engraving at Ku-ring-gai National Park (Norris and Norris 2007)

This connection between the cultural Emu and the emu bird as an egg resource was confirmed by Fuller et al. (2014: 175) in regard to the Euahlayi and Gamilaroi communities of northwestern NSW, where they see changes in the appearance of the cultural Emu in the sky to signal changes in the resource management of the emu bird. When the ‘legs’ can be seen, the female emu is chasing the male for mating, and when the ‘neck’ disappears, it is time to stop collecting the eggs. It is possible that the Guringai people of northern Sydney, who are presumed to have produced the emu engraving, also had further cues in the appearance of the cultural Emu in the sky to help with resource management.

Turner reported (2014: 24) ‘Bursill has described how for the Dharawal people, the rising of some star groups such as the Pleiades, the Orion Cluster, and some larger stars such as Aldebaran directly coincide with the blooming of plant life and flowers, changes in temperature or season, and abundance of fruit growth.’ Bursill also said (pers. comm, 12 February 2018) that the (evening) rising of the Pleiades heralds the Spring and that the dreaming of the Wagilag Sisters (who dream the new season) is done. He also said that (the rising of) Orion’s Belt is the signal of Summer. These examples of resource connections between astronomical objects and seasons are a sign that Aboriginal peoples

in the Sydney Basin used the night sky as a calendar to ensure their survival through knowledge of seasons and resources. Research in other parts of Australia is revealing the close connections between resource management of animals and plants using knowledge of astronomy to provide indicators of when they are breeding, growing, and suitable for use as resources. Leaman et al. (2016) show the close connections between animals represented in the sky by stars and other objects with the breeding cycles of their terrestrial counterparts.

13. 'What's up there is down here' (6 codes)

The concept of 'what's up there is down here' is particularly important in Aboriginal cultures and is a part of the 'connectedness' of all aspects of Aboriginal culture and spirituality. The sky is just as important as the land regarding knowledge and stories.

Awabakal - Gunson (1974: 50) from Threlkeld, reported that a 'medicine man came down on a meteor to initiate men'.

Awabakal/Darling - *Bibiga*, the Eaglehawk (who is Baiame), is represented in the sky by the star Altair (Needham 1981: 36)

Darling - Baiame created the first people, and one went into the sky after climbing a tree with notches. The tree became Crux, and the stars the notches. (Needham, 1981: 71)

Dharawal - Shooting stars become waratahs (red flowers). (Peck 1925: 202-203)

Dharawal - Lightning Brothers (in petroglyphs) become Alpha and Beta Centauri (Bursill, pers. comm. 18 March 2018).

Dharawal - Jannali (in Sutherland) is the place of the Moon. Yennadi, a young woman, wanted the wrong man by marriage rules, became the Moon with a 28-day cycle. (Bursill, pers. comm. 12 February 2018)

Gai-mariagal - Long Island, east of Brooklyn, is a snake, the head at Brooklyn end, the tail the other, and the bulge is a kangaroo with which it fought. (P21)

14. Connecting songlines to stories (5 codes)

Of particular interest are the songlines identified in Chapter 8. These are supported in a couple of cases here:

Gundungurra – *Dyin-yook* (Black Swan) is Crux; Alpha Crucis is the head of the swan. (Mathews 1908a: 203-206)

Dharawal – Black Swan songline all up and down coast. (P3)

Gai-mariagal – story about North Head and the Pelican songline. (P21):

The Pelican songline radiates from Car-rang-gal (North Head). Pelican story follows Warrigal (Thylacine) songline N. Head, W. Head, Yengo, NNW through Gomeroi country, into QLD W. of Goondiwindi, arcs left through QLD and West to Attila (Mt Connor near Yulara), Warrigal Rock/Dingo Hill, up the MacPherson Range and into cave where it was buried, then through Heavitree Gap, Olgas, Lake Eyre. Another Pelican songline starts Lake Eyre, arcs through SA, VIC, up to Mt Tywnam and Carruthers Peak in the Snowy Mts, then Nowra and the coast back to Sydney Harbour. This is the return route. These connections to the inland/Dead Centre from Nowra are marriage connections.

Gai-mariagal – ‘Black Swan songline (shared) goes up the coast via lakes to Grafton and starts around Maroubra. In winter, Bull sharks disappear and go to Northern rivers to breed/have babies. Satellite tags have confirmed this. Swans and sharks linked by going to the same areas. Shark totems share songline.’ (P21)

Gai-mariagal – ‘Black Duck songline (shared) starts at Mascot and goes South to Walaga/Mallacoota (could go to Great Lakes).’ (P21)

4.5 Thematic connections by language group

An analysis of the themes and their relationship with individual language groups in the Sydney Basin does not show any real pattern, other than a strong interest in the Pleiades by the Dharawal and Gundungurra peoples, with most groups having a story about the Moon. Figure 4.5 shows this graphically. Given the known similarity in cultures between these peoples, it would be expected that there would be a similarity in themes, and the lack of such is probably an indication that stories have not made it into the literature after the disruption of European colonisation took place. The lack of any stories from the Dharug, who, depending on whose analysis is used, would be the most populous language group, or at least, the language group with the largest territory, indicates that knowledge was lost or not collected at the time.

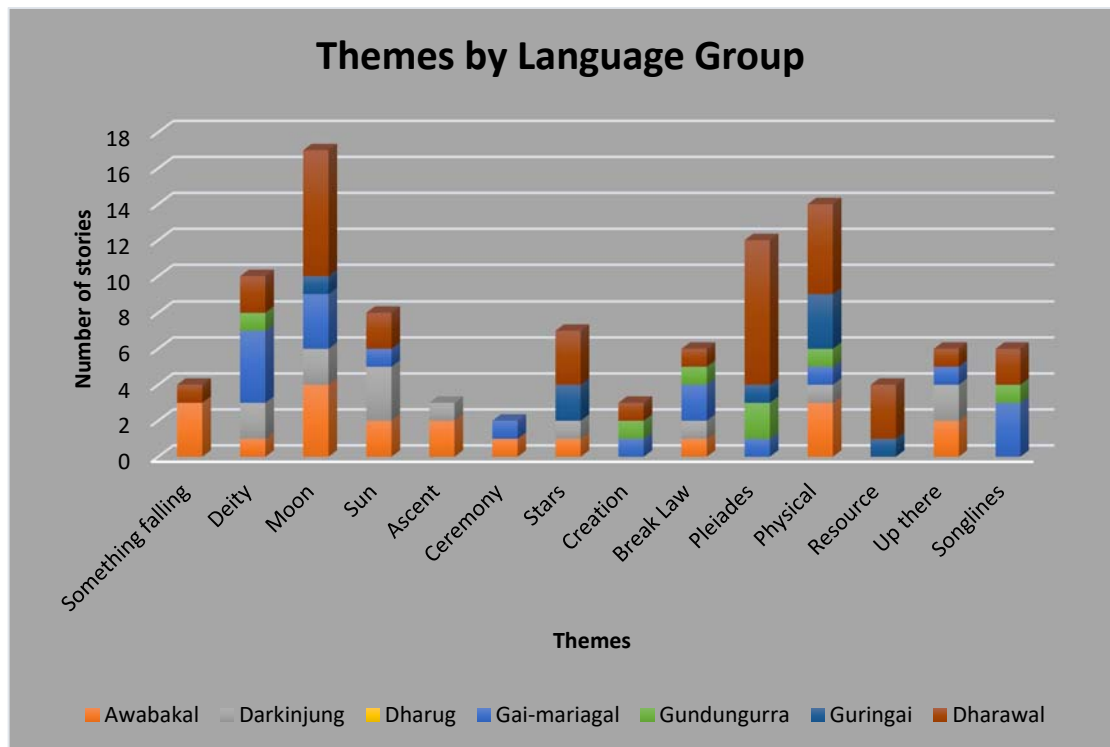


Figure 4.5 Themes Sydney Basin

4.5 Sydney Basin rock art and astronomy

McDonald's (2008) survey of the Sydney Basin rock art examined over 14,000 motifs (individual artworks). Given the large sample, the only reference to a possible astronomical link in this report is that of some possible Darkinjung sun symbols in white ochre (Moore 1981: 396).

However, more recent analysis has led to some hypotheses about some specific examples of rock art in the Sydney Basin. There has been some speculation about star-like motifs which were described by Sim (1966: 2), as well as rock art previously identified as boomerangs which may be the crescent Moon. As previously mentioned, in the same area, there is the Elvina Track rock art depicting the cultural Emu in the sky. Branagan and Cairns (1993) have also suggested that cupules in the sandstone platforms in the Sydney area may represent star constellations, such as the Southern Cross.

An example of an astronomical linkage with Sydney rock art comes from the Guringai language area near Woy Woy on the Central Coast north of Sydney. This story was told to Robert Pankhurst many years ago by a Guringai man and explained the meaning of this particular rock art.



Figure 4.6 Baiame figure with Sun and Moon and paddle (Pankhurst 2016)

This story explains that the figure is *Baiame*. The object across his body is the paddle for his canoe, which is below him. His Mother was sending him to Earth, along with the Sun and the Moon (in his hands). While this story certainly makes a connection between rock art and the sky, the eminent Sydney rock art specialist, Fredrick McCarthy, in reviewing a lifetime of study of the rock art of the Sydney Basin (McCarthy 1985), was only willing to confirm that the rock art themes fell into two categories. One theme was persons and beings related to sacred and ceremonial matters, and the other was animals and objects related to resources and the increase of those resources.

4.6 Discussion specific to the Sydney Basin

Thick descriptions of thematic results are related to ethnographic studies, and while this will be examined in detail in Analysis (Chapter 10), there can be some value in doing one before examining the other regions in this study. ‘Thick descriptions’ are a tool used in symbolic anthropology, which is a study of the way people understand their surroundings, including other peoples’ descriptions of such (Des Chene 1996: 1274). It also studies symbols and processes, such as myth and ritual (Spencer 1996: 535). In the context of cultural astronomy, symbolic anthropology examines the cosmology created by each of these peoples, who are attempting to put meaning to their universe as they see it; in this

case, their universe being the night sky and their own Country, which reflects the night sky.

The description of the themes from my analysis of the Sydney Basin astronomy can be broken down into the following:

- The explanation for natural events, including meteors, the phases of the Moon, and where light and heat come from,
- The origin, behaviour, and eventual location of the creator hero(s), which seem to universally come from the night sky and return there after the creation of the Earth's features and providing Law,
- The explanation for how individual night sky objects, such as stars and asterisms (such as the Pleiades) came to be in the sky, and what caused some of their properties (such as colour),
- Moral messages relating to the breaking of Law,
- The connection between the night sky and resource management,
- And descriptions of the physical features of the night sky, and relationship with Country on Earth.

These themes comprise a cosmological framework to explain what is seen in the night sky and on Earth, and how they are related to the cultural life of Aboriginal peoples. However, based on the stories and items of astronomical knowledge found in this region of the study, creating a thick description from them is problematic. Stories and knowledge sourced from the literature of mostly the 19th and early 20th centuries do not lend themselves to a deep analysis of the symbolism behind the information contained. Most of the writers' intentions in recording knowledge was to record the stories as a means of understanding the cultures of the people being studied, but rarely was there any deeper analysis of how the stories could be interpreted 'to address fundamental questions about human social life', as Spencer suggested (*ibid.*: 535). I know from experience of ethnographic research with Aboriginal peoples that they have both complex and complete cosmologies including their cultural astronomy, so attempting to recreate such cosmologies of the seven communities represented in this literature study from the limited data found would be unreasonable. Further ethnographic research with these

communities has only led to limited knowledge of their cosmologies. Accordingly, the thematic analysis results can only be described as a 'thin description' (Ray 2011).

The thematic analysis produced 12 themes, which are common to most Australian Aboriginal peoples who have had their cultural astronomy studied. The only theme that may be more local in the south-east Australia region is that of a culture hero jumping or stepping back into the sky from what becomes a flat-topped mountain, but it may be that this has just not been reported from other regions in Australia. Attempting to take the results of the thematic analysis and creating a thick description were less successful, but some themes in the manner of symbolic anthropology were teased out of the analysis, and looking at other cultural astronomy projects, may fall into the category of 'universal themes.' Future analysis of a study of other Aboriginal peoples' cultural astronomy would be useful to see if these 'universal themes' extend elsewhere in Australia.

The analysis of the 12 themes by language group in the Sydney Basin from which they came was not particularly instructive; the reason is clear that there is a large gap in the stories that have survived in the literature since 1788, and the limited knowledge by the current Aboriginal communities in the Sydney Basin.

5

5 The Astronomy of the NSW North Coast

5.1 Introduction/language groups

The North Coast of NSW is comprised of six Aboriginal language groups, running from over the QLD border to Newcastle in the Sydney Basin. They are, from north to south, the Bundjalung, the Yaegl, the Gumbayngirr, the Dunghutti, the Birpai, and the Worimi communities.

The Bundjalung community runs from over the QLD border into the Gold Coast and Logan, QLD areas, down to the Clarence River. Within the Bundjalung community, there are many smaller dialect-based communities. At the time of European contact in the mid-1800s, there were reported to be 20 dialects, but only 12 are currently known (Murrumbidgee Aboriginal Language and Culture Co-operative). Sharpe et al. (1985: 123-124) listed 35 names of dialects from archival sources, as well as eight dialect groupings (ibid.: 163). In any case, there does seem to be some uniformity in stories collected in the Bundjalung area.

The other language groups in this area are mostly unified in culture and language, with the Yaegl being a small group on the south side of the Clarence River near the sea at Yamba and Maclean, NSW. The Gumbayngirr Country runs south from the Clarence River to the Nambucca River, and west to the Dividing Range. The Dunghutti Country runs from the Nambucca River south to the Hastings River and west to the Dividing Range (the Hastings River border is contested with the Birpai community, who claim the southern border of the Dunghutti should be the Macleay River which runs through Kempsey, NSW). The Birpai Country runs from either the Macleay or Hastings River south to the mouth of the Manning River and west to Gloucester, NSW. The Worimi

Country runs from south of the Manning River to either Port Stephens, NSW, or the Hunter River north of Newcastle, NSW, and west to the border with the Geawegel community. The Birpai and Worimi share a common language, Gathang. Fig. 5.1 shows the North Coast community map.

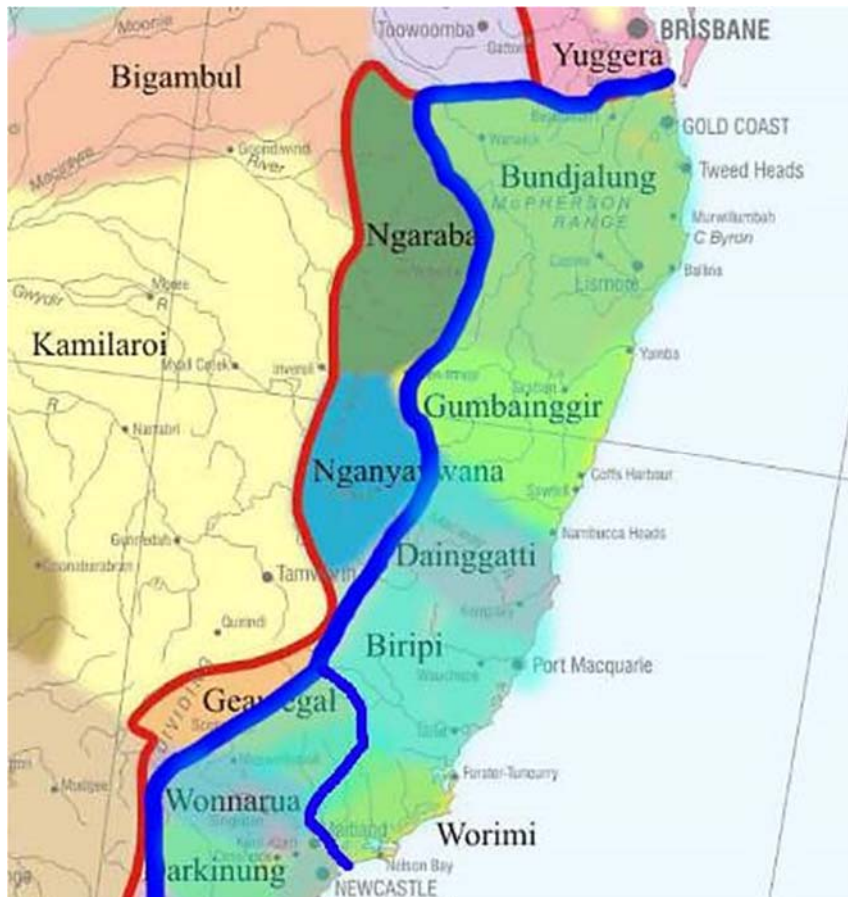


Figure 5.1 North Coast Aboriginal communities (AIATSIS Language Map)

The arrival of Aboriginal peoples on the North Coast of NSW is not clearly understood, but Bowdler (2010: 180-182) surveyed the knowledge and concluded that ‘the eastern Australia strip during the Pleistocene (prior to 11,700 years BP) was not a haven for human occupation’, due to climatic reasons, and that settlement was much more likely after the sea level rise around 9,000 years B.P. This is supported by a limited number of archaeological dates, such as Swansea Inlet at c. 7900 years BP (ibid.: 180), which is slightly south of the North Coast. Otherwise, Sharpe (1985: 104) reports that McBryde had reported settlement in the Bundjalung area in the fifth millennium B.C. (c. 7000 years BP).

Like the previous chapter on the Sydney Basin, this chapter will focus on the historical archival information, material culture, and ethnographic fieldwork done in the North Coast for this study.

5.2 Methods and theory

5.2.1 Literature survey

The North Coast was a productive source of literature, perhaps because of the distance from Sydney (and invasion) and because there are six communities with differing languages. Looking at the sources, there were some well-known collectors of Aboriginal stories who published stories from the North Coast, and there has been a substantial effort to revitalise languages on the North Coast. There were 19 stories of varied complexity found in the survey, and 59 items of vocabulary, many of which came from relatively recently published books (four of the six language groups have their language books published by the Muurrbay Aboriginal Language and Culture Cooperative in Nambucca Heads, NSW. Muurrbay has also published *A Handbook of Aboriginal languages of New South Wales and the Australian Capital Territory*, which covers most of the North Coast).

5.2.2 Material survey

There are many culturally important Aboriginal sites on the North Coast. Howard Creamer, a Cambridge-educated anthropologist, and Ray Kelly (Senior), an Aboriginal elder from the Dunghutti community, were hired by the NSW National Parks and Wildlife Service to carry out an extensive Aboriginal cultural heritage survey in NSW in the early 1970s. Creamer and Kelly enlisted the support of some Aboriginal knowledge-holders around NSW and made several reports to NPWS and the then-AIAS in Canberra, including the *Sacred Sites Survey 1973-1976*. The overall report of the project was published in 1983 and contained significant information about the North Coast, particularly the Clarence River valley, and Bundjalung culture. Most of the information, including a large photographic archive, can be viewed at AIATSIS, but due to the sensitive nature of the material, cannot be copied or republished. My limited review of this large collection suggests that the majority of sites are *djurabils*/increase sites, sacred landscapes, and places of significant stories.

There were a significant number of *bora*/initiation sites on the North Coast, particularly in Bundjalung Country, and these were well recorded by J.G. Steele in *Aboriginal Pathways in Southeast Queensland and the Richmond River*. One, in particular, that is

well-known, and that I have visited several times is the *bora* at Tucki Tucki, south of Lismore, NSW. This *bora* has a very clearly delineated pathway to the southwest, and while the small (sacred) circle has been lost to farming, the direction of the pathway is both towards the Emu in the Sky, and towards a number of landscape features beyond the Clarence River, such as Clarence Peak (Fig. 5.2).



Figure 5.2 Tucki Tucki bora ring looking towards the pathway (© Jeff License)

Bora sites were important initiation places to Aboriginal peoples in the southeast, and the connection to the Emu in the Sky was described in Fuller et al. (2013).

Rock art is not as common on the North Coast as in the Sydney Basin, but where it exists, local knowledge persons have been successful in keeping the existence hidden from the public. I know of and have been shown photos, of a pictograph (painted rock art) gallery in a very inaccessible location in Bundjalung Country that appears to show the Bundjalung origin story of the Three Brothers. Other rock art sites are equally inaccessible or have restricted access.

5.2.3. Ethnography

A large percentage of the ethnographical fieldwork for this study was conducted on the North Coast. The reasons for this were:

1. There were six different language groups/communities, with, in the case of the Bundjalung, many subgroups, all of whom had their own stories.
2. Access to participants in the ethnography required support from community groups, and due to the distances and separations of communities, this was a long time coming in the case of some communities.
3. Tracking down participants, both before they were ‘signed up’, and afterwards was extremely difficult, as many of the knowledge holders were involved in cultural and language activities that required constant travel.

I can say that in the case of some prospective participants, I spent the entire 2+ years of the ethnographical phase of the study trying to track them down through their networks, and in some cases, I was never able to make contact. Where I was successful with participants on the North Coast, I collected a large number of cultural information items and stories (over 150) plus some language items.

Of particular interest, and indicative of Aboriginal cultures on the NSW coast, is the marriage/family connections between North Coast Aboriginal families and Aboriginal people in the Sydney Basin and South Coast. There was significant mixing of persons from different community backgrounds during the period of the NSW Aborigines Welfare Board, who were responsible for sending Aboriginal children to various institutions along the coast, such as the Kinchela Boy’s Home at Kempsey, in an attempt to ‘assimilate’ them into white society until the Board was abolished in 1969 (Egan 2012). Otherwise, there appears to have been a very long-standing custom (probably long before European contact) of North Coast men travelling to the South Coast to marry women, and vice-versa. As a result, most families on the North Coast can show family connections up and down the coast.

My survey of the North Coast identified 39 literature sources relevant to the study, and the ethnography with 18 participants collected 70 items of relevance. There were 29 relevant vocabulary items, added to Appendix 3.

5.3 Results

5.3.1 Results by type and theme

The same method described in Chapter 4 was used to conduct a thematic analysis to create codes. Codes were then combined into themes, to use them for comparative

analysis. The following nine ‘starting’ codes were added to those in Chapter 4 to accommodate the data from the North Coast:

N48. Animals supposed to communicate with the sky-spirits

N49. People become stars

N50. A person put in Moon becomes the face

N51. Creation of the Sun

N52. Moon will not die; rises again

N53. Sun’s size depends on who is travelling with the Sun

N54. Two sisters made the sea, became the Hyades star cluster

N55. Girl chased into the sky, becomes an emu

N56. Aboriginal people observe the movement of the Sun

5.3.2 Combining codes into themes

The previous 12 themes, plus two themes have been added. The descriptions and codes are only for the North Coast.

1. Something falling from the sky (no codes)

2. Culture heroes (4 codes)

Baiame was only mentioned once by P18, who was discussing who created what (*Baiame* created the land). *Birrugan*, a culture hero of the Gumbayngirr, was identified with the Morning Star (P11 confirmed), and the Southern Cross (Morelli et al. 2016: 304), and P11 said that *Birrugan*’s Mother was the Evening Star.

3. The Moon (11 codes)

There were lots of references to the Moon, particularly in Gumbayngirr culture. McDougall, Laves, Enright, and Morelli et al. have reported Moon stories. McDougall (1901: 63) first reported a story of the Moon being speared, and eventually recovering, then giving the plants and animals the ability to restore themselves. Laves (1929: 973-1008) reported the same story, while Enright (1937: 88-89) reported a similar story except that the Moon was first created by a boomerang thrown into the sky. More recently, Morelli et al. (2016: 263, 304) confirmed the Moon as male and reported that at Coffs

Harbour, NSW, the Moon is *Giidanyba*, and there is a Moon rising place over Mutton Bird Island. Enright reported the same story of the Moon being created by a boomerang when writing about the Worimi people. Also, with respect to the Gumbayngirr, P11 said that the names of the phases of the Moon related to the resources available.

The Bundjalung had a couple of stories about people or birds in the Moon. P6 told the story of a man fishing, killed the wrong thing (probably a dolphin), a whale swallowed him, and spouted him to the Moon. He was sitting there, waiting for a bird to take him back, and is still sitting there. P6 also said that a magpie was taken to the Moon and had to wait for a certain bird to take it back to Earth.

P24 had a couple of Yaegl connections to the Moon. One was a story about a man swinging an axe (no further details), and that when the Moon ‘gets a circle’, it will be windy the next day.

4. The Sun (9 codes)

There is a Bundjalung story about the Pelican being jealous of the Emu, which had large eggs. The Pelican threw an emu egg into the sky, where it broke and became the Sun (Roberts 1991, Side A).

Morelli et al. (2016: 59-60) have a Gumbayngirr story about the Sun. The Sun is larger when rising and setting due to *Yuludarla* (Father) being with *Birrugan* (son) at these times. Otherwise, *Birrugan* travels as the Sun alone. This seems to refute the statement elsewhere in Morelli et al. (ibid.: 304) that the Sun is normally female.

P11 has clarified the above story: Story about why Sun is so big at sunrise/sunset. Sun is *Birrugan*, but the father, *Yuludarla*, helps him rise and set (and pass behind the Earth). If *Yuludarla* was to stay with *Birrugan* all day, the Sun would be too strong and would burn everything on Earth.

P6 (Bundjalung) says that in Ballina, NSW, the sun is male, while P32 (Dunghutti) say the Sun is female.

The Dunghutti have some special interest in the Sun, as they are ‘sunrise’ people, and responsible for sending the Sun over the rest of the Country (P31). They call the Sun *Euroka*, which means ‘up above us’ (P32). P32 also said that there is a story of a man who ran away with the Sun (but no detail).

5. Ascent of a culture hero to the sky (2 codes)

The Gumbayngirr have a story about their culture hero, *Birrugan*, ascending to the sky: After *Birrugan* was killed at Trial Bay, he was raised up by two sisters. The Koala's guts turned into Seal Rocks south of Forster. *Birrugan* used myrtle sticks to vault over the island. A Myrtle tree turned into a ladder, and he and two wives ascended into the sky (Morelli et al. 2016: 55). Elsewhere we know that *Birrugan* is associated with the Southern Cross and his wives are the Pointers (ibid: 304).

The Dunghutti (particularly the northern Dunghutti) appear to revere *Birrugan* like the Gumbayngirr, and in fact, *Birrugan* was killed at Trial Bay, and buried at Southwest Rocks, both of which are in Dunghutti Country (P33). P33 said: 'to go' is 'yarri'. Yarrapinni could be jumping off place ('*Wulumpurra*' for Creator). Yarrapinni Mountain (northwest of Trial Bay) is the site of a significant Dunghutti culture story about the killing of a koala and is probably the start of a songline running west to Bellbrook in the foothills of the Dividing Range.

6. Ceremony (1 code)

Enright (1946: 265) was told this Worimi story about the Pleiades:

There were once seven sisters who were inseparable companions. One day they decided to hold an initiation ceremony. Now in those days, the menfolk did not practice initiation rites. When, however, they saw what the sisters were doing they did likewise. The women discovered that they had been spied upon and thereupon attacked the men. The women could throw stones with as much skill as the men. The women were turned into swifts and flew up into the sky, where they are still stuck. The men were turned into kingfish.

Enright also recorded the same story as Gumbayngirr (1937: 194).

7. Characteristics of Individual Stars (16 codes)

The Bundjalung have a story of twin stars, which are twin boys of the Githabul group, who are travelling over the northern mountain range in winter (Robinson 1963: 175; Robinson 1965: 58). This story would make sense for the Githabul, who live in the

northern part of Bundjalung Country, but south of the QLD border, as the Border Ranges are to their north. Whether these twin stars are Castor and Pollux of the Gemini constellation is unclear, as to see them in the winter sky, they would be visible only in the early morning.

Morelli et al. (2016: 304) report regarding the Gumbayngirr that *Birrugan* is identified with Morning Star and mother *Bawnggan* with the Evening Star. He also says *Birrugan* is seen as the Southern Cross, and his two wives are the Pointers. Regarding Orion, Morelli et al. (ibid.: 304-305) say that Laves mentioned *Bulagan.gidam* and three brothers: *Bulagurrgidam*. The three boys are the three large stars of Orion's Belt.

Much earlier, Palmer (1884: 292) reported regarding the Gumbayngirr that: 'The Southern Cross is composed of five sisters in one family called *Thaniken*; Orion is three brothers named *Thallan*, *Bullen*, and *Goorgiddem*.'

There are several examples from Worimi culture, including this story from Paulson (2017: MP3 audio):

Story from the Worimi/Biripi near Taree (Halliday's Point). *Gulambarra* was a spiritual person who got in a fight with a bad clever man and died. His mother, when she found out, started crying, and this can be seen as the weeping bark of a mangrove tree/crying tree at Shelly Beach. *Gulambarra* was taken by his two wives to an island off Seal Rocks, where they all went up into the sky, *Gulambarra* as the Southern Cross, and his wives as the Pointers¹⁰.

Enright (1900: 111) reported that *Goo-lum-bra* was the first man, now presiding genius of the *Keeperra* (initiation) of the Aboriginal peoples of Port Stephens, NSW (Worimi). This story is similar to that of *Birrugan* and his wives from the Gumbayngirr and Dunghutti.

The ethnography also has some examples of the characteristics of individual stars (or things in the night sky). P26 had a Birpai story connected to the Milky Way:

Eaglehawk and Kingfisher having a fight. EH throws firestick at KF, who catches fire. KF goes to the shoreline, which has no waves (during creation time). Sticks

¹⁰ The Pointers are the common name for the stars Alpha and Beta Centauri.

one foot in the water, calls in the waves, one foot in Milky Way, called down rain.

This is why the Milky Way has a ‘smokey’ appearance.

The Dunghutti have some interesting descriptions of stars. Lissarrague (2007: 46, and pers. comm. 15 February 2018) note the name *Wupu Manhatinun*, which can be translated as ‘Travelling Star’, and is the Dunghutti name for the town of Bellbrook, located to the west of Kempsey, NSW, and the site for a major Dunghutti ceremonial site. When I first heard of this description, it occurred to me that it could be about the Morning Star, as Bellbrook is elevated, and might be the first place to see Venus in the morning. Venus, of course, does ‘travel’ during its appearance, both as the Morning Star and the Evening Star, not only changing places but rising at different azimuths and altitudes. In discussing this with P32, I was told that it was *Wupu-man-arri-noni*, which translated as ‘go/move that him away’ and referred to the (male) Evening Star *mayirri*. The reference to ‘away’ was because the ‘star’ (of course, Venus is a planet) goes away (below the horizon) in the evening. P32 further said that the Morning Star (Venus) is female. P31 (also Dunghutti) confirmed that Dunghutti are Sunrise people/Morning Star people.

The Gumbayngirr (P11), as previously mentioned, say that their culture hero, *Birrugan*, is the Morning Star. P11 also said that two sisters become the Pointers, so it must be *Birrugan*’s wives (and they must be sisters). P11 confirmed the literature study that *Birrugan*’s Mother is the Evening Star.

P1, a Yaegl person, said they saw the eaglehawk at Christmas as three stars overhead. The eaglehawk is identified as *Baiame* by some Aboriginal communities in southeast Australia.

8. Creation stories (4 codes)

P18 said that the Birpai believed that *Baiame* created the land, the Dolphin created the sea, and the Bass fish created the rivers.

The main creation/origin story on the North Coast is the Bundjalung story of the Three Brothers who came to the coast by ship/canoe and variously, either settled the Country or brought the Law to the people already there. There are many versions of this story even within Bundjalung Country, but the one reported by Norledge (1968: 26) is, in my opinion, the one with the least references to individual places found in the other versions:

Three brothers created in the Dreaming, Yahberri, Mahmoon, and Birrum. Came by sea in bark canoes (hoop pine - goondool). Had grandmother in canoe. Came to river flowing into sea. Lived there for a while. Sailed back to sea (without grandmother), sailed north until came to place with many black rocks. Landed, one brother threw spear and where it hit sand, fresh water came out. This spring can be seen in the sands today. Sailed north again until saw headlands and came ashore. One brother went north, one went west, and one stayed in the east, and this one gave law and bora rings to people who came there. When spring comes, the daughters of the brothers visit the Earth and come in the blue haze of the mountain.

This story is found in more detail in Chapter 8, along with a discussion about the variations of the story found within the Bundjalung community, and with the Yaegl and Gumbayngirr communities. In talking with participants, I have heard many variations on the story, including that the brothers came by sailing ship; from the 'north', from New Caledonia, and other places. My own theory is that they were 'climate change' refugees who came down the coast from QLD when the last sea level rise early in the Holocene forced them inland and in conflict with the existing people. Interestingly, Enright (1940, p.323) said: 'it appears that the Clarence River is the boundary between two classes of migrants, one of them travelling down the east coast, and the other from the north-west.' He also said (1932: 102) 'Investigations made last month showed that a stream of culture was moving down our eastern coast' (in respect to marriage laws).

9. Breaking Law has consequences (4 codes)

The only story of breaking Law that is not about the Seven Sisters is the Three Brothers story from the Birpai (P26). The story is covered in Chapter 7, and it is only marginally about breaking Law, as the lawbreaker (the witch) may not live under the same Law.

The Bundjalung, the Gumbayngirr, and the Yaegl all have a similar story about the Seven Sisters, which will be covered under Item 10 in this list. It is only their versions that mention a lawbreaker, and the consequences of breaking the Law which, in all cases, ends up with him going into the night sky and becoming, variously, a 'red star', or Aldebaran. Mathew's version (1899: 26-29), collected from the Gumbayngirr, is the most detailed version and will be repeated in Item 10. Mathews repeated the story (1904: 279-280) from the 'Clarence River tribe', assumed to be Yaegl, but with less detail.

It is interesting that, with six different communities (and one with some sub-communities), that there were far fewer stories of breaking Law and the consequences, compared to the Sydney Basin and the South Coast. Perhaps, due to the stronger hold on culture, the rules were more incorporated in ceremony, and the stories told only there.

10. Seven Sisters (11 codes)

The Seven Sisters (Pleiades star cluster) were mentioned regarding all the communities except for the Birpai and Dunghutti. The Bundjalung and Gumbayngirr story collected by Mathews (1899: 26-29) is the most detailed:

On the Clarence River there once lived seven young girls who were sisters, named Wareenggary. They were from the Bunjellung 'tribe' and of the Wirrakan division. They were very clever women and they had yamsticks which contained charms in the end which protected the girls from their enemies. Every day they went out hunting for carpet snakes always taking their yamsticks with them. A young man, named Karambal, from the same 'tribe' fell in love with one of the girls and followed them wherever they went, but his love went unrequited. He watched them every day waiting for an opportunity, eventually one of the sisters strayed away from the others and was not carrying her yamstick with her. Karambal carried her off to his camp, but her sisters were very angry and upset and met to see what could be done to return her to them, as Karambal was of the wrong division and in fact her tribal brother. The eldest sister suggested sending a fierce storm to kill Karambal, but the others were worried that this would kill their sister too. One of the other girls suggested that they went away to the west, where they knew the winter lived, and bring the frost and cold winds to punish the man for what he had done. So, they went away to the west and brought the winter, making it so cold that Karambal almost perished with the frost. The girl did not feel the cold, having secretly received her yamstick from her sisters, eventually Karambal allowed the girl to go back to her sisters. They were overjoyed to get her back and went away to the east to bring the summer because they did not want any more of their own people to suffer in the cold winter. After this the Wareenggary chose to leave the Earth altogether, but before doing so they went into the mountains and made springs at the head of all the rivers so that the people on Earth would always have plenty of water. The seven sisters then went into the sky and the constellation of the Pleiades

represents their camp. They send the summer every year and then the cold winter as a reminder to the men that they should always choose a woman from the correct moiety. Not long after the sisters left the Earth Karambal began to search for another girl, after a while he fell in love with a woman who he could lawfully marry. This girl was already united to another man, Bullabogabun, but she was persuaded to run away with Karambal. When the man found out that his wife had run away he was very angry and followed her to the camp of Karambal. In order to escape the anger of the husband, he climbed up a very tall pine tree. Bullabogabun saw him up there and placed a large amount of wood at the bottom and set fire to it, the fire raged up the tree, flames reaching out into the sky carrying Karambal with it. The flames put Karambal in a part of the sky near the Wareenggary and he became Aldebaran, so that he could follow the sisters continually as he had done in his youth.

Mathews (1904: 279-280) repeats a shortened version of this story, with the emphasis on what happened to Karambal.

Enright collected several Seven Sisters stories, not all of them easily identifiable as such. One from the Worimi (Enright 1939: 194) is: 'One day eight girls went out gathering grubs (*Toorgah*) but only seven of them returned, the other girl was never seen again. The seven girls were placed in the sky as the constellation called *Toorgah*. The big red star called *Jumbarrin* looks after the seven girls'.

Another Worimi story (Enright 1946: 265):

The following story concerning the Pleiades. There were once seven sisters who were inseparable companions. One day they decided to hold an initiation ceremony. Now in those days the menfolk did not practice initiation rites. When, however, they saw what the sisters were doing they did likewise. The women discovered that they had been spied upon and thereupon attacked the men. The women could throw stones with as much skill as the men. The women were turned into swifts and flew up into the sky, where they are still stuck. The men were turned into kingfish.

P14 (Bundjalung) talked about the Seven Sisters: 'Can see 6th and 7th very dull. That one banished from the 'tribe'. Story is that curlew was old woman in community, but

couldn't get on, so they banished her and left her in the bush, crying. They said, 'stop crying', but kept on. 'Tribe' made her whistle. Now that is the curlew¹¹.'

P30 (Yaegl) also had a Seven Sisters story which can be found in Chapter 8.

11. Description of physical features and the environment (12 codes)

Most of the communities on the North Coast reported locations of man-made fish traps along the shoreline. The Birpai reported fish traps at Pt. Plomer, Shelly Beach, and Rainbow Beach, and P18 and P26 confirmed that the Birpai fished with dolphins. In Bundjalung Country, there were fish traps at East Ballina and Prospect, and P6, P12, P13, P14, and P23 all confirmed the use of dolphins. The Dunghutti has fish traps at Crescent Head and Pt. Plomer, and P29 confirmed the use of dolphins. The Yaegl said there were fish traps at Angourie (I have seen this one), Wood Heads, and Brooms Head, and P1 and P24 told about the use of dolphins. No doubt there are many more fish traps on the North Coast, most of them no longer obvious.

Other aspects of physical features and the environment are varied. Morelli et al. (2016: 304) report the 'Two Sisters' story:

Southern Gumbayngirr - the Pleiades are identified with the two sisters who made the sea; besides the common name of this constellation *Janagan* it is also called *Ganay* 'yam stick' appearing as two crossed yam sticks in the sky. This is just like the shape of crossed yam sticks that Split Solitary Is takes; the final resting place of these sisters in the Nymboidan tradition (Coffs Harbour).

This story certainly does not seem to have anything to do with the Seven Sisters; in fact, the Two Sisters story about creating the sea is well known on the North Coast. The reference to 'two crossed yam sticks in the sky' led me to look at the Hyades star cluster, which is located in the constellation Taurus (the Bull), between the Pleiades and Orion. The horns of Taurus are upside down in the Southern Hemisphere and look very much like two long sticks crossed at one end. The Hyades are located along one of the horns (the Pleiades are located to the west, which might be the reason for the confusion).

¹¹ A curlew is a Bush Stone-curlew (*Burhinus grallarius*), an Australian nocturnal, ground-dwelling bird



Figure 5.3 The horns of Taurus (crossed yam sticks of the Two Sisters (Starry Night Pro © 2009 Simulation Curriculum Corporation)

Other descriptions varied from community to community. Enright (1946: 265) reported a story about the emu:

There was once a beautiful girl, whom every ‘tribesman’ admired. One day she was abducted. Five or six of her own ‘tribe’ followed the culprits and pursued them into the sky. As they went up they put out their hands and she was turned into an emu. This girl was a great dancer and that is why the emu dances so well.

This story not only explains why the emu dances well but might be the explanation for how the Emu in the Sky got there.

The Yaegl or the Bundjalung are the subjects of Gilmore’s speculation about a solar observatory (Gilmore 1932: 370):

I well remember my father’s astonishment and sense of discovery at finding that the natives knew the solstices just as truly as we did. I was too young to keep in mind all that he said about how they measured for the period, except that it was done by means of certain fixed mountain-rocks known to the ‘tribes’. One of these was somewhere near the source of the Clarence River. It was a rock mass that neither earthquake nor landslide could shake out of position. When the sun’s edge at setting just touched the down-line on one side of this rock, and the sun’s rising at

the other edge, it marked the period of the sun's turning. The solstice was either just then, or within so many days of that; I cannot now remember which. Watch was kept by those chosen for this duty, which was of the utmost importance, the year being measured by it, and tribal ceremonies dependent on it for the date. When the watchers marked the time, messages were sent to all the 'tribes'. The aboriginal ceremonial year was half the length of ours. And I well recollect my father saying that the aborigines measured the sun's course, and their year, as accurately in their way as we did in ours.

This interesting observation will be further examined in Chapter 9, Archaeoastronomy in Australia.

The Birpai story of the Three Brothers has been examined regarding the breaking of Law, but it also explains the physical features of the Three Brothers Mountains. P18 forwarded Marion Hampton's story of the Three Brothers, and the last part covers this aspect:

The *Gumal*, head of the Birpai, was responsible for punishment. He turned the brothers into what is now the Three Brothers (North Brother; *Dooragan*), (Middle Brother - *Mooragan*), and (South Brother - *Booragan*). The *Gumal* saw *Dooragan* as the innocent brother and now North Brother splits the two lakes (Watson Taylor and Queens). By doing this, the *Gumal* split the mother's spirit in two.

P18 also mentioned navigation by the stars: 'Uncle *Goola* (Koala) (Bill) Holton knew how to tell direction by the stars.' P25 (Yaegl) said: 'Go from old camp in Yamba - use stars to work out time to flying fox, possum, go fishing. Use stars to navigate back home to camp.'

P26's story of the Eaglehawk and the Kingfisher (Section 7 this Chapter) is a way of explaining why the Milky Way has a 'smoky' appearance.

The Bundjalung had some descriptive stories and features. P6 said that there were star observing sites at Wardell and Woodburn, NSW, the purpose of which was not explained. In nearby Ballina, P6 said: 'Whale dreaming was sung at East Ballina, near Missingham bridge. There is/was a big rock in the North wall (of the break wall). The song was to sing the whales into the beach.' P14 said about the Moon: 'tells you if it was going to rain or not. (when crescent laying over to the left; holding water. When crescent is to left,

but upright, will rain).’ (I have also heard this in Kamilaroi Country in north central NSW).

The Yaegl (P24) say if the Moon gets a circle (ring), then the next day will be windy.

The Dunghutti have a large number of places in their relatively small Country that have significance and history. P34 said that ‘the Carpet Snake was what created the Macleay River valley’.

12. Resources (1 code)

Surprisingly, the only mention of resources related to the night sky on the North Coast was from the Gumbayngirr (P11), who said that the phases of the Moon were signals to resources available.

13. ‘What’s up there is down here’ (2 codes)

Naputa and Patston (1996) recorded the story of *Binnungar* the frill-necked lizard who was supposed to deliver a message to *Gagadoo*, the cockatoo, who passes it on to the Sky Spirits.

Roberts (1991: Side A, No. 4) told the story of *Javreen*, the great boomerang thrower, who was practising for a contest and lost his best boomerang in the bush. Two little girls making flower chains near the riverbank found it for him. With the help of a *weeun* (clever man), he thanked the girls by putting one in the Moon, which is the face that can be seen, and the other, as the rainbow.

14. Connecting songlines to stories (10 codes)

There were ten references to songlines in the literature and ethnography, mostly from the Bundjalung community (7). Of particular interest to Chapter 8 (Songlines) are the references to *Gnibi*, *Ginibi*, or *Gineevee*, the Black Swan. Ken Gordon told Robinson (1965: 51) the following story:

Old Mick Robertson could have told you all about the stars, every star you can see in the sky. He had names for them all. The stars must have been his *jurraveel* because he could tell you all about them.

He told me that the Southern Cross is *Gineevee*, that's the black swan flying along. And the two pointers are the head and tail of a spear thrown by a black-feller to kill *Gineevee*.

That Southern Cross only came here with the white-man. Before the white-man came here he was a swan. That's a *jurraveel*. You won't see *Gineevee* in any other part of the world.

Margaret Sharpe (n.d.: n.p), in a list of Bundjalung star names, listed: 'Southern Cross *Ginibi* ('swan': the Cross is the swan flying, and the Pointers are a spear sticking into that swan).'

Regarding this story, P6 said: 'Black swan songline continues from Grafton North to Tabulam, Casino, and Ballina. Gnibi/Gineevee story but we only have the basic story.' P7, who is a direct descendant of Ken Gordon, also confirmed the story, and that it was only the basic, 'public' version of the story. As described in Chapter 8, the Black Swan songline may originate in Sydney, travel up the North Coast, through Yaegl Country (P30 says that the Yaegl have the *Ngaragan* (black swan) story), through Bundjalung Country on the route worked out by P6, and then further north and then west (see Chapter 8 for the whole route).

Other Bundjalung participants had information about other songlines. P12 talked about three of them:

1. Bunya Mountains to Wollumbin Mountain to Nimbin Rocks, to Coraki, then to Evans Head. The Bunya Mts. are the site of the Bunya Festival, Wollumbin Mt. (Mt. Warning) is a significant cultural feature, as are the Nimbin Rocks. The route to Coraki and Evans Head is the route of the fight between the goanna and the serpent, and Evans Head has cultural significance as a result.
2. Nimbin Rocks to the Nightcap Mountains. This is a valley route west from central Bundjalung Country around Nimbin and could be the jumping-off place for a route into QLD or west over the Border Ranges.
3. P12 said there was a Dolphin songline to the Kimberleys (the Dolphin totem is common around Byron Bay, NSW). It changes into the Brown Snake songline, then into the Dingoes chasing the Emu (songline). This songline is investigated in Chapter 8.

P6 spoke about a songline from the Tweed River (Razorback Ridge) to Casino, NSW (which was a cultural centre with a large *bora* ring), which travelled via Kyogle and Nyngan. This songline would have been a route for Bundjalung people from the Tweed and Gold Coast to get to central Bundjalung Country.

Further south, P31 confirmed that the Dunghutti had a songline from Mt. Yarrapinni to Bellbrook, which was a ceremonial site. The story of the koala also travelled along this songline. South of the Dunghutti, P26 (Birpai) said: ‘Stories travel on songlines. Features on songline tell the story. Coming from the Manning River, you see the Three Brothers’.

5.4 Thematic connections on the North Coast

Compared to the Sydney Basin, the North Coast themes were more concentrated around Stars and Songlines, with a strong interest in the Moon and the Pleiades. There was a lack of stories about Something falling, Ascent (culture hero), Ceremony, and Up there. These differences will have to be examined in Chapter 10, Analysis.

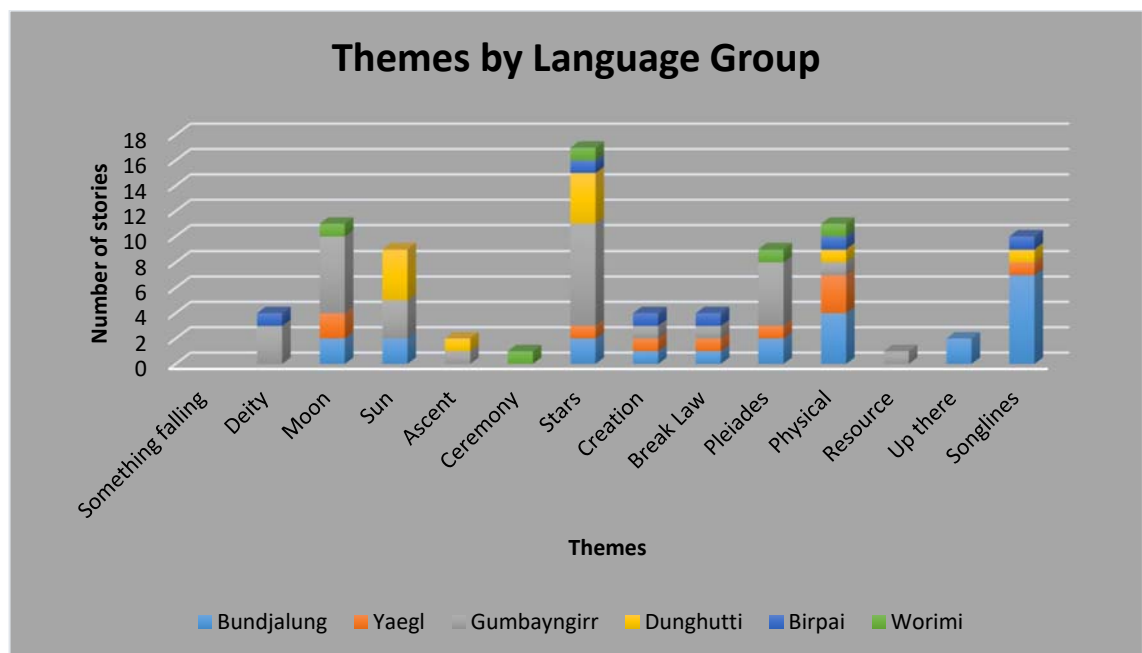


Figure 5.4 Themes North Coast

5.5 Significant landscape features

The North Coast is a large geographical area, even compared to the South Coast, with six, rather than one, Aboriginal communities. Landscape features are important on the North Coast but vary considerably from community to community.

For the Bundjalung, most of the significant landscape is in the north of their community, although this is just speculation, given that a lot of knowledge has been lost or hidden. The most significant geological feature in Bundjalung Country is Wollumbin or Mt. Warning. This is the volcanic plug of an ancient shield volcano (Tweed Volcano) that erupted 23 million years B.P. It was named Mt. Warning by Cook, who could see it from offshore. There are cultural stories about Wollumbin that are related to a leader of the Bundjalung, and a story including a brush turkey. It is unclear whether any of the original stories related to the night sky, and because the town of Murwillumbah, NSW is within the volcano caldera, and there is a strong 'alternative' culture in the town, there are a number of published stories and cultural claims about Wollumbin that were denied by some of the participants in this study. Some of the stories are related to the Seven Sisters, but there is so much disagreement about some of the stories that I will not repeat them in this study.

The mountains of the northern Bundjalung Country, which are mainly south of the QLD border, would have been traversed by Bundjalung and other North Coast peoples travelling to the Bunya Festivals near Kenilworth, QLD, and I have been told that some of these routes were songlines. I will explore these routes further in Chapter 8.

In looking for Gilmore's possible solar observatory (see Themes, Section 11) at 'the head of the Clarence River', P6 came across a possible observation site connected to a rock shelter in western Bundjalung Country. Fig. 5.5 shows an 'arrow stone' which is part of a rock shelf which points towards some high points close to the solstices. Fig. 5.6 shows the Horizon profile to the west of the 'arrow stone', with the solstices and equinoxes fitting into the terrain.



Figure 5.5 Possible 'arrow stone' (pointing west) Ian Fox

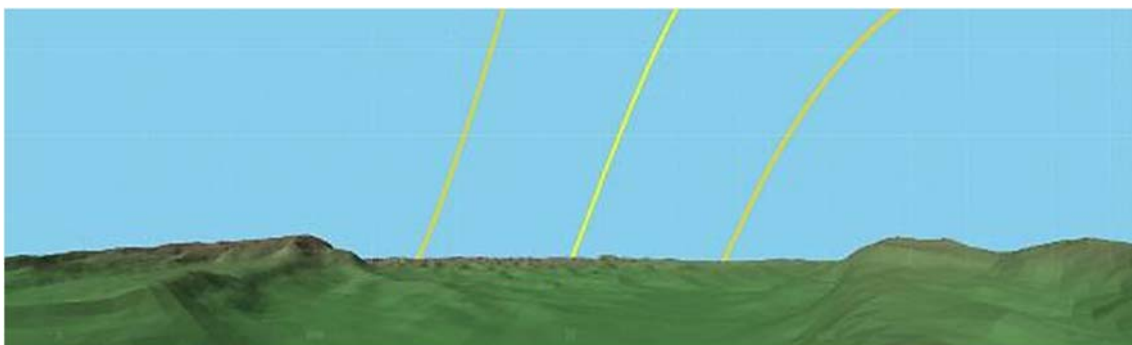


Figure 5.6 Horizon profile from 'arrow stone' (looking west) (Horizon©)

In the south of Bundjalung Country, most of the significant landscape I have been told about is close to the coast and is tied up in stories about the Three Brothers and the Goanna. The south central of the Country is fairly featureless, but there are many high points to the west and south past the Clarence River. The Yaegl no doubt share some of these significant features in and near their Country.

The Gumbayngirr people have significant landscape and seascape in their Country. As mentioned in Themes, Section 4., Moon, there is a significant story and possible alignment of Mutton Bird Island off Coffs Harbour which is connected to the Moon and is probably an alignment with the Moonrise from some point behind Coffs Harbour.

Sunrise from behind Coffs Harbour could have been viewed from a position on the Orara West hillside looking at Mt. Coramba, which is just west of Coffs Harbour. P10 took me to a possible cultural site which could have been used to view the sunrise equinox, which is shown in Fig. 5.7.

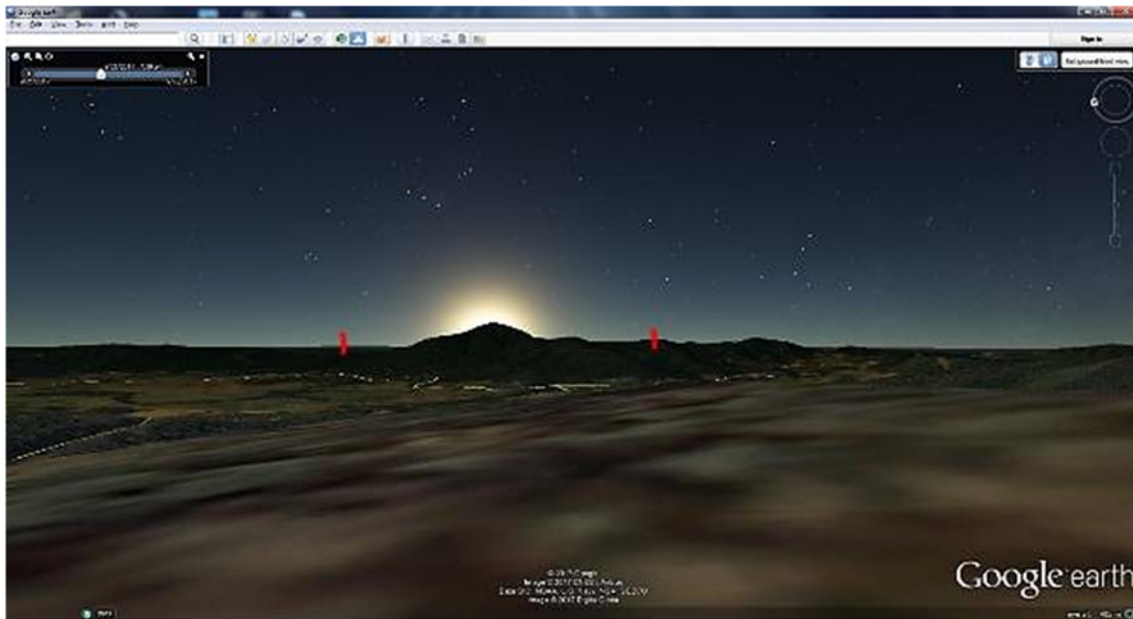


Figure 5.7 Sunrise equinox over Mt. Coramba (red marks are the solstices)

Much further west in Gumbayngirr Country is the Serpentine River, which has several Aboriginal stone arrangements, one of which could have possible connections to the night sky. McBryde (1963) studied this site, and since then, it has been kept closed by the local Aboriginal community. Fig. 5.8 shows some of the unusual ‘standing stones’, but of particular interest is the clear view of the sky to the east, which can be seen in the image marked ‘2’. As this site is high on the Dividing Range, it would have had extremely good views of the night sky, and judging by information from participants in this study, the higher the ceremonial site, the more likely it would be used for training and initiating ‘clever men’, the ‘Aboriginal Men of High Degree’ described by Elkin (1945). Clever men had a close connection to the sky, where they received their final training while on a ‘spiritual flight’.



Figure 5.8 Serpentine River stone arrangement site (McBryde 1963 Plate 1) (Courtesy of JSTOR)

South of Gumbayngirr Country, the Dunghutti have several significant landscape features. Yarrapinni Mountain, where there is a koala story, is the start of a songline running west past Kempsey, NSW, and on to Bellbrook. At Bellbrook is Buralbalayi (Mt. Anderson or Sugarloaf), a significant ceremonial place for the Dunghutti, where it is believed that clever men were initiated (like Serpentine River, it is on the west of Dunghutti Country, and is higher than other ceremonial places).

The Birpai significant landscape is the Three Brothers Mountains near Laurieton, NSW. The story of the Three Brothers was told in Themes, Section 11.

No significant landscape was found in the literature for the Worimi.

5.6 Discussion specific to the North Coast

Like Chapter 4, the Sydney Basin, getting themes for thick descriptions required analysis of the literature and ethnographic data and adding starting codes as appropriate for the North Coast. These were coded into the themes used in Chapter 4, but due to additional data, two further themes, ‘What’s up there is down here’, and ‘Connecting songlines to stories’ were added to the original 12 themes. The evaluation of the themes and their possible validity in creating thick or thin descriptions will have to wait for the analysis in Chapter 10.

The overall quantity and quality of the literature and ethnographic data for the North Coast will contribute greatly to the aim of discovering significant songlines along the entire NSW coast, and already some major themes are becoming clearer. These will be analysed in Chapter 7, but to point to several strongly represented on the North Coast will support the aim of showing connections in stories between the communities of the NSW Coast. These are the themes of three brothers, and the Seven Sisters.

6

6 The Astronomy of the NSW South Coast

6.1 Introduction

The South Coast of NSW is mainly dominated by the Yuin community, which is five or six dialect groups, depending on whether the Wandandian at Jervis Bay are considered Yuin or Dharawal. The other dialect groups are Bidawal, actually located over the border in VIC, the Djiringanj, the Thaua, the Walbanga, and the Ngarigo (who are located over the Dividing Range in the Monaro region (Sapphire Coast Tourism n.d.: 4). The languages are even more confusing (possibly being exacerbated by linguists), with seven languages: Bidawal, Dyrirringan, Thawa, Walgunja, Dhurga, Dharamba, and Ngarigo, not necessarily aligning with the dialect groups, and often overlapping (AUSTLANG, n.p). That said, Dhurga is the main language being recovered today, and where language from the South Coast is used in this study, it will be Dhurga.

While the Dharawal are an adjoining language group with some cultural features connecting to the Yuin, their astronomical knowledge was included in Chapter 4, on the Sydney Basin, as they straddle the Sydney Basin and the South Coast. Connections in knowledge about songlines between the Dharawal and the Yuin are discussed in Chapter 8.

Like the other chapters on the Sydney Basin and the North Coast, this chapter will focus on the historical archival information, material culture, and the ethnographic work done in the South Coast for this study. While the original definition of the area of this study was defined by being the country to the east of the Dividing Range, in a few instances I have had to try and connect with the Ngarigo group of the Yuin, who are to the west of my defined area. This only applies to one story and the likelihood of a songline crossing

the Ngarigo Country, which is discussed in Chapter 8. The likely dialect boundaries are shown in Fig. 6.1.

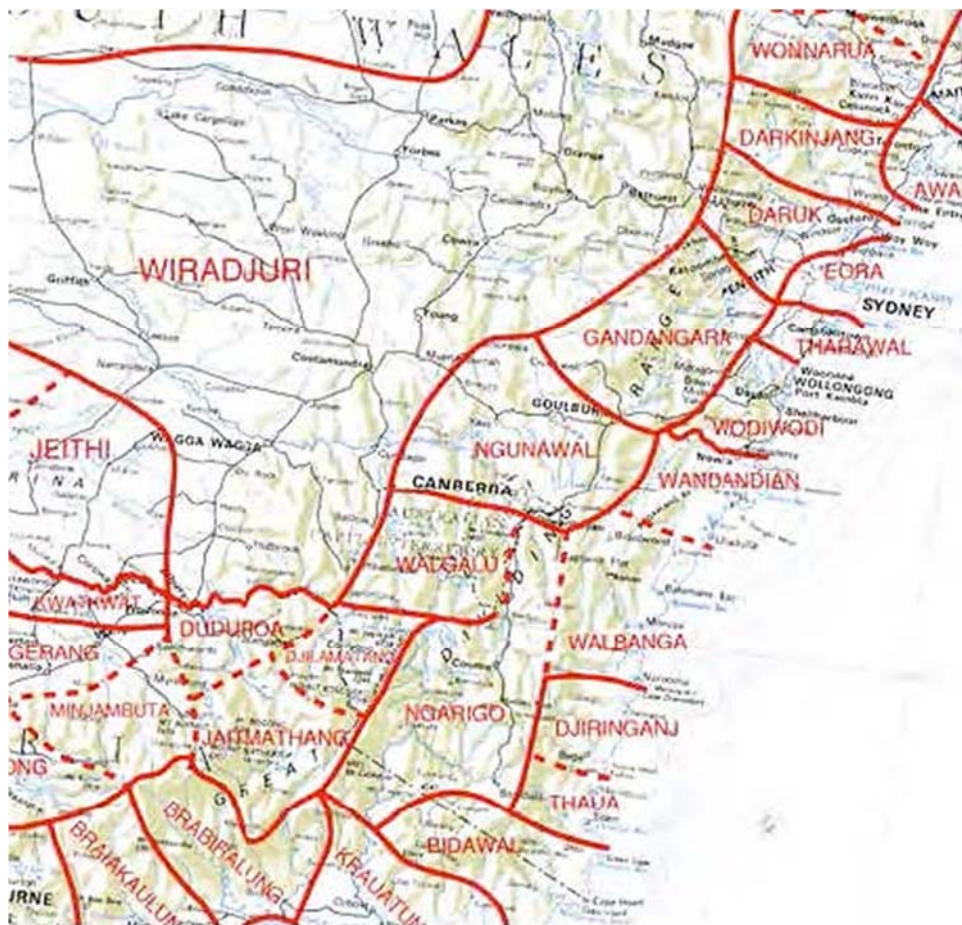


Figure 6.1 Yuin dialect group boundaries (from Tindale 1974)

6.2 Language groups

Unlike the Sydney Basin, there are few uncertainties in the language groups on the South Coast, as all the Yuin group, while originally having different dialects have retained a similar culture, with varying degrees of recovery of their dialects. The Dhurga dialect appears to have had the most success in recovery to date.

The arrival of Aboriginal peoples on the South Coast appears to be in the same period as the North Coast and the Sydney Basin, and Burrill Lake, near Ulladulla, NSW, has archaeology dating from over 20,000 years B.P (Mulvaney and Kamminga 1999: 103), and Bass Point in Dharawal Country has a slightly more recent date (Flood 1988: 112). In both cases, it is clear that Aboriginal people were living on the South Coast long before and after the most recent sea-level rise approximately 9,000 years B.P.

6.3 Methods and theory

6.3.1 Literature survey

The literature on Yuin culture seems to be divided between early anthropologists, such as A.W. Howitt, whose *The Native Tribes of South-East Australia* seems to be heavily reliant on the knowledge gained from working with the Kurnai people of northeast VIC and the Yuin people to the north of the Kurnai, and later collectors of stories. Regarding the Yuin, Howitt was particularly detailed in his description of the initiation ceremony, the *Kuringal* (Howitt 1904: 516-563), and I have been told by Yuin people that he had such good access because he claimed to be initiated by the Kurnai. Unfortunately, Howitt repeated the astronomical knowledge and stories of many Aboriginal communities in *The Native Tribes...*, but practically none from the Yuin. Much later, there has been a revival in interest in Yuin culture, and some stories and more detailed cultural information have been published in the last decades. Unlike the Sydney Basin, the last initiated men are still remembered, and some of their knowledge has been recorded.

6.3.2 Material survey

While rock art in the Sydney Basin has extended into Dharawal Country behind the Illawarra region, if there is much rock art on the South Coast, it has either been lost to development or is being kept noticeably quiet by knowledge holders. It may be that the South Coast has a greater geological tendency to granitic and volcanic intrusions, with less sedimentary sandstone sites suitable for petroglyphs (O'Neill and Danis 2013: 5, 9).

From a geological approach, there is a remarkable focus in Yuin culture on some of the granitic mountains located on the South Coast, such as Gulaga and Mumbulla Mountains between Narooma and Eden, NSW, as well as some of the higher peaks of the Dividing Range.

6.3.3 Ethnography

Unlike the North Coast and the Sydney Basin, the South Coast (south of the Dharawal community) can be considered one cultural group, with separate communities (somewhat like the Bundjalung language group). Access to participants in these separate communities did require separate approaches to several communities, including Walaga Lake and Eden, NSW, for Support Letters. Unfortunately, many attempts to connect with

Yuin people in the 'gap' between Walaga Lake/Narooma, NSW and the Dharawal area were unsuccessful. Several Yuin participants had a direct connection to initiated knowledge holders, either by being taught by them or by being direct descendants. Those participants were the source of significant knowledge used in this study and are still engaged in active dissemination of their knowledge through both publications and cultural tours in their Country. Those participants were also extremely helpful in confirming my research with other persons and sources, and how they did this is instructive in understanding the Aboriginal method of pedagogy, which I had previously been exposed to in working with the Euahlayi community.

Aboriginal pedagogy, or way of teaching, is an interesting aside to the subject of ethnography, as anyone wanting to conduct ethnography with Australian Aboriginal peoples needs to understand the principles before commencing research. As Ghillar Michael Anderson once told me, 'Aboriginal people skip a generation' (in teaching knowledge). Aboriginal children up to the age of initiation are generally taught their cultural knowledge by their grandparents (and, as happened to Anderson, with the assistance of a great-grandparent). In thinking about this, it makes perfect sense. The parents, whether the community is a hunter-gatherer community or practising agriculture, are busy most days with their roles in producing resources for the livelihood of the community. The grandparents, who have 'retired' from most of these duties, have the time to spend with the education of young people. The method of teaching was shown to me by Anderson in practice when he would impart some knowledge to me, or answer a question on a subject, and then suggest that I should 'research this further', either in the literature or by talking to others. When I felt I understood the subject, I came back to him and explained my understanding, upon which he would either say 'you got it', or 'not quite, you should go and talk to so-and-so'. This method of 'back and forth' teaching is, of course now used in Western education (and may have always been used). In any case, judging by the evaluation of the method by educators, the students tend to retain knowledge better with this method and understand more of the nuances of the knowledge.

6.4 Results

6.4.1 Results by type and theme

The same approach described in Chapter 4 was used to conduct a thematic analysis to create codes. Codes were then combined into themes, to use them for comparative analysis.

My survey of the South Coast identified ten literature sources containing eight stories and two cultural items, and the ethnography with 5 participants collected 77 items, of which 20 were stories, 21 related to songlines, 4 to landscape, 4 to language, and the balance related to cultural items. Vocabulary related to astronomical terminology was added to Appendix 3.

6.4.2 Thematic analysis ‘starting codes’

The thematic analysis of the stories and cultural items used an additional 16 ‘starting’ codes, in addition to the previous ones developed in Chapters 4 and 5. The additional 16 follow:

- S57. Man sent to Moon for doing the wrong thing
- S58. In the story, a group of animals (totems) end up as stars in the sky
- S59. People were buried facing the rising Sun (head to west)
- S60. The sky was held up with wooden pillars
- S61. The Seven Sisters sing the whales up and down the coast
- S62. The Emu jumped from Kosciuszko (Mt), and Daramulan’s eyes are the Pointers
- S63. Stories connect to a songline
- S64. There is a Black Duck constellation in the summer sky
- S65. Orion’s Belt has a connection to ceremonies
- S66. Things seen ‘up there’, are seen ‘down here’
- S67. When the sky was too low, people used spears to lift, which became stars
- S68. Star Maps were used for travel on songlines
- S69. Yuin understood the relationship between tides and the Moon

S70. Landscape with story is connected to the Seven Sisters

S71. Navigation using stars (with or without songlines)

S72. Weather forecast from Moon or sky

6.4.3 Combining codes into themes

The previous 12 themes, plus two themes added in Chapter 5, were used. The descriptions and codes are only for the South Coast.

1. Something falling from the sky (2 codes)

This theme covers several examples, including the Yuin origin story of Toonku and Ngardi, who came to Yuin Country on a star (P19). While there was not any information from the Yuin whether falling stars (meteors) have any meaning as omens or negative connotations, Ross (2014: 11) said that ‘other sources from the Yuin Nation appear to verify that Yuin peoples observed meteorites. Hoskins (2013: 71) talks about a traditional Aboriginal story from the south coast NSW referring to ‘a huge mass of molten red heralding the decent of the stars and the movement of the sky’.

2. Culture heroes (2 codes)

The only mention of culture heroes on the South Coast was the information from P2 that *Baiame* was not important on the South Coast, and that *Daramulan* was the Creator or All-father. Elsewhere on the East Coast, *Daramulan* seems to be considered either the son, relative, or associate of *Baiame*. Regarding *Daramulan*, P2 said that he told the Emu (spirit) to go to Mt. Kosciuszko and leap off in May and to go west and north. Consequently, the Pointers (Alpha and Beta Centaurus), which are located near the Emu in the Sky’s head, are *Daramulan*’s eyes.

3. The Moon (5 codes)

There seems to be some dispute regarding the gender of the Moon and the Sun in Yuin culture. P2 said that the Sun was ‘Grandfather Sun’ and the Moon was ‘Grandmother Moon’, while P19, who was educated by the same knowledge person whom I assume educated P2, said that ‘down here (being the southern end of the South Coast) the Sun is female’. There does not seem to be any way to confirm who is right, although in most of southeast Australia, the Sun is female, and Moon is male. I also wonder, given the Tunku

and Ngardi story, where Tunku ends up being in the face of the Moon, whether that story would indicate that the Moon is male.

The Tunku and Ngardi story illustrates some themes besides Tunku becoming the man in the Moon:

A version of The Story of the Waratah, recounted by the Yuin Elder Guboo Ted Thomas, is located in the NSW State Library. Thomas tells us that Toonkoo (also spelt Tunku) and Ngaardi (also spelt Ngardi) came from the sky, upon a star, to Earth. Toonkoo and Ngaardi learnt to live off the land by trapping animals and using the natural resources that surrounded them. The Great Spirit, Daramah, tried to teach Toonkoo how to hunt effectively but Toonkoo became enraged and threw his spear towards a star. In response, Daramah bent Toonkoo's spear into a boomerang and sent Toonkoo to live on the Moon. When Toonkoo failed to return from his hunting trip Ngaardi went in search of him. During her search, Ngaardi looked to the sky and saw Toonkoo's face in the Moon. Ngaardi tried to reach Toonkoo by climbing to the top of a mountain. When she reached the top, Ngaardi was exhausted and collapsed. Her tears became the rivers and creeks in the land and Ngaardi's broken heart became the red waratah. (Ross 2013: 10)

This story also includes Code 8 (Creation Story) and Code 9 (Breaking law has consequences).

Another story is about the Seven Sisters and Thowra, who eventually becomes the Moon:

Seven sisters lived together and were the most beautiful pure women on Earth, they lived alone away from their community apart from their neighbour Thowra. They were much sought after in marriage but they refused all advances. Every morning Thowra went out hunting and the girls went fishing, one of them staying behind to tend to the fires. It was too much to expect Thowra to be immune to the women and he was in love with the eldest of the sisters, one morning instead of going hunting he hid in the grass and played to his human weakness. He put out his fire and waited for the girls to come and re-light it, the youngest two came back and lit it, but the other sisters refused, and eventually the oldest sister returned to tend to the fire. It was this sister that Thowra desired, so he ran out and caught hold of her, the sisters tried to stop him, but they could not pull him off so they threw burning

branches at him. Thowra was badly burnt and the wounds never healed, but sent out an awful stench like that of a dead whale. The eldest sister had a daughter as a result, the young girl's hair grew at an immense rate, which the sisters hid from Thowra. Eventually they had collected enough hair to make a long fishing line which they threw up into the sky, they left the Earth and took the child with them. When Thowra returned he wondered what had happened to the girls, crying out their names asking where they were. They replied saying that they were up in the sky and that he could join them if he could climb up the rope. He began climbing and had reached a great height when the sisters cut the line and Thowra fell back down to Earth. The girls hated Thowra for what he had done and could not stand the stench. He was found on Earth and two men helped him to recover by placing him in a bag on top of a high hill and bringing him food and medicine. Thowra went down the hill and met all the people on Earth and he was grateful for being healed again, he was told that he should not touch the man that had healed him but he could not resist, so touched him and turned into a boomerang. The healer took up the boomerang and threw it round the ring 5 times, no one else could throw the boomerang because it was as heavy as Thowra had been. A boomerang that no-one can throw is useless, so he threw it up into the sky for it never to come back. Thowra is the boomerang in the sky and he takes his male form when the Moon is full, sometimes you see a child very close to him, and the seven sisters remain in the sky as the Pleiades. (Brothers 1897: 10-11)

That story has a bit of everything in it, chasing the Seven Sisters, medicine, and an example of a story seen elsewhere about a boomerang becoming the moon.

4. The Sun (4 codes)

Other than the difference between Yuin communities on whether the Sun is male or female (see Code 3), the only point of interest on the Sun in Yuin culture is that people are buried facing east/southeast to face the Sun. This practice is similar to the Darkinjung practice of burying people facing that direction (head to west), so the Sun 'can look at them each day' (Needham 1981: 38)

5. Ascent of a culture hero to the sky (1 code)

The only mention of a culture hero ascending to the sky is the story in Code 2 where *Daramulan* asked the Emu to jump up off Mt. Kosciuszko. There do not appear to be any significant flat-topped mountains in the South Coast region, so this may be a reason for this story not being a part of Yuin culture.

6. Ceremony (2 codes)

In Yuin culture, the *Bunan* is the equivalent of the *bora* initiation site found to the north and west, and the *Kuringal* ceremony is performed there. Like most of the rest of Aboriginal cultures, ‘what’s up there, is down here’, meaning significant events, such as ceremony, are reflected in the night sky. There is no data on the alignment of *Bunan* sites, other than that P2 said they were always on the east side of hills, presumably so that certain celestial objects could be seen, but there is no data on this. P34 did say that ‘three stars in Orion’s Belt connected to ceremonies’, and in early summer, Orion rises from the northeast.

7. Characteristics of Individual Stars (5 codes)

The story of Wunbulla, the grey bat, and his (snake) wives, who eventually travelled into the night sky as Munowra, which is part of the Western constellation Canis Major, is an example of an unknown number of stars being connected to a story (Turbet 1989: 125-126). Both P19 and P34 mention the Black Duck constellation, which is connected to the Pacific black duck, which is an important totem to the Yuin peoples. P34 said it was a ‘summer’ constellation, while P19 described where it could be seen from Walaga Village. I am still trying to find it in Stellarium, the planetarium program, and may have to go to Walaga to see it. P2 told the story of when everything was new, the sky was too low, and people wanted it higher, so they pushed it up with a large number of spears. Those spears became the stars. The story of the Emu in the Sky’s eyes (the Pointers) becoming *Daramulan*’s eyes is interesting, as the Euahlayi and Gomeroi believe that the eaglehawk’s (*Muliyani*) eyes are the eyes of *Baiame*.

While not specifically about individual stars, the concept of star maps, which are also from the Euahlayi, were confirmed by P2, who said he had heard about them from some of his elders. Star maps are a pattern of stars, usually in the winter night sky, which is used by knowledge holders to teach people to travel to a destination out of their own

Country, usually along songlines. The pattern of stars teaches, as a memory aid, the route of travel via song, and according to P2, the song also contains information about the (night) sky at the destination.

8. Creation stories (2 codes)

Manning (1882: 155-173) said:

The Aborigines of the southern part of New Holland have a belief in the existence of a Supreme Being; and, from connecting circumstances, I am of opinion that the same creed upon religious subjects exists throughout the whole continent of New Holland.

The God of their belief is called 'Boyma', who, they say, dwells at an immense distance to the north-east, in a heaven of beautiful and supernatural appearance, where the Almighty is represented by them as seated on a throne of transparent crystal of vast magnitude, which has its base in the great water, and rises to a stupendous height towards the stars.

To Boyma is ascribed the creation of all the heavenly bodies. They believe the earth to be an immense plane, and fixed, the sun, moon, and stars revolving round it to give it light. On my representing the fixed position of the sun, the rotundity of this world, and its own diurnal and annual motions, he was quite amused at our strange belief, and endeavoured to convince me we must be wrong.

While Manning, in this early reference, does seem to conflate *Boyma* (probably *Baiame*) with the South Coast Aboriginal peoples, Organ (1993: 16-24) does count this statement as referencing Dharawal and Yuin belief.

I have previously discussed the *Tunku and Ngardi* story, which is likely to be a creation story.

9. Breaking Law has consequences (2 codes)

The *Tunku and Ngardi* story is about breaking Law (even minor infractions), and the consequences. This would have been a great story, in that the Law breaker can still be seen in the night sky (the Man in the Moon).

A more serious story of breaking Law is woven into the main story of the Black Duck totem and its songline. As will be seen in Chapter 7 on songlines, the Wauwilak Sisters

are black ducks, and break one of the most serious Laws on marriage and relationships with men who are not the 'right men'. As a consequence, they are sent back into the Seven Sisters, from where they came. The 'wrong men' end up in the sky as the Pointers. This story appears at least two places on the South Coast, one in the rock art at Royal National Park (RNP), and one in some large stones near Moruya, NSW.

10. Seven Sisters (5 codes)

The Seven Sisters (Pleiades) are important to Yuin culture. As I report in Chapter 7, they sing the whales up and down the Whale Songline (P2). They are the subject of the Thowra story about the Moon (see Code 4). They are the source and eventual destination of the Wagalag Sisters, who are one of the main stories of the Black Duck songline. P35 said that regarding the cultural heart of Yuin Country, Gulaga Mountain, Gulaga was one of the Seven Sisters who was left behind on Earth. Regarding seasons and resources, like the Dharawal, the Yuin believed that the Seven Sisters, who brought the summer and season of plenty, were responsible for the heat, not the Sun (Manning 1882: 155-173).

11. Description of physical features and the environment (3 codes)

One of the more interesting bits of information from P2 was regarding the Mystery Bay fish traps. Like most other Saltwater peoples, the Yuin used natural or man-made fish traps on the coast to gather fish and seafood. There were extensive fish traps at Mystery Bay (no longer visible), and P2 said that regarding fish traps, the Yuin peoples understood the relationship between the Moon and the tides, in that the Moon lifted the water into the fish traps.

Also related to the environment is the belief that the Sun does not bring the summer heat, but it is the Seven Sisters (who first rise in the evening in November) who do (P3).

Another belief in the southeast of Australia, confirmed by Willey (1975: 55) as applying to the South Coast is where Yuin peoples believed that the sky might fall. Specifically, Willey tells us that Aboriginal peoples of the NSW south coast believed that wooden pillars were needed to hold up the sky.

12. Resources (3 codes)

Two beliefs related to resources is that the Seven Sisters bring the summer heat and that they sing the whales up and down the coast. The other belief was the understanding of the connection between the Moon and tides used with fish traps.

13. 'What's up there is down here' (3 codes)

The connection between the (night) sky and matters of Earth is often referenced in talking to Aboriginal knowledge persons. P2 talked about the Emu in the Sky not having a voice, and the bush on the ground has a language without a voice. P34's reference to the three stars in Orion's Belt being significant in ceremony is another example, while P2 simply expressed that 'up there is down here'.

14. Connecting songlines to stories (5 codes)

There were several (P2 and P19) references to the Umbarra/Black Duck songline in discussions, and P2 talked about several small songlines connected to landscape in the South Coast. Knowledge about the Whale songline where they were sung up and down the coast was mentioned by participants, and P2's knowledge of star maps connected the Yuin culture to other parts of NSW.

6.4.4 Thematic connections on the South Coast

Unlike the Sydney Basin and the North Coast, there is only one Aboriginal cultural group on the South Coast, assuming that the Dharawal are included in the Sydney Basin. For that reason, the themes are plotted only for the Yuin community and are shown graphically in Fig. 6.2. As they are not compared against any neighbouring community, they are interesting only to compare to the other Saltwater regions, and the thematic data will be used in the overall analysis in Chapter 10.

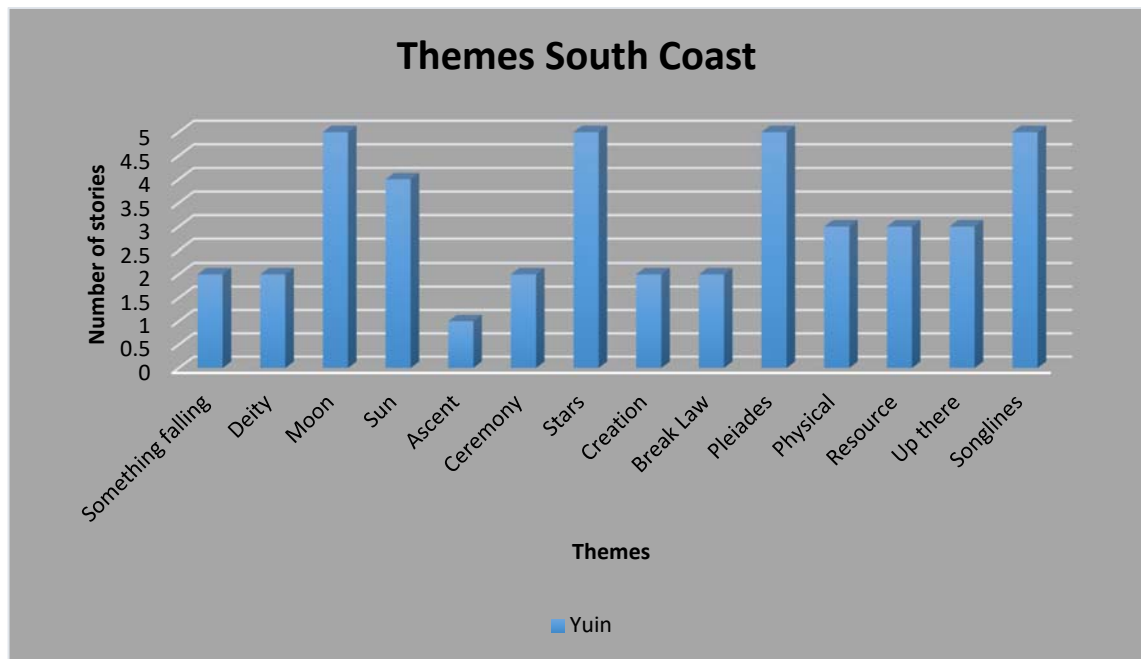


Figure 6.2 Themes South Coast

6.5 Significant Landscape Features

While landscape and features are important in any Australian Aboriginal community as a part of their connection to Country, on the NSW coast there does seem to be some variation in this importance between the major regions. In the Sydney Basin, it appears that Mt. Yengo is an important landscape feature, and in the southern part of the North Coast the Three Brothers Mountains are important to those communities in that area. However, on the South Coast, there are several landscape features that connect strongly to the identity and culture of the Yuin peoples. These are Gulaga (Mt. Dromedary), and Biamanga (Mumbula Mt.), located in the first case just northwest of Walaga Lake, and in the second, just north of Bega, NSW. Gulaga is the Mother Mountain, and a significant women's ceremonial site, and Biamanga is the husband of Gulaga, and a significant men's ceremonial site (P19). Both mountains are mainly granitic outcrops on the coastal plain, and visible from some distance along the coast. In the case of Gulaga Mt., there is a small and separate outcrop of granite to the southeast, which is known as Nadjinooka and is identified as Gulaga's youngest son. While it is a granite island approximately 20km northeast of Gulaga, Barranguba (Montague Is.) is identified as Gulaga's oldest son and is known as a men's ceremonial site. It is not clear whether Barranguba was an island during the last sea level reduction, but it certainly would have been a more significant landscape feature. Along with several other high points in the vicinity discussed in the

subject of songlines in Chapter 8, the landscape around Gulaga and Biamanga is clearly one of the sacred features connected to culture, teaching, and initiation.

P2 said: ‘A songline runs from Gulaga to Biamanga. Partway along this route, there is a spot near Bermagui (NSW) where you stand to see things. You can see Biamanga, Gulaga, Peak Alone, Muleema (Strong Woman), Wadagudarn (Range), Nadjinooka, Barranguba from this spot (and sing them)’. All these places are spiritual: Gulaga is the Mother Mountain, the spiritual centre of Yuin culture, Biamanga is Gulaga’s husband, and father to her two sons, Nadjinooka (a small hill near Gulaga) and Barranguba’.

I was curious to see what these landmarks might look like, so I did a horizon profile using the Horizon© software program that is described in Chapter 9. Using Bermagui, NSW as the observation point, the horizon profile from south to northeast was shown (Fig. 6.3).

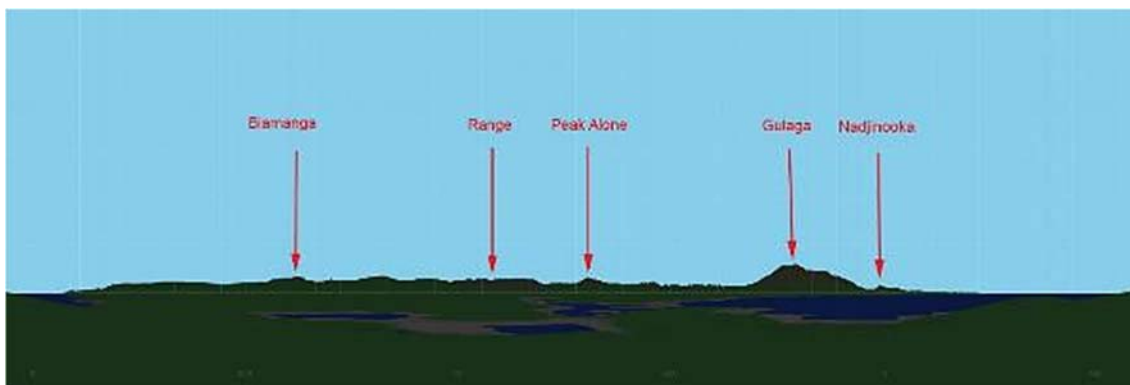


Figure 6.3 Horizon from south to northeast from Bermagui (Horizon©)

All the high points mentioned by P2 are visible except for Muleema and Barranguba. Muleema may be on the horizon but is not a geographical name in the region, and Barranguba is behind the small horizon rise behind the viewer (at sea). Just visible below Gulaga is Walaga Lake.

Since this point in Bermagui seems to have cultural or ceremonial significance, I wondered whether there was any astronomical significance. I then added the solar solstices and equinox to the horizon shown in Fig. 6.3, and it would appear that this might also be a solar observatory (Fig. 6.4).

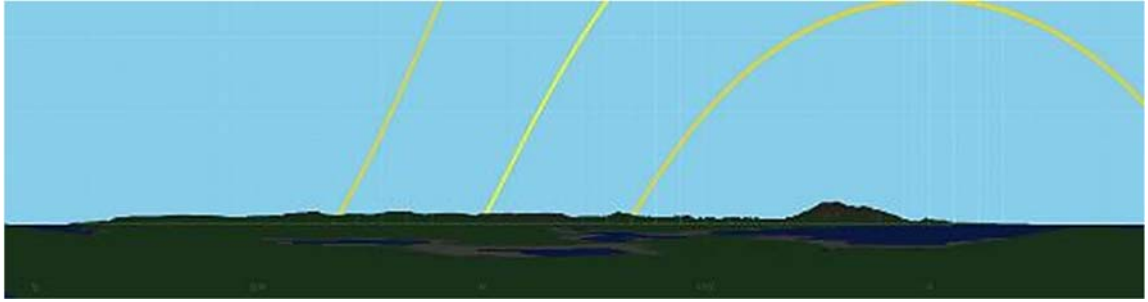


Figure 6.4 Bermagui horizon with solar solstices and equinox (Horizon©)

The yellow trails to the southwest and northwest denote the summer and winter solstices (furthest south and north setting positions), and the equinoxes are marked by the yellow centre trail (the equinox is when the Sun is halfway between the solstices). If the observer were to move slightly southwards of the current Bermagui position used in the Horizon© calculation, then the summer solstice would fall on Biamanga, and the winter solstice would fall on Peak Alone. Of course, this is no evidence that the Yuin peoples observed the movement of the Sun between the solstices, but there is some suggestion that this was so, on the North Coast, and, as a reference, there is Wurdi Youang, the possible solar observatory between Melbourne and Geelong, VIC. Wurdi Youang is a stone arrangement in the Wathaurong community that shows significant alignment with the solstices and the equinoxes. The reasons for Aboriginal interest in the movement of the Sun could be for ceremonial reasons or resource reasons (to indicate the seasons), or both.

The other astronomically significant landscape in this area is Gulaga Mt., which is linked to the Seven Sisters by the story that Gulaga was one of the Sisters left behind on Earth. Fig. 6.5 shows the track of the Seven Sisters in the night sky in January, looking north from Bermagui to Gulaga.

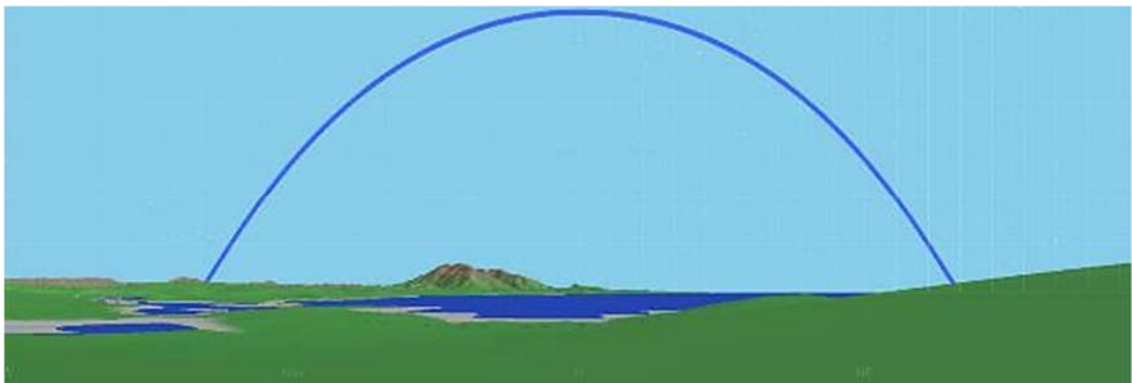


Figure 6.5 Track of the Seven Sisters over Gulaga Mt. (Horizon©)

The Seven Sisters certainly seem to arc over Gulaga from Bermagui, and if you consider that Gulaga's son, Nadjinooka, is part of the story, the Sisters arc over the centreline of the two peaks. Otherwise, a slight move by the observer to the west would also put Gulaga directly under the arc of the Sisters. Once again, this is no proof that such an alignment would be celebrated but is a possibility.

From the culturally significant area of the South Coast around Gulaga, Biamanga, and Walaga Lake, there appear to be significant landscape features that form part of Yuin culture. This is no doubt true of most Aboriginal communities, but the limited evidence in the Sydney Basin and the North Coast does not preclude that they had just as significant landscape features as the Yuin of the South Coast. The opportunity to test the landscape features of the South Coast was a welcome test of this aspect of cultural astronomy.

6.6 Discussion specific to the South Coast

As discussed in Chapters 4 and 5, thick descriptions are the eventual result of an analysis of the literature and ethnographic information about the peoples of the South Coast. The themes that came from the analysis of the Sydney Basin data do not change in any significant way; however, as in Chapter 5 (North Coast), more information about specific knowledge is available. This includes observations of landscape in regards to the day and night sky, connections between stories and songlines, and the connection of those songlines to the sky, and more information about the general theme of 'what's up there is down here'. It will take a full analysis to see whether a thick or thin description is possible. While the aims of this study concerning themes connecting communities of the NSW Coast are reinforced by the Seven Sisters stories of the South Coast, there were no three brothers stories found during the study.

Of more interest is the contribution of the Yuin literature and ethnography to the overall aims of this study, particularly regarding discovering songlines and their connection to cultural astronomy. These will be discussed in Chapter 8, where it will be clear that the major contributions came from the South Coast.

7

7 Themes and the NSW Coast

7.1 Background

In Chapters 4, 5, and 6 I have reported the results of the literature studies and ethnography for the three regions of the NSW coast. For each region, I have collated the results, in the form of stories, language, and cultural knowledge, into codes, and then into themes. These themes have been initially analysed and displayed in such a way that they can be later combined into the inputs of the thematic analysis process that I will apply to the overall data from this study. While that analysis will go some way to coming up with a ‘thick description’, and may provide the data required for a phylogenetic analysis, in the course of the collection of these inputs, there were a small number of themes that ‘jumped out’ of the data and were significant enough to suggest a separate evaluation.

7.2 Themes in cultural stories of the Saltwater peoples

While looking at stories in the literature, and collecting the same from participants, the following themes were apparent enough, even though they were very different narratives, to suggest themselves for special treatment.

7.2.1 Three Brothers stories

I was aware of at least one Three Brothers story from Aboriginal sources before starting this research but was surprised by how often the theme of three brothers appeared during the literature survey, to the point where, in searching outside the area of this study, it seems to be repeated regularly. A few questions to some of the participants revealed several more instances. In the end, I was able to confirm Three Brothers stories in the Bundjalung, Yaegl, Birpai, Gumbayngirr, and Gai-mariagal communities within the area of study, and outside the study, in the Yolŋu (NT) and Wangkumara (far northwest NSW) communities. No doubt there are many more across Australia. While the actual stories

are different, the feature of three brothers is the same, which set me to thinking: is this some universal feature of cultures? A literature survey of the subject resulted in finding Three Brothers stories from the following sources: The Brothers Grimm (Germany, and there were three brothers Grimm!) and the Arabian Nights Stories; also, stories from Albania, India, Nagaland, Bulgaria, Ukraine, West Africa, Jewish sources, and Spain. The ethnographer, Franz Boas, collected a story from the Cochiti Indians of the U.S. Southwest, but the one story that is best-known is the Harry Potter story of the *Deathly Hallows*, which is sourced from England, from either *Tales of Beedle the Bard*, or Geoffrey Chaucer's *The Pardoner's Tale*.

Detailed investigation of scholarly sources on the subject of Three Brothers was only possible via research on folklore and folktales, such as Goldberg's *The Construction of Folktales* (1986), and through folklore classification, such as Thompson's *Motif-Index of Folk-Literature* (1955). Both of these, like all the other literature reviewed, only studied folklore of the Northern Hemisphere, with an emphasis on Europe, so while the Three Brothers theme existed, it had no connection to the stories in Australia. This research also revealed that the Three Brothers theme in Europe was an extension of a basic Two Brothers theme (which also appears to be a theme in Aboriginal Australia).

Further reflection on this matter led to an examination of what the early anthropologists and ethnographers in Australia felt about stories of the type I have been collecting, and my earlier research on the history of the understanding of songlines led me to Carl Strehlow, T.G.H. Strehlow's father. Carl Strehlow studied the culture of the Aranda people of Central Australia in the late 19th and early 20th century. A German Lutheran missionary/scholar, he came from the German anthropological tradition of humanist thinking, which contrasted with the then-current British tradition of Darwinist evolutionism (Kenny 2013: 4). Kenny (ibid.: 4-5) suggests that the German tradition (originating with Johann Herder, and developed by Franz Boas as Particularism) came from the fact that Germany was not then a colonial power, and was not needing the Darwinist support for colonialism which seems to be a factor in the colonisation of Australia.

The Grimm brothers, in their dictionary (*Deutsches Wörterbuch*), classified stories as *Mythen, Sagen und Märchen* (Myths, Legends and Fairy-tale). Carl Strehlow even included the German *Mythen, Sagen und Märchen* at the end of the title of his major

work, *Die Aranda – und Loritja-Stämme in Zentral – Australien (1907-1920) Mythen, Sagen und Märchen* (1907) (which, sadly, has never been translated and printed for publication). However, in recording and analysing the stories of the Aranda and Loritja peoples, Strehlow presented the mythologies as a whole, internally connected, culture (ibid.: 144). This approach may have been because he was working mainly with initiated men and recording only stories linked to the culture and sacred knowledge. On the other hand, the stories I am working with may fall into any of the three classifications, but the Grimms said (ibid.: 141) that ‘Myths are narratives of sacred events that are held to be true by their tellers’. The Three Brothers stories from Europe and elsewhere must be classified as Legends and Fairy-Tales, and in the case of such stories in Aboriginal cultures, they may fall into any of the three classifications, but not often into that of Fairy-Tales, as they rarely seem to exist solely for entertainment.

7.2.1.1 Bundjalung, Gumbayngirr and Yaegl Three Brothers

The Three Brothers stories from the North Coast of NSW come in at least five versions, but all are origin stories, which could be classified as Legends. The basic story is similar, but there are differences in the locality of the story, with the Bundjalung versions having the three brothers coming ashore at either Ballina or Evans Head, NSW, and the Yaegl version having them coming ashore near Yamba, NSW. The following version from Norledge (1968: 26) covers the salient facts without emphasising the location:

In the time of the Dreaming, the waters of the rivers and seas teemed with fish; in the air birds were flying everywhere; and trees, grasses, herbs and animals were to be found on the earth. It was in this far-off time that three brothers were created. The names of these brothers were Yahberri, Mahmoon, and Birrum. Until these brothers came and dwelt upon the earth, there were few people to be found. The brothers came by sea in a bark canoe. The canoe was made from the bark of the hoop pine tree, the name of which was goondool. The three brothers had their grandmother with them in the canoe. They came to a river that was flowing into the sea and landed on the shore. They put their grandmother on the land and lived there for a long time. Then the three brothers sailed out to sea again. Onwards, ever onwards towards the north they sailed in their bark canoe. Finally they came to a place where many black rocks could be seen on the shore and there they landed once more. One of the brothers picked up his spear and at a place where he cast his spear a spring of fresh water bubbled up. The water was good to drink so the

brothers took some of in the vessels they had in their canoe. To this day the spring where the brothers got the water can be found on the sands of the shore. It is found at the place where the brothers landed in their canoe. Once more the brothers sailed northwards until they came to a place where there are headlands to be seen, and once more they ran the canoe ashore. One brother went to the north, so that there might be people in the north. One brother went to the west, so that there might be people in the west of the land. One brother dwelt in the east, so that there might be people in the east of the land, and to the people who came to live there, this brother gave tribal laws and made their bora rings for them. When springtime comes to the earth each year, and the blue haze is seen on the mountain, the beautiful daughters of Yahberri, Mahmoon, and Birrum come to visit the earth people. The daughters of Yahberri, Mahmoon, and Birrum come in the blue haze, so that the earth people may not see them. And that is the story of the three brothers who came to this land from the sea so that there might be people on the earth.

Other versions of the story, such as found in Robinson (1965: 40), have the brothers with their own families, and in some versions, the grandmother is accidentally left behind when sailing on from the first landing (she is not pleased with this, and uses her magic to create a storm, which drives the canoe onto the shore). In the Robinson version, the first place of landing is the Clarence River at Yamba, which is in Yaegl Country. This may also be a story for the Gumbayngirr people in Grafton, which is a meeting place for the Bundjalung, Yaegl, and Gumbayngirr, although I did not find the story from a Gumbayngirr source. In any case, this is an origin story for North Coast NSW peoples, falling into the category of Legend, and creates some interesting questions about early Aboriginal migration to this area, including whether the early arrivals were climate change refugees from sea level rise further up the East Coast. An amusing aside is that I was contacted early in my research by a Classics-trained scholar from northern NSW who had a theory about the arrival of the three brothers. He claimed that their names, Yahberri, Mahmoon, and Birrum, were the words for ‘1’, ‘2’, and ‘3’ in an ancient priest language from Bali (presumably some version of Sanskrit or Hindi, as the Balinese were early converts to Hinduism). It must be a fairly obscure language, as the translations of these numbers in modern Sanskrit and Hindi do not match up with the names of the brothers in any way.

The other interesting feature of the Norledge version of the story is that the daughters of the Three Brothers come to Earth each spring. The number of daughters is not specified, but the Seven Sisters (Pleiades) appear in the northeast sky each spring, and in many Aboriginal communities, this is a sign of warm weather and an abundance of plants and animals.

7.2.1.2 Birpai Three Brothers

The Birpai community of the Mid-north Coast of NSW, and perhaps the neighbouring Worimi and Dunghutti communities, has a quite different Three Brothers story, this one anchored in the landscape of the area. There are two versions, but in both, there were three brothers living in the area of the Camden Haven River. In the version told by Harry Buchanan (a Gumbayngirr person) in 1975, Van Kempen (2005: 4-5) wrote that the three brothers of the Birpai 'tribe' were living in the bush as part of their initiation. The youngest brother went to check on the health of their Mother, and encountered a witch, *Widjirriejuggi*, and told his parents, who warned them to return to his brother's camp to warn them. He returned, but the witch was there, but not the brothers. The witch said she had eaten them and would eat him, but he used his boomerang to split her down the middle. He buried the remains of his brothers where North and Middle Brother Mountains are today, and in shame, went to the site of South Brother Mountain and killed himself. Spirits of the Creation built mountains where each brother lay, and the mountains were then known as 'the Three Birroguns', or wise men of the Birpai 'tribe'. ('*Birrugan*' was a hero-ancestor to the Gumbayngirr community, so perhaps Buchanan borrowed that from his community, or maybe *Birrugan* was known in the Birpai Country).

The other version was published by Marion Hampton, a Birpai elder (n.d., 1-22), and has been recorded by P18 for online Mid-north Coast tourism resources:

The Legend of the Three Brothers: North Brother, Middle Brother & South Brother Mountains

A long time ago, when the land was flat, there were three brothers. Dooragan, he was the oldest, Mooragan he was in the middle and Booragan was the youngest of the three. Their mother represented the spirit of the lake. When it was time for the three brothers to undertake their initiation they were fostered out to other clans among the Birpai nation. The oldest brother was fostered out to the Stingray people and started walking north to meet them. The middle brother was fostered out to the

Crab people and started walking towards the sea to meet them. The youngest brother went south to the Shark people. At this time Mooragan tried to persuade Dooragan to join him in doing away with their youngest brother, so that he himself might find more favour in his mother's eyes. Dooragan refused, but nevertheless Mooragan ran south towards his youngest brother and killed him. The Willy Wag Tail saw what happened and flew to tell the boy's mother. When she heard, she was angry and without questioning the boys condemned both brothers for the murder of Booragan. Afterwards their mother realised her mistake and was very sad. Meanwhile the Gumal, head of the Birpai people was cross. Punishment among Birpai people was his responsibility. As punishment, the Gumal turned the young Aboriginal boys into what is today known as the Three Brothers – North Brother (Dooragan), Middle Brother (Mooragan) and the South Brother (Booragan). The Gumal saw Dooragan as the innocent brother and North Brother Mountain symbolically splits the two lakes Watson Taylor and Queens Lake. By doing this, the Gumal split the mother's spirit into two.

This story in its two versions is most likely a Myth¹² in the latter version; not sacred, but probably instructive in that one should wait for all the facts before making a judgement. The witch version may have just been a Fairy-Tale to scare children.

Interestingly, Lieutenant James Cook, when travelling up the coast on the *Endeavour* in 1770, reported (Cook 2005: 295) that he sighted '3 hills laying near the shore and contiguous to each other bore N.N.W. These hills I have call'd the 3 Brothers'. His charts confirm that these are the same hills as the Three Brothers.

¹² I use 'Myth' only in the sense of the classification by Folklorists (see apology in Footnote 2)



Figure 7.1 Three Brothers Mountains; left to right: South, Middle, North (image courtesy of Paul Ma)

7.2.1.3 Gai-mariagal Three Brothers

P21 told me that three brothers had been turned into stones on the edge of the Wakehurst Parkway in northeast Sydney because they had ‘broken the Law’. I have not been able to track down any other mention of this story, and while I have walked part of the Wakehurst Parkway to inspect rock engravings, there are not any obvious three stones. If this story is correct, it will fall into the category of Myth, as instruction on what not to do. Turning people into (large) rocks is common in Aboriginal stories, as was shown by the rocks at Whittakers Creek representing the two sisters (Chap. 8).

7.2.1.4 Yuin Three Brothers

In Chapter 6 (6.5) I examined the landscape around Gulaga Mt. at Narooma, NSW. In the Yuin story of Gulaga, the Mother mountain, she had two sons, *Nadjinooka*, who is now a small basalt peak to the east of Gulaga, and *Barranguba*, which we know as Montague Island, in the ocean east of Narooma. I had asked several participants whether there was a third son, but never had a definitive answer. On my last field trip to the South Coast, I spoke to several Yuin persons casually, and one said that Peak Alone, which is the high point in the landscape closest to Gulaga to the west, was also known as *Wandella*, and while the story was unclear (maybe due to secret/sacred issues), was really the third son of Gulaga. There is a story connected to Gulaga and her two (known) sons, but that is about how *Nadjinooka* ended up so close to Gulaga, and *Barranguba* ended up in the sea. *Wandella* is not mentioned in this story.

7.2.1.5 Wangkumara Three Brothers

While not in the area of this study, an example of a Three Brothers story where the brothers can still be seen as rocks comes from the Wangkumara people who live west of Tibooburra in the far northwest of NSW and beyond to Coopers Creek. In this story

(Mathews 1994: 88-91), the Three Brothers were creators who ended up helping the people and acting as examples. They, unfortunately, started breaking the Law of kinship rules, and Clever men recommended they be punished. They were put on a hill near Tibooburra and ‘smoked’ with fires. When the smoke died down, there were three tall stones on the hill representing the brothers, and this was a sacred reminder to adhere to the Law. This story falls into the category of Myth.

7.2.1.6 Yolŋu Three Brothers

In Arnhem Land, the Yolŋu people have a story that the three bright stars in the Belt of Orion are three young men (Three Brothers), sitting in their canoe, with the star Betelgeuse representing one end, and the star Rigel representing the other. One version of the story (Norris 2016: 12) said that the Sun-woman blew the men and their canoe into the sky for eating their totem, the kingfish. Another version has the Sword of Orion as some kingfish that they had caught hanging off their canoe, which was why they were sent there. These brothers stories also fall into the category of Myth, as an instruction not to break Law.

7.2.2 The Seven Sisters stories

The star cluster called the Pleiades (Messier Catalogue M45), which is commonly known as the Seven Sisters, is one of the most universal of cultural representations of stellar objects. Of 41 ancient cultures surveyed, 16 represented the Pleiades as either a group of females or female in nature¹³ (Wikipedia, Seven Sisters: n.p; Ceci 1978: 302).

In Australia, a literature survey using the MURA© database from AIATSIS, and a literature survey of my literary resources quickly found 47 Aboriginal language groups with stories representing the Pleiades as a group of females, against three language groups where they were represented as something else. Fallaize et al. (1922: 64) said (in respect to Australia) ‘The almost unvarying association of the Pleiades with women among different races is remarkable.’ (Presumably, Fallaize meant ‘communities’ rather than ‘races’).

The seemingly strong interest worldwide in the Pleiades as a cultural object and the strong connection in myth with them being a group of women led d’Huy and Berezkin (2017)

¹³ Tuareg, Greek, Norse, Ukraine, Kiowa, Lakota, Monte Alta, Nez Perce, Mono, Ban Raji, India, Indonesia, Basotho, Australia, Seneca, China

to use phylogenetic analysis to look at motifs connected to the Pleiades. The intention was to determine if the motifs could have spread out of Africa with the earliest migrations. They found that core traditions (including other traditions that are strong in Australian cultures, such as the snake) were most likely to be inherited from previous generations, rather than borrowed from neighbouring cultures. The phylogenetic software showed a strong correspondence between Bantu Africa and Australia (southeast Australia and Central Australia), corresponding to an 'out-of-Africa' spread theory. Further comparisons between the correspondence of myths about connection/opposition between the Pleiades and the Orion constellation led to a possible source in Sudan/East Africa with a similar implication for this larger myth migrating to Australia.

The *Songlines Tracking the Seven Sisters* exhibition by the National Museum of Australia in 2017 explored the Seven Sisters stories of the Martu, Anangu Pitjantjatjara and Yankunytjatjara (APY), and Ngaanyatjarra peoples of central and western Australia. These are women's stories (the Seven Sisters are women in these stories) and tell the story of the Seven Sisters (*Minyipuru* in Martu, and *Kungkarangkalpa* in the other languages) and their male pursuer (*Yurla* in Martu, and *Wati Nyiru* in the other languages). The songlines for each community may extend beyond 600 km and may have many branches and returns of the route, and as they are *Tjukurrpa* or Dreamings of individuals and communities, they have many important sites in the landscape connecting to the story. Some of the story and sites are represented with rock and cave art, as well. The Seven Sisters and *Yurla/Wati Nyiru* travelled on the land, under the land, and above the land, and, of course, the Seven Sisters ended up in the night sky. It may not appear from the maps of the songlines of each community, but the suggestion is strong that the songlines travelled from one community to another and linked up across western Australia and central Australia. From what I was told when working with the Gamileroi and Euahlayi communities in northwest NSW, there were Seven Sisters stories in their Countries, and in the surrounding Countries. They differed from those of central Australia, and judging by the ones I have read from the Euahlayi (Parker 1896), the Muruwari and the Ngemba (Mathews 1994) (the latter also western NSW communities) the stories vary but have the theme of escaping from a threatening male by going into the sky. In some other communities in Australia, such as the Wardaman of the NT, the Pleiades are not women, but young children and their mother (Cairns and Harney 2003: 204).

The antiquity of Australian Seven Sisters stories is unknown, but Tindale (1984: 374) suggests it could be more than 7,000 years ago in the southeast of Australia, based on the fact that the southeast stories do not mention the dingo, while in the centre and west of Australia, dingoes are included. Current research on the arrival of the dingo (Fillios and Taçon 2016) shows that a date range of 5,000 to 12,000 years ago still exists.

In the area of this study, there were a lot of references to the Pleiades/Seven Sisters, but not a lot of complete stories. Of 28 stories (some of which were very similar), all but seven came from the literature review, and all ten language references (the name of the Seven Sisters in an Aboriginal language), all came from literature. There were stories from the Bundjalung, Darkinjung, Dharawal, Dharug (Eora), Gai-mariagal/Yuin, Gumbayngirr, Gundungurra, Guringai, Worimi, Yaegl, and Yuin.

7.2.2.1 Bundjalung Seven Sisters

Of all the Seven Sisters stories on the NSW coast, the Bundjalung story in Chapter 5, which was published by Mathews in 1899 (119-120) covers almost all the aspects of these stories in this region:

This story could be a summary of all the features of the other stories along the NSW coast:

1. A man of the wrong division of the marriage rules falls in love/lust with one or more of a group of seven young women, usually sisters.
2. After being rebuffed (as he should be), he carries away the desired young woman.
3. The other sisters search in vain for their sister and either go somewhere else or into the night sky.
4. The abducted sister either is rescued by her sisters or escapes and joins them.
5. The sisters bring the cold to the Earth, particularly the frost when they rise in the early morning (early Winter in Australia).
6. The sisters are responsible for bringing the warm weather of summer when they rise in the evening (early Summer in Australia).
7. The sisters (or in this case, the pursuer) often reach the sky by either being on a tree that grows enormously or in the pursuer's case, a fire which reaches the sky.
8. The pursuer of the sisters is either the Belt of Orion, which is usually three young men, or the star Aldebaran, both of which are to the east of the Pleiades in the night sky and appear to be 'chasing' them across the sky.

According to Sharp (n.d.: n.p), the Bundjalung words *warinehn*, *warinihnygan* for the Pleiades translate as 'winter stars, winter woman stars'.

7.2.2.2 Dharawal Seven Sisters

Brothers (1897: 10-11) recorded the Thowra story, which is probably both Dharawal and Yuin:

Seven sisters lived together and were the most beautiful pure women on Earth, they lived alone away from their community apart from their neighbour Thowra. They were much sought after in marriage but they refused all advances. Every morning Thowra went out hunting and the girls went fishing, one of them staying behind to tend to the fires. It was too much to expect Thowra to be immune to the women and he was in love with the eldest of the sisters, one morning instead of going hunting he hid in the grass and played to his human weakness. He put out his fire and waited for the girls to come and re-light it, the youngest two came back and lit it, but the other sisters refused, and eventually the oldest sister returned to tend to the fire. It was this sister that Thowra desired, so he ran out and caught hold of her, the sisters tried to stop him, but they could not pull him off so they threw burning branches at him. Thowra was badly burnt and the wounds never healed, but sent out an awful stench like that of a dead whale. The eldest sister had a daughter as a result, the young girl's hair grew at an immense rate, which the sisters hid from Thowra. Eventually they had collected enough hair to make a long fishing line which they threw up into the sky, they left the Earth and took the child with them. When Thowra returned he wondered what had happened to the girls, crying out their names asking where they were. They replied saying that they were up in the sky and that he could join them if he could climb up the rope. He began climbing and had reached a great height when the sisters cut the line and Thowra fell back down to Earth. The girls hated Thowra for what he had done and could not stand the stench. He was found on Earth and two men helped him to recover by placing him in a bag on top of a high hill and bringing him food and medicine. Thowra went down the hill and met all the people on Earth and he was grateful for being healed again, he was told that he should not touch the man that had healed him but he could not resist, so touched him and turned into a boomerang. The healer took up the boomerang and threw it round the ring 5 times, no one else could throw the boomerang because it was as heavy as Thowra had been. A boomerang that no-one can throw is useless,

so he threw it up into the sky for it never to come back. Thowra is the boomerang in the sky and he takes his male form when the Moon is full, sometimes you see a child very close to him, and the seven sisters remain in the sky as the Pleiades.

This story has some of the features of the Bundjalung story but is related to South coast cultures, concerning a dead whale. The use of a rope or line is also either different or comes post-Contact. The addition of the Moon to the story is also unique, although there is another story where the Moon is the ‘person’ chasing the sisters. This is found in Turbet (1989: 123):

Seven sisters were out fishing at Poolinjirunga and were approached by the moon who’s attention was caught by the sisters’ beauty. However, before he could come near, they heard him nearing and went to Jindowla. The moon followed the singing voices of the sisters, but could not see them. He exclaimed: ‘Where are they singing about me?’, ‘I hear them sing about me, singing in the gully. Let me have white clay to corroboree. Sing that song; let me dance’. The moon then threatened to spear them if they did not show themselves to him, but the sisters did not show themselves and instead, went into the ground and then up into the sky, becoming The Pleiades. This story is also repeated in Ridley (1875: 146) in both Dharawal (‘Thurawal’) and English.

Another Dharawal/Yuin connection to the Seven Sisters is the Wauwilak Sisters story as connected to the Black Duck Songline. The Sisters came from the Seven Sisters, although it is not clear that they were of the original seven, and they also return and become two of the known seven, with specific Dharawal names.

One interesting aspect of Dharawal culture regarding the Pleiades was mentioned by Manning (1882: 168): ‘Baiaame created all the heavenly bodies, with Earth an immense plane, around which circle the Sun, Moon, stars. The Sun just provides light, while the Pleiades provide warmth.’ When I discussed this with a Dharawal participant, it was suggested that since the Pleiades only rise (visible in the evening) in late Spring, then the heat must come from them, not the Sun, which is visible all the year, even in the winter. The same participant (P3) said: ‘When looking at the Pleiades, the women there represent the flowers, honey, fruit, trees (general resources), in other words, renewal. Every September, they are called to come down, the Snake to come; start-up everything.’

7.2.2.3 Dharug Seven Sisters

The Dharug are represented by two entries under language, one based on ‘Dharug’, and one based on ‘Eora’; the latter being a very contested name for the people around Sydney Harbour, who were probably a dialect group of the Dharug or coastal Dharug.

Under ‘Dharug’ there is *dhinburr* (Collins 1798) Under ‘Eora’ there is *mulumulung mo-loo-mo-lon* (Turner 2014 Appendix XII from Collins 1798), and *miirrinmurrin*, *mullamullu* (Turner 2014 from Ridley 1875: 67, 112). I would go with *miirrinmurrin* due to the *mirri* root (*mirri* means ‘star’: see Appendix 3).

7.2.2.4 Gai-mariagal Seven Sisters

See the shared story of the Ngarigo Seven Sisters with the Yuin.

7.2.2.5 Gumbayngirr Seven Sisters

In Morelli et al. (2016: 304), there is the following story: ‘In the Southern Gumbayngirr tradition of Harry Buchanan, the Pleiades are identified with the two sisters who made the sea: besides the common name of this constellation as *Janagan* it is also called *Ganay* ‘yam stick’ appearing as two crossed yam sticks in the sky. This is just like the shape of crossed yam sticks that Split Solitary Island takes: the final resting place of these sisters in the Nymboidan tradition.’ The ‘Nyboida’ appears to be a dialect group located on the Nymboida River, which rises on the Dividing Range west of Coffs Harbour and joins the Clarence River near Grafton. Unfortunately, this could be a story referring to the Hyades, as the story talks about two crossed yam sticks, and Hyades is in the ‘V’ of the horns of Taurus, which looks like two crossed sticks, and is very close in the sky to the Pleiades. In any case, the two sisters story may have an interesting connection to a songline, which is discussed in Chapter 8.

The only other story from the Gumbayngirr Country that appears to be about the Pleiades was recorded by Enright (1937: 194) and repeated from Chapter 5:

There were once seven sisters who were inseparable, one day they decided to hold an initiation ceremony. At this time the men did not practice initiation rites, but they spied on the girls and decided to copy them. The girls discovered they had been seen and attacked the men, the women were then turned into swifts and flew up into the sky where they stayed, and the men turned into kingfish.

It is quite possible that the main story from the Bundjalung in 7.2.2.1 was also known by the Gumbayngirr, given the overlapping culture around the Clarence Valley. P30, a Yaegl person, also repeated a shorter version of the Bundjalung story, supporting the Clarence Valley ‘culture’ idea.

7.2.2.6 Gundungurra Seven Sisters

Mathews was able to collect some stories from the Gundungurra, including the following one (Mathews 1908a: 203-206):

Karrugang and the Seven Sisters. A story about the Pleiades from the Gundungurra people of the Blue Mountains. In the Dreaming, a group of sisters were pursued by a magpie named Karrugang, who wanted to make one of the sisters his wife. One day, while digging for edible roots near a river, one of the sisters slipped into the river and became tangled in the weeds, drowning. The magpie saved the woman and made her his wife. The other sisters stayed at the camp with the magpie and his wife. The magpie was lazy and made all the women do the work. The women frequently tried to escape, but the magpie would find and return them to his camp. One day during a storm, the wife pulled stringy bark from a tree to make a shelter whilst her sisters sang a charm song. As the lazy magpie lay around, the sisters sang making the tree grow taller and taller. They quickly climbed the bark into the sky where they are seen today as the sisters of the Pleiades.

This is quite different from the other stories, except for the feature where the tree grows taller, and the sisters escape to the sky this way.

7.2.2.7 Guringai Seven Sisters

This story comes from Robert Pankhurst (pers. comm. 19 February 2016), and he advised he was told it by an elderly Guringai man many years ago:

Back, a long time ago when the world was young there lived in the forests of Ourimbah seven beautiful sisters; these sisters had some magical powers but could only use them if they had their magic digging sticks which they all carried with them. Also in the forest there lived a young warrior who was in love with the eldest of the sisters but she did not want to have anything to do with him and rejected all his advances. In time he became desperate for her and one night he

sneaked into the girls' camp and kidnapped her while she slept; she was powerless to stop him from carrying her away as she had dropped her magic digging stick in the struggle. He took her to his camp where he restrained her and kept her prisoner while he tried to get her to love him. The other sisters were worried when they found her gone and they knew something had happened because she had not taken her digging stick; they suspected that the warrior who lusted after her was probably responsible, so they sneaked through the forest to his campsite and they caught a glimpse of her in his Gunyah, but as he was a very skilful warrior and trained in the ways of the hunt he detected their presence every time they tried to get close and would launch spears at them very accurately. They tried several ploys using magic to try and release her but none were successful because she could not use her own magic until she was in possession of her digging stick. Using their most powerful magic they summoned up an extremely cold period where everything froze with ice and snow and the warrior was frozen solid and then they went into his camp and gave the elder sister her magic digging stick. Very soon using her magic she became unfrozen and escaped into the mountains with her sisters. They decided to leave the Earth and go up into the sky away from the warrior but before they did, using their magic, they created springs on the tops of all the hills which flowed with fresh water down the hillsides and formed creeks and rivers; then they all leapt up into the sky holding hands where they became the constellation Pleiades. To this day when this constellation sinks in the western sky at evening the Aboriginal people know that the sisters are going away to create the cold winter.

This story has a lot of common features to the Bundjalung story in 7.2.2.1, with some Guringai localities added.

7.2.2.8 Worimi Seven Sisters

Confusingly, Enright (1946: 265), repeats the story about the women turning into swifts he told from Gumbayngirr Country, word-for-word, attributing it to 'S.K.'. He was, however, one of the main ethnographers on the North coast of NSW, and he has another Seven Sisters story (Enright 1939: 194): 'Toorgah, the name of a grub much sought after by the natives, is also the name of a group of seven stars. The big red star, which is called *Jumbarran*, looks after children.'

This would seem to be part of the same story as the Gumbayngirr, except for the addition of the ‘big red star’, which is no doubt Aldebaran, which is between the Pleiades and Orion, so maybe it is protecting the ‘children’/Pleiades from Orion.

Lissarrague (2010: 318) said the Pleiades in the Gathang language (Worimi/Birpai) are *miiriyin manday*, which means ‘many stars’ (once again, the *mirri* base).

7.2.2.9 Yaegl Seven Sisters

P30 had the following Seven Sisters story: ‘Seven Sisters - North Coast story. Wiringin after eldest sister. Had 7 penises for sisters. Went out West, turned himself into different fruits to attract the women. The eldest sister said ‘No’. Went through country from East coast to West coast, then to Top End. Stories come from East.’ P1 had what was a non-cultural description: ‘Seven Sisters were going to a dance or place. One was always late, and was held up - that's the big star apart.’

Mathews’ (1898) story of Karambal is also credited to the Yaegl and considering that it may also be a Gumbayngirr story, it would seem that it is a ‘Clarence River’ story.

7.2.2.10 Yuin Seven Sisters

Probably all the Dharawal stories are also Yuin stories, except for the specific one about the Pleiades being the source of summer heat. As well, the Ngarigo story shared with the Gai-mariagal would be Yuin, as well, as the Ngarigo are a dialect group of the Yuin.

The major connection to the Seven Sisters in Yuin culture must be the whale. P2 said: ‘The whale/dolphin songline north shows the path of the Yuin journey. The spirit of Yuin is in the whale, so is the Yuin songline. The whaling industry in Eden disrupted the connection to the whale. Before that, there was a whale dance (celebration of the whales going north to give birth). The whale dance/ceremony was in May. The Seven Sisters were part of it – they were singing up the whales. The movement of the Milky Way was also a signal, and also a star which pointed to the north/northeast. There was also a ceremony when the whales came south later in the year.’ More about whales and dolphins later in this chapter.

P35 talked about the Seven Sisters connection to Gulaga Mountain near Narooma, NSW, which is the spiritual centre of Yuin culture: ‘Gulaga - Mother mountain. Connection to Seven Sisters. Gulaga is elder sister to Seven Sisters when she was on

land she got caught and stayed.' Gulaga is connected to the whales, and the whales are connected to the Seven Sisters.

The Ngarigo story, shared with the Gai-mariagal (source P21), is quite different and has no whale connection, but the Ngarigo lived in the Monaro, closer to the Snowy Mountains, so the story has those connections:

Three sisters story - Ngarigo (shared) story. Ngarigo were close to Gai-mariagal due to mullet festival. Ngarigo were once a large mob, even out West. Pushed back to mountains by robust people from down the Murray. Ngarigo ended up on the peaks only. A chief had three daughters, very pretty, had ice in their hair. When the chief's family ended up in the mountains, there were only six of the 'tribe' left. One brother threw the three sisters into the sky, and they are now three bright stars in Orion (belt); ice in their hair is the twinkling. The father was badly injured, and was thrown up into Orion as a red star, pulsating slowly (Betelgeuse?). The strongest brother was thrown up, and is the brightest star in Orion (Rigel?). He leant down with his spear and pulled the other (younger) brother up, who became the dimmest star (Bellatrix?). This story was told to encourage respect, defend sisters' virtue as own. At age 14-15 the male takes on role of protector of old people.

This story seems to be an amalgam of the Seven Sisters and the three stars of the Belt of Orion. The fact that the sisters had ice in the hair is very reminiscent of western NSW stories where the Seven Sisters bring the cold and frost and have ice in their hair. Also interesting is the mention that the father was thrown up, becoming the slowly pulsating red star. Both Betelgeuse, one of the four main stars of Orion, and Aldebaran, which is close to Orion, are red-giant, pulsating variable stars (Hamacher 2018). Hamacher argues that some Aboriginal stories, mainly from central Australia, recognise the pulsating nature of these stars.

7.2.3 Whale stories

The third of the major themes is that of the whale. On some of the NSW coast, the dolphin seems to be believed to be connected to the whale, as its protector (P2), but as the dolphin was an important helper of Aboriginal peoples in its own right, it will be treated separately.

The prevalence of whale stories and knowledge seems to be proportionate to the distance from Sydney, but I suspect that is only a factor of colonisation and cultural destruction. As I will mention in Chapter 8, the Yuin have extremely high regard for the whale and have the only offshore songline that I have encountered in this study. The majority of whale stories and knowledge have come from the Yuin/Dharawal of the South coast, and the Bundjalung of the North coast. Most of the information from the communities in between is quite old and more related to the idea of feasting on stranded whales rather than including them in culture. Lieutenant Coke, who was stationed at Newcastle in 1828, reported ‘that Newcastle beaches frequently witnessed beached whales, this was looked upon as a great treat by the Awabakal ‘messengers travelled for miles inviting far off ‘tribes’ and clans to come and enjoy the monstrous feast’ (Supplement to the Newcastle Herald Tuesday, May 11, 1993: 2).



Figure 7.2 Joseph Lycett painting (ca. 1820) of Awabakal people cutting up a beached whale (National Library of Australia)

The first missionary to the Australian Aboriginal peoples, L.E. Threlkeld, who worked with the Awabakal people, said: ‘A whale cast on shore, is a feast, and messengers are dispatched to all the neighbouring ‘tribes’, who assemble and feast upon the monster of the deep so long as the treat lasts.’ (Gunson 1974: 55)

The only ethnographical information on whales in Sydney was from a Gai-mariagal participant, P21:

Whales in Sydney Harbour. Engraving of man inside (Balls Head) is actually whale riding, final stage of initiation of the Cameraygal clan. The Cameraygals were a warrior clan around Chatswood. Right Whales, Humpback Whales went up beyond the Harbour Bridge (around Balls Head, which is very deep); other whales, such as Sperm Whales and Killer Whales waited in the main Harbour. The Balls Head environs was a birthing area (for whales). The whales would know the songs of the old people, male and female. The persons riding them would be introduced to them over several seasons. Whales birthed in Sydney Harbour and Moreton Bay and moved to Harvey Bay due to whaling. Women would sing sick whales into Manly Cove. Floating carcasses would wash up on Collins Beach. If sick whales were coming up the coast, fires would let women know.

Beyond these stories of feasting on stranded whales, the main evidence for a connection to whales in the Sydney Basin is in the rock art. As detailed in Chapter 4, the Sydney Basin is a major site of rock art, mainly engravings. The major catalogues of the engraved rock art were surveys by W.D. Campbell from 1886 to 1896, F.D. McCarthy from 1940 to 1960, and Ian Sim from 1960 to 1983. McCarthy combined these surveys in a catalogue (McCarthy 1983) which shows 445 groups of engravings. A later thematic study of rock art in the Sydney Basin was carried out by MacDonald (2008), and within that survey is some information about the prevalence of engravings of whales. Whale engravings were present at 10% of the sites (ibid.: 276), and the Dharawal (RNP) and Guringai (Pittwater) areas had the highest percentage of whale engravings (ibid.: 262, 269). Like other rock art, the significance of the whale engravings has been lost along with cultural knowledge, although there is a tantalising clue to a connection to ceremony, as some of the whale engravings have two lines across their bodies creating a ‘band’, and P3 informed me that this represented the hair belt worn by initiated males in many Aboriginal cultures.

There was one interesting aspect to whale engravings in the Sydney area. Many of the engravings I have seen have men, not culture heroes or anthropomorphic figures, nearby. In the case of a whale at Muogamarra Nature Reserve, Cowan, NSW above the *Dyarubbin*/Hawkesbury River, there is possibly a whale feast shown (McCarthy 1939a: 410), with a line of 31 human figures stretching in a line towards the whale (Stanbury and Clegg 1990: 80), suggesting that people were waiting in line for their share of the

whale. Near the whale is a dolphin, which is another common feature. At Balls Head, on the north side of Sydney Harbour, is a whale with a man engraved within the outline of the whale. At the Gumbooya site at Allambie Heights (above Manly, NSW) there is a man standing up inside the outline of a whale. At America Track, near West Head, there is a whale with a woman inside, and at Bantry Bay, Elvina Track, and West Head engraving sites, there are men close to whales. The Balls Head whale has often suggested in the popular imagination the Jonah story, with the man swallowed by the whale, but in discussing this with P21 (see above), a Gai-mariagal man from the North Shore of Sydney Harbour, he had a startling suggestion (see p. his people (who were of the community that covered all these sites) were whale riders, and that this was a part of the initiation of young men (and women, if you accept the concept and the engraving at American Track). He said that whales came to the upper part of Sydney Harbour to give birth and raise their calves and that young men/people were expected to befriend them, and eventually ride them. This story does fit in with the New Zealand Maori story of Paikea, who arrived in New Zealand on the back of a whale.

7.2.3.1 South Coast Whales

Whales featured in the Dharawal people's origin story, which traditionally suggests that they came to the Illawarra region by sea. The story was recorded by Mathews (1899: 91-92):

Arrival of the Thurrawal 'Tribe' in Australia

In the remote past all the animals that are now in Australia lived in another land beyond the sea. They were at that time human creatures, and resolved to leave that country in a canoe, and come to the hunting-grounds in which they are at present.

The whale was much larger than any of the rest, and had a canoe of great dimensions; but he would not lend it to any of his fellows, who had small canoes, which were unfit for use far from the land. The other people, therefore, watched in the hope that an opportunity might present itself of the whale leaving the boat, so that they could get it, and start away on their journey; but he always kept a strict guard over it.

The most intimate friend of the whale was the starfish, and he conspired with the other people to take the attention of the whale away from his canoe, and so give

them a chance to steal it, and start away across the ocean. So, one day, the starfish said to the whale, 'You have a great many lice on your head; let me catch them and kill them for you.' The whale, who had been very much pestered with the parasites, readily agreed to his friend's kind offer, and tied up his canoe alongside a rock, on which they then went and sat down. The starfish immediately gave the signal to some of the co-conspirators, who soon assembled in readiness to go quietly into the canoe as soon as the whale's attention was taken off it. The starfish then commenced his work of removing the vermin from the whale's head, which he held in his lap, while the other people all got quickly into the canoe, and rowed off. Every now and then the whale would say, 'Is my canoe all right?' The starfish, who had provided himself with a piece of bark to have ready by his side, answered: 'Yes, this is it which I am tapping with my hand', at the same time hitting the bark, which gave the same sound of the bark of the canoe. He then resumed his occupation, scratching vigorously about the whale's ears, so that he could not hear the splashing of the oars in the water. The cleaning of the whale's head and the assurances on the safety of the canoe went on with much garrulity on the part of the starfish, until the people had rowed off a considerable distance from the shore, and were nearly out of sight. Then the patience of the whale becoming exhausted, he insisted upon having a look at his canoe to make quite sure that everything was right. When he discovered that it was gone, and saw all the people rowing away in it as fast as they could go, he became very angry, and vented his fury upon the starfish, whom he beat unmercifully, and tore him almost to pieces.

Jumping into the water, the whale then swam away after his canoe, and the starfish, mutilated as he was, rolled off the rock, on which they had been sitting, into the water, and lay on the sand at the bottom till he recovered. It was this terrible attack of the whale which gave the starfish his present ragged and torn appearance, and his forced seclusion on the sand under the water gave him the habit of keeping near the bottom always afterwards. The whale pursued the fugitives, and in his fury spurted the water into the air through a wound in the head received during his fight with the starfish, a practice which he has retained ever since. When the people in the canoe saw him coming after them, the weaker ones were very much afraid, and said: 'He is gaining upon us, and will surely overtake us, and drown us everyone.' But the native bear, who was in charge of the oars, said, 'Look at my strong arms.

I am able to pull the canoe fast enough to make good our escape!’ and he demonstrated his prowess by making additional efforts to move more rapidly through the water. This voyage lasted several days and nights, until at length land was sighted on ahead, and a straight line was made for it. On getting alongside the shore, all the people landed from the canoe sat down to rest themselves. But the native companion, who had always been a great fellow for dancing and jumping about, danced upon the bottom of the canoe until he made a hole in it with his feet, after which he himself got out of it, and shoved it a little way from the shore, where it settled down in the water, and became the small island now known as Ganman-gang, near the entrance of Lake Illawarra into the ocean. When the whale arrived shortly afterwards, and saw his canoe sunk close to the shore, he turned back along the coast, where he and his descendants have remained ever since.

David Unaipon, the polymath Aboriginal writer from South Australia, has written a greatly more detailed version of this story he titled *Wondangar, Goon na Ghun (Whale and Star Fish)* (in *Paperbark a collection of Black Australian writings* from University of Queensland Press).

P3, a Dharawal, explained about whales in Port Hacking:

Rock art sites heralded movement of people in the Deeban Jibone (Geebung fruit) and Port Hacking areas. Mid-September, when the Wattle is blooming, people came together at Warrumbul Point for ceremony. Maybe 150-200 people. The old men on the coast would call for Orca to come into the bay, driving whale calves, fish, dolphins, and seals, which would be harvested by the locals. People fed the Orcas with offal. When the ceremony was going on, the Orca would beach themselves. The Dharawal said the Orca whale spirit emerged. The whale spirit (*Lumaluma*) goes right up each coast. The Orca spirit has an enormous penis (bifurcated), and took over the ceremony, and settled disputes. As the resources dried up, he would declare the best food was *mareiin* (sacred). He started molesting the young women. At the end of the ceremony he was ritually speared and driven back into the sea. At Maningrida in Arnhem Land, the Orca is *Lumaluma*, and in art, has 3 protuberances on his head. There are drawings of *Lumaluma* in the Arctic, Orca in the Columbia River of Washington State, USA. The *Loma Loma/Lumaluma* ceremony is presumed to be a celebration of the Pleiades.

In that story, the connection between the Orcas and whales is clear, and in post-contact history, there is evidence of this connection from the Yuin peoples at Eden, NSW. The Yuin, at least among the Saltwater dialect groups, had a very close connection to the whale, and this is reflected in the whale and dolphin songline (Songline 1 in Chapter 8) which travels from Eden up to Jervis Bay, NSW offshore in the sea. This close connection may be because the Yuin are the first coastal peoples on the Australian mainland to sight the whales travelling north to their calving grounds in the winter. P2 had a more detailed explanation of this connection:

Many years ago, when the sea was lower, there was a land bridge between Tassie and the mainland, which was a mountain range. People were coming from the South Pole; they saw the water rising, and looked for higher ground. The first mountain was Tasmania, so they got on a high hill in Tassie. They were a language group from Cape Barren to Yuin country; some of their language got into Yuin and Gunai (Kurnai). They were worried that they wouldn't be able to communicate with the whales. They asked other tribal elders if they could go on to the continental shelf and become part of the whale 'tribe' (this was the sea/Gadoo 'tribe'). Elders said it was OK, but they had to make a songline to travel, and a condition was that they must come on shore and regurgitate their Law, which meant give themselves up so that others could feast. They also had to take the dolphin mob with them. Dolphins are whales connected by songline. This was agreed by most everyone in the southern part.

P2 also explained the connection between the Yuin and the whales and the dolphins:

The whale/dolphin songline north shows the path of the Yuin journey. The spirit of Yuin is in the whale, so is the Yuin songline. The whaling industry in Eden disrupted the connection to the whale. Before that, there was a whale dance (celebration of the whales going north to give birth). The whale dance/ceremony was in May. The Seven Sisters were part of it – they were singing up the whales. The movement of the Milky Way was also a signal, and also a star which pointed to the north/northeast. There was also a ceremony when the whales came south later in the year. In the whale watching time, the dolphins are inshore. Dolphins were the whale bodyguards.

It also is clear that the Yuin have a different relationship to the orca than the Dharawal, also explained by P2:

The Orcas separated from the whales, but it was good to have knowledge of the orcas. The Yuin didn't have to hunt whales, who came to shore of their own accord (their Law). Also, discussed possible Orca ceremony near Bundeena (the one described by P3). Maybe it was to ask the Orcas not to kill whales.

Later, post-Contact, the Yuin peoples in the Eden region joined the new whaling industry set up there and became master whalers. There is the famous story of the Orca, Old Tom, who would come to the whaling site and alert the whalers that whales were in Twofold Bay, and if the whalers were successful in the hunt, would share in the whale(s) brought in for processing. Old Tom's skeleton resides in a museum in Eden.



Figure 7.3 Whale and calf on Gulaga Mt. (NPWS NSW)

P19 said that there was a songline from the whale rocks on Mt. Gulaga to Eden. Whether this existed before whaling in Eden is unknown (P2 later confirmed the songline). P19 also said that when the red sap of a certain tree started to come out, the whales were travelling north, and when the sap piled up at the bottom of the tree, the whales were travelling south along the coast. It is pretty clear that whales were important in Yuin culture, as P35 said that they travelled to ceremonies when the whales came down the coast with their new calves, and that 'birth/rebirth, boys to men/whale birth'.

7.2.3.2 North Coast Whales

Bundjalung:

P6: 'There is a whale dance (ceremony) that uses short steps.'

P6: 'Whale dreaming was sung at East Ballina, near Missingham bridge. There is/was a big rock in the north wall (of the break wall). The song was to sing the whales into the beach.'

P6: 'Ballina story. Both came down to East Ballina together. Versions are of whale and female dolphin OR whale and female dugong. The story was probably about wrong skins, shouldn't have been together.'

P6: '*Migaloo* - white whale - the spirit of someone who has come back. *Migaloo* is Sydney name - *Yiraleegan* is Bundjalung.' (*Migaloo* is a bit of a celebrity on the NSW coast – an albino humpback whale)

P6: 'Man fishing, killed the wrong thing, maybe a dolphin, swallowed by a whale, spouted up to the Moon. Sitting on the Moon, had to wait for a bird, but still waiting (man in the Moon).'

P13: 'Whales passed, sometimes stranded. Heard that people talk to whales.'

Gumbayngirr:

P23: 'Whale Dreaming - Taylors Arm, dead pool, the spirit of whale in there. Possibly the same at Orara River near Coffs Harbour.'

Birpai:

P18: 'Whales coming up and going down the coast identify North Brother Mt as halfway point.'

These stories from the ethnographical fieldwork are the only stories found about whales. The only story in the literature from the north coast is a rather fanciful one about the connection between the whale and the Seven Sisters, told in a 'New Age' manner, and connected to the Githabul dialect group of the Bundjalung.

What can I interpret from this information? There may have been a large loss of cultural knowledge in this area, but other cultural knowledge from the North Coast is quite a bit more detailed, so it may just be that there was not such a close connection to whales as

found on the South Coast. Another thing that occurred to me was that P21 told me that whale mothers used to calve in Sydney Harbour (and presumably other harbours and bays up the coast before colonisation), so maybe they didn't have to travel to Hervey Bay in QLD to find a safe place to calve and raise their calves, thereby not transiting the North Coast.

7.2.4 Dolphin stories

Except for a story in Robinson (1965: 27-29), which will be repeated in the North Coast section, most of the information on dolphins came from the ethnography. Looking at it by the regions:

7.2.4.1 Sydney Basin dolphins

Bidigal:

P27: 'Dolphins (porpoise) came into Bay (Botany Bay) end of Sep-early Oct. Could be related to fishing.'

Gai-mariagal:

P21: White-headed dolphin story - Mallacoota to Bribie Island. Old guy (fisherman) with long white hair and beard. Dolphins helped him fish, and he always gave best back to dolphins. He passed away, and the dolphins were upset; his family wrapped him in possum skins, placed in a canoe, and pushed out to sea towards the morning Sun. The dolphins disappeared, and the fish also disappeared. After several seasons, the dolphins came back with a big school of fish. The lead dolphin had a white head (like the old man). This story was heard at Eden, Narooma, Pambula, Yamba, and Stradbroke, and told to me as a child. Quite a few stories about people buried by putting into a canoe and sending out to sea. Dolphins were only used for beach fishing, not in rivers and harbours.

P21: Creation story. A sandbank at Palm Beach. The man saw baby dolphin trapped on sandbank, being circled by sharks, went into the shallow water to protect baby dolphin. He was trapped in deep water (when the tide rose), sharks approaching, when adult dolphins protected him. This is when the connection between dolphins and the Gai-mariagal was made. There is also a story about a man saving a dolphin when it couldn't breathe. He rammed a spear on the top of the head, creating a breathing hole. and it became a dolphin with a blowhole (Gold Coast story, could

be Yuggera, and it is also a Stradbroke/Quandemooka story). Also, the red ochre on the Gold Coast is from the blood of the dolphin which is located near the site.

The only other information on dolphins in the Sydney Basin is, like the whales, in the rock art. At Gumbooya (Allambie Heights), Wheeler Heights, Topham Track (West Head), and the Bulgandry site above Woy Woy, there are dolphins in the rock engravings. In some cases, they are associated with whales, but in one case (Topham Track), they could be herding a shoal of fish although Stanbury and Clegg (1990: 57) suggest it could be a shark. The Woy Woy site is also interesting, as P30, a Yaegl person, said that *wuy wuy* was 'dolphin'.

7.2.4.2 North Coast dolphins

Birpai:

P26: 'Dolphins bringing in fish. Women called them sitting on the shore.'

P18: 'Two Aboriginal people (man and woman), wrong skin, ran away, dived into the water. The man was speared, and the woman dived after, both were drowned. Both turned into dolphins.'

P18: 'Dolphins called in, in language, to get fish in.'

P18: 'Totems of the Birpai – Port Macquarie was dolphin.'

Bundjalung:

P6: 'Entrance to Ballina shaped like a dolphin.'

P6: 'Ballina mob closely associated with the dolphin (one of their totems).'

P6: '*Gwandi* - dolphin totem in Ballina - beach opposite RSL is dolphin *djuribil* (increase site).'

P12: 'Dolphins still deliver fish on the beach. Dolphin Dreaming across to the Kimberley. Local mob First (Light) People. Dolphin songline to Kimberley turns into Brown Snake, then Emu man chasing Seven Sisters.'

P13: People could talk to whales and dolphins. Went to the beach, hit the water, dolphins brought fish in. Put net around, throw some back to dolphins. Went out fishing at night, but didn't need a line. On Richmond River, point off Cabbage Tree Island, sitting in the middle of the river. Two dolphins came up the river. Rowed

towards bank, dolphins followed, mullet jumping into the boat. Mullet crossed the river, dolphins followed, then waiting for the boat. Gave fish to dolphins.

P13: Ballina story, back when island, across from RSL, old lady left with kids, fell asleep, kids swimming. Man came across in canoe and stole a young girl, old lady woke, chanted, hit water, big wave came, tipped the canoe. Two dolphins came out. Now, only see two dolphins in river. The sandbank in front of the RSL is the dolphins, which is an increase site.

P23: 'Dolphins called in for fishing.'

Dunghutti:

P29: 'Dolphins came up creek to Hat Head - old people trained them clicked river shingle. Trained to go out and bring fish (whatever). Nets made of kurran and bark (women plaited them).'

Yaegl:

P1: Some people knew how to get them to herd fish. The fish trap at Angourie, Wood Heads, some are natural, some man-made. Brooms Head, as well. On the beach, old men talk to porpoise to head mullet to beach, where men would catch them. Old men then tell porpoise to get in and have their share.

P24: 'Uncle Billo (Wallace) - go fishing - he'd sing out to dolphins. Later on dolphins herded brim at Harwood.'

This is the story in Robinson (1965: 27-29), which comes from Bob Turnbull, a Bundjalung man:

The Man who killed the Porpoise

In the winter-time, the 'tribes' all along this coast used to camp in the hills and caves in the mountains where there was plenty of firewood and plenty of tucker, wallaby, porcupine, possum and all that.

Summer-time, they'd make down to the beaches for a feed of fish. They'd change their food. That's when they'd get the porpoises to help them.

The porpoises were the old people's friends. When the season of the sea-mullet was in, the old people would go down to the river and beat their spears on the water.

The school of porpoises would come and chase the schools of sea-mullet right into the shallow water, ankle deep, where the old people used to get just enough for two or three meals without wasting any. The old people used to tell us that when we went fishing we should spear just enough fish for our needs, without wasting any.

Another thing, when the old people wanted to cross the river in canoe, or by swimming across, the porpoises would always be there to chase away the sharks.

The old people used to make a little net out of *kurrajong* bark. They'd go down to the beach and beat the water. They'd call on the porpoises. All the porpoises would come and chase the fish into the bay. Then the old people would shoot the net around the fish and catch them.

One day, two men went down to the beach with their net. They got too greedy. When they ran the net around the fish, they got a porpoise in it. One of these fellers was curious about this porpoise. He wanted to know how it came to be so clever. Well, out of curiosity, he killed the porpoise and cut it open on the beach.

A good while after this, some of the people of another 'tribe' went down to the beach to net some fish. They beat on the water, they called to the porpoises, they sang them, but the porpoises wouldn't appear.

Those people couldn't get any fish. They wondered what was the matter. They couldn't make out why the porpoises wouldn't come to hunt the fish for them.

Well, this old-man went to see another old-man, one belonging to the 'tribe' whose fisherman had killed the porpoise. These two old-men met and talked together. 'Well,' said this second old-man. 'I don't know anything about it, but I'll find out.'

This old-man soon found out that one of his men had killed a porpoise when he had caught it in the net.

They took this feller who had killed the porpoise and killed him with a boomerang. They used the boomerang like a tomahawk to kill him. Then they took this man and threw him into the sea and threw the boomerang in after him.

That man, when he was thrown into the sea, turned into a porpoise. Next time when you see a porpoise jumping and turning over, you have to look, you'll see a boomerang on his side.

Killing this feller did no good. It didn't make the porpoise come back.

Those two 'tribes' had a fight over the killing of that porpoise, but it still didn't do any good. From that time the porpoises would never help those people with the fish no more. No matter how they called on the porpoises to come and help them, the porpoises stopped coming.

They never came back no more.

7.2.4.3 South Coast dolphins

Yuin:

P3: Old man sitting on rocks, very sad, porpoise surfaces and asks 'why?'. The man said his people were hungry. Porpoise said if you only take what you need, then they would help by jumping and alerting people that there were fish. The next day the old man saw the porpoise jumping and directed women to go out and catch fish, which they did OK. Another day the old man was sitting on the rock, and the porpoise surfaced and said they were impressed, and thereafter they would continue to help people. There is rock art in RNP showing porpoise and fish.

P19: 'Called in by singing dolphins after slapping water, singing and speaking in dolphin language.'

It is pretty clear from most of the stories that the relationship between Saltwater Aboriginal peoples and dolphins was one of cooperation. The Yuin, as seen in the evaluation of their whale culture, saw them as part of the same mob as the whales, and even as protectors of the whales. There are historical mentions of a cooperative relationship between man and dolphins going back to ancient Greece, and today there are still some examples of cooperative fishing between man and dolphin. The best documented is in southern Brazil, at Laguna, where Bottlenose dolphins and fishermen using cast nets cooperate to catch mullet. In Myanmar, the Irrawaddy dolphin has begun cooperative fishing in relatively recent times, and in Mauritania, dolphins herd mullet onto beaches. Interestingly, most of the Aboriginal stories also refer to cooperative fishing for sea mullet, which migrate up and down the NSW coast during specific seasons.

There are other themes, such as stories involving dolphins used for teaching correct behaviour or even teaching marriage rules. In the case of the Bundjalung, there is the suggestion of a dolphin songline, probably travelling over the Dividing Range and west

along the same route as the possible Black Duck and Black Swan songlines, but heading northwest at some time towards Broome.

Sometime after colonisation, the fishing cooperation between the NSW Saltwater Aboriginal peoples and dolphins began to break down, probably by overfishing from white people, and Robinson's story included in this section would be an explanation that was not too contentious.

7.3 Summary

The four major themes that came out of the literature study and ethnography were:

- Three Brothers
- Seven Sisters
- Whales
- Dolphins

The Three Brothers stories are probably the most interesting, as they may be a universal mythic theme, but the differences between the stories on the NSW Coast suggest that while there may be an underlying theme, there are few similarities in the stories.

The Seven Sisters stories are ubiquitous along the NSW Coast, as they appear to be across Australia. For Saltwater peoples on the East Coast of Australia, the Seven Sisters appear to rise out of the sea and set behind the Dividing Range, and the timing of their rise in the morning and evening is significant. For the Yuin, they coincide with the travel of whales up and down the NSW Coast, and in Chapter 8 a whale songline is described. The history of the myth of the Pleiades star cluster is world-wide, and there has been significant work on tracking the development and spread.

Whales and dolphins were important animals to Saltwater peoples, both as resources (stranded whales), and helpers in getting resources (dolphins herding fish). While whales have significant cultural connections to the Yuin and Dharawal, this may have been lost further north on the coast. Dolphins and their helper status seem to be a theme everywhere, and while there are a few cultural connections on the North Coast, generally they are seen as cooperative beings.

Out of these selected themes, some may be useful in the thematic analysis of this study. Most of the themes have at least some connection to knowledge and stories in the sky, and this knowledge fulfils part of the aims of this study, which was to fill the gaps in academic knowledge and provide information which can be used to educate persons from the dominant culture. The impact of describing these themes is a bit more difficult to judge, as most of the actual knowledge and stories have been part of the literature for a long time, but in many cases, there has not been any attempt to search for patterns in the knowledge. These patterns may be useful in further research to link knowledge and stories from outside the area of this study, and, eventually, find widespread cultural practices in Aboriginal Australia.

8

8 Songlines and the NSW Coast

8.1 Background

In approaching the search for songline connections to the astronomical knowledge of the Saltwater peoples of the NSW Coast, there was a certain trepidation on my part. In my previous research with the Gamilaroi and Euahlayi peoples of north-central NSW, there had been a clear familiarity with songlines by some of the participants, which both introduced me to the subject, and encouraged me into a fascinating area of study. With very little published on songlines in the coastal NSW context and an expectation that there would be more loss of cultural knowledge among the Saltwater peoples due to the proximity to colonisation, and later, the effects of government policies of displacement from Country, this aspect of research would prove to be the most difficult.

I have described the basic concept of songlines in the Introduction. By way of expansion of that description, the history of the Western knowledge and understanding of songlines will be examined first, as well as their significance in the understanding of the Aboriginal peoples' approach to creating their cosmogonies, cosmologies, and ongoing cultures.

8.1.1 History

Two early Scottish anthropologists, Alfred Lang, and John Frazer, in their respective best-known studies, *Custom and Myth* (1893), and *The Golden Bough* (1900), used earlier and contemporary sources to comment on Australian Aboriginal cultures and stories, but had no idea of songlines. The first published Australia-based ethnographers, A.W. Howitt and R.H. Mathews, who wrote extensively about Aboriginal cultures in the period 1889 – 1912, clearly understood the totemic nature of Aboriginal cultures, but did not report any suggestion of songlines, even though they referenced the work of B. Spencer and F.J. Gillen with the Arunta (Arrernte) peoples in Central Australia. Spencer and Gillen, who

wrote *The Native Tribes of Central Australia* in 1899, and *The Northern Tribes of Central Australia* in 1904, had extensive fieldwork experience with the Arrernte and other Central Australian Aboriginal peoples, and published very detailed cultural knowledge, including on totemism, but there is no specific mention of songlines in those publications. Gillen, however, in a letter to Spencer dated June 18, 1897, mentions ‘the wanderings of the various totems’ and ‘it would have helped us to a better understanding of the various ceremonies’ (Mulvaney et al. 1997: 166). Mulvaney et al., in reviewing Gillen’s letters to Spencer (ibid.: 38), says that Spencer and Gillen understood that ‘the Central Australian landscape was crossed by a network of intersecting ancestral tracks’. This suggests that Gillen, at least, may have understood that totemic places were linked by routes and ceremonies, but there is no clear mention of this in the books (as may be the case with other researchers, perhaps Spencer and Gillen felt that this knowledge was too much of a secret/sacred nature, and should not have been published).

Later, Australian anthropologists Herbert Basedow, A.R. Radcliffe-Brown, A.P. Elkin, and Ronald and Catherine Berndt did not publish specific information about songlines, although Elkin and the Berndts would have been exposed in the latter parts of their careers to other researchers who clearly understood songlines and wrote about them. Included in a list of those researchers would have been the anthropologists A.P. Mountford, W.E.H. Stanner, and Norman Tindale. Mountford didn’t specifically mention songlines in his publications but used the phrase ‘line of songs’ about the story of *Jarapiri*, a ‘totemic route’ (Mountford 1968: 4). He also used ‘totemic route’ in later publications (Mountford 1976: 310-311). Stanner, who is known for his marvellous descriptions of the Dreaming, does not seem to have mentioned songlines. Tindale investigated the *Wati Kutjarra* story in Western Australia (Tindale 1936). This story is part of the Seven Sisters Dreaming (and the most extensive songline existing), but he does not specifically mention that it is a songline. However, he describes the travels and songs related to the travel.

That leaves us with the question; did any of the classical anthropologists of the 20th century understand songlines as a result of their research? The publications of T.G.H. Strehlow point to him being entrusted with this knowledge, but he never specifically called the knowledge ‘songlines’. In *Aranda Traditions* (1947), *Songs of Central Australia* (1971), and *Central Australian Religion* (1978), he hints at the songline as being the base of the performance of culture related to ancestral totems (*Tjuringas*). What makes it clear that he understood the culture is his published story of his father’s (Carl

Strehlow, Lutheran missionary, linguist, and anthropologist) death in *Journey to Horseshoe Bend* (1969). (Ted) Strehlow, who was raised at Hermannsburg Mission with Aranda (Arrernte) people, and was educated in their culture, describes the stories of Dreaming ancestors and their connection to the land as he travels as a 14-year-old with his dying father from Hermannsburg to Horseshoe Bend on the Finke River, but once again doesn't specifically use the word 'songline'. However, he does use the description 'this storied land' (ibid. p. 218) at the end of the book, which is an acceptable way to describe the idea of stories that make up songlines. Later, Isabel McBryde used 'storied landscape' in a similar manner (McBryde 2000). Strehlow also described 'the 400-mile mythical route taken by the original honey-ant ancestors' (Strehlow 2008: 95).

The first use of the word 'songline' in the professional literature appears to be by Bob Tonkinson in 1972, in his PhD thesis, *Nga:wajil: A Western Desert Aboriginal Rainmaking Ritual*. Tonkinson, an anthropologist who later became a Professor at the University of Western Australia, was studying the Mardu people in the Pilbara community of Jigalong (Western Australia). He defined a songline as 'a series of short songs pertaining to the travels and exploits of ancestral beings during the Dreamtime. These songs are usually sung in association with a ritual activity, particularly dancing. The Aborigines use the English word 'line' frequently, to refer to a ritual complex as well as to a song series.' (Tonkinson 1972: 18). As Tonkinson studied under the Berndts, it suggests that they would have understood the word. It is interesting that his use of 'song series' is now being suggested as a replacement for 'songline' by Prof. Marcia Langton (Chair Australian Indigenous Studies, University of Melbourne) (pers. comm. D. Hamacher 10 May 2019).

The popular understanding of songlines had to wait until 1987, when the English writer, Bruce Chatwin, explored his themes of nomadism and walking (in the sense of Thoreau's description of walking and Nature) in his semi-fictional book, *The Songlines* (1987). Chatwin, in his writing, explored the need for man to walk in nature, and after a visit to Alice Springs and Central Australia developed a theory in which Aboriginal song and walking combined to create 'songlines'. His theory is probably a bit under-developed reference current anthropological theory of songlines and Dreaming tracks. While the second half of his book became more of a ramble through his theories on walking in general, *The Songlines* was popular with readers and exposed the concept of songlines to the general public. Howard Morphy (1988) reviewed it the year after it was published

from an anthropologist's view, and while he found Chatwin's 'theories' on nomadism incomplete, he was sympathetic to Chatwin's attempt to show the divide between Aboriginal cultures and Western incomprehension of the same.

Since Tonkinson and Chatwin brought the understanding of, and the word, 'songlines' into popular usage, many academics working in archaeology and anthropology have written on the subject, including John Mulvaney (2002), Isabel McBryde (2000), Paul Taçon (2005), and Val Donovan (2010).

8.1.2 The Dreaming and songlines

Glenn Morrison, in *Songlines and Fault Lines* (2015), his study of six narratives of walking and 'place', has brought together the strands of Aboriginal culture that connect through Dreaming tracks and songlines (which, according to him, are similar in that stories and songs travel in a comparable way, but may have subtle differences (Morrison pers. comm. 16 Nov 2018)). These strands include the Dreaming, which Stanner and others have explored. Stanner's description (1965: 273) of the Dreaming as 'everywhen' is still the most successful in this respect. Other strands are the Aboriginal concept of their own Country as being a separate Country to the surrounding Countries of other Aboriginal peoples (Sutton 1998: 390), and the connection between ritual and observation of Aboriginal Law 'that relates self to land and movement across it at specified intervals' (Morrison 2015: 234). In his analysis of *The Songlines*, Morrison suggests that interpretations of Chatwin's narrative 'that it represents Aborigines as 'nomadic' may have been overstated' (ibid.: 234). He explores and refers to an exchange between the two main characters, Bruce and Arkady, which suggests the connection between Aborigines and their land:

'So the land,' I said, 'must first exist as a concept in the mind? Then it must be sung?

Only then can it be said to exist?'

'True.'

'In other words, 'to exist' is 'to be perceived'?'

'Yes.' (Chatwin 1987: 14)

Chatwin, at the conclusion of *The Songlines*, reminiscences about the various suggestions by other people when songlines were being discussed, which included ‘ley-lines’, the Nazca Lines, and Chinese ‘dragon lines’. He felt that songlines were more significant and more universal:

‘Trade means friendship and co-operation; and for the Aboriginal the principle object of trade was song. Song, therefore, brought peace. Yet I felt the Songlines were not necessarily an Australian phenomenon, but universal: that they were the means by which man marked out his territory, and so organised his social life. All other successive systems were variants – or perversions – of this original model.’ (ibid.: 280)

James (2013: 33) said ‘It is one of the great resilient oral knowledge systems of the world.’

Natale (2009: 112) examined Chatwin’s *The Songlines* along with an Aboriginal story, *Murgah Muggui*, which was originally collected by K. Langloh Parker:

The multiple-level of understanding shown in each mythological story has the function of activating analogical intuition, therefore giving instructions to the Aboriginal in connection with all systems of life: biological, social, psychological, spiritual. Their symbols do not arise from the mind only, but derive from the holistic experience and power of mind, body, sex, heart, soul, and world, all moving together in a partnership dimension. This is the dream-body language of ancient rituals, the thinking of magic and poetry, storytelling and song. This explains how the songlines work as an instrument of geographical and physical navigation across the Australian land:

There were people who argued for telepathy. Aboriginals themselves told stories of their song men whizzing up and the down the line in trance. But there was another, more astonishing possibility. Regardless of the words, it seems the melodic contour of the song described the nature of the land over which the song passes. So, if the Lizard Man were dragging his heels across the salt-pans of Lake Eyre, you could expect a suggestion of long flats, like Chopin’s ‘Funeral March’. If he were skipping up and down the MacDonnell escarpments, you’d have a series of arpeggios and glissandos, like Liszt’s ‘Hungarian Rhapsodies’.

Certain phrases, certain combinations of musical notes, are thought to describe the action of the Ancestor's feet. One phrase would say, 'Salt-pan'; another 'Creek-bed', 'Spinifex', 'Sand-hill', 'Mulga-scrub', 'Rock-face', and so forth. An expert song-man, by listening to their order of succession, would count how many times his hero crossed a river, or scaled a ridge – and be able to calculate where, and how far along, a Songline he was.

'He'd be able', said Arkady 'to hear a few bars and say, "This is Middle Bore" or "That is Oodnadatta" – where the Ancestor did X or Y or Z.' 'So a musical phrase,' I said, 'is a map of reference?' 'Music', said Arkady, 'is a memory bank for finding one's way about the world'. (Chatwin 1987, 119-20)

To try and summarise the more recent discussions of archaeologists and anthropologists such as Mulvaney, McBride, Donovan, Morphy, and Taçon (to name a few) on the subject of songlines, a few themes appear to be accepted:

- Songlines are stories, often of Ancestral beings, who travelled over the land in the Dreaming, and left culturally significant objects or features along the routes of travel,
- Songlines are designed to be sung; singing them as they are travelled refreshes the story and the land; Morrison (2017: 133) said that 'unsung land is dying land',
- Songlines and Dreaming tracks may be the same thing, but there are suggestions that Dreaming tracks may not have the same requirement to be sung,
- Songspirals, as described in Gay'wu Group of Women et al. (2019), are a Yolŋu women's version of songlines, and will be described later in this Chapter,
- Songlines and Dreaming tracks are multi-purpose; the stories educate and confirm the Law, they are also used as routes of communication and trade, and,
- Songlines form a navigational network not based on coordinates to some external reference, but lines of travel. Morrison says this is 'wayfinding' (Morrison 2015: 93).

In a more recent commentary on songlines, *Metaphysics of songlines*, in *Songlines: Tracking the Seven Sisters*, to accompany the National Museum of Australia's exhibition

of the same name, Mike Smith (2017: 218-219, emphasis in original) has listed a 'checklist' of songline attributes:

- 'Are songlines a map? The evidence on this seems equivocal. Certainly, they are not route maps.'
- 'Are they a mnemonic guide to country, a 'memory'? Probably, as these narratives implicitly include a great deal of detail about local landscapes.'
- 'Are these narratives primarily a kind of scripture, a corpus of sacred knowledge in the garb of oral tradition? Certainly, they have some attributes of scripture.'
- 'Are songlines a form of parable or allegory? I have never seen them used this way.'
- 'An oral history? I doubt that songlines are historical narratives, though they are often seen by the public as a primordial history, the missing first chapter of Australia's story.'
- 'Charter to land. The most important aspect of songlines is the way they relate individual people to specific places. Sacred knowledge is specific and localised.....So songlines are primarily a frame of reference for asserting connections to place, and working out proprietary rights to land, without which there would be the chaos of a *terra nullius*.'

8.1.3 Songlines defined

Songlines are a significant part of Aboriginal cultures, but by now in this study, you must have understood (if you already had not) that everything in Aboriginal cultures is a part of a whole. Just as the sky and the Earth (Mother Earth as I have heard it so many times) are part of the whole, then Aboriginal peoples and everything they do and believe are also part of the whole, both now and in the past. This is why stories never die as long as they are repeated, and songlines will continue, as long as they are being walked and sung. Defining songlines is difficult, as can be seen as experts have tried to do in the previous section. I can only add my thoughts on this, which are that songlines may be the hidden core of Aboriginal philosophy that connects all Aboriginal peoples across the vast distances of Australia and has permitted them stable cultures over the millennia.

8.1.4 Songspirals

Songspirals are a Yolŋu women's variation on songlines, which Yolŋu people clearly also celebrate in their culture (Norris and Harney 2014: 145). In *Song Spirals* (Gay'wu Group of Women 2019) the authors explain that (ibid.: 231) 'When we keen milkarri, it takes us back. We have travelled, as have those who have passed away.' "Keening milkarri" is a specific kind of women's singing that connects to the songspirals. Continuing with the explanation, 'It's memory and actually telling a story, remembering that person, Country, what you've seen, what we hear.'

As part of the journey, we might keen and sing other clans' parts too, because Country is connected to many people. Songspirals connect through space and time.....There is order in all the songspirals, it ensures that we do things for a purpose, we burn land for a purpose. Process, order and structure must be followed. It is important that the songs are sung in the right place, in the right way. (ibid.: 238)

This knowledge of songspirals has been very recently published, so there has been no apparent response elsewhere in Aboriginal Australia that this women's cultural version of songlines is common. My best interpretation of songspirals is that they are a combination of celebration of the travel of creation ancestors and the travel of a person from the totemic place of birth in Country and back again when the person passes away, along a specific route, aided by the 'keening milkarri' of the women celebrants.

8.1.5 The significance of songlines

'While the narratives connecting the travels of these Dreaming Ancestors to specific sites may be sung or spoken, they collectively represent a significant body of oral literature, comparable with other great world literatures, such as the Bible, the Torah, the Ramayana, and the Greek tragedies of Aeschylus and Sophocles, to name but a few.' (Nichols 2014: n.p)

Aboriginal peoples are the oldest continuing culture on Earth, splitting with 'the ancestral Eurasian population 62,000 to 75,000 years B.P.' (Rasmussen et al. 2011: 97) when commencing their migration from the Middle East. Aboriginal peoples had oral cultures, so there are no Bibles or Korans to document the source and the growth of Aboriginal spirituality, which led to the stories of Ancestral beings and creators who formed the land and the features which were eventually celebrated by walking and singing the songlines.

For all modern science knows, it could have come full-blown with the ancestors of Aboriginal peoples as they travelled to Australia, but given the connection to the land of Australia, there would be a strong case for that spirituality to have developed in Australia. When, in that long history, it did develop, will never be known for certain, although rock art in northern Australia dated variously to 24,000 years B.P. in the Kimberley (Aubert 2012), and rock art associated with occupation in Arnhem Land to 50,000 years B.P. (David et al. 2017), may have cultural connections to Dreaming stories. In any case, the significance of songlines is not in their antiquity, but in their consolidation of the various threads of spirituality and linkage to landscape that has become the subject of intensive study by scholars working in diverse disciplines. In her theory of memory spaces and landscapes, *The Memory Code*, Lynne Kelly (2016) has examined the use of landscape by oral cultures and First Peoples to create and maintain memory spaces, which encoded their stories and knowledge of their environment. It was this vast knowledge of the environment and seemingly prodigious memory of animals, flora, and landscape by some Aboriginal elders that put Kelly on to the research that led to her theory of memory spaces. Songlines are a perfect example of landscape encoding memory, as the songs linked to the landscape encode stories and knowledge of the environment.

During my previous research with the Euahlayi community of northern NSW, one of my participants, Ghillar (Michael Anderson), taught me how his community had used a memory device to teach people the route to ceremonial and trading locations outside their own Country. To do this, they used a pattern of stars in the night sky during the winter months to create a mnemonic of ‘waypoints’ across the landscape beyond their Country to the destination, which was taught to people about to make the journey. The ‘waypoints’ were often waterholes or significant points in the landscape. The stars were not used for actual navigation, as the people mainly walked during the daytime, and by the summer travel months, those same stars were not visible at night. They were, however, a pattern similar to the route to be travelled, and each star was one ‘waypoint’ in the mnemonic. As I was introduced to the concept, I wondered how these ‘waypoints’ were described and was told that they were ‘sung’, and that the instructions were made up of a series of linked songs which incorporated cultural knowledge. Of course, what the learners were singing was a songline, and the songs included knowledge about the route and the directions (‘wayfaring’, as described by Morrison). Some of these routes from northern NSW into QLD travelled 500km over the difficult Channel Country of south-west QLD

during the summer months, so knowledge of water in the songline was essential for survival. I had also been told that there was a ceremonial connection between the Euahlayi and the Arrernte peoples of Central Australia and that the latter travelled over 1000km to meet for ceremonies near Quilpie, QLD, every three years. The Arrernte route was most likely the *Mullian-ga* (Eaglehawk/Wedgetail Eagle in Euahlayi language) songline that ran from (possibly) Byron Bay, NSW to Emily Gap, east of Alice Springs. This songline was the story of *Mullian-ga* travelling to Emily Gap and fighting with *Yipirinya* or *Ayeparenye* (green caterpillar in Arrernte language). This songline crossed over Euahlayi Country and was one of the songlines dividing the night sky (Fuller 2014: 115-116).

If Kelly's (2016) theories are correct, then oral cultures and First Peoples needed a way to remember their stories, which were linked to the land by travelling to landmarks which held the stories. In those cases where they no longer had access to the landmarks, they used a variety of devices to encode the stories, such as stone arrangements and rock art. Aboriginal peoples also used these devices, but in many cases, were still able to travel their Country and use the landmarks to refresh the stories (and the land). In that, they are the holders of that special cultural technology which may have once been practised by all peoples, but today, due to colonisation and the encroachment of 'modern' societies, has been all but wiped out. Not all Aboriginal communities have been able to retain and practice this knowledge and approach to spirituality, but enough remains that we can admire it as a remarkably resilient approach to cultural continuation, and it connects to other admirable approaches to living with Country, including ecological harmony. These features of Aboriginal cultures show the significance of songlines in the past, and, in some places, continuing today.

8.1.6 Some significant songlines

The Kimberley cultural man, David Mowaljarlai, explained to his co-author, photographer Jutta Malnic (Mowaljarlai and Malnic 1993: 190-191), that the continent of Australia, *Bandaiyan*, in his Ngarinyin language, was a body, 'Corpus Australia', floating on the sea since the Flood, with body parts like a human, enclosing the Snake, *Wunggud*. Across the surface of Australia is a crosshatch (Fig. 8.1), with the lattice lines representing the history stories that travelled along the trade routes (which are undoubtedly songlines). The Aboriginal communities are the diamonds within the pattern, and they are connected by the sharing system, which he called *Wunnan*. Mowaljarlai was probably the first to write of Australia as 'criss-crossed by mythological tracks' (Mulvaney 2002: 4), as

Strehlow (2008), Taçon (2005), Blair et al. (2001), and Kerwin (2010) all confirmed the existence of such a network. Kabaila (2005: 14) even likened the network to ‘not so much a topographic map as a diagram, much like a suburban train diagram’. The stops on the train diagram would be the equivalent of the points of the songs/stories in the songline. It even seems possible that some songlines are circular, with the Ancestral/totemic being returning to the starting point via a long loop. Several of the long-distance songlines I have studied on the NSW coast could be such loops.

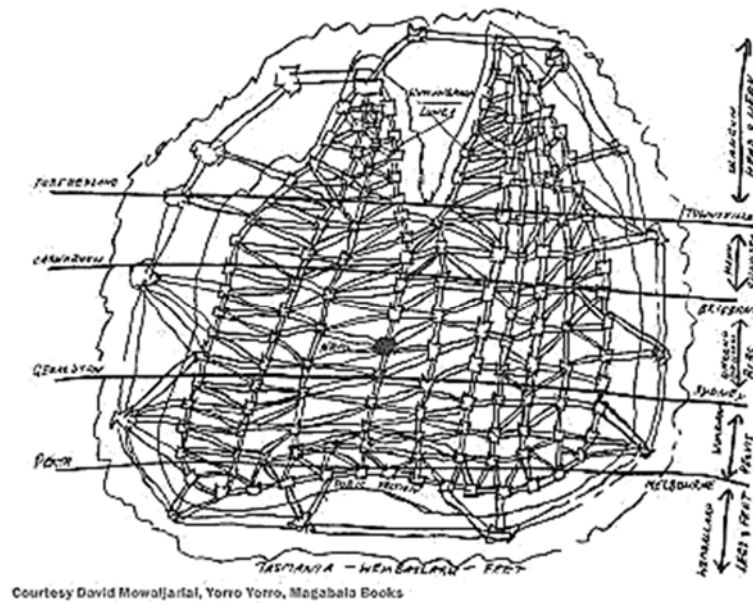
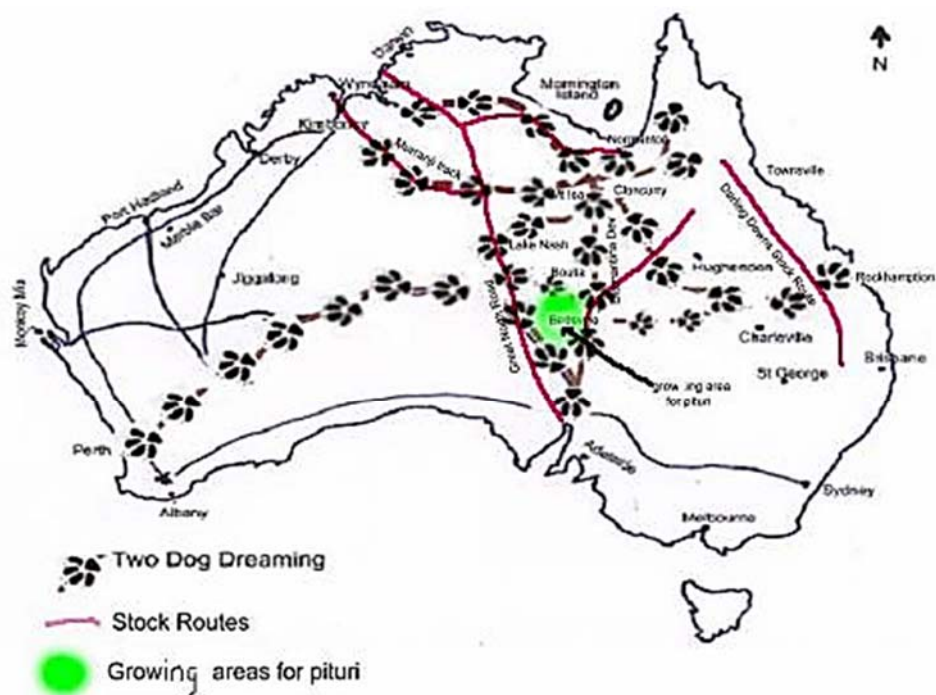


Figure 8.1 'Australia crisscrossed by mythological tracks' (Mowaljarlai and Malnic 1993)

These various descriptions of songlines bring up the question; are songlines all long-distance, or can they be local? It appears that they are both, and in some cases, local and long-distance on the same songline. (Smith 2017: 219) says ‘Some are limited local regional narratives. Others are long continental tracks (*Wati Kutjarra* (Two Men), *Malu* (Red Kangaroo), *Tingarri*, *Kungkaragkalpa* (Seven Sisters), *Atyelpe* (Native Cat) and *Kipara* (Bush Turkey)).’ To this, I would add the story of dingoes (two to five) chasing emu(s) (one to three), which McBryde (2000: 157-169) has explored. I have heard from previous research that this story runs for vast distances in Central Australia, and even via QLD and NSW. In most cases, however, the emu(s) is/are chased to Pukardu Hill near Parachilna in the Flinders Ranges, where it/they die(s) and becomes the blood of the quarry which is the source of the prized red ochre (McCarthy 1939b: 86-88) which was traded along the very songlines that carry the story. Interestingly, in McBryde’s research, there were some versions of the emu story told by different cultural persons living near

the end of the songline. In most cases, the story told only commenced locally, with the suggestion that the emu was coming from somewhere further north (in these cases). Some of McBryde's sources did suggest the beginning of the story/songline somewhere quite distant but did not include details of the story in the distance. Jones (2007) has also investigated the history and stories connected to the Pukardu ochre mine, including the history of white knowledge and eventual accommodation with the Aboriginal users of the mine. In Jones (ibid: 351-352), several variations in the stories are described, notably that for Aboriginal visitors from southwest QLD and northeast SA, the ochre is the blood of the Ancestor Emu, and for Aboriginal visitors from the Flinders Ranges and south, it is sacred Dingo blood.



This information would concur with Smith's thoughts that regional songlines were absorbed into the long-distance songlines. In my research presented in this chapter, I have identified regional songlines that appear to stay regional, and regional songlines that have been identified with long-distance songlines.

To make a list of significant songlines brings up the question; significant to whom? Most of the well-known songlines tend to pass through Central Australia, and there are several possible reasons:

- The culture of songlines in Central Australia has survived colonisation better than in coastal regions, and
- Uluru, which is in a central location, is not only significant to the Anangu people who live in that area but is considered by many Aboriginal peoples to be spiritually central to Aboriginal cultures and may be the origin and endpoint of many songlines.

Based on Smith (2017) and my current and previous research, I would suggest the following list of long-distance songlines, which are identified only with the main characters, as every community would have a name in their regional language:

- Seven Sisters
- Red kangaroo
- Native cat (quoll)
- Emu and dingoes
- Wedgetail eagle and green caterpillar
- Brush turkey
- Black snake and crow

No doubt there are many more which have been 'buried' by the owners of the songlines or have been lost with colonisation. Rather than examine each of these songlines, I will examine only those who have surfaced in my research on the songlines of the Saltwater Aboriginal communities of the NSW Coast, when I come to that part of this study.

8.2 Finding songlines and Dreaming tracks

Finding songlines is like chasing the ‘pot of gold’ at the end of the rainbow; it often seems like it keeps moving just out of your reach. There is a lot of talk in the media about songlines, some of it a result of professional research; some of it just because ‘songlines’ sounds cool! In my literature review and ethnohistorical survey, I found little serious information about songlines and surprisingly few references. Of 76 references in Mura®, the AIATSIS library database, there were seven referring to actual research into songlines, four that referred to Aboriginal language group/community projects on songlines (all of which were from Central Australia or Arnhem Land), two of which were movies with a songline theme, and several compilations of studies. A few more were either media references, such as articles in *The Guardian*, *The Conversation*, or ABC radio interviews on the subject. The balance of the 76 was the use of ‘songline(s)’ in an art project/exhibition or related to Aboriginal music projects that did not appear to have much to do with actual songlines.

The ‘*Songlines: Tracking the Seven Sisters*’ program at the National Museum of Australia, Canberra, running from Sep 2017, which I attended, was educational in that what I saw (and read in the accompanying book edited by Margo Neale 2017) confirmed a number of my thoughts and theories developed during the literature review. It also confirmed that the subject of songlines and their exposure to non-Aboriginal people is still a very fraught issue to Aboriginal peoples, as there was some controversy regarding objections from some traditional owners of the Seven Sisters stories.

Much of the actual research on songlines, from Central Australia and Arnhem Land, was either inaccessible due to restrictions on access for cultural reasons (this at AIATSIS), or in the form of audio recordings of songs in languages I had no way of translating. Towards the end of the fieldwork, I had the chance to read Strehlow’s *Songs of Central Australia* (1971), which includes many Arrernte songs in the format of a line of text in Arrernte, with the translation on the line below. Judging by the text of the translated songs, it was clear that some, such as the verses about the honey-ant women, were songs which would have been sung as part of ceremonies while travelling a songline.

Of course, songs from Central Australia, while instructive, were not going to solve my problem of finding songlines along the NSW coast. In the end, it came down to a few hints in the literature, followed by doing a significant part of the ethnography, then trying

to tease out of the stories and data hints pointing to potential songlines. In some cases, I had discussions with participants who had some limited ideas about potential songlines, and in the course of discussions, we were able to put information together and come up with a complete picture of the possible songline. In a few cases, questions to participants about stories read in the literature and confirmed (and in some cases, filled out) by the participants, led to questions about whether the story travelled in the respective Country and was, in fact, a songline. For the two long-distance songlines that are proposed in this research, it was a matter of talking to a lot of people, doing a lot of detective work, coming back to participants with ‘could this be the case?’ questions, and eventually coming up with a theoretical songline. In one case, some knowledge from my previous work with the Euahlayi community led to a possible long-distance connection to one of the coastal songlines, which then led to a possible connection 1000km south along the coast. In the end, there were a lot of gaps in the long-distance songlines that were never going to be filled by participant knowledge. These gaps are once again a confirmation of the cultural destruction along the coast caused by colonisation and the later removal of Aboriginal peoples from their respective Countries.

One helpful suggestion in my search along the NSW coast came again from Kerwin (2010: 109-110), who, in searching for trade routes along the East Coast, identified a route from Cape York down the Great Dividing Range into VIC. This route incorporated the trade in bunya nuts from south-east QLD, and linkages between major *bora* (initiation) grounds along the coast (which, fortuitously for my search, are most prevalent on the NSW coast and south-east QLD). This trading route, like so many others, was expected to have another existence as a songline (Fig. 8.3).

With these leads from the literature, followed by my fieldwork, I have been able to identify some unambiguous local songlines and some strong contenders for long-distance songlines along the NSW coast.

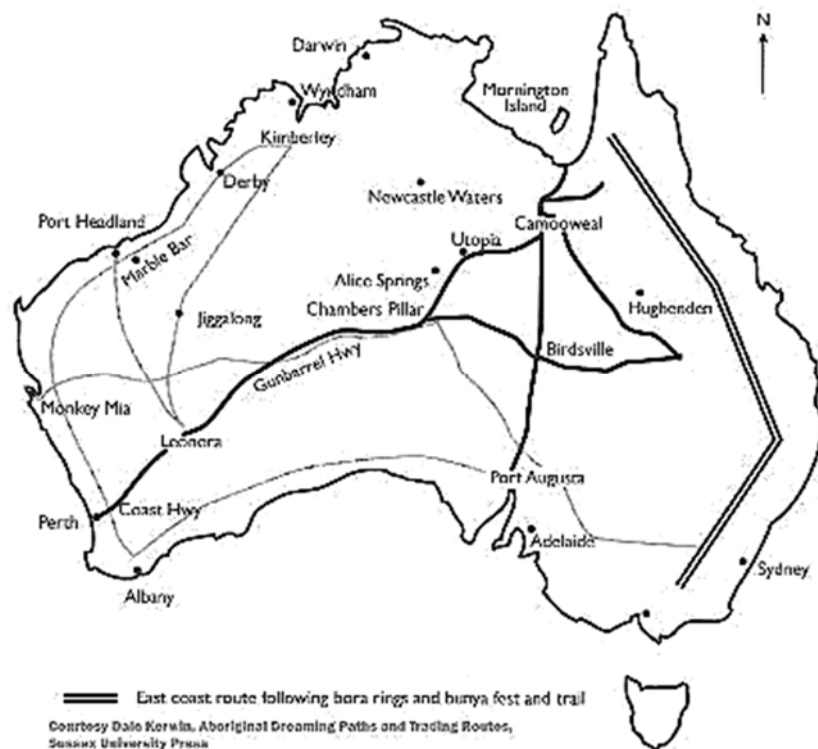


Figure 8.3 Cape York to Victoria coastal Dreaming track (Kerwin 2010, Map 8)

8.3 Songlines of the NSW coast

8.3.1 Local songlines

Interestingly, some of the local songlines that I encountered in my research seemed to travel east-west, with the direction of travel to the west, unlike the longer-distance songlines on the coast that mostly travel north-south. There have been no theories advanced about this that I can find, so I may as well advance one. There's evidence that Aboriginal peoples (at least on the NSW North and South Coast regions) travelled from the coast to the Great Dividing Range, most likely for ceremonies, while people living in the Dividing Range travelled to the coast to share resources (Somerville and Perkins 2010). Perkins (ibid.: 212) also described the 'diamond pattern of linking trails' (songlines) which mirrors the diamond shape of the Southern Cross (which he says is used for navigation), and that the linking trails 'connect sky country to earth country to sea country' (ibid.). This description of a 'diamond pattern' is similar to that of Mowaljarlai's 'squares' (1993: 190), and was also described by Rhoda Roberts in 'Songlines at Vivid Live 2016', a video production for playing on the sails of the Sydney Opera House (Sydney Opera House 2016, video).

8.3.1.1 North Coast

One of the clear local songlines that came from my research is the songline described by P31, a Dunghutti person. The songline starts at Mt. Yarrahapinni, which is in Yarriabini National Park, south-west of Scotts Head, NSW, goes south-west to Skillion Flat near Kempsey, and then west to Bellbrook, which is a significant cultural site for the Dunghutti people. While P31 did not attach a story to the songline, other than to say it was about ‘Koala Dreaming’, there is a well-known story about Yarrahapinni, which is available in several versions. The following story seemed to be the most complete and was collected by Gerhardt Laves in 1929. *Wirruung buraal* means the ‘high god’, which is two parts, ‘Father’ and ‘Son’, *yarri* is bear (koala), *mirri* = dog, Yarrahapinni comes from *yarri* = koala, *yapa-n-i* = ‘to roll’ (which will make sense once you read the story):

The story about Yarrahapinni.

Told by Bob Dotti and recorded by Laves (1929: 1140-1141) in his fieldwork notebook.

[Two] *Wirruung buraal* starting out from Harry Halfpenny [Yarrahapinni] hill.

They fell a tree and kill *yarri* and they start cooking him in a fire and gutted him and they scattered firewood cooking meat in coals. *Gutuyi* (savage bloke) came from seaside, (two *gutuyi*: dog big one *mirri* blackfellow). Blackfellow called

Yindji. He travelled from [the] sea and let [the] dog scent along way. *Wirruung buraal* decide to beat it and cut [the] head off *yarri* and when the two *gutuyi* come along they threw [the] head down and [the] dog chased after the head, *Wirruung buraal* fled, taking their mother along hiding her at place (hill) called *Daltun*, she being too tired. As soon as they left her they covered her up and went away to flee from the *gutuyi*. And when they went a long way ‘North Pole’ [?] coming to sea: waters divided so the *Wirruung buraal* could pass through and the sea fell in again. But the *gutuyi* couldn’t follow.

Many years later Doug Scott added the following details to this story:

Nuu 'ang yarri yapa-n.

he that bear roll

He rolled the bear [down the mountain].

(Nuu) buu gadhi-n yarri guthun,

he head cut- koala belong

ban mirri-yu buu guruuma-n, buu dhama-n.

then dog- head chase- head eat-

He cut that head off (to slow up the dog) [then the dog chased the head and ate it]. (Lissarrague 2007: 67, 95).

The reason for this story is obscure, but no doubt the koala is/was a totemic figure to the Dunghutti people. If this story followed the songline as indicated by P31, then it ended up at Bellbrook, the site of *Burrel Bulai* (Mt Anderson/Sugarloaf), which is a powerful sacred site where 'clever-people' ('Aboriginal Men of High Degree') (Elkin 1945) would prepare for specialised initiations (likely to be the final initiation of men to the status of 'clever-man'). *Burrel Bulai* is also near the centre of Dunghutti Country and would be an important meeting place (NSW Department of Environment and Heritage 2015: n.p). *Burrel Bulai*, according to Lissarrague, means 'two fathers', so perhaps the *Wurrung Buraal* ended up at Bellbrook. In any case, the meaning is no doubt contained in secret/sacred knowledge and will not be pursued here.

Whether this songline has any extensions is not clear. One version of the story (P33) says the two protagonists come from the east, which is the coast at Stuarts Point. Stuarts Point, Scotts Head to the north, and Southwest Rocks to the south, all have significant cultural stories connected, but those do not seem to be related to the songline. P33 has also spoken of a songline travelling west, where fireflies carried fire over a high peak and passed it to a little lizard, but it is not clear whether this songline was linked to the Yarrahapinni songline. P33 also had a completely different story to this songline, in which the two persons from the east were sisters (with their mother) who cooked the koala and were pursued by a 'Nuni' with two dogs. P33 said it was possible that Yarrahapinni mountain

could be a jumping off place for the Creator (there are some ‘jumping off’ places in NSW, including Mt. Yengo, and Mt. Oxley).

Further up the North Coast in Bundjalung Country, there is an intriguing collection of possible songlines/communication routes which are known, but the stories connected to them appear to have been lost. Many of these are routes reported by John Steele (1983) in his *Aboriginal Pathways in South-east Queensland and the Richmond River*, which was the product of many years’ bushwalking and asking local Aboriginal peoples about their routes. In looking at the routes in the book, there is a clear pattern in the routes which, if joined up, would suggest several routes out of Bundjalung Country to south-east QLD. The destination of these routes would likely be the Bunya Festival, which was a gathering of Aboriginal peoples every three years in the mountains behind Brooloo and Kenilworth in south-east QLD, to share in the bunya nut harvest (Moynihan 1901, Kerkhove 2012). One of these routes would be via Mt. Lindesay on the NSW/QLD border (Mt. Lindesay is a significant spiritual place), and the other via the Tweed River valley. Steele (1983: 30, 38) suggests a route via Tucki Tucki (a *bora* initiation site south of Lismore, NSW) could be the means for people from the Clarence River valley to head north. This route includes Robson’s Knob, which Steele (1983: 30) suggests could be a corroboree site for travellers to the Bunya Festival. P12 has suggested a route from Nimbin Rocks (Nimbin, NSW is a short distance from Lismore) to the Nightcap Ranges, then more westerly into QLD via Mt. Lindesay. Collins (2000: 39) also suggests a route to Nimbin from the Dunoon, Whian Whian, and Rosebank (NSW) areas north of Lismore. From there it would be more or less a straight route north to Kenilworth and the Bunya Festival. Steele (1983: 184) suggests the final part of the route would have followed what is now the Gympie Road. An early European reporter on the Bunya Festival, Archibald Meston (Kerkhove 2012: 38), said that the Festival was attended by Bundjalung people from the Clarence River. P6 suggested that the more nomadic people from Baryulgil and Tabulam (NSW) would have used this route via Kyogle, NSW, continuing to Beaudesert, QLD and the Samford Valley, QLD, and then on to the Festival.

The Tweed River valley route suggested by Steele (1983: 38) is from the upper Tweed valley over Mt. Durigan in the MacPherson Ranges to the Beaudesert region in QLD, then north to the Bunya Festival. P6 suggested that this route would have been used by people from the more settled (eastern) part of Bundjalung Country.

P12 has suggested there was a ‘canyon’ from the Bunya Festival area in QLD to Mt. Wollumbin (Mt. Warning) in northern NSW which was a songline, and it extended to the Nimbin Rocks, then to a mountain near Coraki/Woodburn (NSW), then to Goanna Headland at Evans Head, NSW, and finally to the Rain Cave nearby. P14 said there was a songline from Casino, NSW to Kingaroy, QLD via Beaudesert and Ipswich, QLD.

Unfortunately, all these suggested routes/songlines make sense concerning travel for ceremonial and trade purposes, but no-one has been able (or was willing) to attach a story to these songlines. The closest is the description of a route through the MacPherson Ranges called ‘Jiggi’s Route’ (no further detail) (Collins 2000: 32). P6 has suggested that the QLD Aboriginal communities who were responsible for the Bunya Festival would have ownership of the Bunya Dreaming, and the stories connected to the songlines leading to the Festival. These communities would have likely been the Kabi Kabi and Waka Waka peoples, who lived in the areas of main *Bunya Bunya* tree forests. The Queensland Museum (Bunya Mountains Gathering) says that the Bunya Festival ceased around 1902, but more recently, it has been resurrected by several Aboriginal communities as a festival open to everyone, starting in 2007.

8.3.1.2 Sydney basin

Finding songlines in the Sydney basin was always going to be difficult, given the lack of cultural knowledge surviving the disruption of invasion and colonisation beginning in 1788. Chapter 4 shows the limited cultural knowledge coming from the ethnographic process, with the majority of the collected information coming from the literature survey. The literature survey itself was very limited regarding the type of cultural knowledge reported from Aboriginal communities within the Sydney basin, and at the time of the original collection of knowledge, in most cases, songlines were neither understood by the white collectors of knowledge nor spoken about by the sources of knowledge. Once disease and other factors in the dispersal of local Aboriginal communities took place, there was a general loss of cultural knowledge, which would have included knowledge about songlines. In the years since the invasion, many descendants of the local Aboriginal communities, who were dispersed to other Countries up and down the NSW coast, would have lost the relevant stories that connected to songlines, and if they did return to the Sydney basin, they did so without the local stories.

The result of this process was that there were only limited sources of songline knowledge found in this study within the Sydney basin. These included the very significant Dharawal knowledge of the Wauwilak Sisters rock art in the Royal National Park, which is covered in the following section on the South Coast, and one participant, P21, from the Gai-mariagal community, who had some knowledge of long-distance songlines either passing through the Sydney basin, or beginning in it.

P21 said that songlines radiated from *Car-rang-gal*, which is North Head, at the entrance to Sydney Harbour. He said that a pelican story followed the Warrigal (thylacine, an extinct dog-like marsupial) songline from North Head to West Head (mouth of the *Dyarubbin*/Hawkesbury River) to Mt. Yengo in Darkinjung Country. It then went north-northwest through Gamilaroi Country into QLD west of Goondiwindi, then arcs west through QLD (possibly via Lake Machattie in the Georgina River area, which is a known pelican breeding area (Reid 2010: n.p). It continues west to Attila (Mt. Connor, east of Uluru, NT), then north to the MacDonald Ranges and into a cave where it was buried (the story/thylacine). From there the pelican story/songline goes through Heavitree Gap in Alice Springs, Kata Tjuta (the Olgas) near Uluru, then Lake Eyre South, SA, where pelicans breed in their thousands when flood waters reach the lake. They could travel to Lake Eyre via the Coongie Lakes, which are north of Lake Eyre, and a place where pelicans have been reported (ibid.: n.p).

P21 said that another pelican songline started at Lake Eyre, arcs through SA and VIC, up to Mt. Tywnam and Carruthers Peak in the Snowy Mountains, then to Nowra, NSW, and the coast back to Sydney Harbour, which is the return route of the pelican. By way of background, the pelican was created by *Baiame* when *Baiame* and *Daramulan* sat on *Car-rang-gal* for the first ceremony (P21).

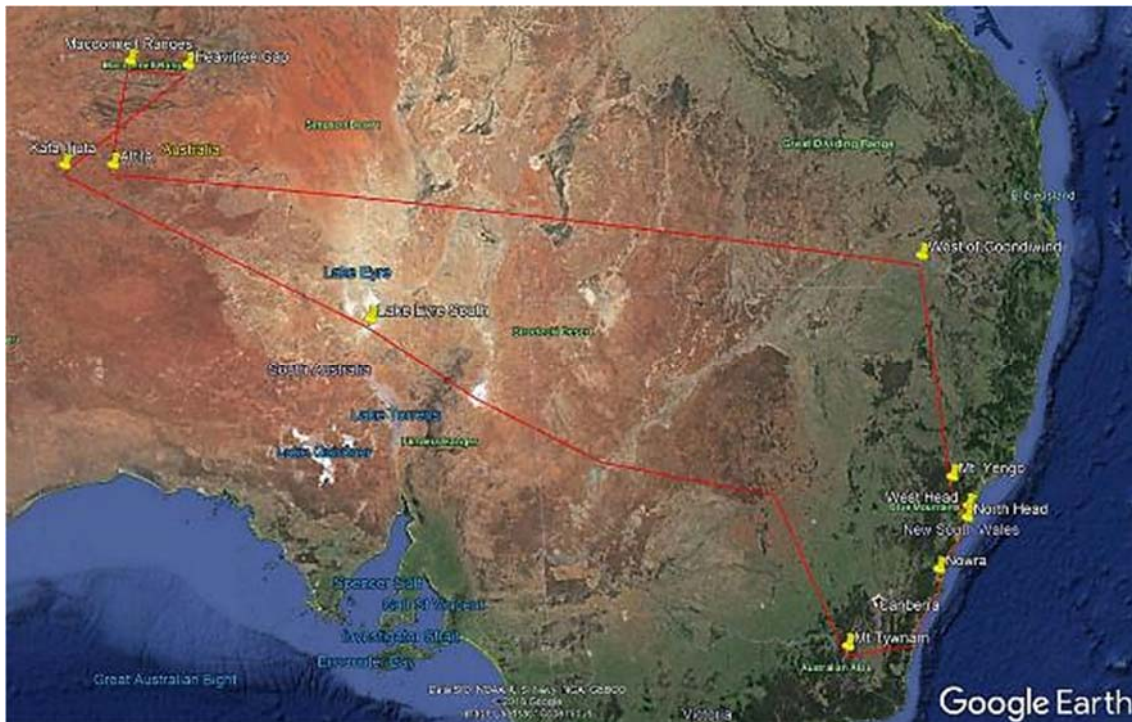


Figure 8.4 Pelican songline from North Head, Sydney (Google Earth)

P21 also confirmed the Black Duck and black swan songlines, which passed through Sydney, and added that swans and bull sharks share a songline going up the North Coast of NSW, as bull sharks disappear from Sydney waters in winter and go to northern rivers to breed and have babies.

The mention of *Baiame* brings up the likely importance of Mt. Yengo, the ‘jumping off’ place for *Baiame* which is the closest to Sydney. Taçon (2005: 6) says: ‘Routes across the Wollemi (which is centred on Mt. Yengo) are emerging from rock-art and other site-location data while the imagery and oral history suggest paths are associated with major Dreamtime Beings such as the Eagle Ancestor.’ It would seem unlikely that the place described as the ‘Uluru of the sandstone country’ (Jones 1993: n.p) would not be a significant point, if not a starting point, for many songlines. There is practically no ethnographic evidence of this, but as Taçon suggests, the rock art may hold some clues and suggestions, including that of culture heroes. As discussed in Chapter 4, the rock art of the Sydney Basin is extensive, and nowhere more so than in the Wollemi region, where several rock art platforms such as Finchley and Burragurra are known for their extensive engravings. On those platforms, and on many other rock art platforms on the north side of Sydney, there are representations of various beings such as *Daramulan*, who is, variously, *Baiame*’s son, associate, or representative at Aboriginal ceremonies.

Daramulan may be an emu or may have a connection to emus through his wife (an emu), so emus and emu tracks are prevalent in this rock art. Pankhurst's *Culture Heroes of the Guringai and Darginung People* (2015), is a photo record of rock art from northern Sydney across the *Dyarubbin*/Hawkesbury River and past Wollemi. In it, there is a strong suggestion in reviewing the images of *Daramulan* figures and their orientations (which can be identified variously by a club/emu foot) that the heads are often towards the north or northwest, in the direction of Mt. Yengo. This orientation could suggest a relationship with *Baiame* and Mt. Yengo, and in association, a connection to emus. General research on songlines at the beginning of this chapter looked at the story/songline of the Emu and the Dingoes, and previous work with Ghillar (Michael Anderson) leads me to believe that an Emu songline/Dreaming track runs east from Central Australia to QLD or northwest NSW. It then continues southeast, ending up at Barrenjoey headland, at the mouth of the *Dyarubbin*/Hawkesbury River. The suggestion was made that Barrenjoey headland, when viewed from above, looks like the head and body of an emu (Fig. 8.5). This might seem a bit out of context, given that aerial photographs and Google Maps are recent developments, but the source of this, when queried, said 'Well, we can fly, can't we?'. Presumably, he was referring to the the supposed ability of Aboriginal clever men to fly.



Figure 8.5 Barrenjoey headland (emu facing right) (Google Earth)

If an Emu songline comes down from the northwest into the Sydney area, it would likely pass by Mt. Yengo, and it seems unlikely that Mt. Yengo would not be a waypoint on the songline. What evidence is there? Once again, Pankhurst helped by pointing out (pers. comm. 17 Dec 2018) that there was a major grouping of emu engravings on a rock platform at Flat Rocks Ridge, north of the *Dyarubbin*/Hawkesbury River, identified as Group 6 in McCarthy (1956: 44 and Fig. 5). From the emu engravings are nine engraved emu tracks on a northerly heading, towards Mt. Yengo. Also, on the same rock platform are six male figures and one female figure, all of which have their heads pointing towards Mt. Yengo. McCarthy described the site as a ‘Daruk (Dharug) ceremonial ground’. If Mt. Yengo, Flat Rocks Ridge, and Barrenjoey headland are plotted (Fig. 8.6), there is a fairly straight line connecting them, so while the evidence is circumstantial, there does seem to be a reasonable suggestion of an Emu songline terminating in the Sydney basin.

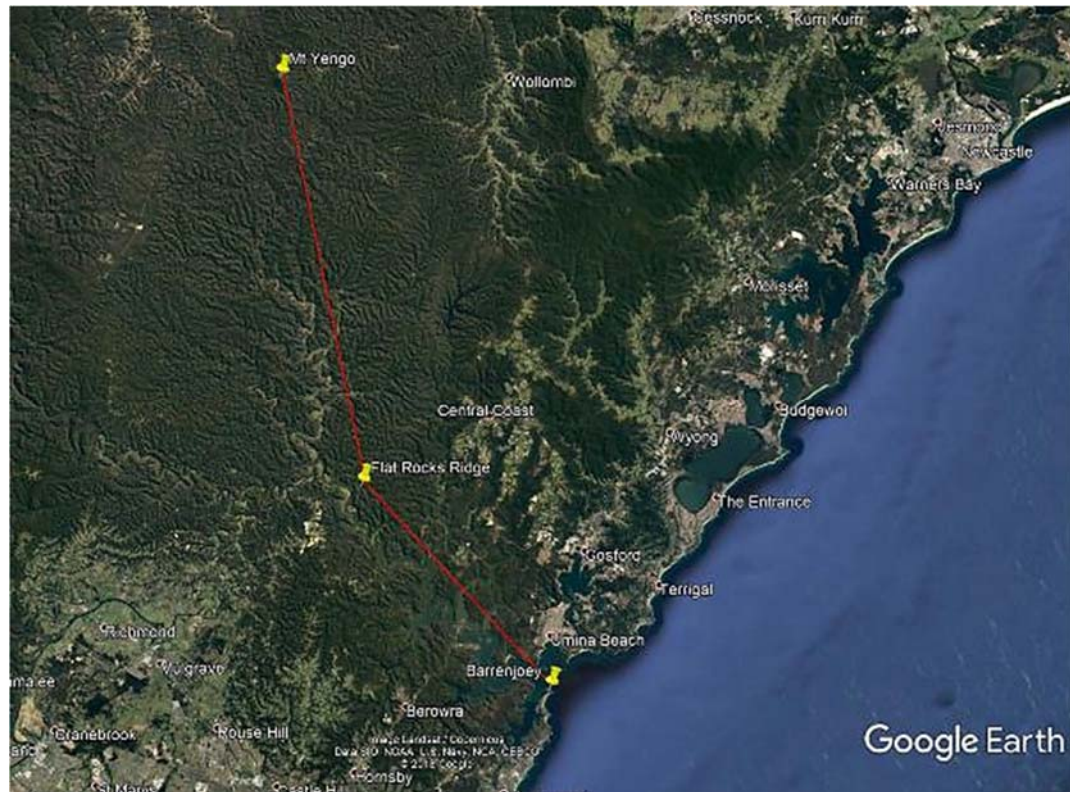


Figure 8.6 Possible emu songline from Mt. Yengo to Barrenjoey headland (Google Earth)

8.3.1.3 South Coast

The South Coast dialect groups of the Yuin community, with the possible exception of the Ngarigo, appeared to have close connections to the sea, and this is reflected in some of the short and medium songlines. Whales and dolphins, in particular, played a large part in the stories connected.

P2 told the story of how the first *Gudoo/Gadu* (Sea) songline was created. This songline 1 (Fig. 8.7) running along the Yuin coast had important associations with Yuin culture and spirituality, as P2 confirms:

The whale/dolphin songline north shows the path of the Yuin journey. The spirit of Yuin is in the whale, so is the Yuin songline. The whaling industry in Eden disrupted the connection to the whale. Before that, there was a whale dance (celebration of the whales going north to give birth). The whale dance/ceremony was in May. The Seven Sisters were part of it – they were singing up the whales. The movement of the Milky Way was also a signal, and also a star which pointed to the north/north-east. There was also a ceremony when the whales came south later in the year. In the whale watching time, the dolphins are inshore. Dolphins were the whale bodyguards.

There is no doubt that whales are important in Yuin culture. P19 and P2 talked about the whale rock on Gulaga, the mountain near Narooma, NSW, which is central to the Yuin Creation story (Harrison 2009: 17-32). P19 said that there was a songline from Eden to the whale rock. The connection between whale migration along the NSW coast and other seasonal indicators, particularly the Seven Sisters, is a strong suggestion of the importance of the whales in the yearly cycle. The fact that the Seven Sisters were singing the whales up and down the coast is an interesting connection to the sky and astronomy. I was aware that the whales migrated north to QLD in the period from April to August, and south to Antarctic seas in the period September to November. I was wondering how the Pleiades could be seen in the time of the northwards migration, as the Pleiades would not be seen in the evening sky until November (rising at sunset is *acronychal rising*) when they could be singing the whales south. I then realised that Yuin peoples no doubt were early risers and that the Pleiades would be seen just before sunrise (*heliacal rising*) and would be able to sing the whales north in June.

P2 and P19 also clarified the cultural connection between the Yuin and the whales. As whales were originally elders before they joined the sea, they were, like other Aboriginal elders, holders of the Law and lore. Harrison (ibid.: 130) explained that the whales communicated with elders on the shore, and one whale would come ashore (beach) to pass on his knowledge. Once the whale died, the people would feast on the whale and ‘they would be learning more of the wisdom of the ocean and the land and sharing and caring with each other’. P19 said there was a specific whale dance, which was a slow shuffle, and the suggestion was that the dance took place in the dead whale’s skeleton once the flesh had been removed.

While there is not a cultural story connected to this Sea songline, it is pretty clear that the songline (whale and dolphin) just runs along Yuin Country. P2 said that the dolphin story ran from Eden to Jervis Bay and that Yuin fishermen would sing up dolphins by slapping the water. This method of calling dolphins was reported in many Saltwater communities along the NSW coast, and the use of dolphins to herd fish onto the beach or into traps appears to be almost ubiquitous. P2 also said that when fishing with dolphins, fishermen would call up *koorah koo-rie* (west wind) to flatten the waves.

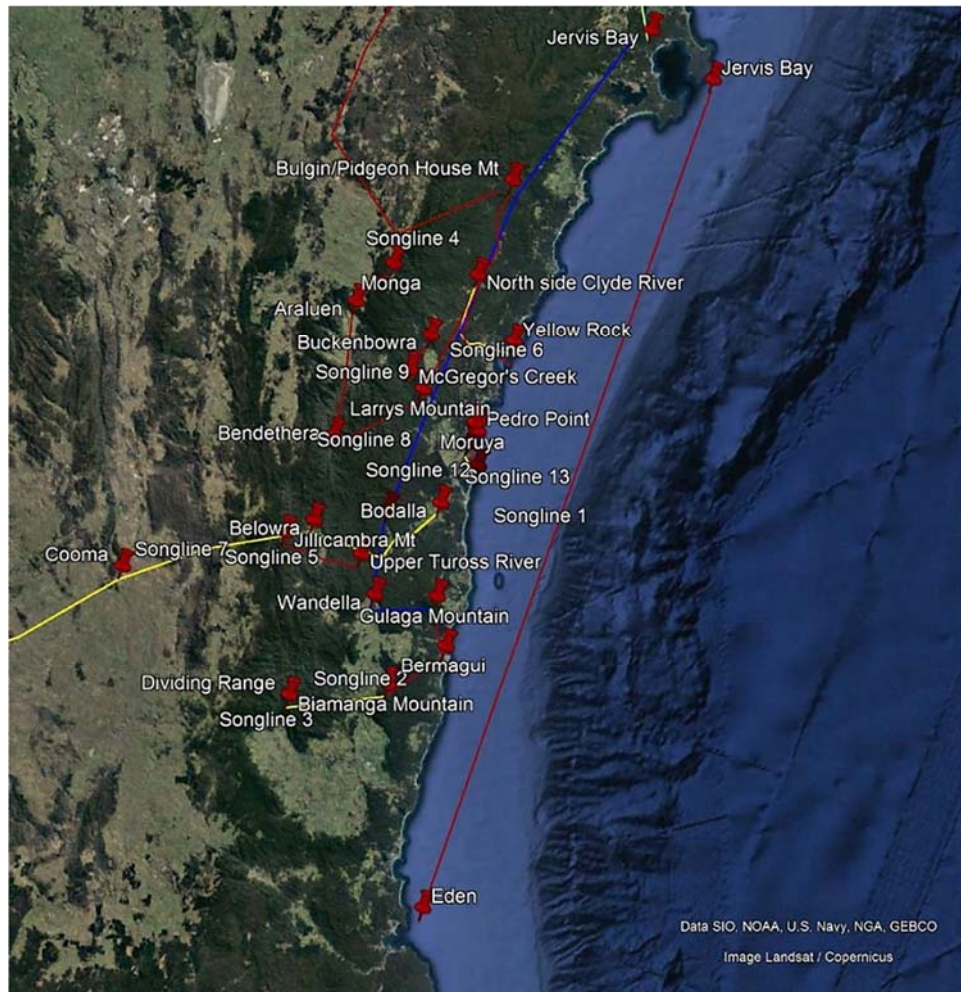


Figure 8.7 Songline 1 Gudoo/Sea (Google Earth)

Other songlines in Yuin Country are either connected to specific spiritual places or may be part of trade and communication routes running inland from the coast. They have been numbered in a sequence and are marked along the songline in the Figures. P2 said:

A songline runs from Gulaga to Biamanga (songline 2) (Fig. 8.8). Partway along this route, there is a spot near Bermagui (NSW) where you stand to see things. You can see Biamanga, Gulaga, Peak Alone, Muleema (Strong Woman), Wadagudarn (Range), Nadjinooka, Barranguba from this spot (and sing them)'. All these places are spiritual: Gulaga is the Mother Mountain, the spiritual centre of Yuin culture, Biamanga is Gulaga's husband, and father to her two sons, Nadjinooka (a small hill near Gulaga) and Barranguba (we know this as Montague Island).

A further connection is this story from P2:

There is a story of a mountain woman and a girl who come from a serpent which is the eastern head of Biamanga. When the girl is initiated, they go to a waterhole on

Biamanga. Blood runs down to salt water (*mura*). Spirit of girl and woman. They sing the story at Bermagui on the Biamanga to Gulaga songline, but they sing it off the songline.

P2 identified other short songlines: ‘Another songline is the Death Adder songline running from Biamanga (birthing country) to the Great Divide (songline 3) (Fig. 8.8).

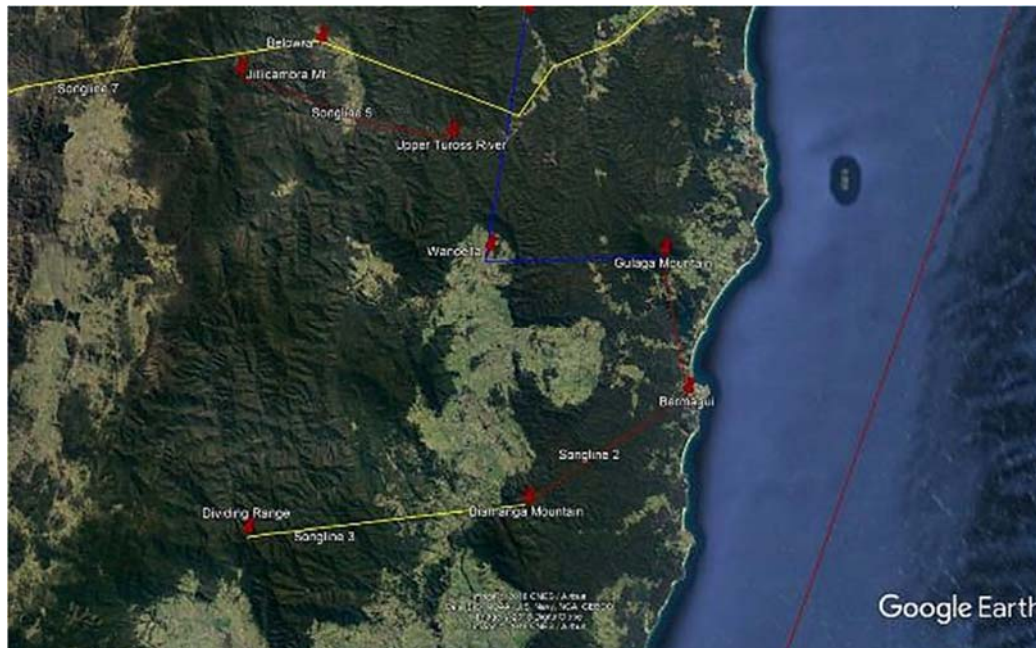


Figure 8.8 Songline 2 Gulaga to Biamanga; songline 3 Biamanga to Great Divide (Google Earth)

The Death Adder is a snake common to Yuin Country and is probably the local equivalent of the Rainbow Serpent. ‘*Bulgin* (breast) songline is part of *Gadoo* (ocean) songline. (songline 4) (Fig. 8.9) Water comes down into Clyde River, over mountain range, waterfall into Shoalhaven River (near Nerriga). All connected to *Gadoo* Dreaming’. *Bulgin* is Pidgeon House Mountain behind Ulladulla, NSW. None of these short songlines on the South Coast has any significant detail as to the stories, and once again it is probably a case of lost knowledge or being secret/sacred.

There were some trading and communication routes running from the Yuin coast, over the Dividing Range, and across the Monaro Plains. John Blay, while surveying the Bundian Way, an Aboriginal route of travel from Eden over the Dividing Range into the Monaro, mentioned (Blay 2005: 18-19) *Dyillagamberra*, a local rainmaker for the southern Snowy Mountains, the Monaro, and the associated South Coast. Mathews (1904: 350-351) described *Dyillagamberra* as being ‘present in the landscape’ on the upper reaches of the Tuross River to Jillicambra Mountain (songline 5) (Fig. 8.9), which is a likely songline (confirmed by P20, pers. comm. 13 Nov 2018), and created Jillicambra

springs all over the Country that he was responsible for as a rainmaker. No doubt many other routes running from the coast to the interior had similar functions as songlines.

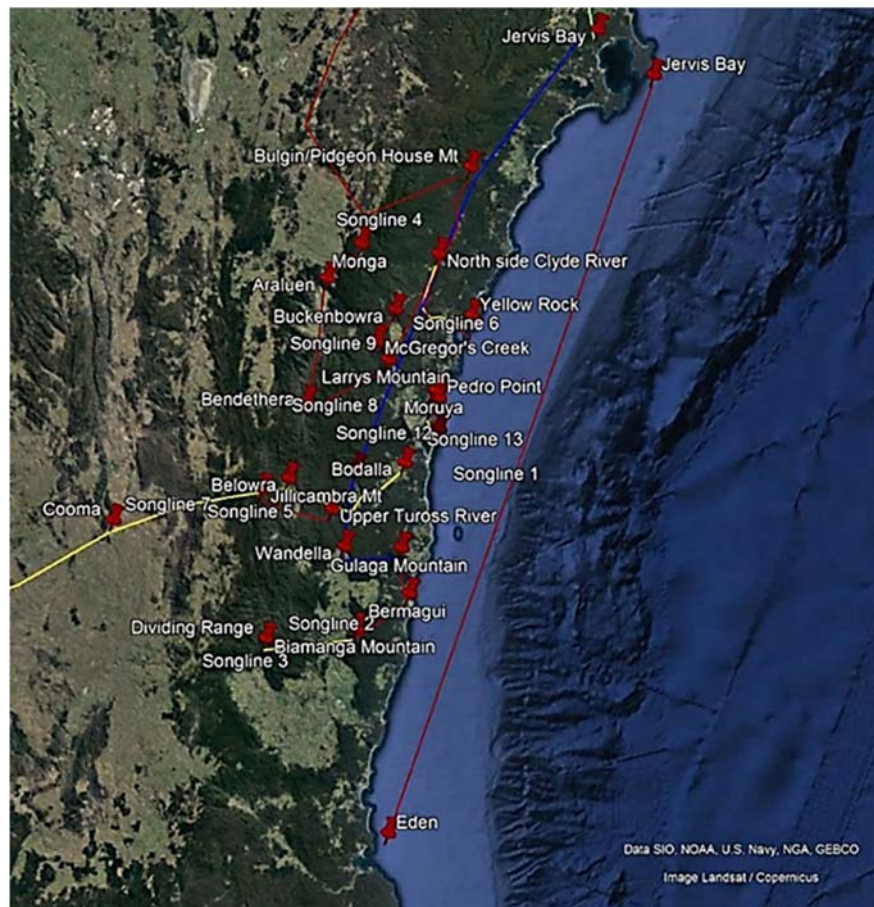


Figure 8.9 Songline 4 Bulgin, songline 5 Tuross River, songline 6 Corn Trail, songline 7 Bodalla to Kosciuszko, songline 8 Gulaga to Shoalhaven, songline 9 Buckenbowra to McGregor's Creek (Google Earth)

Some other routes were identified by Yuin elders and knowledge people as part of the *Eurobodalla Aboriginal Cultural Heritage Study (Stage 2)*, (Donaldson 2006), and are reported verbatim. A comment by the author, Susan Donaldson, on Dreaming tracks, is very instructive:

Travelling routes or walking tracks used by people are distinct yet interrelated with the Dreaming tracks described above. Travelling routes exist along the entire length of the Eurobodalla Shire coastline, extending beyond the Shire boundary to the north and south. Such tracks also extend between the coast and inland creeks and ranges.

Although the purpose and existence of the travelling routes vary across time and place, they generally relate to food gathering, recreational activities, the ritual

retracing of ancestral dreaming tracks [as described above] and meeting to maintain kinship connections, to fight, trade, undertake a ceremony or to exchange goods. Different sections of the coastal walking route were and continue to be used by Aboriginal people for different reasons at different times of the year. An individual's place of residence, their intentions, their tribal affiliations and more recently, their property access rights affect the usage of such tracks. (Donaldson 2006: 10)

The Eurobodalla Shire runs along the South Coast from Walaga Lake, NSW to the north of Bateman's Bay, NSW, and generally back to the peak of the Dividing Range, which covers a significant part of Yuin Country.

The suggested travel routes in the Donaldson document follow (in no particular order; the name of source and date in square brackets):

The Corn Trail¹⁴ (songline 6) (Fig. 8.9) is the shortest way down the Clyde Mountain; Uncle Syd talked about the corn trail [Les Simon 3.11.2005]. (ibid.: 11)

The corn trail is linked in with traditional walking routes, pathways created in the dreamtime past, connecting places together via water ways and ridge lines [Trisha Ellis 4.2.2006]. (ibid.: 11)

The corn trail is a link between salt-water people and the 'inlanders'. Bendethra is linked into the Corn trail [Keith Nye 1.3.2006]. (ibid.: 11)

There are walking tracks, which follow the Tuross River and nearby ridges linking the coast to the mountain range. From Bodalla one track (songline 7) (Fig. 8.9) leads to Belowra following the path of the existing road that they made over the ancient travelling route. From Belowra the track heads to Cooma and onto Mt Kosciuszko, also along the present-day road. At Mt Kosciuszko, people would gather for the Bogon moth-hunting season, barter and undertake kinship/marriage exchanges. Another walking track (songline 8) (Figs. 8.8, 8.9) links Gulaga [Mt Dromedary] to the Shoalhaven, via Nerrigundah and Wandella. This route also has links to Cooma and onto Mt Kosciuszko.

‘.....Walking tracks are similar to the pathways created by Biamban / Biambee, the God.....Everything comes from Biambee, the lore and all, ...they talk to us

¹⁴ 'Corn' is used here in the U.K. sense of 'wheat' (or other grain crop)

today to give us lores and the language, place names.....it is all still going on, it's not just in the past.....some walking tracks are more religious than every day bushwalking tracks, but they still get you from A to B....the tracks along the coast show you the easiest way to find food and a good place to camp. Other pathways lead you to ceremonial places, like the circular track starting at Mumbulla [Biamanga] Mt, to Gulaga Mt, to Hanging Mt, to Pigeon House Mt, to a place near Goulbourn, Cooma and eventually Mt Kosciuszko’’ [John Mumbler 24.5.2006]. (ibid.: 11-12)

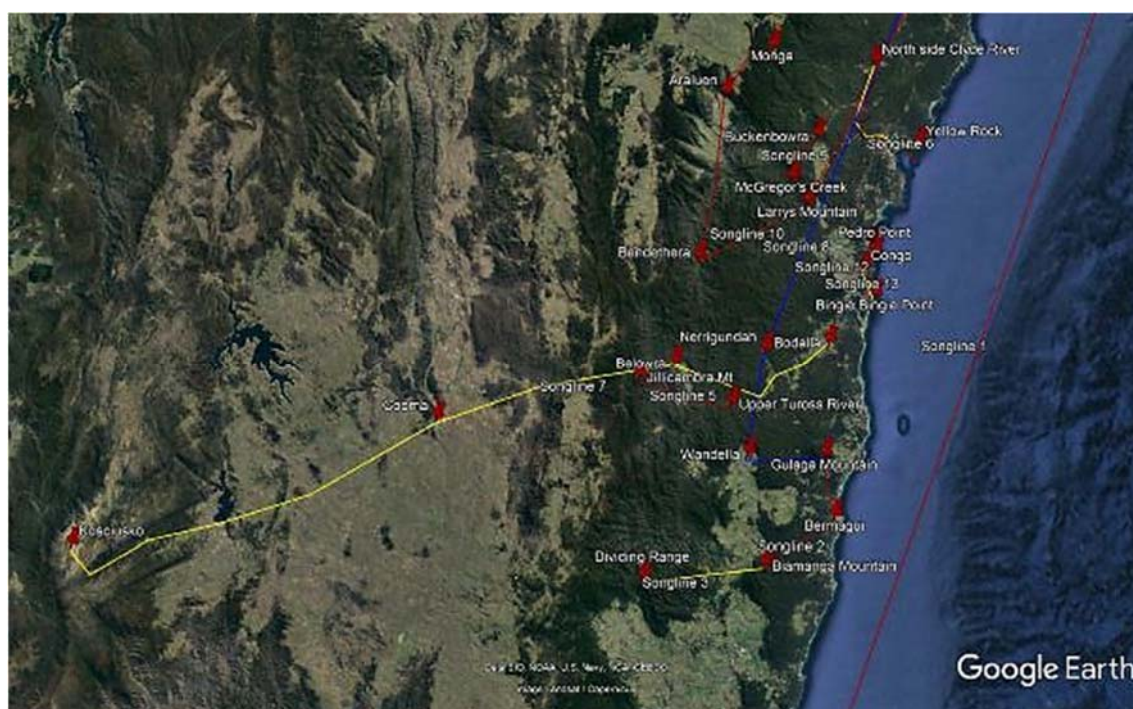


Figure 8.10 Songline 10 Shallow Crossing (Clyde River) to Monga (Google Earth)

A dreaming track (songline 9) (Fig. 8.9) connects Buckenbowra to McGregors Creek [Trisha Ellis 4.2.2006]. (ibid.: 37)

As told to Dave by Percy Mumbler and his sister Mavis Mumbler there are ancient walking tracks linking the coast to the mountains. One such track (songline 10) (Fig. 8.10) passes through Shallow Crossing, Clyde River, linking Bendethra and Larry's mountain to the Monga and Araluen areas [Dave Tout 25.1.2006]. (ibid.: 62)

There are Bora Grounds and spiritually imbued Stone formations in the McGregors Creek area. The *dulagarl* [Yowie-like spirit] walks around here at night. The Connell family camped here, just up from Burrumbella, on an annual basis. Sometimes there was up to 60 people. Trisha was told that this area is part of the Brinja tribal area and also a part of

the dreaming track (songline 9) connected to Buckenbowra [Trisha Ellis 4.2.2006]. (ibid.: 69)

Pedro Point is along the travelling route linking Moruya to Binge (songline 12) (Fig. 8.11). There is an anchor off the headland. Georgina camped here with her parents and has camped here with her children. The families collected muttonfish, lobsters, periwinkles, conks, and salmon. Georgina's daughter Jeanie was chased by a bull ray, she was carrying muttonfish at the time; the bull ray came up onto the cunjevoi after the muttonfish, forcing Jeanie onto the rocks [Georgina Parsons 14.12.2005]. (ibid.: 72) (the Eurobodalla Shire Council has signposted the Bingi Dreaming Track, Fig. 8.12)

Trisha's grandmother, Ursula Connell said that the section between Congo and Bingi is part of a traditional dreaming track (songline 13) (Fig. 8.11). Trisha was shown a pre-European burial site, an ochre quarry, shell middens and a natural fish trap at Congo¹⁵ [Trisha Ellis 4.2.2006]. (ibid.: 73)

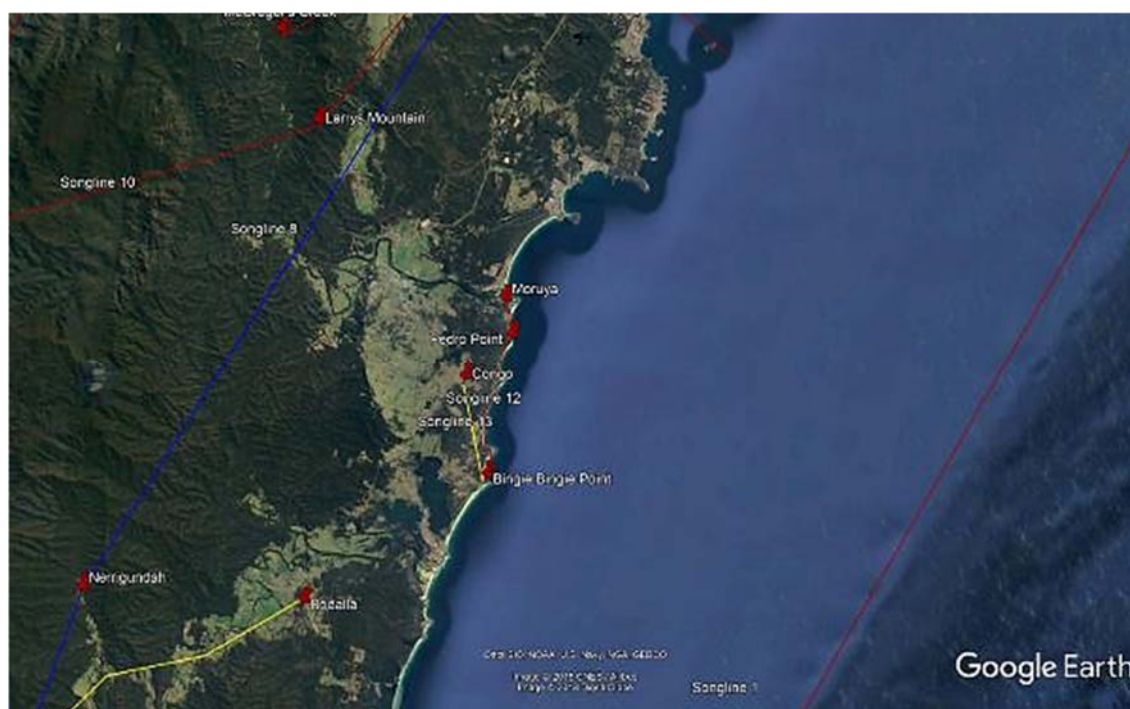


Figure 8.11 Songline 12 Moruya to Bingie, songline 13 Congo to Bingie Bingie Point (Google Earth)

Trisha recalls picnics at Bingi Bingi Point with her Nan Connell, and her Nan's sisters during school holidays or on the weekends. They camped on the northern side of the point, sheltered from the southerly winds. Trisha and her family ate kangaroo, lobster and

¹⁵ Congo is a village 10 kms north of Moruya, NSW

collected fish in the naturally occurring fish traps. Trisha was told that people, generations before she camped here, was shown all the bush foods and medicines, and told dreaming stories for the area by her Nan Connell. She was told about the Dreaming track (songline 13) between Bingi Bingi Point and Congo, and how it was used:

‘....’Bingi’ is a Dhurga word meaning stomach. When repeated as in Bingi Bingi Point it indicates abundance and therefore is interpreted to mean an abundance of food is available in this area. The Bingi-Congo walking track forms part of the Dreaming Track utilised by the Brinja-Yuin peoples prior to European development. The walking track (as did the Dreaming Track) brings you in close proximity to shell middens, stone quarries, napping sites, campsites and freshwater sources. There were also beacon sites for sending smoke signals, areas abundant in particular foods and lookouts traditionally used for spotting schools of fish and visitors (wanted or unwanted) to the area. The Dreaming Track although used as a highway had a much deeper spiritual significance to the Aboriginal peoples in that it was, and still is believed, that the Spirit Ancestors of the people created the Dreaming Track in the journey of creation across the land.’ [Trisha Ellis 4.2.2006]. (ibid.: 74)



Figure 8.12 Bingi Dreaming Track

A walking track (songline 8) links Gulaga to the Shoalhaven, via Nerrigundah and Wandella. This route also has links to Bodalla [Tuross River] and Mt Kosciuszko via Cooma [John Mumbler 25.11.2005]. (ibid.: 109)

Donaldson (2007: 123-124) lists ‘Travelling Routes’ identified as a part of her studies. A number of the 18 routes were identified for ‘Resource collection’ or ‘Assisting European exploration’, but five were identified as ‘Ceremonial’ or ‘Spiritual’. Only one of those five are listed in the above 12 songlines I have identified. The other four are mainly connected to Braidwood, NSW, which was not mentioned by any of Donaldson’s participants, and there is not enough detail for them to be plotted.

The other South Coast Aboriginal community is the Dharawal, who nominally extend from the south side of *Kamay*/Botany Bay down through the Illawarra region to Nowra, NSW, and back to the Dividing Range. While there were interesting stories from the Dharawal, there was little information about short and medium distance songlines (they do play a part in a major long distance songline, however). Donaldson, Bursill, and Jacobs (2015: 4) report ‘One well-used path (songline 14) (Fig. 8.13) ran 150kms from Jervis Bay via Nowra through Kangaroo Valley, Wilde’s Meadow and Robertson to Appin, a five-day journey.’

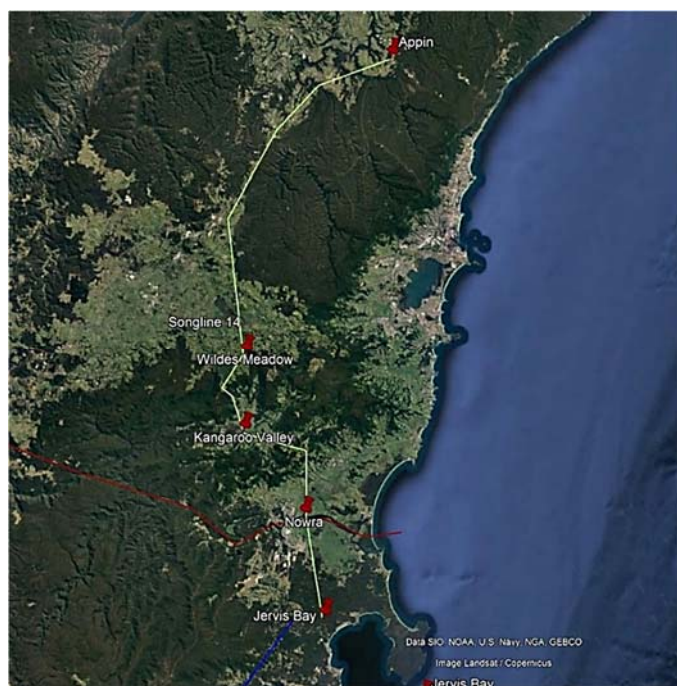


Figure 8.13 Dharawal songline 14 Jervis Bay to Appin (Google Earth)

8.3.2 Long-distance songlines

Smith (2017: 219), when talking about the central desert area of Australia, said: ‘There are great and small songlines. Some are limited local or regional narratives. Five or six others are long continental tracks.... [here he mentions six in the central desert]. I doubt

that anyone actually travelled along these trunk routes, or that they record prehistoric movements of people.’

I have shown some of the ‘small’ songlines along the NSW coast, and except the routes to the Bunya Festival, all appear to be limited to the geographical area of a particular cultural group or community. A possible exception is the *Gudoo* or Sea songline of the Yuin community, which is linked to whales and dolphins. There are a few mentions of whale connections along the rest of the NSW coast, and dolphin stories are almost a standard feature, but other than an unconfirmed connection of whale spirits to the Seven Sisters in Bundjalung Country, there is no evidence of that songline continuing north along the coast.

An examination of long-distance or continental songlines suggests that, except for the Seven Sisters and *Wati Kutjarra* (Two Men) songlines of the Centre, most of these songlines are related to an Australian native animal or a bird. This relation is based on Totemism, and on which Stanner (1965: 236, emphasis in original) quotes Elkin: ‘Totemism is our *key* to the understanding of the aboriginal philosophy and the universe - a *philosophy* which regards man and nature as one corporate whole for social, ceremonial and religious purposes...’

Strehlow (2008: 94) said: ‘For the Simpson Desert was crisscrossed from south to north and from east to west by the myths of travelling totemic ancestors and ancestresses: and those mythical travel routes provided lawful points of social contact between the totemic clans and local groups joined by them.’

Aboriginal totems in south-east Australia were, for the most part, animals (including aquatic), birds, and snakes, although plants were also used as totems. Some of these animals, birds, and snakes were frequently included in the rock art of the NSW coast, and Taçon (2005: 6) says that: ‘Rock-art evidence also helps define major links through great stretches of country, suggesting there must once have been Dreaming Tracks across south-east Australia as significant and detailed as those of the north and centre.....I believe it is valid to use the detailed Dreaming Track landscape model of the north to reinterpret cultural landscapes of the south.’ I believe I may have confirmed Taçon’s belief in the following sections.

Rock art features prominently in the first long-distance songline described in the following section, so it is important that the connection between rock art and Aboriginal culture be considered. Chippendale and Taçon (1998: 1) have described rock art:

For at least 40,000 years.....human beings have increasingly marked landscapes in symbolic ways. A characteristically human trait, this is one of the ways we socialise landscapes.

And (ibid.: 2), ‘They (*rock-art*) are all direct material expressions of human concepts, of human thought.’

In the context of cultural astronomy, Murray (2015: 240) has said ‘Rock art is more than just an artifact – it is also a message.’ And (ibid.: 244), ‘In essence, all rock art is form of visual communication, but its message remains unintelligible without a cultural key.’

This ‘unintelligibility’ is well known to rock art researchers, and there are, according to Chippendale and Taçon (1993: 6-8), two methods of interpreting rock art, formal and informal. Informal methods are those that ‘depend on some source of insight passed on directly or indirectly from those who made and used the rock-art, through ethnography.’ Formal methods are those that ‘depend on no inside knowledge’. Without insight, either through ethnography or through the historical-archival research, ‘any interpretation of it is inherently speculative’ (Bednarik 2007: 240).

Iwaniszewski (2015: 316) understood this clearly, and said:

Now, when examining the material record, we do not observe astronomical concepts and ideas of the people who lived in the past. They have to be somewhat inferred.

You will see that in the course of investigating the rock art connected to the Black Duck songline, informal methods based on ethnography were the key to interpreting this rock art.

8.3.2.1 Black Duck songline

In the course of the literature review and initial ethnographic work, I came across some information on both totems and animal/bird stories. In my first discussion with P2, the subject of the black duck came up (Pacific black duck, *Anas superciliosa* sp. *Rogersi*) which is known as *Umbarra*, being the totem of the Yuin peoples. P2 said that not only

was *Umbarra* the totem but Walaga Lake, NSW is where the story of *Umbarra* is based. The following is a public version of the story:

Back in the old days, when the people used to live around here, a lad named Merriman had his totem called Umbarra the Black Duck. Umbarra warned Merriman everywhere he went of the danger. How he did it was he fluttered. The Black Duck fluttered, and he dived down into the water and made splashes. When Merriman, the old man, saw that bird doing that, he knew that there was danger coming.

One day, all the 'tribe' was out getting a feed of fish, bimbullas and djungas. Merriman spotted Umbarra and he was going off his head. He was diving in the water, splashing about, ruffling his feathers up and so Merriman knew there was some people coming.

He told all the people to get all the women and children. He put them in the canoes and he sent them out to the island, Merriman's Island. All the women and children, and the Elders, went out there.

All the warriors were around the lakeside waiting for these other fellas. They were coming here to steal the women. The night came and those fellas came. They were sneaking up and, as they were getting nearer, the Black Duck he warned the people. When they came and tried to go to the island where all the people were, all the warriors on there kept them off from invading that land and taking the women. That's why we're still here today, because Umbarra the Black Duck saved us. (Source: Dreamtime, Umbarra (Black Duck): n.p)

Another version of the story comes from Chris Griffiths in Donaldson (2006: 116):

During the life of King Merriman [Dec 1904], a battle took place between the Lake Tyers and Wallaga Lake people. As the women and children hid, King Merriman waited on what is now Merrimans Island. A Black Duck came to inform him of the approaching invaders. Merrimans either turned into a whirly wind to escape the battle, or the battle was fought and won by the Wallaga Lake mob, the Lake Tyers mob returning home to the south.

In the same document, there is confirmation of the 'tribal' totem status of *Umbarra* (ibid.: 12). Mariah Walker said many totems are birds (family birds), and Trish Ellis and Tanya

Parson both confirm *Umbarra* as a community/tribal totem. There is a suggestion that due to the loss of culture, some totems were not passed on to the next generation, and *Umbarra* may have become a 'default totem'. P37 also said that the likely correct pronunciation would be '*Yumbarra*'. Warren Foster, a Wallaga Lake culture person, said (Donaldson 2012: 14):

'.....that Island has black duck Dreaming, that is where they come from, in the creation. That is part of our story and totem. It is the home of the black duck; this is where he lives and comes from, he starts here and everyone, all Yuin, all the people who identify as Yuin have the black duck as their totem. Gulaga where it all started for Yuin people, from Gulaga you can see that Merriman's Island is the shape of a duck. The man Merriman lived there and Umbarra was his totem, but the story didn't start with him, it started in the Dream time....'

Robinson (1966: 199-203), has a lengthy and detailed account of King Merriman and the black duck related by Percy Mumbulla, a significant Yuin cultural person from Wallaga Lake. In this version, Merriman is eventually defeated by the Lake Tyers, VIC people and has to flee to the Jervis Bay, NSW, area.

Several Yuin participants, P34 and P35, mentioned that *Umbarra* could be seen in the night sky, as a pattern of stars in the summer. One said it could be seen in the late evening in the direction of Gulaga Mountain from Walaga Village, and the other said it could be seen low in the western sky near Orion, and that it 'looked like a duck with the beak to the left, body to the right, and feet under'. A search using the Stellarium computer planetarium has not yet shown such an asterism of stars, however.

It appeared that *Umbarra* is culturally significant to the Yuin peoples, and, if so, was there a songline connected, and was there a deeper story than the King Merriman one?

As with most other songlines recovered in this study, I am not aware of any references in the literature to an *Umbarra* songline, so while I was aware of *Umbarra* as a significant totem to the Yuin peoples, there was not much else. I starting asking questions quite early in the ethnographic fieldwork study, and while the main Yuin participants mentioned some of the short distance songlines, it wasn't until I started discussing it with Les Bursill, a Dharawal, that a possible story connected to the songline was offered, which then led to more specific questions about the route of the songline. As the songline became clear,

it was also clear that it travelled beyond the Yuin community, and was, at least, a story to the Dharawal community. For that reason, I will refer to it as the Black Duck songline, rather than the various names in community languages. It should be pointed out that knowledge of songlines generally resides within the specific community, such as the Dharawal, and does not extend into other communities, which have their own knowledge and interpretation, even if it is an extension of the same songline. The following description is a specific interpretation by a Dharawal person and should not be ascribed to any other community.

As described in the chapter on the Sydney Basin, the rock art assemblages in that area are considered to be some of the most significant ones in the world. To my knowledge, no rock art in the Sydney Basin has been specifically identified with a known songline, so when Bursill proceeded to tell me the story of some petroglyphs in the Royal National Park (RNP) south of Sydney, I wasn't prepared for the connection to the Black Duck songline. The petroglyphs are located north of Garie Beach and consist of four different panels, three of which (Figs. 8.14, 8.15, and 8.16) are co-located, and the fourth is nearby (Fig. 8.17). On first examination (and I first saw the three panels on a wet day with no understanding of the songline, as a part of a general rock art tour), there are two unusual women. This is unusual in terms of the 'standard' depiction of women on the East Coast, and there are also what appears to be a child in the same panel, a group of men dancing in another, and an axe-grinding site with a water pool (for use in axe-grinding) in the third. I have only seen the fourth panel in images, and it also is a bit unusual, as it appears to be two men side-by-side, except that they appear to be 'tumbling'. In all, there are some strange aspects compared to other Sydney Basin rock art, and some standard aspects, such as the axe-grinding site with the water pool.



Figure 8.14 Two women and child (Bursill 2013)

(Please note that Figures 8.15 to 8.19 were labelled by Bursill with his own interpretation of the meaning and identification of the petroglyphs, with which I mostly agree, except where I have stated otherwise).



Figure 8.15 Men dancing (Bursill 2013)



Figure 8.16 Axe-grinding pool (Bursill 2013)



Figure 8.17 Two men 'tumbling' (Bursill 2013)

In later discussion with Bursill, he recounted that earlier in his professional career, he travelled to Central Australia, visited remote Aboriginal communities, and met some of the older men. He showed them photographs of the rock art described above, and they responded by saying that the story was of the Wagalag Sisters, but was missing some elements, including the serpent and the Lightning Brothers, who are a feature of cultures in northern Australia. Later, Bursill was advised of a large engraving of a serpent about 2 km from the other panels (Fig. 8.18), and a colleague of his later discovered the panel with the tumbling men (Fig. 8.17). Bursill believed the men/Lightning Brothers are a cultural feature in southeast Australia, but other than some rock art, are not currently recognised in most communities. They are harbingers of thunder, lightning and rain, and lightning is the sparks produced by their fighting with stone axes. Lightning comes with storms (fronts) passing over southeast Australia from the south, where the Lightning Brothers are often seen at night as the stars Alpha and Beta Centauri (the Pointers). P37 also said that the Lightning Brothers were known to his Monaro community.



Figure 8.18 Serpent (Bursill 2013)

The Wauwilak Sisters (Berndt 1951 and Eliade 1967 use this spelling, rather than the ‘Wagalag’ used by Bursill)¹⁶ are part of a greater story based in north-eastern Arnhem Land. Berndt (ibid.: 230) describes the story from the Yolŋu people of Yirrkala, NT, which is part of the *kunapipi* ritual that comes from the Dreaming. *Djanggalawul* is the name of important Ancestors (two men and two women) who first came to the area from the east, and the Two Sisters are their daughters. Berndt (ibid.: 237) describes the story of the Wauwalak Sisters as one where they are travelling across that Country, and the oldest is pregnant from a liaison with a man who was not ‘correct’ according to the marriage rules. The younger sister is just reaching puberty. The older sister has her child, and they continue, coming to a waterhole where they stop and build a shelter. The older sister’s afterbirth gets into the water, where *Julunggul*, the sacred Serpent (the Rainbow Serpent, who is a rock python in that Country) resides. As a keeper of the Law, he is angered by the woman’s breaking of the marriage rules, and comes for the women. They attempt to dance it away all night, but the younger sister has her first menstrual flow, which further angers *Julunggul*. He swallows the women and the child. Eventually, the

¹⁶ Other spellings are Wagalak, Wawilak, Wawilag, and Wagalag

Serpent regurgitates the women and the child, and they are resurrected (this rebirth is part of the larger ritual of Fertility Mothers, called *kunapipi*). *Kunapipi* is the second of a three-part cycle of ceremonies; *djunggawon*, *kunapipi*, and *ngurlmak*, which are associated with the *dua* moiety of northeast Arnhem land. They are partially men's initiation ceremonies (at least two levels) and fertility ceremonies connected to The Mother ('Old Mother'), who is a non-totemic fertility 'Creative Being' (ibid.: 230-237).

The Wauwalak Sisters story appears to be significant in the Arnhem Land, and P3's advice and that of a colleague of mine (T. Leaman, pers. comm. 14 Dec 2018) would indicate that it exists as a story in Central Australia. This was confirmed in the literature by Glowczewski (2016: 90), an anthropologist who worked with the Warlpiri:

It is said that the Walpiri received the Kajirri ceremony from their northern neighbours, the Kurintji, a hundred years ago.

and (ibid.: 91):

Although *warlpirized*, the Kajirri ceremony is connected with some fertility cults of the northern 'tribes', such as the Big Sunday among the Kurintji and the Kunapipi from Arnhem Land. The Big Sunday refers to a maternal entity properly called Kajirri, while the Kunapipi celebrates the two Wawilak sisters who scattered numerous Dreamings and spirit-children....

"Wawilak" is another spelling of Wauwilak, so the path of the Wauwilak Sisters story from Arnhem Land to the Walpiri, whom Bursill consulted, is clearly via their northern neighbours, the Kurintji.

It was not until the final rewrite of this thesis that some of the implications of this story based on rock art in southeast Australia began to sink in. I re-read Eliade (1967: 61-82), which concerns Initiation Rites and Secret Cults, and focuses on the Wauwilak Sisters and the *kunapipi* ceremony, based on the previous work of Berndt (1951) and Warner (1937). Eliade (ibid.: 78-80) says that the Ancestress/Primordial Mother cults (connected to the Rainbow Serpent) are exclusive to Arnhem Land (and were imported from Melanesia), and:

Such fertility cults disclose a pan-Australian pattern. As everywhere else in Australia, the cult of the Ancestress reiterates a primordial drama. The rituals assure

the continuation of the cosmic life and at the same time introduce the initiates to a sacred history that ultimately reveals the meaning of their lives.

In south-eastern Australia, there is practically no mention of fertility cults, although the Rainbow Serpent was clearly a feature of religious culture (Radcliffe-Brown 1930). In this region of Australia, the ethnographical focus on understanding has been, from the beginnings of interest in Aboriginal religion, on what Howitt (1904) called the 'All-father', and others called 'High Gods' (Hartland 1898), 'Ancestral Heroes' (Berndt 1940) and 'sky heroes' (Elkin 1938). These heroes and gods were, variously, *Baiame*, *Daramulun*, *Nurunderi*, and *Bunjil*, depending on the language group/community and location.

Lévi-Strauss, on whose structuralism this study is grounded, would have been fascinated by the Wauwilak Sisters story and the *kunapipi* and other related, ceremonies, and Chris Knight (1983)¹⁷ has explored them in relation to Lévi-Strauss' *Mythologies*.

Suddenly, based on what has been deducted from the rock art at RNP, we are presented with a story, and possibly the connected religious beliefs, of a 'cult' (to quote Eliade) based in northeast Arnhem Land, with a known spread only to Central Australia and northwestern Australia (Berndt 1951: 234-235). While this should not be a total surprise, given what we understand about the spread of stories, song, and ritual via songlines, it could lead to a significant re-evaluation of Aboriginal religious culture in southeast Australia. Interestingly, there was knowledge among a few of the ethnographical participants of the rock art in question, but only one confirmed Bursill's theory of the Wauwilak Sisters connection.

Whether that name (Wagalag or Wauwilak) was used on the East Coast is unclear, as Bursill was told by a cultural person from La Perouse (Sydney) that the name of the women at RNP was *djurrwali*, which means 'big sisters'. The question is: in which language? I checked the limited language resources online for Dhurga, which is the main Yuin language, and nothing seemed to match. In the website 'Dharug and Dharawal Resources', under 'Languages', the wordlist showed *djurumin* as 'sister' in Dharawal, but 'elder sister' is *guwaigaliang* in Dharug (which is a closely related, if not the same,

¹⁷ One of the members of the Radical Anthropology Group

language), so *djurrwali* probably can't be confirmed as 'elder sister(s)' in any local language.

What connects the Wauwilak Sisters story at RNP to the Black Duck songline? At first glance, there is nothing. However, examining the Sisters and the child panel with items labelled (Fig. 8.19), the younger sister next to the child has a duckbill and the older sister has at least one webbed foot (the Arnhem Land version of the story has the younger sister as *Boaliri* and the older one, as *Waimariwi* (Berndt and Berndt 1985: 255) , whereas Bursill, who kindly provided these Figures, had the older named as *Garangal*). These latter names are the names of two of the stars of the Seven Sisters in Central Australian languages (Fig. 8.20). Bursill has indicated that the older sister is pregnant, whereas the Berndt version of the story has her as already having given birth, but reading the many sources has shown that there are many variations of the story, including the older sister having given birth, and the younger one being pregnant, both being pregnant, and both having given birth.



Figure 8.19 Wagalag Sisters and child



Figure 8.20 Seven Sisters, including Boaliri and Garangal (Bursill 2013)

Bursill, and later confirmed by P2, a Yuin elder, said the whole Wauwilak Sisters story is encompassed in the panels at RNP. The Wauwilak Sisters are on the one panel, and about 400 metres away the two men (who seem to be brothers in some versions) are located and appear to be ‘tumbling’ in space. Near the Sisters is the panel with the six men, one of whom Bursill suggests is the ‘owner’ of this story and is watching the men dance it to ensure it is done correctly. Both Bursill and P2 suggested that the men are calling the Serpent to punish the Sisters for breaking the Law, and as punishment, sending them (back) into the sky, where they become part of the Seven Sisters. Bursill said that the serpent on the rock about 2 km away is the Serpent, but P2 says it is not related. The alignment of the men, according to Bursill, is such that they are calling to the Serpent engraving to the west. Bursill said that the Sisters originally came down to Earth and came from the Seven Sisters (but were not of the ‘Seven’, but lesser stars) The Serpent was already there on Earth. P2 says that it is possible that the two ‘tumbling’ men are known in Yuin culture as ‘Shorty and Talley’, who were enforcers of the law (known as ‘feather feet’ in other Aboriginal communities, for using feathers on their feet to disguise their tracks) and also were there to punish the Sisters. Bursill also said that after the

Sisters were sent back to the sky, the two brothers were also sent to the sky, where they became the Pointers (Alpha Centauri and Beta Centauri near the Southern Cross).

The information from Bursill and P2 certainly provides evidence that the Wauwilak Sisters story has connections to the Seven Sisters in the name of at least one of the Sisters. Bursill said that the Serpent which he connects to the Wauwilak Sisters rock art is ‘the Great Serpent (diamond python to the Dharawal)’ because there appears to be a kangaroo on the head of the Serpent in the engraving. Bursill said the kangaroo is associated with the Serpent, and when the Serpent became angry with the Wauwilak Sisters, it came across Country, creating the landscape, and the kangaroo followed, and where it landed, grass grew, opening up Country. Bursill also said that the Serpent and kangaroo connection was well known in the Centre. Further, after the kangaroo brought the grass, the Sisters, as part of the Seven Sisters, bring the grass and flowers in the Spring, and look after them. Fig. 8.21 shows the relationship of the various rock art panels in the RNP. The line from the Sisters panel to the Serpent runs east to west.

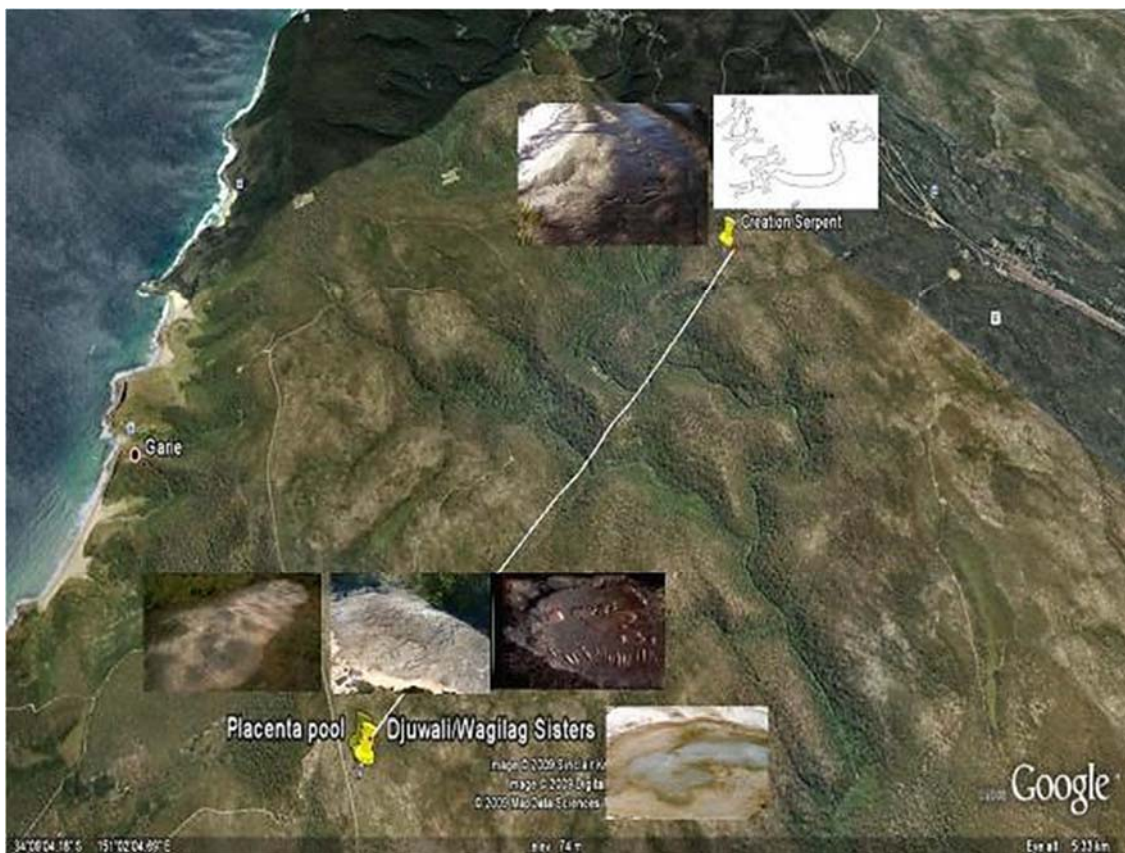


Figure 8.21 Wagilag Sisters story, rock art panels in Royal National Park (Bursill 2013)

The only rock art panel at the RNP without a clear purpose is subject to differing views by Bursill and P2. Bursill called the panel in Fig. 8.17 ‘the placental pool’, as it is possibly

a birthing pool, and the orientation of the axe grooves is north-east, which might mean a connection to the Seven Sisters (who rise in the north-east), and the singing of the Wauwilak Sisters back to the Seven Sisters. P2 says the panel is simply an axe grinding or teaching site. My interpretation is that, as a small pool containing water, it might be symbolic of the waterhole in Arnhem Land where the Serpent, *Julunggul*, attacked the Wauwilak Sisters.

A possible confirmation of the *Umbarra* story and the songline connection to the RNP Wauwalak Sisters comes from much closer to the spiritual home of *Umbarra* at Walaga Lake. P2 said that:

Between Narooma and Bodalla (NSW), the Two Sisters and their dog are large rocks. They got caught up with the wrong men. Talley and Shorty were sent to get them back. They were turned into stone, and serve as a warning to everyone like an electricity substation with signs [**Warning: 240,000 volts**]. They were turned into ducks at RNP.

This story is confirmed by two of the participants in Donaldson (2006: 95-96):

‘.....There were two sisters from Jerrinja country, Nowra. They were promised to be married but for whatever reason left their marriage arrangements and began walking south with their dog. Their elders sent someone after them asking the two sisters to return to their own country to marry. They did not return and were punished. They were turned into stones, as was their dog, at the place where they are today, south of Whittakers Creek. ...’ Percy Mumbler told John Mumbler this story [John Mumbler 24.5.2006].

‘She (Trisha Ellis) was shown the Two Sisters, the rock site, and told the associated story. ‘....there was a big camp of Jeringa people camped at Kianga near Bodalla. The Jeringa people had travelled from the Crookhaven Heads area, east Nowra and were heading south for the annual corroboree that was to be held in Bega. ..two young warriors from the Monaroo ‘tribe’, crept into the camp and stole away with two of the young women. These two women had a pet dog who followed along faithfully.When the Jeringa men returned from their hunting expedition they were angered to learn of the passing events, the women who had been stolen were promised from birth to a tribal Elder (as was the way of our people then) and such

an act was unlawful.....The Jeringa men caught up with the Monaroo men, the two women and the dog, at what is now known as ‘Whittakers Creek’. The two men were speared dead, the two women and their dog were turned to stone. They stand to this day, a reminder to others of the penalties imposed for breaking our lores....’ [Trisha Ellis 1.6.2006].

P2 refers to the persons who were sent after the Sisters as ‘Talley and Shorty’, and John Mumbler says ‘someone’ was sent after them, presumably with the power to turn them to stone. It appears that the story at Whittakers Creek is a simplified version of the Wauwilak Sisters and one of the versions where there was a dog, rather than a child (Berndt and Berndt 1985: 254 list a version where the Wauwilak Sisters had dogs).



Figure 8.22 Two Sisters at Whittakers Creek (L. Thomas)

In both cases, these are teaching stories, teaching people that marriage rules are Law, and not to be broken without serious consequences. Using the Black Duck to connect the stories from Walaga Lake to RNP creates a songline with a serious story.

Regarding connection to the sky, in Bursill’s version of the story, the Wauwilak Sisters at RNP came down from the Seven Sisters, and were sent back there after their transgressions of the Law. His version has the wrong men/Lightning Brothers sent into the sky to become the Pointers (hence the ‘tumbling’ effect in the rock art), but the Arnhem Land versions do not seem to even mention these men, other than them being of the wrong moiety for marriage with the Wauwilak Sisters.

The Black Duck songline and the story connected is a powerful one to the Yuin and Dharawal, so how far did it extend for these peoples? P19 said that the songline goes from the VIC border at Mallacoota along the coast to the north side of the *Dyarubbin*/Hawkesbury River (north of Sydney). Rock engravings along the way identify a Black Duck passageway, a songline from Wallaga Lake to Bundeena, south of Sydney, where there are duck feet engravings. There are other, similar, engravings on the high ground behind Wollongong which are the entry to the Sydney area. Presumably, the songline crosses Sydney to the *Dyarubbin*/Hawkesbury, where there is rock art connected to the songline, and in the past, an old man (Mr Walker, who was a tribal man) who was a midwife. This location was a woman's birthing place and can be identified by two boomerang drawings back-to-back (this location has not been identified) (P19).

P21, who is connected to a Sydney community, said that the Black Duck songline (which is shared) starts at Mascot (south side of Sydney) and goes south to Walaga Lake and Mallacoota, and could go to the Great Lakes in VIC.

Other sources (Donaldson et al. 2017) talk about Dreaming tracks in the area just south of the RNP, including Bulli Pass (which is now the main highway route down into the Illawarra coastal area), and Sandon Point, which could serve as the starting point for the Bulli Pass. In Donaldson et al. 2015), the Dharawal dialect groups from *Kamay*/Botany Bay down to the Shoalhaven were described, and the travelling of the Dharawal and Yuin communities was depicted (ibid.: 4):

The clan always travelled along a songline or storyline, a pathway journeyed by a creative spirit while bringing their country into existence. Everything lies on a songline, otherwise it was not created and does not exist. Songlines thread the continent. Some are very short, others travel for thousands of kilometres, crossing many countries and language groups. A songline is a map, a compass and a calendar.

Taking the information from the ethnographic participants, we can plot the Black Duck dreaming from the Gippsland Lakes, VIC (P21), Mallacoota, VIC (P21/P34), Walaga Lake (P3, P27, P2), Gulaga Mt. (P3, P27), Mt Coolangatta, Nowra (P27), Lake Illawarra (P3), Wodi Wodi Track (P3), Bulli Pass (P3), Mt Ousley (P27), RNP rock art site (P2, P3), Mascot (P21), *Dyarubbin*/Hawkesbury River (P19). These locations are plotted in Fig. 8.23.

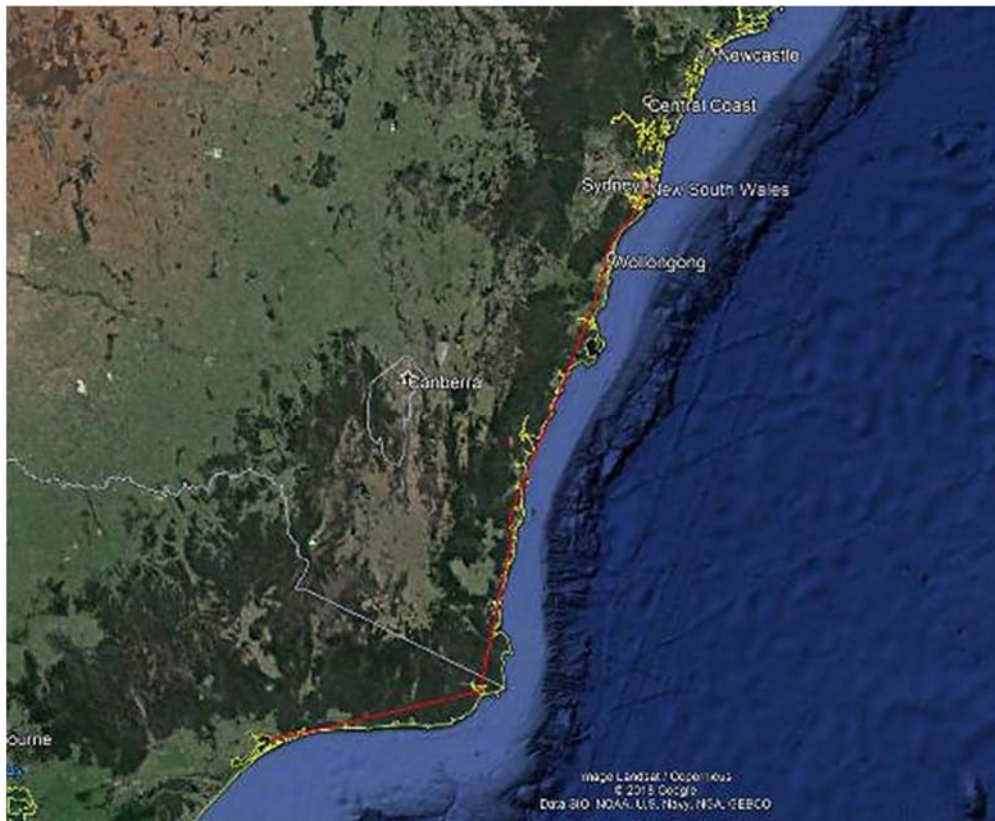


Figure 8.23 Black Duck songline from Great Lakes to Sydney (Google Earth)

It does appear that the Black Duck songline extends slightly beyond the Countries of the Yuin and Dharawal, so does it extend further? There was no literature or ethnographic evidence of it going up the NSW coast further north, but P29, a Dunghutti, confirmed that the black duck was an abundant source of food in the past, and was found at Frogmore Swamp, near Kempsey and Clybucca, NSW. It was not until nearly the end of the ethnographic phase of this study that a conversation with one of the last-recruited participants, P36, led to a possible breakthrough in extending the songline north of Sydney. P36 reminded me about the Gumbayngirr story of the two sisters who created the sea (see Chapter 7, p. 13). This story was recorded in Morelli et al (2016: 304), and I had seen it when I first got a copy of this book (mainly because page 304 had a paragraph headed ‘Stars and Heavenly Bodies’). After talking to P36, I went through the rest of the book, which is mainly Gumbayngirr Dreaming stories in the format of each named speaker/character of the story, followed by a line in Gumbayngirr and then the translation in English (these stories were mainly transcriptions of accounts and recordings of various Gumbayngirr knowledge holders and notes from anthropologists). Reading the story of the two sisters who created the sea from the original transcriptions, and in two versions;

Southern Gumbayngirr and Nymboidan (from the Nymboida River), I was struck by several features of the story:

- In the Southern version the sisters, when finished on Earth, go into the sky and become the Seven Sisters.
- *Madaan*, who is an old man who is husband to the two sisters, eventually goes into the sky and becomes a ‘red star’ (most likely Aldebaran), with his wives becoming (as well as the Seven Sisters) “twin stars’ near him, which could be the visual double stars Theta Tauri. This is in the Southern version. In the Nymboidan version, they end up as Split Solitary Island, north of Coffs Harbour, NSW.
- A young man wants to marry one of *Madaan*’s wives, and the sisters discuss whom of them should marry him.
- In both versions, the women make yam (digging) sticks and walking out onto what was then land, start striking the ground with the sticks, resulting in water coming out of the ground, and eventually creating the sea. They then go north and south, striking the land and creating the sea. I had been told by some participants that they walked around Australia, creating the sea, and leaving Australia as an island. This story should have been one of the ones Nunn and Reid (2015) used to show that the sea level rise 9000 years ago was faithfully recorded as a cultural story, but on checking that article, it was not included.

While this story, in its two versions, is not exactly like the two sisters/Wauwilak Sisters story described as the basis for the Black Duck songline, there are a lot of similarities, including a possibly ‘wrong’ young suitor (‘wrong’ in that the sisters were already married). There is the connection to the Seven Sisters, to a Carpet Snake in one of the versions (possibly the Serpent), and the location of the yam sticks after the story finishes as the two ‘horns of the Bull’ in Tauris, which is next to the Seven Sisters. There is, however, no clear evidence that this story is a version of the Wauwilak Sisters story, and therefore linked to the Black Duck songline. As the sources for both versions have passed, it is unlikely that any more details will be available.

Looking further at the North Coast, Beck et al. (2015) showed that upland lagoons in the New England region west of Gumbayngirr Country supported (and still support) large populations of Pacific black ducks, and at Guyra, there is the Mother of Ducks Lagoon.

There does not seem to be any history of this name, but it would not be unreasonable to assume that this name came from an Aboriginal person during early colonisation, and surely has some significance regarding a duck totem in the area. General information about the Pacific black duck is available from several sources, but there seems to be little information about their migratory habits. Frith (1959: 120-124) studied their ecology and concluded that they dispersed from their wintering areas at inland swamps to the coast in early summer, and back inland in early winter, sometimes travelling up to 985 miles (1585 km) during their travel. This study also suggested that black ducks were more numerous in inland NSW (study based in the Riverina area) than the Australian wood duck (*Chenonetta jubata*).

P21 mentioned that a water rat kept a black duck as a prisoner and raped it, producing the platypus. That reminded me that Ghillar Michael Anderson had told the story of the Seven Sisters at Narran Lake near Walgett, NSW in *Star Stories of the Dreaming*, a documentary about the sky lore of the Euahlayi people of that Country. In the documentary, the story was about seven young female ducks who came to Narran Lake with their parents. Their father was Mt Kosciuszko in the Snowy Mountains, and their mother was the Snowy River, which runs from there down to the sea on the Gippsland, VIC, coast. The story was that the young ducks were playing, and one ignored the warnings about going near the reeds. She was caught by a water rat, abducted, and raped. When she did not return, and her siblings and parents could not find her, they had to return to the Snowy Mountains without her. She eventually had an offspring and returned to her home with it, which is how the platypus was born as the offspring of the water rat and the duck. Her father was upset, and to protect the young ducks, put them into the sky for safety, where they became the Seven Sisters. I asked Ghillar what type of ducks they were (pers. comm. 15 Nov 2018), and he said they were black ducks. This led to some research with P19 and a map, and we were able to show a possible Black Duck songline from the Narran Lakes to the Snowy Mountains, and then down the Snowy River to the coast (Fig. 8.24), where it could turn north at the Gippsland Lakes and pick up the Yuin songline. The fact that the Seven Sisters are black ducks corresponds to part of the story in the rock art at the RNP.

However, since that discussion in 2018, Ghillar has corrected his advice (pers. comm. 2 June 2020), saying that the ducks were wood ducks, which, while not as common inland, are still very numerous. I have researched the duck and platypus story since, and have

found a number of contradicting sources regarding the type of duck. Bodkin and Bodkin-Andrews (2015) have published a story of how the platypus came to be that is connected to their Dharawal heritage, and seems to be set in western Sydney (*Wirrimbirra*). The names in the Dharug language of the water rat and the black duck appear as ‘rat’ and ‘duck’ in the online Dharug Dictionary, respectively, but the D’harawal Dreaming Stories website that has this story has a dictionary with many more words than I have ever seen in other Dharawal dictionaries. Otherwise, the name for platypus (*gayadari*) is Yuwaalaraay language (Ash et al. 2003: 83), which is from the Narran Lake area, which is the source of the story.

Further complicating this issue is a children’s book by Trezise (1988), *Black duck and water rat*, which describes the same story. In this version the water rat is *goomai*, which is very close to the Euahlayi *Guumay* (Euahlayi/Yuwaalayaay is the Narran Lake language), and while the young duck has two platypuses, the second is also *gayadari*, which means ‘monster’ in Euahlayi (interesting that the first Europeans to see a platypus also thought it was a monster or practical joke).

In the course of chasing this information, I had further information (R. Metzenrath pers. comm. 30 June 2020) from a Ngarigo source in the Snowy Mountains that the same story existed there with black ducks being the duck species.

Given the complications in regards to the duck species in the platypus origin story, while I will accept that either there has been some confusion in the story, or that the duck species did not matter, I will still now consider it only speculation that the Black Duck songline could incorporate the platypus story from Narran Lake to the Snowy Mountains and possibly to the VIC coast.

If, in future, there is more evidence of a black duck songline travelling from Narran Lake, this leaves tracing the Black Duck songline up the remainder of the North Coast and across to Narran Lake as an exercise in tracking a songline. P6 helpfully searched some old topographic maps from Grafton up to Byron Bay, NSW for wetlands that would connect the black ducks up through Bundjalung Country, and this supported my theory that the songline could have travelled up the NSW coast mainly via wetlands and fresh water.



Figure 8.24 Possible Black Duck songline Narran Lakes to Great Lakes (alternative via Tumut and Talbingo in yellow) (Google Earth)

Unfortunately, other than the possible connection with the Gumbayngirr two sisters story, research has not turned up any other story in this Country to do with the Black Duck. If indeed, the songline reaches Byron Bay, a route to Narran Lake could complete the circle back down to the Snowy Mountains. Researchers working in a different area of study on the distribution of the black bean tree (Rossetto et al., 2017), identified a significant songline running from Byron Bay over the Dividing Range in the direction of the northern NSW border. This songline was confirmed by McClean (2011) in his work with the Githabul community of the Bundjalung. The songline is called the Nguthungulli songline, after the Ancestor who first walked it. Robinson (1963: 45-47) was told the story by Charlotte Williams, a ‘Gindavul’ (Githabul) woman. Nguthungulli was their Father and created a rock ‘six miles out from Byron Bay’ (called Julian Rocks today). As a Creator, he walked all over Bundjalung Country, leaving things like bean trees (see Rossetto et

al.), and eventually walked over the Dividing Ranges and to the desert, and even further to the sea in that direction (the Indian Ocean). He eventually moved to an island on the West Coast, with his four daughters and one son, and remains there. Back in Bundjalung Country, there were two brothers, Wao and Jarring. Jarring died, and Wao chased two fairy emus, who were the spirit of Jarring. Wao chased them to Nguthungulli, who refused Wao to have the emus for his totem but gave Wao a song instead (the song is in Robinson 1989: 91-92). This cannot be confirmed, but that song is likely the song connected to the Nguthungulli songline. Rossetto et al. (2017: 8) report that the route was found to be traced along the ridges of the Nightcap, Border, and MacPherson ranges, as shown in Fig. 8.25.

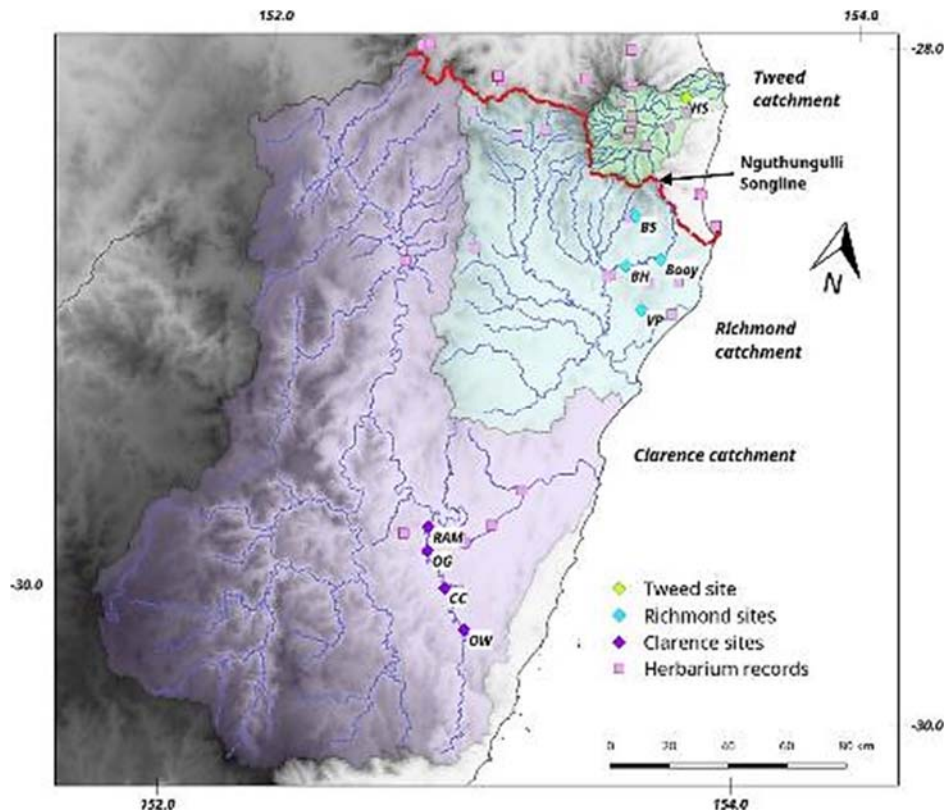


Figure 8.25 Nguthungulli songline from Byron Bay (Rossetto et al. 2017; Creative Commons)

Connecting the Black Duck songline to the Nguthungulli Songline would seem to be without support, but there is evidence that there was a songline route running from Byron Bay over the Dividing Range, and much further west for other stories. One of these is the *Mulliyan-ga* (Eaglehawk) songline described in Section 8.1.3 that runs from Byron Bay to Emily Gap near Alice Springs. While the route was not described in detail when the story was collected while working with the Euahlayi people, it likely travelled from Byron Bay to Quilpie in QLD via Dirranbandi, QLD, which was a waypoint on a Euahlayi

songline running to the Bunya Festival from Goodooga, NSW. This route (Fig. 8.26), if following the Nguthungulli songline, would lend itself to making the turn at Dirranbandi down to Narran Lake, and completing the Black Duck songline (Fig. 8.27) via the Snowy Mountains, Snowy River, and the Gippsland Lakes, if it ever becomes possible to confirm the route from Narran Lake.



Figure 8.26 Mulliyan-ga/Eaglehawk songline Byron Bay to Emily Gap, NT (Google Earth)

P37, who is from the Monaro community (and has connections with the Yuin community), said that the black duck was known in that area as *Moonbah/Mowamba*, and that there is a Moonbah River (shown on the maps as the Mowamba River) near Jindabyne in the Snowy Mountains, and that it runs into the Snowy River nearby. When he was told about the Narran Lake story, he suggested that the route from Narran Lake might run to Tumut, NSW, then to Talbingo, NSW, over to the headwaters of the Eucumbene River, which then runs into the Snowy River, and past the junction with the Moonbah River.



Figure 8.27 Black Duck songline, full circle from Walaga Lake to Sydney, Byron Bay, Dirranbandi, Narran Lake, Braidwood, Snowy Mountains (alternative via Tumut and Talbingo in yellow), Snowy River, Gippsland Lakes, Walaga Lake (Google Earth)

Assuming the Black Duck songline can be shown to be longer than the 400+ km songline described by the Yuin and Dharawal participants in this study, what does this mean? Previous research on songlines has been focused on Central Australia, where Aboriginal peoples are still walking and singing their songlines. Jones (2017: 212) says there are three main types of songlines; ‘extensive Dreaming tracks, concentrated in the desert regions, Estate Dreamings [within countries], and localised Dreamings’. The ‘more sedentary Dreamings of the third type may be concentrated in south-eastern Australia, where the extended Dreaming tracks model appears least applicable.’ If the Black Duck songline is eventually shown to be a fully circular songline, as shown in Fig. 8.27, it is close to 3000 km in length, possibly approaching the length of the *Kungkarrangkalpa*/Seven Sisters songline of the Central Desert. P2 said he was told that

the Black Duck songline went up the coast via the wetlands and lagoons, and looked like a ‘duck egg’ (oval), which suggests that it is a fully circular songline. Further research may be able to find more stories from more locations to confirm that the Black Duck songline does continue outside the Yuin and Dharawal Countries.

If further research and support for the Black Duck songline as a circular songline (or at least a long-distance songline) confirms the route, the significance of this to the understanding of Aboriginal culture in southeast Australia cannot be understated. Many researchers, Aboriginal and non-Aboriginal, have been trying to connect much of the material culture, such as rock art, to barely-understood cultural stories which have survived colonisation. This example of connecting rock art to cultural stories could be both an example and an inspiration to recovering further songlines and cultural connections in this region. I am hoping that such an example may also encourage knowledge holders with older stories to bring the non-sacred/secret stories ‘out’ so that they may be considered for connection to rock art and possible songlines. Public understanding and enthusiasm for this knowledge can go a long way to assisting reconciliation and other positive de-colonising effects.

8.3.2.2. Black Swan songline

The other long-distance songline investigated in this study is that of the Black Swan (again a totem animal/bird). A remark by a participant led me to look for a story in Robinson (1965: 125) about *Gineeveen*, the Black Swan. Bundjalung man Ken Gordon told Robinson that:

the Southern Cross is *Gineeveen*, that’s the black swan flying along. And the two pointers are the head and tail of a spear thrown by a black feller to kill *Gineeveen*. That Southern Cross only came here with the white-man. Before the white-man came here he was a swan. That’s a *jurraveel*. You won’t see *Gineeveen* in any part of the world. (Fig. 8.28)

Note: a *jurraveel* (also spelt *djurabihl*, or *djurabil*) is a ‘Dreaming’ or totemic story to the Bundjalung, and it is usually related to a specific site which is used for ‘increase’ ceremonies (to ensure the continuation of the totem animal/bird).



Figure 8.28 Ginevee and the Southern Cross

The story told to Robinson seemed limited, so I asked some of my Bundjalung participants, but the full story of *Gnibi* (the current spelling) and the hunter may have to wait for further ethnographic research or may be restricted knowledge.

I looked into the ecology of the black swan (*Cygnus atratus* Latham) and found that they are heavily represented in the south-east of Australia (Fig. 8.29), and while non-migratory, have complex movements, living in coastal lakes and estuaries when the climate is dry, and dispersing to the inland when it rains there (Braithwaite 1970: 376). Their distribution is almost Australia wide, except for the far north, and the coastal area from Jervis Bay to Merimbula, NSW is ideal (Braithwaite 1966: 6, 27).

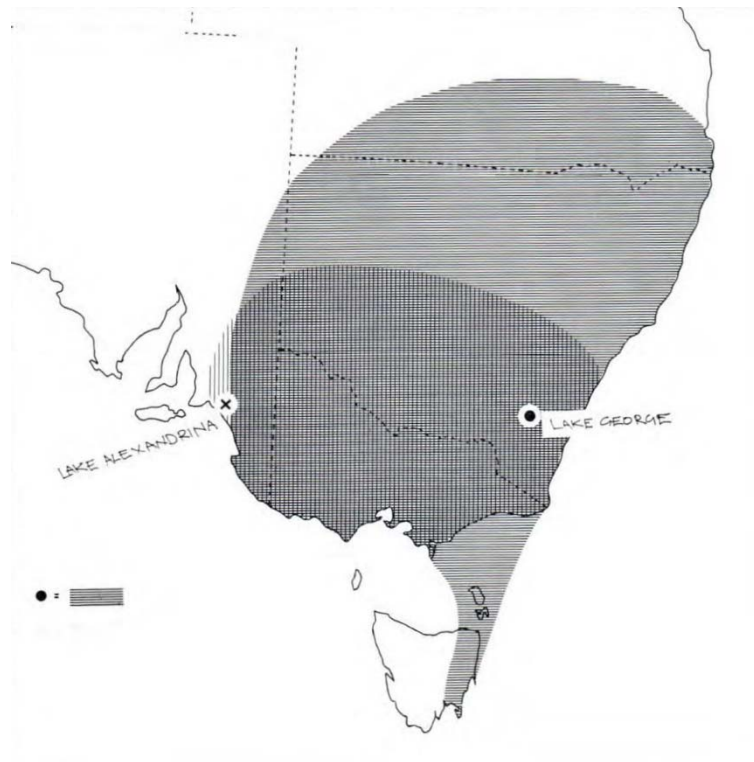


Figure 8.29 Black swan distribution south-east Australia (Braithwaite 1970)

Given that the black swan is distributed over the entire area of this study, and inland, I asked my participants about whether there was a songline. The answer was generally ‘yes’, but the details varied by community. P7, who was the original participant suggesting the Robinson story, said the Black Swan songline travelled along the coast. Some of the Sydney participants said the songline went north from Sydney; P27, a Bidjigal from La Perouse, NSW, said this. P21, a Gai-mariagal, said it went north from Maroubra, a Sydney suburb, then ‘up the coast to Grafton via the coast and lakes’ (somewhat confusing this; the Sydney suburb of Mulgoa is supposed to mean ‘black swan’ in Dharug, a west and south-west Sydney language). P6, a Bundjalung, worked out a route from Grafton based on stories and on the original names of some of the wetlands/lakes in that Country. The route was Grafton to Tabulam to Casino to Ballina. On the Mid-north Coast, P33, a Worimi, said there were wetlands at Newcastle which would have been a site for black swans, and P32, a Dunghutti, said that black swans would have been found in the wetlands near Kempsey and east of Heatherbrae/Raymond Terrace, where there had been wetlands. P29, also a Dunghutti, said they would have been found at Frogmore Swamp, near Clybucca.

On the South Coast, P3, a Dharawal, said the songline went ‘all up and down the east coast’, while P2, a Yuin, confirmed that a Black Swan songline ran from Moruya to Merimbula (in Dhurga, a black swan is *Goonu/Gunyoo/Gunyuuu*). Moruya is certainly significant, as Donaldson (2006: 13, 53) says that the black swan is the totem of Moruya (the Bringa Yuin dialect group) and that Barlings Island (in the bay at Broulee, just north of Moruya) is the place of origin of the black swan, Lady Merrima, recognised as ‘queen’ of the area (I wonder if this is ‘Lady Merriman’, who might have been married to ‘King’ Merriman from Walaga Lake, just south?). Further linking Moruya to the black swan is the following story about how the black swan’s feathers are black, told by Tom Butler (Donaldson 2012: 15):

.....as the story goes, there were never any swans here at Bevia Swamp, just eagles. ‘The swan always wanted to know why the eagle didn’t want the swan to come here; he thought he might have been hiding something. So when the eagle went out one day, two swans came to Waldrons Swamp to investigate. The eagle hawk caught them and pulled all the feathers out of them, the swans were white then and all the nice soft white feathers were fell away. Blood from the swan fell on the white waratahs and they turned red. The swans went to Wagga Wagga, which means place of many crows and dropped their feathers in a paddock. They were freezing and so when the black crows came along and said ‘the eagle is our enemy too’, and pulled their feathers out too. The swans took the crow’s black feathers and pushed them into their bodies with their beaks. Today the swan around here has black feathers, a little bit of white and a red beak; from the blood shed from pushing his feathers back in. You can see black swan at Bevia Swamp and Malabar, but not at Waldrons. Don’t come here looking for black swans, there are sea eagles here though. It is not far between all three places, the weir is just over the hill from Waldrons and Bevia Swamp, what we call Barlings Swamp, is not far again.....’

Tom Butler mentions Malabar, which is a Sydney suburb next to Maroubra, so maybe P21 is right about the songline in Sydney. Bevia Swamp and Waldrons Swamp are just north of Moruya. Wagga Wagga (*‘Wagga’* means ‘crow’ in Wiradjuri, so *‘Wagga Wagga’* should mean ‘many crows’ or ‘place of crows’) is about 260 km west over the Snowy Mountains (there is probably a *Wagga* songline.....). P35 confirmed that the black swan flew west, as in the story.

The story about how the black swan got its black feathers is available quite freely, and on first look, it seems suspiciously like the post-Contact stories where the Aboriginal person is answering a question about Australian animals/birds that were unfamiliar to the settler (the black swan was not known in Europe until contact with Australia). On second thought, there is a strong tradition in Aboriginal stories of explanation of how some animals/birds got certain features, and, in fact, there are a lot of stories to explain how the crow itself got its black feathers (see Mathews 1994: 74-55, Parker 1898: 1-2, Tindale 1937: 151-152, Thomas 1923: n.p).

What other evidence is there that the black swan is more than a resource on the NSW coast? Mathews (1908a: 35) in his study of the stories of the Gundungurra people of the Blue Mountains, said that *Dyin-yook*, the black swan, was identified with the Southern Cross and that Alpha Crucis, the brightest star in Crux, is 'the head of the swan'. P30, a Yaegl person, said that they also have the black swan/*Ngaragan* story and that the Southern Cross is *Ngaragan*. P30 also says that *Ngaragan* tells them when birds are travelling along Dreaming tracks, and when it is time to collect black swan eggs. It is probably also significant that all the languages of the communities in this study, Bundjalung, Yaegl, Gumbayngirr, Dunghutti, Gathang speakers (Birpai, Worimi), Dharug, 'Sydney', Dharawal, and Yuin, have a name for the black swan. As we will see, the Gamilaroi and Euahlayi in western NSW also have names and significant stories.

It appears that a Black Swan songline runs from at least Merimbula on the South Coast to Ballina on the North Coast. Is it possible to find if it travels any further? P2 said it travelled up the coast, and 'all the way to Western Australia'. P6's research on the detailed route through Bundjalung Country from Grafton leads back to the coast at Ballina. It's barely 25 km north along the coast from Ballina to Byron Bay, with significant wetlands behind Byron Bay. Once again, this is the start of the Nguthungulli songline running west over the Dividing Range, and, possibly in the case of the Pacific black duck, to Narran Lake, where another duck story took over to go south to the Gippsland Lakes. In the case of the black swan, it is strongly linked to the culture of the Noongahburra (Nhunggabarra) dialect group of the Euahlayi (Yuwaalayaay) people, who themselves are a neighbour of the large Gamilaroi (Gamilaraay) community. Narran Lake is *Terewah*, 'home of the black swan', *Byahmul* (Somerville 2008: 4). Chrissiejoy Marshall, one of Somerville's collaborators, said (ibid.: 13) that *Byahmul* was a *Mulgury* (totem) for *Terewah*.

To confirm my theory, I spoke to Ghillar Michael Anderson (pers. comm. 4 Jul 2018), and he said that there was a Black Swan songline from Narran Lake to Byron Bay (which would no doubt use the Nguthungulli songline for the last part to the coast). Tex Skuthorpe, a Nhunggabarra man, in Sveiby and Skuthorpe (2006: 104-106), tells a very similar story to that from Moruya about white swans, in this case from Narran Lake, who were attacked by eaglehawks and left nearly featherless. In this story, the crows dropped their black feathers to the swans, who ended up nearly all black with red beaks (from the blood when they lost their feathers). In the Moruya story, their blood coloured the (red) waratah flowers, but in the Narran Lake story, the white feathers of the swans created the (white) paper daisies.

Is it possible to do the same as with the Black Duck songline and complete the circle back down to the South Coast? Somerville does report a songline (2008: 1) from Narran Lake to Brewarrina to Byrock to Mt. Gunderbooka, NSW, but there is no detail. In working with Badger Bates, a Paakantji artist and cultural person, Somerville (ibid.: 11-14) was able to connect Narran Lake to the Darling River (probably via the existing songline to Mt. Gunderbooka), and Bates, whose interest is in the brolga (bird), indicated that the bird(s)/story goes down the Darling to the Murray River. Swan Hill, VIC, is on the Murray River, just east of the intersection of the Darling. All of these locations are either lakes or rivers, so black swan movements along these routes are not unlikely. It does appear, however, that black swans do not migrate in significant numbers to the great drainage endpoint, Lake Eyre, which is even further west than the Darling (Kingsford and Porter 1993: 145 Table 2). This would tend to point to the Darling and Murray as black swan routes.

Further discussion with Gillar Michael Anderson (pers. comm. 8 Feb 2019) led to an understanding that the songline to Mt. Gunderbooka is a 'fish' songline, but that there is a black swan connection from the Narran Lake to the Coorong in SA, which is the mouth of the Murray River, and also a well-known location for birdlife. This would suggest that the Darling and Murray Rivers route might still be correct, except that the swan travel to the Murray River mouth and then up the river and back east to the coast.

It is only a theory, but I am suggesting a circular Black Swan songline, starting at Moruya on the South Coast, up the NSW coast via wetlands, rivers, and lakes to Byron Bay, west along the Nguthungulli songline, then to Dirranbandi, QLD, south to Narran Lake, NSW,

west to the Coorong, up the Murray River to Wentworth, east along the Murray to Swan Hill, VIC, and east to Merimbula, NSW, by way of either Wagga Wagga or Albury, NSW, and then back to Moruya. Gilmore (1934: 140), who lived in Wagga Wagga in her youth, said that ‘at Ganmain and Deepwater (waterways near Wagga Wagga) there were alternately swan and duck sanctuaries’. All these locations are within the area of black swan travel shown by Braithwaite (1970: 377), and accord with other information about the travel of black swans in south-eastern Australia. Depending on climate and rainfall, black swans may not make long journeys very frequently, or even in the same year, but given the right conditions, there could be a combination of wet conditions on the coast and inland to make this possible. The route of the Black Swan songline, with variation, is shown in Fig. 8.30.

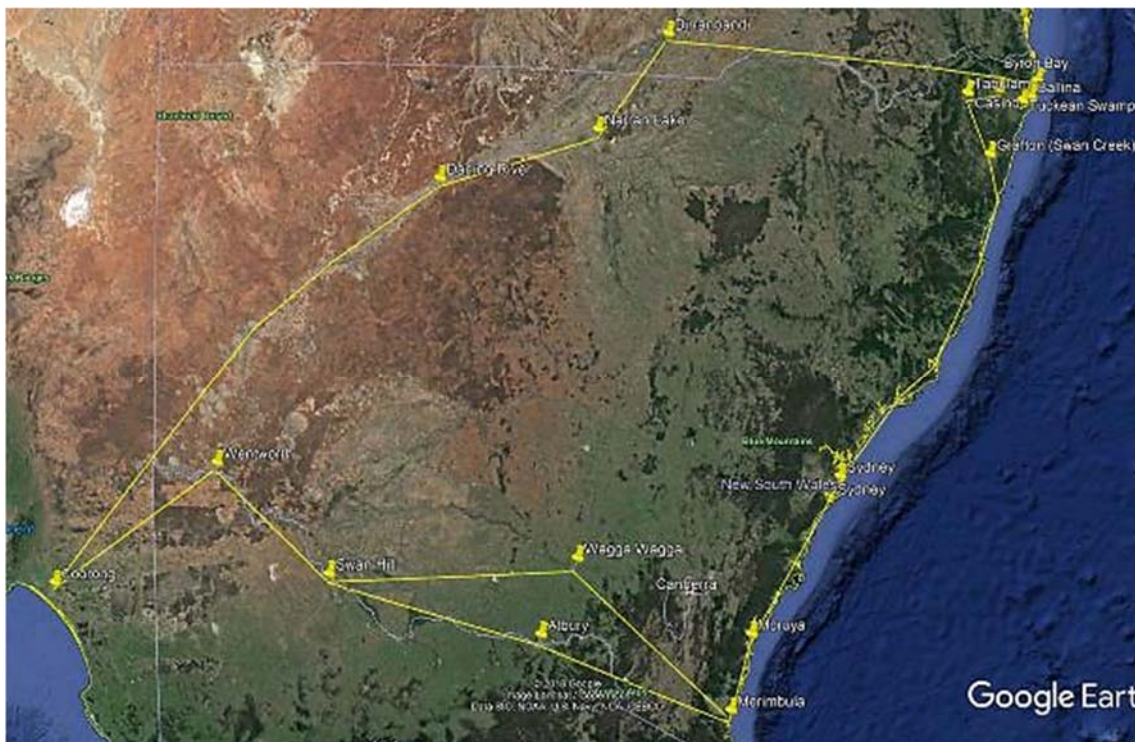


Figure 8.30 Possible Black Swan songline (Google Earth)

The rough distance along the songline, via Wagga Wagga, is over 3500 km and stays within reasonable distance to mostly permanent water the entire route. One of the methods of tracking the possible route in Bundjalung Country is interesting. P6’s work on where the possible songline travelled from Grafton (P21 advised the route Sydney to Grafton) was based on knowledge of Country. I suggested ‘Little Swan Creek’, which is just east of South Grafton (having passed over it numerous times on the Pacific Highway during fieldwork) as the starting point. P6 knew that the next waypoint, Tabulam, had lots of

water holes along the rocky Clarence River, while Casino had, on old topographic maps, a wetland just north of a town called ‘Geneebeinga’, which surely meant ‘black swan’. The next waypoint is the Tuckean Swamp, near Wardell, NSW, and due to the Jali Indigenous Protected Area being located nearby, there was plenty of ‘old knowledge’ about black swans at the Swamp. Finally, there are extensive wetlands to the west of Ballina, which made up the next waypoint.

From Merimbula north to Sydney, and then on to Grafton, there was advice from some participants that the black swans would have travelled or settled on the numerous estuaries, lakes, and rivers that make up the coastal strip, so I just connected these points. I also suspect that the Black Duck songline would pass through the same waypoints, as the Pacific black ducks and black swans were often found together.

No doubt the Black Duck and Black Swan songlines are only just representative of a much larger collection of long-distance songlines travelling around south-east Australia, and in many cases, running out of the area.

8.4 Summary

In this chapter, one of the two major themes of this study, songlines, has been explored through the stories and cultures of the three regions of the NSW coast and the communities living there. While knowledge about songlines may have been nearly lost in some of the communities most impacted by invasion and colonisation, there are hints and fragments of knowledge in most communities, particularly those communities furthest from Sydney. Previous collections of community knowledge have provided some fragmented songlines on the South and North coasts, and the perseverance of one of the participants, Les Bursill, provided the evidence in rock engravings that may have confirmed the long-distance nature of the Black Duck songline originating in the Yuin community. The Black Duck songline, even if it can only be proven to transit the South coast up to the Sydney area, is still one of the most significant songlines to have been recovered through research in southeast Australia. If the full circular route can be confirmed, then this songline could even be as significant as the Seven Sisters songline is to the Aboriginal peoples of the western and central deserts.

This study aimed to fill gaps in the knowledge and develop knowledge which could add to the general interest in Aboriginal cultures, and in these respects, I believe that the

songline research has fulfilled both aims. One of the impacts of this work perhaps will be to encourage other researchers to find details of this and other songlines along the East Coast and confirm that songlines were just as important a cultural feature of Aboriginal peoples on the coast as they were and are to Aboriginal peoples of the Centre.

9

9 Archaeoastronomy in Australia

9.1 Introduction

‘Archaeoastronomy is the study of the [I]ndigenous written and unwritten record relating to the practice of astronomy in the ancient world ‘(Aveni 1984: 25). In general, this means cultures which are not still viable, and where people are no longer able to express the astronomical knowledge of theirs and previous generations (that we call ethnoastronomy). It is sometimes called the understanding of prehistoric astronomy, but that is a misnomer, as archaeoastronomy can deal with the knowledge of peoples who have historical records but simply cannot be interviewed. In other words, archaeoastronomy can be viewed as the archaeology of cultural astronomy, in that it uses a methodology similar to that of archaeology, where the knowledge-holders are no longer present.

In Australia, we have a rich archaeological record from up to 65,000 years of settlement on the Australian continent, but a limited archaeoastronomical record. The reason for this is the type of material record left by the many previous generations of Aboriginal Australians. Their cultures touched the land lightly, and they lived in ecological harmony with their Countries, so there are limited structural remains of the type that archaeoastronomy has depended on in the Old World of Europe, the Middle East, and Asia (and, to a lesser extent, the New World of the Americas). For that reason, archaeoastronomy is much less commonly practised in Australia than in those other areas. That does not mean, however, that some of the tools of archaeoastronomy are not useful in cultural astronomy investigations in Australia. In this chapter, I will examine some of the tools useful in cultural astronomy in Australia and show an example of

archaeoastronomical methodology in analysing an interesting Aboriginal story about an astronomical event.

9.2 Horizon© and other archaeoastronomical tools

In this study, I have mainly used two archaeoastronomical tools, Horizon©, a GIS tool developed by Andrew Smith to assist archaeoastronomers in alignment of sightlines and presentation of horizon views, and Stellarium, which is open-source computer planetarium software (GNU General Public License) which has the flexibility to allow input and output of data significant to archaeoastronomical projects.

9.2.1 Horizon ©

Horizon is useful in archaeoastronomy in that from any point on Earth (within certain latitudes), calculations can be made to create the actual horizon, taking into account the terrain seen by an observer at that location. Horizon © creates the visual horizon using DTM/DEM (Digital Terrain Model/Digital Elevation Model) data from the Shuttle Radar Topography Mission (SRTM) collected in 2000. That data is available in either 3 arc second or 1 arc second accuracy (90m or 30m accuracy). The user selects the location of the observer and using data files downloaded from the USGS Global Data Explorer website, a calculation is made that creates a digital horizon. That horizon may be modified by exaggerating the heights by factors up to x2 (to show small variations more clearly).

The output of Horizon© is mainly a visual file, which can be either just a horizon profile for the full 360° or a 3D horizon, which has the terrain features coloured as a factor of elevation. In later versions of Horizon©, archaeoastronomical features were added, including path lines in the sky above the horizon showing the path of the Sun on a selected date and at the Solstices and the Equinoxes, the Moon path at the date, and the paths of the major and minor lunar standstills (points that the Moon varies in declination furthest from the median path to the horizon). It also will show the star paths of the Pleiades star cluster, and all the major stars in the night sky.

Also useful in Horizon© is the ability to export the horizon to Stellarium, where further archaeoastronomical tools can be used, and the Horizon© 3D horizon can be substituted for the choice of photo-realistic horizons available in Stellarium. This allows near photo-realistic images of the night sky to be created for use in research and education.

In Old World and New World archaeoastronomy, a tool like Horizon© would be used to try to examine alignments between buildings and other archaeological objects and events in the sky, such as aligning the access shaft of a burial mound with the sunrise on, say, the Winter Solstice. In Australia, there is not that level of archaeological structural features created by Aboriginal peoples, so the interest in Horizon© here is as a tool to look at horizons and see if they fit into the historical and current cultural landscapes. Just because Aboriginal peoples didn't build 'Pyramids' doesn't mean that they didn't see landscape features as connected to their stories and cultures. In my research, there are suggestions that landscape features are also connected to songlines. In order to find these features, a point of observation in the landscape needs to be identified. As reported in Chapter 6, I was told by a participant that there was a songline from Gulaga Mt to Biamanga Mt, and halfway along, near Bermagui, one could see some high points or peaks. Using an estimated point of observation slightly inland from Bermagui, I did a Horizon© calculation and found that all of the high points mentioned by the participant could be seen and that there was a 'cultural horizon' from that point.

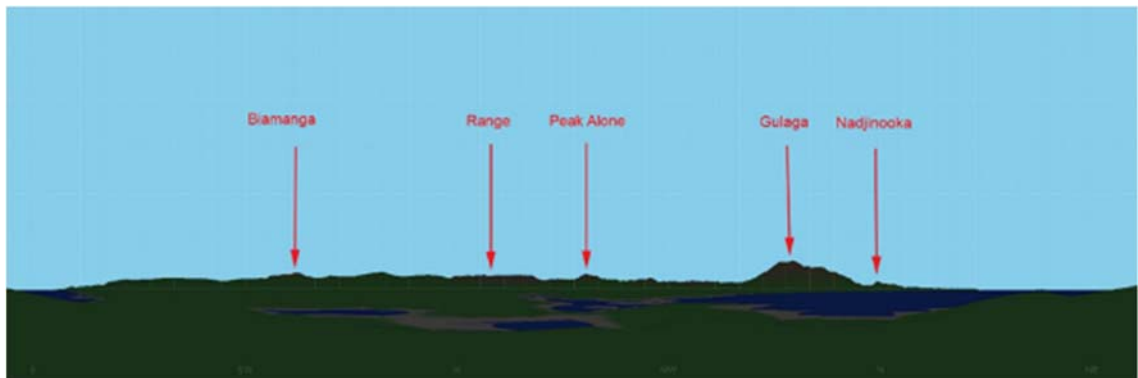


Figure 9.1 Cultural horizon from Bermagui (Horizon©)

From that horizon, I was able to determine that some of the high points corresponded to the Solstices of the Sun and that the Pleiades arced over Gulaga Mt, which had a connection (see Chapter 6 for the details).

Colleagues have used Horizon© for investigating other possible cultural landscapes in Aboriginal Australia with some success, and as more work is done in cultural astronomy in Australia, this tool may be successful in identifying more connections between landscape and the night sky.

9.2.2 Stellarium

There are several commercial computer planetarium programs available, some which are extremely sophisticated and can control telescopes and other astronomical equipment. For archaeoastronomers, other features are more desirable. As described in Horizon© (above), the ability to import a horizon profile is important, as most planetarium programs just show generic ground and horizon images. Stellarium, in later versions, has an Archaeolines feature, where lines of all the major solar and lunar passages are shown in the night sky and down to the horizon (which may be one imported from Horizon©). Of great interest to cultural astronomers is the Stellarium feature called Skylore, which allows the user to develop Sky Cultures, which are specific artistic representations of animals, culture heroes, and stories which can be placed in the Stellarium night sky against the proper background of stars and other features. These Sky Cultures have been developed by several researchers and added to the Stellarium package for other users to enjoy. Each Sky Culture can be turned on and off and has a separate text file where details of the individual lore items in the sky can be described. For outreach to the public in lectures, and at public planetariums, this has been particularly useful, and in the case of the *Star Stories of the Dreaming* video mentioned earlier, it was used to illustrate stories and knowledge being discussed by the narrator. I used artwork from Ghillar Michael Anderson to create a Kamilaroi/Euahlayi Sky Culture, which can be seen by anyone in the world who has downloaded the files. Fig. 9.2 is an example, showing *Gawarrgay*, the Emu in the Sky, as visualised in May by the Euahlayi people of northcentral NSW:



Figure 9.2 Gawarrgay, the Emu in the Sky, in Stellarium

Stellarium can be run in such a way that the night sky progresses across the screen at whatever speed is desired, and this is useful in illustrating various cultural features that appear at different times of the night and of the year, and this was used to great effect in the video mentioned.

Finally, the best feature of all is that Stellarium is free, and as a result, has been used in various programs for school education into Indigenous science and culture.

9.2.3 Other tools

There are other tools used in archaeoastronomy and cultural astronomy, including software to calculate the location and timing of eclipses at historical and even prehistorical dates. The software can show when planets are visible in the night sky, and this can be useful when certain ceremonies are connected to a particular planet being visible. Stellarium is useful in looking for possible alignments of stars or planets, simply by setting the time of night desired, and running the ‘clock’ forward or back at a very fast rate until the desired alignment comes into view.

More serious astrophysical mathematical tools even have to be used at times, such as calculation of the brightness of the Southern Aurora against the sky brightness of a total solar eclipse. This calculation was used in examining the Burratorang Eclipse, which is an example of archaeoastronomy that follows.

9.3 The Burraborang Eclipse, an example of archaeoastronomy

Section 9.3 is a re-written version of an article published by me (lead author), and Duane Hamacher in 2017, ‘Did Aboriginal Australians Record a Simultaneous Eclipse and Aurora in their Oral Traditions?’, in *Journal of Astronomical History and Heritage* 20(3): 349-359. I did more than 80% of the development and all of the writing. A colleague, Trevor Leaman, assisted with the graph in Fig. 9.7. The Conclusions section was rewritten as a result of comments after publication.

9.3.1 Introduction

The oral traditions of Aboriginal Australians are multi-layered and multifaceted. Within these traditions are descriptions of natural events, both mundane (e.g. lunar phases) and rare (e.g. eclipses). These descriptions are often incorporated into a narrative, or storyline, which can include mythological elements. This serves as a mnemonic for remembering the information encoded in the story.

We examined an oral tradition recorded by Charles Peck (1933) from an Aboriginal person that appears to describe simultaneous rare natural events. The source could have been Ellen Anderson, an Aboriginal person from south-west Sydney with family connections to that area (Organ 2014: 60). There are several explanations for this oral tradition. The description could be based on a witnessed event. It could be purely ‘mythological’ in nature, serving a symbolic and mnemonic purpose. It is also possible that the elements of the story could have utilised a degree of ‘poetic license’ by Peck, but the story could be an Indigenous voice expressed by a white/Colonial writer. It is difficult to know the reasons, but some of them can be tested.

We hypothesised that the story reflects a living memory of simultaneous natural events that were witnessed and recorded in oral tradition. We tested our hypothesis by exploring various natural phenomena that the tradition could be describing, then utilised historical records and scientific studies to test each one rigorously to identify the phenomena that best fit the narrative in the storyline.

This study serves as a test case for showing how the methods and frameworks of cultural astronomy (archaeoastronomy) can be used rigorously to examine Aboriginal oral traditions for records of natural events. Our analysis is not conclusive, but rather

highlights the various challenges and uncertainties researchers face when conducting this type of research.

9.3.2 The story

Aboriginal stories were collected and recorded by non-Aboriginal people. These individuals were often missionaries and ‘explorers’ in the early days of European colonisation, followed later by linguists, ethnographers, and government agents. In the early 1900s, many people published collections of Aboriginal stories as popular books. As part of a project exploring the Aboriginal astronomical traditions of the Sydney region, I identified an unusual story in one of these books that seems to describe simultaneous rare sky phenomena.

Peck published the book of Aboriginal stories, *Australian legends: tales handed down from the remotest times by the autochthonous inhabitants of our land*, which is considered by contemporary Aboriginal people to be a valuable source of Gundungurra traditions (Smith 1992). The Gundungurra are an Aboriginal language group based in the Blue Mountains south-west of Sydney, centred on the Burratorang Valley (Figure 9.3).

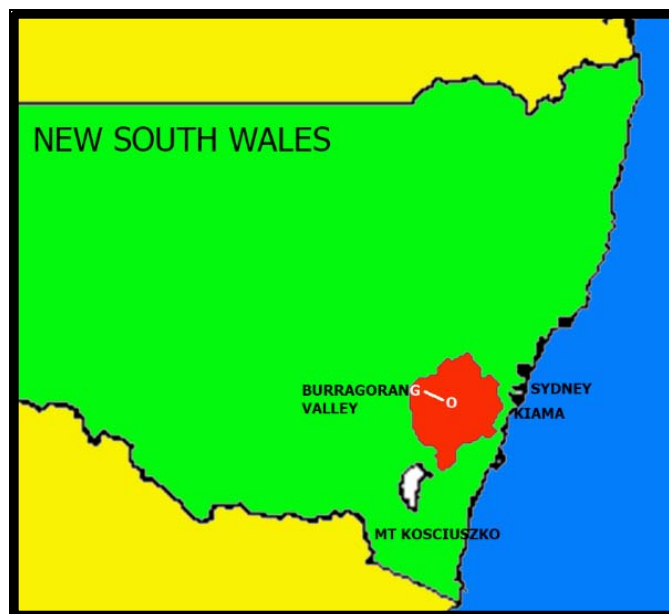


Figure 9.3 Gundungurra language group location (Commonwealth of Australia, NNTT)⁴

The story, entitled ‘The First Kangaroo’ (Peck 1933: 85-86), tells how the first kangaroo was borne to Australia upon the ‘greatest wind that ever blew’. It was blown across Australia from Perth to the area of the story, where it was able to touch down. At the same

time, an Aboriginal leader was searching for new Country, and saw the following in the sky:

The strangest mass of cloud he had ever seen was there. It was sepia coloured with black edges. It seethed and curled and split. It billowed and curled and broke – and frayed out. Long spirals of lighter colour worked wonderful patterns against the brown, but drawing out and contracting, waving like giant battle-plane streamers, now straight as spears, now bent over like millions of boomerangs, now detaching, then adhering; the awe-striking masses of vapour came on from the west. Big rocks were tumbling there. High walls built up and tottered over and tumbled and crashed. Giant forests were born and waved in a giant storm and were felled. And with all that turmoil of vapour up aloft, the earth below was calm and serene. It faced an inevitable, and inevitable was a catastrophe.

Suddenly it grew dark.

A night in the daytime descended in a second, blotting out everything. But in the heavens a wondrous light appeared. Long streams of liquid fire started from the south, and shot sheer across the heavens from pole to pole. They waved from west to east. Red and yellow, purple and brown, pink and grey, golden and black, white and pale green. All these colours in long straight fingers stretched from pole to pole, waved and crossed, and passed away towards the east. The unfortunate black man had never seen such a sight.

But he had heard of it.

It seemed to him that perhaps once in a lifetime a man was privileged to see such a thing. He cowered before it. Then came the tornado. With the wind the lights waved out and the clouds passed, and the night (for it was really night then) showed starlight and clear.

The story goes on to describe the arrival of the first kangaroo and the leader's further investigation of the new Country. The story says Aboriginal peoples from a large area witnessed this event, ranging from Mt. Kosciusko in the south, the Nepean River in the north, Kiama to the East and Goulburn to the west, also including Mittagong, Currockbilly Mountain, Burragorang, and the Monaro District (Figure 9.4).



Figure 9.4 Map of south-eastern New South Wales, the Australian Capital Territory, and north-eastern Victoria, featuring places mentioned in the oral tradition from where the event was visible. The story is centred on the Burragorang Valley (Google Maps)

This remarkable description of multiple phenomena in the sky could be easily mistaken for a mythological story, which may be the case. But is it more than this? Could this story describe an actual event(s), as fantastic as it appears to be? I studied the story for this possibility.

9.3.3 Methods

Hamacher and I examined a range of possible phenomena that could explain the three natural events:

1. A large thunderstorm cell.
2. Something causing the day to turn to darkness very quickly; and
3. The appearance of multicoloured streams of light stretching across the sky.

The approaching mass of cloud seems to be a clear description of a large thunderstorm cell, which is common in the Blue Mountains. The sudden darkening of the sky could be attributed to cloud cover, but this seems an unlikely explanation given the description. Rather, an eclipse of the sun seems to fit the description in the story better. The sky will

only turn noticeably dark during a total solar eclipse. A partial eclipse can pass relatively undetected. A total solar eclipse would explain how the light display in the sky could be seen, which would not occur if the sky were overcast. Partial eclipses are largely ignored, as Hughes (2000:205) calculated that it is possible for a person to miss the change in sky brightness that would signal an eclipse when the moon covers less than 93.7% of the Sun's disc.

As for the light display, we considered several atmospheric phenomena, including nacreous clouds, sun pillars, Parhelia, lightning sprites, and the Aurora Australis. Nacreous clouds are very high-altitude clouds illuminated by the sun that can exhibit a wide range of colours, including many of those mentioned in the story. The clouds can also exhibit long streams, but there are several behaviours in the story which nacreous clouds do not exhibit, including 'waving from west to east' (they do move, but very slowly) and their location is normally from about 50° to 60° latitude (although they can be seen further from the poles)¹⁸. Sun pillars are caused by low angle sunlight reflecting from horizontal ice crystals¹⁹. There is no reported evidence of sun pillars moving rapidly in the sky. Parhelia, also known as Sundogs, is a similar phenomenon formed when sunlight reflects off ice crystals, creating a halo effect around the Sun²⁰. Under certain conditions, smaller phantom suns can be visible on either side of the Sun. They are often seen when the sun is lower on the horizon and under the right conditions can produce a range of colours. However, Parhelia are not associated with the movement of the lights described in the story. A solar eclipse would rule out sun pillars, Parhelia, and possibly the nacreous clouds (except in areas near the edge of the path of totality). With the description of an approaching storm cell, lightning sprites are another possibility. These transient luminous events are high altitude plasma discharges that can appear as large reddish flashes in the sky, similar to lightning (Füllekrug et al. 2006: 8-11). They occur on very short timescales (fraction of a second) but could certainly have been visible during the event in question given the approaching thunderstorm. However, sprites would not be able to produce the full display described in the story (Heavner et al. 2000).

¹⁸ Atmospheric Optics, Nacreous Clouds (Type II Polar Stratospheric Clouds) viewed 31 August 2016, <http://www.atoptics.co.uk/highsky/nacr1.htm>

¹⁹ Atmospheric Optics, Sundogs, Parhelia, Mock Suns viewed 31 August 2016, <http://www.atoptics.co.uk/halo/parhelia.htm>

²⁰ Atmospheric Optics, Pillar viewed 31 August 2016, <http://www.atoptics.co.uk/halo/pillar.htm>

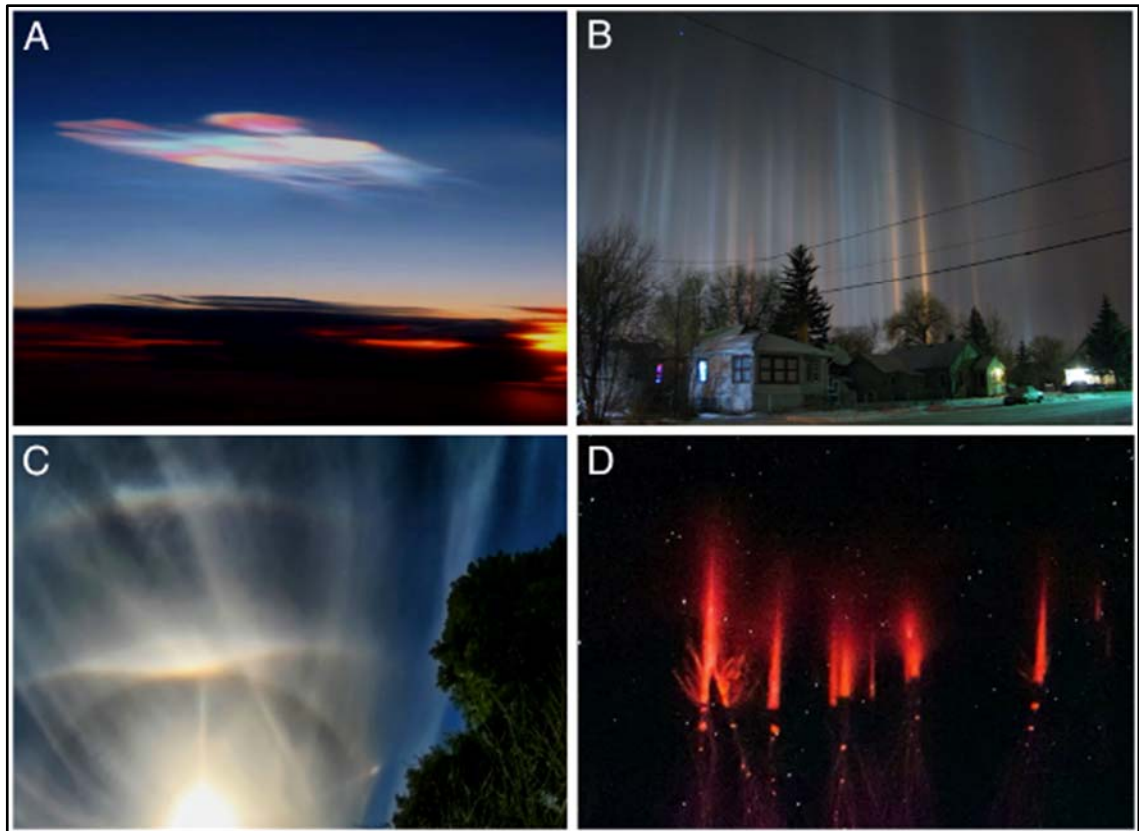


Figure 9.5 (A) *Nacreous Cloud* (Wikipedia Commons: Foobaz), (B) *Light Pillars* (Wikipedia Commons: Christoph Geisler), (C) *Parhelia/solar halo phenomenon* (Wikipedia Commons: Brocken Inaglory), (D) *Lightning Sprites* (University of Alaska: Jason Arhens, Creative Commons)

Our final consideration was that the story describes an unusually bright display of the Aurora Australis. The Aurora Australis is recorded in Aboriginal traditions across the southern half of Australia (Hamacher 2013a) and as far north as southwestern QLD and the Central Desert. Aurorae can technically occur at any time of the year at any year. They can also be seen far closer to the Equator, depending on the intensity of the event. They were seen in Cuba and Hawaii in 1859 (Windridge 2016: 174). However, events seen at latitudes nearer the equator are rare, and the frequency and intensity of aurorae are dependent on cyclic solar activity and the latitude of observers. Aurorae are more frequent within the auroral zones – a ring-shaped band stretching around the Earth’s poles where auroral displays are the strongest and most frequent. While dynamic and changing, the northern edge of the southern auroral zone can extend to the far southern extremities of Australia, such as southern VIC, South Australia (SA), WA, and all of Tasmania.

While uncommon, aurorae are visible from the Sydney region, including the area in question. Powerful geomagnetic storms resulting from a large solar coronal mass ejection

can expand the range of visibility on the Earth and increase the intensity of the display. On the night of 1-2 September 1859, the Carrington Event, a coronal mass ejection, led to a powerful auroral display that was visible from tropical latitudes such as QLD, Australia, Cuba, Sub-Saharan Africa, Colombia, and Hawaii (Green 2005; Cárdenas et al. 2016).

But do significant auroral displays exhibit the characteristics described in the story, and can they be seen during a total solar eclipse? The story describes ‘long streams of liquid fire’ in ‘red and yellow, purple and brown, pink and grey, golden and black, white and pale green.’ Several references (e.g. Douma 2008; Tate 2016; Trondsen 1998: 86-88) describe the possible colours of aurorae to include all of those mentioned in the story, assuming brown could be a dark red, and purple could be a dark blue. Grey is an absence of colour due to low light intensity, and is seen in aurorae (Windridge, pers. comm., 13 Oct 2016). The description of streams of liquid fire waving from west to east is typical of aurorae bands following the Earth’s geomagnetic lines, and the colours ‘in long straight fingers’ (Peck 1933: 85) are seen in curtain-like bands in aurorae (Windridge 2016), see Figure 9.6 (left image).



Figure 9.6 Strong displays of the Aurora Borealis over Norway. Displays like this could potentially be visible over the Sydney region during a powerful geomagnetic solar storm (Telegraph.co.uk: Tommy Eliassen)

Critical to our hypothesis was whether an auroral display of this magnitude could be seen in the brief darkness of a total solar eclipse? Silverman and Mullen (1975: 2839) investigated the sky brightness during total solar eclipses in 1963, 1966, and 1970, and reported that it is not uncommon for observers to see 3rd magnitude stars during totality. They estimated that the sky brightness at totality is equivalent to approximately -5° to -7° of solar elevation during twilight or the equivalent of 10⁻³ the brightness of the daytime

sky. More recently, Zainuddin et al. (2013) measured the sky brightness during a 2009 total eclipse at Hangzhou, China using a Sky Quality Meter. At totality, they measured the sky brightness as $16.13 \text{ mag/arcsec}^2$ at the zenith. This enabled us to make a comparison to the brightness of aurorae. The brightness measure for aurorae is based on the International Brightness Coefficient, Classes I, II, III, and IV, which are expressed in kilo-Rayleighs. A Rayleigh is a unit of photon flux, see Hunten et al. (1956).

To compare auroral brightness to the sky brightness at totality requires finding equivalent (visual) mag/arcsec^2 values for the IBC Classes, which are not part of the IBC data. The brightness of the Milky Way, which is the equivalent of IBC Class I, is magnitude 21.4 (Crumley 2014: 2619). The brightness of the full Moon (IBC Class IV) is magnitude -12.6 (Strobel 2010). The sky brightness equivalents for Classes II and III are 21.1 and 18.0, respectively. I calculated these values by fitting the data to a linear (log) plot (Figure 9.7). The Class III value of $18.0 \text{ mag/arcsec}^2$ is within the range of the B , V , and R bands (16.6 to 18.5) reported by Dempsey et al. (2005: 93). This provides a first order approximation.

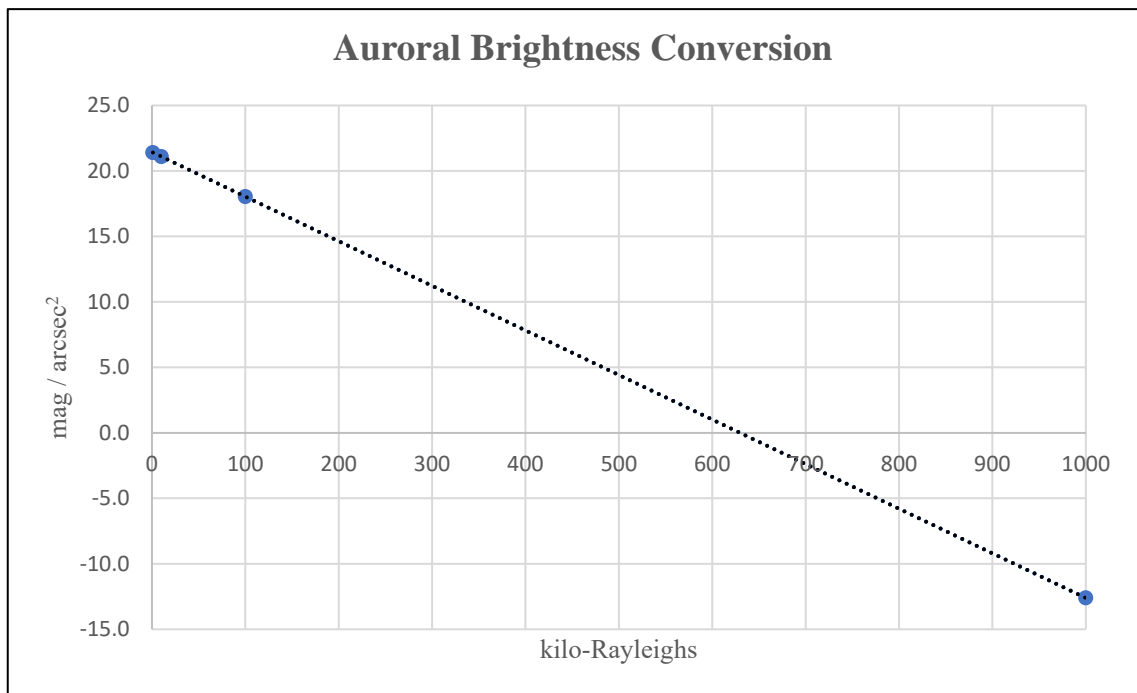


Figure 9.7 A linear plot fitting data of sky brightness (mag/arcsec^2) versus auroral photon flux (kilo-Rayleighs) using data from Crumley (2014) and Strobel (2010)

Using Zainuddin et al. (2013), who measured sky brightness of 16 mag/arcsec^2 during the 2009 eclipse, we calculated that an auroral flux of approximately 185 kilo-Rayleighs is necessary for an aurora to equal this sky brightness, and a flux exceeding this value if it

were to be visible during a total eclipse. Therefore, for an aurora to be visible during a total solar eclipse, it would need to have a brightness between Class III and IV (see Table 9.1).

AURORAL BRIGHTNESS			
IBC Class	kiloRayleigh	Description	mag/arcsec ²
		Faint, brightness of Milky Way. No colour apparent.	21.4
I	1		
II	10	Brightness of thin moonlit cirrus cloud.	21.1
III	100	Brightness of moonlit cumulus cloud.	18
IV	1000	Bright as the full Moon. Casts shadows.	-12.6

Table 9-1 International Brightness Coefficient, after Thomson 2016

We considered a significant display of the Aurora Australis to be the best description of the light display in the story, although lightning sprites could also have been visible given the approaching thunderstorm. Therefore, the best fit to the description in the story is an approaching large thunderstorm, a total eclipse of the sun, and a simultaneous strong auroral display. Two of these (eclipse and aurora) are extremely rare events. The probability of them occurring simultaneously is extremely low, but I demonstrate that this is possible under the right conditions.

If this is the case, can we use scientific studies and historical records to pinpoint when this event took place? The Analysis will attempt this.

9.3.4 Analysis

To identify the date of the event, we established the following ranking criteria:

1. The solar eclipse should have been total in the Gundungurra community area, centring on the Burragorang Valley, and should be visible as a total or high percentage coverage partial eclipse (>93.7% of solar disc coverage²¹) from all locations described in the story. I rejected annular eclipses,
2. There should have been a high probability of there being an Aurora Australis visible in Southeast Australia during the year of the nominated solar eclipse or historical records of aurora in that year,

²¹ from Hughes 2000: 205

3. And there should have been a high likelihood of a thunderstorm occurring in the area of the event at the time of year and time of day the eclipse took place.

Concerning criterion #1, I used the Alcyone Eclipse Calculator²² and the NASA Javascript Solar Eclipse Explorer²³ to search for total solar eclipses with the path of totality passing over the Burragorang Valley (33° 56' S, 150° 24' W). My search was limited to the period between 1500 BCE and 1900 CE for this study to work within the limitations of eclipse calculating software. I acknowledge that the event may have occurred at an earlier date. I ignored the period 1900 to 1925 CE, as this is the period that Peck may have been told the story, and there were no relevant eclipses in this period.

I identified five total solar eclipses visible from the Burragorang Valley in this timeframe and calculated the visibility of this eclipse from the locations described in the story (Table 9.2). Any eclipses that fell below the 93.7% threshold were rejected. Of the five eclipses identified, two (1033 CE and 1857 CE) were rejected as they fell below the visibility threshold as seen from Mt Kosciusko. This left three candidate eclipses, which occurred in 189 CE, 196 CE, and 764 CE (Figure 9.8).

Year	Date	T _{max tot.}	D	Alt	Mt K.	Kiama	C'billy	G'burn	N. River
189 CE	27-Oct	15:04:53	1m 41s	40°	96.3	100	99.9	100	99.5
196 CE	14-Jun	08:31:04	2m 41s	15°	99.0	99.8	99.2	100	100
764 CE	28-Nov	13:43:14	2m 52s	63°	96.6	100	99.2	100	100
1033 CE	04-Jan	12:43:19	2m 04s	76°	93.3	98.9	96.6	99.2	100
1857 CE	25-Mar	10:47:15	1m 24s	8°	92.6	98.7	96.1	98.8	100

Table 9-2 Data for the five total eclipses visible from the Burragorang Valley between 1500 BCE and 1900 CE. Data includes the year, time of maximum totality, the duration of totality, and the altitude of the sun at totality. Also shown is the maximum eclipse coverage (as a percentage of the Sun's disc) visible from Mt. Kosciusko, Kiama, Mt. Currockbilly, Goulburn, and the Nepean River. Values in red are those that fall below the 93.7% visibility threshold.

²² The Alcyone Eclipse Calculator uses data based on the Five Millennium Canon of Solar Eclipses -1999 to +3000, with eclipse predictions by Fred Espenak.

²³ The NASA Javascript Solar Eclipse Explorer calculates eclipses from the time range 1500 BCE to 3000 CE. <http://eclipse.gsfc.nasa.gov/JSEX/JSEX-AU.html>

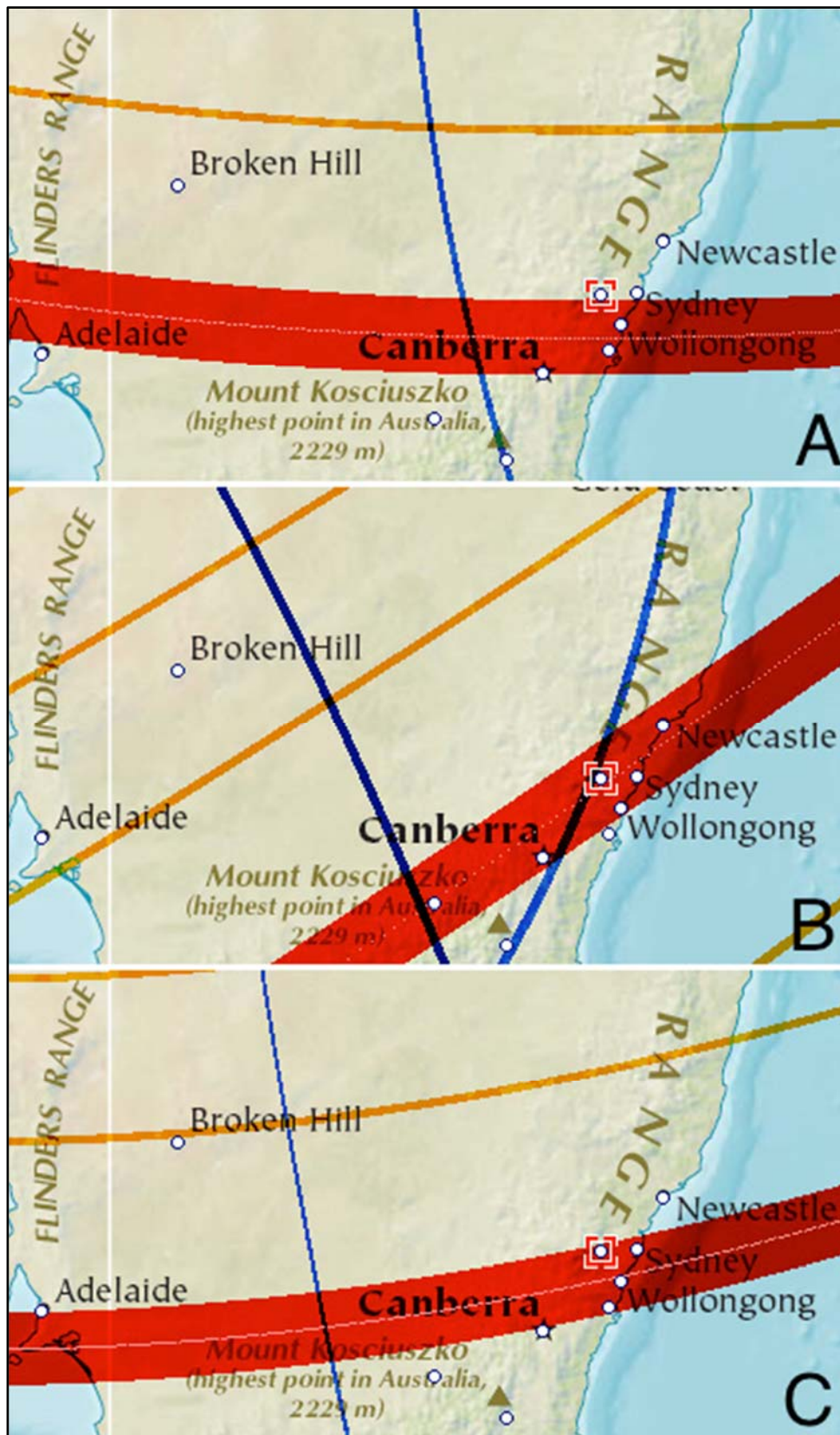


Figure 9.8 The paths of the three eclipses that meet the first criterion: (A) 189 CE, (B) 196 CE, and (C) 764 CE. The box west of Sydney denotes the Burratorang Valley. The triangle in the bottom-centre denotes Mt. Kosciuszko (created with Alcyone Eclipse Calculator)

To address criterion #2, I searched for evidence of a major auroral event that would have occurred during the time of the 189 CE, 196 CE, and 764 CE eclipses. Attolini et al. (1998: 12,733) established an 11.4-year periodicity in the period 1180-1450 CE through the record of ^{10}Be deposits in polar ice ($^{10}\text{Beryllium}$ is a product of solar particle interaction with the upper atmosphere). Through historical reports of aurorae for the period 687 BCE to 1720 CE, they were also able to establish a variable periodicity of aurorae in the range of 9.5 to 11.5 years.

Usoskin et al. (2013) reported a 774-776 CE SEP (solar energetic proton) event calculated at >30 MeV (the Carrington Event of 1859 was similarly assessed as >30 MeV). This 775 CE event was determined by ^{10}Be deposits in polar ice samples and ^{14}C measurement in trees. The 774 CE event is the strongest spike in the last 11,000 years of cosmogenic isotope records (Usoskin and Kovaltsov 2014). Strong aurorae were recorded in some historical records in 770 and 776 CE (Yau et al. 1995).

If the 775 CE event took place at the maximum part of the Sun's periodic activity, then subtracting the average 11.4-year periodicity would mean that in 764 CE, the Sun would only just be past its maximum peak. The variable periodicity of aurorae for this time suggests that 764 CE could be consistent with a peak in solar activity, leading to stronger aurorae.

I investigated whether the location of the South Magnetic Pole (SMP) (the Dip pole, where the lines of electromagnetic force are vertical) might have a bearing on the strength of the aurora at Burratorang Valley. Historical records of the SMP exist from 1590 CE, and the National Oceanic and Atmospheric Administration (NOAA) publishes a historical declination map (Historical Magnetic Declination Viewer²⁴) from that date. During that period, the SMP had been located along the coast of Antarctica, moving west from approximately 170° W longitude to 130° E at present, which is directly South of the Great Australian Bight. Extrapolating the movement back to 764 CE, assuming that the movement has been west along the Antarctic coast, would put the SMP somewhere under South America, opposite Australia. If anything, that would mean that aurorae would be

²⁴ NOAA Historical Magnetic Declination (n.d.), National Centers for Environmental Education, available at: https://maps.ngdc.noaa.gov/viewers/historical_declination (Accessed 3 July 2016).

centred further south from the Australian continent in 764 CE, but any movement before 1590 CE is only conjecture.

Further evidence of a possible peak period coinciding in 764 CE was inconclusive. McCracken et al. (2001) examined the Gleissberg periodicity of sunspot activity (an 80-year cycle which has a peak in solar particle events in the middle of the cycle) between the years 1561 and 1994 CE. Working backwards from the peak year 1620 CE of the 1580-1660 CE Gleissberg cycle (ibid.: 21602) in 80-year increments, the closest peak to 764 CE is 740 CE, which means that 764 CE is on the 'shoulder' of the peak in that cycle. Steinhilber et al. (2009) used ^{10}Be records from polar ice to establish a Total Solar Irradiance (TSI) record for the Holocene over the last 9300 years. This 40-year cycle (ibid.: 3) does not show any peaks near 764 CE. Rather, it shows a possible minimum around 700 CE.

Using 775 CE as a peak in the various estimated solar cycles (11, 11.4, and 11.8-year cycles), I extrapolated backwards to 189 CE (586 years). None of the results shows the 189 CE eclipse occurring near a peak in solar activity. Using the first solar maximum year reported (1620 CE), the 189 CE eclipse would have occurred on the shoulder period extrapolating back using the 80-year Gleissberg periodicity. From historical records, Chinese aurora accounts show activity on 24 November 195 CE (Yau et al. 1995: 2). This is pushing the data to its limits and is only a rough first-order estimate: there is little evidence for auroral activity in 189 CE or that being a peak of any solar cycle maxima estimates.

As for criterion #3, Rasuly (1996: 73) found that Katoomba, in the Blue Mountains 40 km from the centre of the Burragorang Valley, has the highest number of thunderstorm days, and the highest thunderstorm rainfall annually, in the entire Sydney Basin (which extends from Newcastle to Wollongong). Rasuly (ibid.: 199) also found that thunderstorm frequency is highest in the Spring and Summer (October to February) in the Sydney Basin, with a peak in November. Therefore, I reduced the ranking of eclipses occurring outside of this time frame. Thunderstorms are also more likely to occur in the afternoon and evening, as they tend to form at the warmest and most humid times of the day. Therefore, the highest ranking was given to eclipses that were visible at totality in the late afternoons or evenings from October to February.

Another line of evidence for the time of year the story may have taken place is about the Aboriginal leader following a native bee (*Tetragonula carbonaria*) to its hive. Honey was a food source for Aboriginal peoples and bees are most active from November to March (Dollin et al. 2000). This indicates the story may have occurred at a time between late spring and early autumn.

We developed a ranking system to estimate how well each candidate fit these criteria (rejecting any that did not meet criterion #1). The point system was intended to reflect the probability of each category supporting the data. For example, aurora activity is difficult to determine, so a combination of historical accounts and the year being within the solar maxima attained high rank, while those candidates not meeting the criteria were given a very low rank. The next two categories reflected the probability thunderstorms would occur at a particular time of the year and day. Since thunderstorms can occur at any time of the year or day, the point system is not as far removed between the top and bottom ranking and worth less overall.

Aurora Activity

- Eclipse coincides within the peak solar cycle and records of Aurorae visible on that year can be identified. **5 points.**
- Eclipse coincides with a peak in solar cycle on that year but is not mentioned in the historical record. **3 points.**
- Eclipse does not coincide with a peak in solar cycle on that year or in the historical record. **1 point.**

Time of Year

- The eclipse occurred in November, coinciding with a peak in thunderstorm activity in the region. **4 points.**
- The eclipse occurred in the period between October and February but not November, coinciding with the period of more frequent thunderstorms (and bee activity). **3 points.**
- The eclipse occurred in the period between March and September. **2 points.**

Time of Day

- The eclipse occurred in the afternoon or evening. **2 points.**
- The eclipse occurred in the morning. **1 point.**

Each candidate is ranked using the following guidelines:

- **10-11 points:** Highly supported by data
- **7-9 points:** Moderately supported by data
- **4-6 points:** Poorly supported by data

For each eclipse event, the combined scores were ranked as follows: 764 CE (9), 189 CE (6), and 196 CE (4). None of the candidates received a top ranking of ‘highly supported’. Of the three candidates, the 764 CE eclipse best fitted the description in the story but is only moderately supported by the data.

9.3.5 Discussion

We concluded that it is plausible a thunderstorm, solar eclipse, and auroral display could have occurred at the same time at the Burraborang Valley. Our best fit date to the description, assuming this event occurred within the 3,400-year time frame of this analysis, is on the afternoon of 26 October 189 CE or 28 November 764 CE (the latter achieving a higher ranking). We acknowledge that this is inconclusive and an aurora and eclipse happening simultaneously is highly improbable, but not impossible.

It is also possible that the Burraborang story is an amalgamation of two or even three events in the sky at different times. Certainly, a total solar eclipse and a strong aurora (at night) at different times would be memorable (for example, the 764 CE eclipse and the 774-775 CE auroral event), and incorporating them into a single story featuring the more frequent appearance of a thunderstorm could add a dramatic element to serve a mnemonic function.

It is equally plausible that this is a description of a witnessed natural event that occurred much earlier than the period of our study. With an Aboriginal presence in the Burraborang Valley stretching back at least 15,000 years (Attenbrow 2002: 3), the story could be much older. Aboriginal oral traditions are flowing and dynamic, not static in time. Oral traditions often incorporate new information and new events. This may be an example of

this, but it remains uncertain. A key question often asked about Aboriginal oral traditions is how long they could be transmitted from generation to generation without loss of fidelity? Hamacher and Norris (2009), and Hamacher and Goldsmith (2013) demonstrated that records of volcanic and meteoritic events in Aboriginal oral traditions extend back from 4,000 to >10,000 years ago. Nunn and Reid (2015) found oral traditions of sea level change from Aboriginal communities around Australia's coastline date back over 7,000 years. Research by Kelly (2016) may explain the mechanism by which oral communities can make 'vast stores of knowledge memorable' for long periods. Kelly's research focused on the concept of a memory code created using fixed objects such as landscape or night sky to encode memory over long periods. Thus, the idea that the memory of a rare natural event in 764 CE recorded in oral tradition surviving to 1933 is entirely plausible.

In reviewing the sequence of events witnessed by the Aboriginal leader, one sequence at the end was of concern to our hypothesis: 'Then came the tornado. With the wind the lights waved out and the clouds passed, and the night (for it was really night then) showed starlight and clear.'

The time of totality of the 764 CE eclipse was in the early afternoon. Astronomical twilight (when the Sun is 18° below the horizon, and the sky is effectively dark) was not until 19:54 on the evening of 28 November. What happened in the intervening time between totality and the sky becoming dark? We suggest one possibility is that the 'tornado' was the arrival of the thunderstorm (Figure 9.9(A)), which had been coming from the west but had not reached the Aboriginal person mentioned in the story. Thus, the person was able to see the sky during totality to observe the Aurora Australis. Before totality was over, the thunderstorm passed overhead, blocking off the view of the sky, and reducing the light level significantly. Thunderstorms in the Blue Mountains can be very large (Rasuly 1996: 47) and take some time to clear to the East. Rasuly (ibid.: 49, their Fig. 2.10) also shows that they start over higher terrain to the west of the Blue Mountains in the time 13:00 to 16:00 and move eastwards in the time 16:00 to 19:00 (while still being active in the Burragorang area). So, it is possible that it was nearly dark by the time the sky had cleared, and that the story, while not being detailed regarding time, may have reflected the sequence of events. The night would have fallen six hours after the eclipse.



Figure 9.9 (A) *Supercell thunderstorm, Lismore, NSW (Jason Paterson)*, (B) *Tornado at Bathurst, NSW on 16 December 2015 (Ray Pickard)*

Another possibility is that the ‘tornado’ in question was a meteorological tornado (Figure 9.9(B)). On 20 November 1994, an estimated F0/F1 tornado struck Yellow Rock in the Blue Mountains, so tornadoes have occurred there²⁵. As most tornadoes are concurrent with thunderstorm activity, both could have occurred on the day in question.

9.3.6 Conclusions

We determined that the Gundungurra story recorded by Peck (1933) is a *plausible* description of the simultaneous occurrence of a thunderstorm, a total solar eclipse, and the Aurora Australis observed by Aboriginal people in the Burragorang Valley and incorporated into oral traditions. We determined that this could have occurred on 28 November 764 CE, given the best fit to my analysis. However, there is no recorded documentation or scientific data that demonstrates an aurora was visible during the solar eclipse during the years in question.

While there are many assumptions and variables in my analysis, it is a useful exercise in evaluating Aboriginal oral traditions for descriptions of natural events in a rigorous and systematic way. The methods used for analysing this story show promise for future research into plausible descriptions of natural events in Aboriginal oral traditions.

²⁵ List of Southern Hemisphere tornadoes and tornado outbreaks, viewed 17 August 2016, https://en.wikipedia.org/wiki/List_of_Southern_Hemisphere_tornadoes_and_tornado_outbreaks

10

10 Analysis

10.1 Introduction

In writing Chapter 2 on Methodology, which was done before most of the fieldwork, I was torn between the two main disciplines of this study, cultural astronomy, and anthropology. Notwithstanding that cultural astronomy is the ‘anthropology of astronomy’ (Platt 1991: S82), there are a lot of uncertainties in the methodology of cultural astronomy, particularly given that anthropology is a much older discipline with many years of development in theory. Ruggles (2011: 2) while saying that cultural astronomy is ‘a science asking social questions’, other than some work by Lopez (2015), there is little methodology extant for ethnoastronomy.

In the end, this is a PhD in Ethnography, which is a data-gathering tool for (big-’A’) Anthropology, and while the field of study is cultural astronomy, I must use the methodologies of anthropology to analyse the data from this study. In this study, I have chosen thematic analysis and mythological analysis.

10.2 Research questions

Here is a good point in this document to remind the reader of the original research questions in Chapter 1:

1. The first hypothesis of this study is that Aboriginal stories were transmitted geographically from community to community, and in the process retained the major theme of the story but may have incorporated changes which will demonstrate that the story underwent modifications during travel.

2. The second hypothesis concerns the routes of transmission of the stories. As will be described, songlines are routes of travel for trade, including trade in stories and culture. This second hypothesis is that in the geographical area of the study, songlines would have been the major routes of transmittal of stories, and it will be attempted to identify the likely routes of transmission in stories studied.

10.3 Thematic analysis

10.3.1 Analysis process

In an attempt to place my analysis of the data from the study into a recognisable research category, a review of the subject quickly established that it is (1) qualitative research, and (2) the type of qualitative research is ethnography (Dey 1993: 17), shows 40 different types of qualitative research, of which ethnography is one).

I had already nominated thematic analysis as the analysis methodology for this study, and in anticipation of the final analysis, I had studied enough of the subject to develop the codes used in Chapters 4, 5, and 6 and the subsequent 14 themes. I then started to explore the different approaches to thematic analysis in seeking a path to answering my research questions. I soon discovered that:

- Coding and the subsequent themes are mainly used for analysing interviews, particularly long and complicated interviews. My story and knowledge collection process certainly qualified as ethnography, but unlike ethnography, which is attempting to find a deep understanding of large parts of a culture, my data is based on just several aspects of the Aboriginal cultures I am investigating.
- Themes in thematic analysis are linked to the data (in this case the codes developed from the literature review and the ethnography), but unlike thematic analysis linked to grounded theory, phenomenology, and other assumed pre-existing frames of reference, my research is looking for more of a ‘small picture’ answer to my research questions.

I then went back to my coding and themes, which were a bit a muddle, having been developed on the fly, so to speak, and tried to see whether they would benefit from a more systematic approach. Saldaña (2013: 13) suggests that codes → category → themes → theory, and that the process goes from ‘real’ to ‘abstract’ and ‘particular’ to ‘general’. I could see the process in my development of codes and the consolidation into themes, but

there didn't seem to be a better way to work with my data. I had a look at NVivo as a possible solution and could see that my communities could be Cases, my themes could be Nodes, and my codes could be Case Nodes, but it was clear that I would have been better off to have started the project with NVivo than try to back-load it at the analysis phase. In any case, NVivo did not seem to offer any in-built analysis tools other than searching for words and creating word clouds. I'm sure it has deeper capabilities, but they didn't appear to offer me any solutions.

I then used Excel to try and put all the data in a format which might give me a clearer picture. Appendix 4 is a matrix of the 72 codes used in the study with the 14 themes (which are shown in Appendix 5). Where a code 'coded' to a theme, the theme column is marked with an 'X'. One code can 'code' to more than one theme when using the data. The outputs of the process were the spreadsheets that created the stacked column charts used in Chapters 4, 5, and 6.

I wondered whether a similar chart with each of the three regions as variables might clarify the data. Fig. 10.1 shows this.

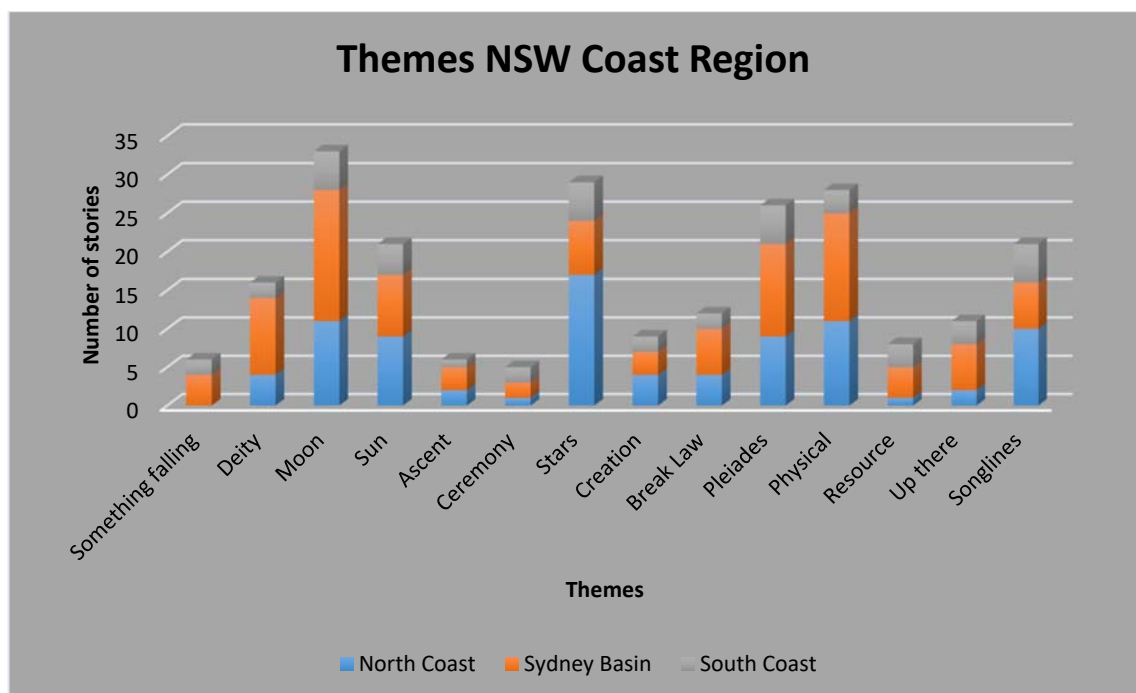


Figure 10.1 Themes by NSW Coast region

That chart can be compared to the raw theme data chart shown in Fig. 10.2:

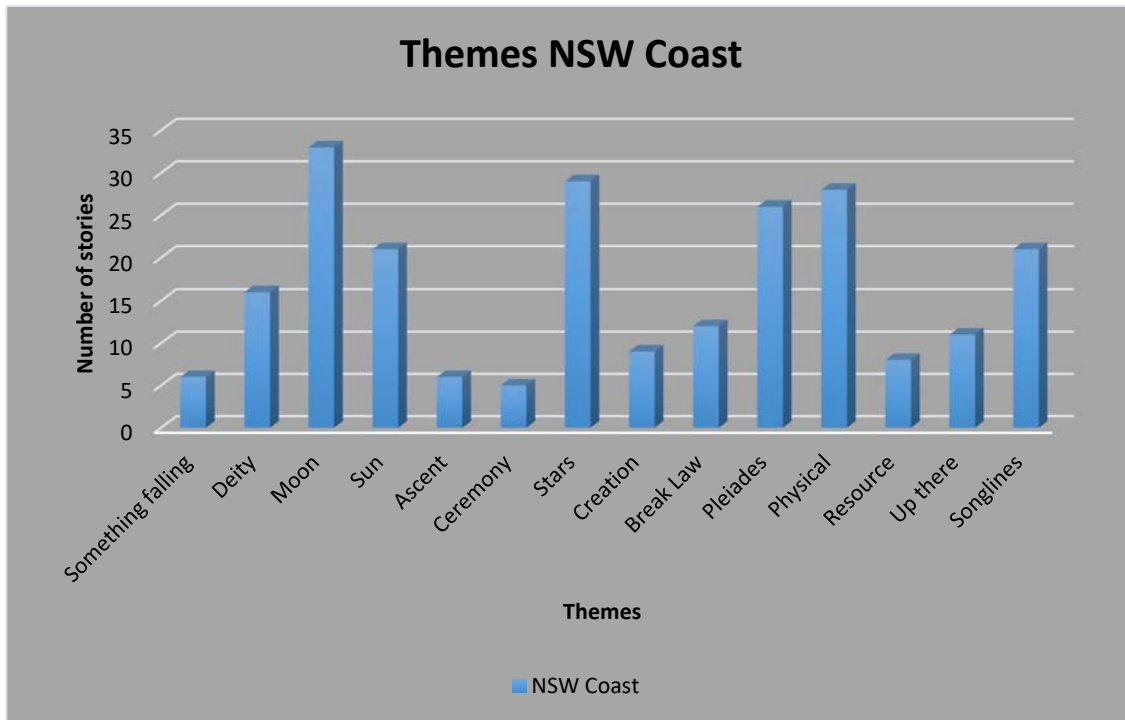


Figure 10.2 Themes NSW Coast

Both charts show some useful trends. Fig. 10.2, which is raw numbers of stories plotted against themes, is useful in picking the most important themes in the data. After using a cut-off of 10% of the total data items, the following themes remained:

- The Moon
- The Sun
- Characteristics of individual stars
- Seven Sisters
- Description of physical features and the environment
- Connecting songlines to stories

On pure numbers, the Sydney Basin had 102 coded items, the North Coast 85, and the South Coast 44. Why this is, is not clear, as there was less ethnography (but maybe more literature survey) in the Sydney Basin, with about the same number of communities as the North Coast. The South Coast is a single community, so the lower number of items is not surprising. Looking at the raw data, most themes had a similar spread of numbers between the three regions, so this may simply be a case of the number of sources researched, and participants interviewed resulting in a similar spread in the results.

I had used the correct approach to coding and themes ('narrative coding', Saldaña 2013: 131-136), but it all needed to be checked by a review to see if the codes and themes were the correct ones to reflect the data and answer the research questions. If they turned out to be correct, then the themes had to be analysed to see if they supported the data and met the theoretical approach of this study, which is structuralism as applied to mythology. This analysis required a clear definition of each theme, what information informed it, and how it could be used in developing the thick description, which is the intended result of the thematic analysis. For this analysis, only the six themes (above) were investigated.

10.3.2 Theme analysis

Taking the selected themes in order:

1. The Moon – there were surprising differences between the three regions regarding the Moon and how it fitted into stories. For the most part, the Moon is male, except for a difference between a few participants on this point. On the North Coast, the Moon was involved in a story about being speared, and recovering, which may be a reference to the Moon appearing to 'die', and then renew, after three days. In the Sydney Basin, the Moon was used to illustrate several unwanted behaviours, such as jealousy, and even plays a part in illustrating what happens to people who break the Law. On the South Coast, the Moon illustrates an origin story, and is the 'wrong person' in a Seven Sisters story. On both the North and South Coasts, there are stories that the Moon was created by a boomerang thrown into the sky. There were some Moon gender differences between the communities.
2. The Sun – while there were a lot of mentions of the Sun, who is usually female (except for Grandfather Sun, as suggested by a Yuin participant), there were few stories. On the North Coast, there is a story about the pelican being jealous of the emu, resulting in the creation of the Sun, and there is speculation about the Sun having a companion, which, if it travelled with the Sun, would burn up the Earth. In the Sydney Basin, there is a belief that the Seven Sisters, not the Sun, bring the heat in summer, while the Sun just brings the light. On the South Coast, people are buried facing east/southeast (head to west) to face the rising Sun (also done by the Darkinjung of the Sydney Basin).
3. Characteristics of individual stars – this theme probably had the most individual stories, but also had one common theme. Usually, a cultural story ended up with

one of the characters becoming a star or group of stars in the sky. On the North Coast, *Birrugan* becomes the Southern Cross and his wives, the Pointers, but he is also the Morning Star (Venus). The Dunghutti on the North Coast also call the Evening Star (Venus), the ‘travelling star’, as it does move around from evening to evening. In the stories of the Seven Sisters, *Wurrannah* (the wrong man) consistently becomes Aldebaran (the Red Star). This is also a story from the Sydney Basin, and from the South Coast, where the Seven Sisters story relates to the Black Duck, and the wrong (men in this case) end up as the Pointers. On the South Coast, they also see a Black Duck constellation of stars at certain times of the year.

The process of characters in stories becoming individual stars is a theme not restricted to First Peoples like Australian Aboriginal peoples. Geoffrey Chaucer, the medieval English poet, in *The House of Fame*, talked about ‘stellification’, where characters became stars (Swinford 2013; 45).

4. Seven Sisters – the Seven Sisters is a consistent story up and down the NSW coast, and for that reason will be used in a mythological analysis in this chapter. The Seven Sisters stories in all the regions of the NSW coast are consistent in that they are seven, they are (mostly) young women, they (or one of them) are desired by a wrong person (according to the marriage laws), they are forced to flee to the sky, and often the wrong person ends up in the sky as a feature, but just out of reach. In a few cases, they are birds, rather than women, but in those cases, the ‘wrong person’ is the ‘wrong bird’. Their method of transport into the sky is often via a tree that grows into the sky. In both the North and South coasts, they are associated with winter and summer, cold and frosty weather, and the springs and streams. This connects to the belief that they bring the warmth, not the Sun, and are bringers of resources and abundance.
5. Description of physical features and the environment – this is a complicated theme, as it covers a wide range of features of Aboriginal life and the environment. They range from the cosmological question of ‘how are the Earth and Sun organised?’ to the question of ‘how is the sky held up, and how did it get there?’. There are many descriptive stories explaining how things work, how they originally ‘got there’, and how fish traps and fishing with dolphins worked. Not

everything was connected to the sky, but fish traps worked because Aboriginal peoples understood that the Moon controlled the tides, which then filled and drained the fish traps. Almost any phenomenon seen in the night sky, such as ‘why is the Milky Way smoky in appearance?’, could be answered with a story in explanation.

Use of the sky in managing resources and life, in general, must have been common. There is some evidence that Aboriginal peoples on the NSW coast observed the movement of the Sun in regards to the regularity of the year and seasons, and that certain things in the night sky (such as the Seven Sisters) could tell people that winter/summer is coming, certain resources are available, the whales are going up/coming back down the coast.

6. Connecting songlines to stories – as this study places much emphasis on songlines as the possible carriers of stories, this theme was of great interest. The ‘local’ songlines on the North Coast were varied, and for the Bundjalung, they appeared to be mainly routes of travel over what is a large area with serious mountain ranges. From the research, it appears that a number of the routes were for people to travel over the QLD border to the Bunya Festival every three years and that the other routes were means for people from the south to access those routes. Given the number of *bora* initiation sites along these routes, they would also have had ceremonial purposes. The Dunghutti had their koala songline leading from the coast to an important ceremonial site in the foothills of the Dividing Range.

In the Sydney Basin, songlines were exceedingly difficult to find due to disruption of culture. A Gai-mariagal participant was quite knowledgeable about the ceremonial aspects of North Head in Sydney (Car-rang-gal), and that the pelican was created by *Baiame* there. He said a pelican songline runs from there north to Yengo, through Gamilaroi Country, to Uluru, and then to Lake Eyre and back via the Snowy Mountains. I have also proposed that an emu songline runs to or from Barrenjoey on Sydney’s Northern Beaches, northwest and possibly via Mt. Yengo, eventually joining a songline that I have been told about that came from the centre of Australia. It appears that Mt. Yengo, which has been suggested is the Uluru of the sandstone country (i.e., Sydney Basin) (Jones 1993: n.p), plays a part in songlines in the Sydney Basin.

On the South Coast, I found numerous short songlines connecting the Country around Gulaga and Biamanga Mountains, some of which were likely to be ceremonial, and others which might have been routes of travel. There also appeared to be songlines running over the Dividing Range into the Monaro and up to the Snowy Mountains, but these are yet to be confirmed. Another songline connects to the Seven Sisters, as there is a whale songline running offshore of the coast along Yuin Country (and the Seven Sisters sing the whales up and down the coast each year).

The major finding in this theme are the two long-distance songlines, the Black Duck songline, and the Black Swan songline. Both of these runs along the coast north-south for what appears to be part of the NSW Coast, and both have stories connected to them. The Black Duck songline has the most complete story, which is reflected in landscape and rock art features in both the north and the south of the South Coast. The Black Swan songline is hazier, being based on a single story in Bundjalung Country and a possibly connected story from Moruya and Wagga Wagga in the south. Other participants have confirmed their belief that both songlines ran through their Countries and provided various levels of support. The other, even more, unsupported proposal on these songlines is that they turn west in the north of the North Coast, cross the Dividing Range, eventually turn south via Narran Lake in NSW, and in the case of the Black Duck, go to Mt Kosciusko and via the Snowy River to the Gippsland (VIC) coast and back up to NSW. The Black Swan route may be more westwards, passing the Coorong (mouth of the Murray River in South Australia), and coming back to the coast via Wagga Wagga.

10.3.3 Which theory?

The data mainly consists of stories/myths, so which theory of myth best suits the data when coming up with a theoretical construct? Looking at structuralism first, as I suggested this in Chapter 2, I had written down a quote: ‘structures produced by the mind are manifest in various cultural forms such as kinship systems, myths, and totemic classifications’ (Messer 1986: 9). This explanation suits Aboriginal cultures better than any other that I have seen. It appears to be related to Lévi-Strauss’ theory (the article by Messer was titled: *The Unconscious Mind: do Jung and Levi-Strauss agree?*). Regarding myth, I also looked at Jung’s ‘archetype’ as a guide to the development of myth in

Australia, but the more I look at his archetypes, the less I see of Aboriginal cultures. There are certainly some 'hero figures', as he describes one of the archetypes, but the Creator/ancestors in most Aboriginal cultures don't seem to fit this mythic mould. The only figure on the NSW coast which is in any sense heroic is *Birrugan*, who gets himself killed while fighting the neighbours and goes into the night sky as the Southern Cross, but there is no worshipping of him unless there are ceremonies of which I am unaware. Most of the other mythic figures, particularly those who end up in the night sky, get there by having done the wrong thing and have broken Law or convention. As such, they are object lessons in why people should observe the Law. Hardly heroic..... Even the Seven Sisters, who appear to be a foundation myth, do not fit into Jung's archetypes.

That brings me back to structuralism and Lévi-Strauss. His theories fit my observations and reading better than any other, and his development of mythemes also suits my intended evaluation of phylogenetic mythological analysis. This is notwithstanding the apparent move to post-structuralism in human study, which appears to have replaced structuralism with something which does not fit into the type of analysis that I am doing with the data from this study.

10.3.4 Theoretical construct

The difficulty in creating a theoretical construct using structuralism as the theoretical basis, and a set of data which is significantly smaller than Lévi-Strauss would have wanted to analyse the development of a whole culture from the mind, leaves me facing the question of whether I can actually come up with a thick description of the Aboriginal cultures of the NSW Coast and the transmission of stories and myth along the songlines. The correct thick description would be a description of the cultures of the NSW Coast as a whole, with the aspect of the transmission of stories and myths as one part of the description. Since I am not qualified to create such a description, either by acquired knowledge, or from the data produced by this study, I will attempt to create a part-description, based on the knowledge I have acquired through this study and others, and the data from this study.

10.3.5 Writing a thick description

Geertz, while describing the ethnographer's tool of thick description, said: 'the determining question of any example of it.....is whether it sorts winks from twitches and real winks from mimicked ones.' (1973: 16). That well describes the conundrum I

have found myself in. I haven't been recording winks and twitches, but stories connected to the larger 'cultures' of the Aboriginal peoples of the NSW Coast. Out of these, I am attempting to not only understand the Law and cultures behind the stories but how they might travel from community to community. The winks and twitches I am looking for are subtle similarities between stories and myths that show connections between communities.

Going back to the six themes that I further analysed, I looked at each of the themes and the stories from the North Coast, Sydney Basin, and South Coast, and found from two to four features of the stories for each theme. An example would be the Seven Sisters, and the features were:

- Seven in number
- Women
- Travelled to the sky
- Bring the cold/heat

I then plotted these for the Seven Sisters, and the other themes' similar features, against the NSW Coast regions, with the features that showed up in all three regions identified as 'common', as shown in Fig. 10.3:

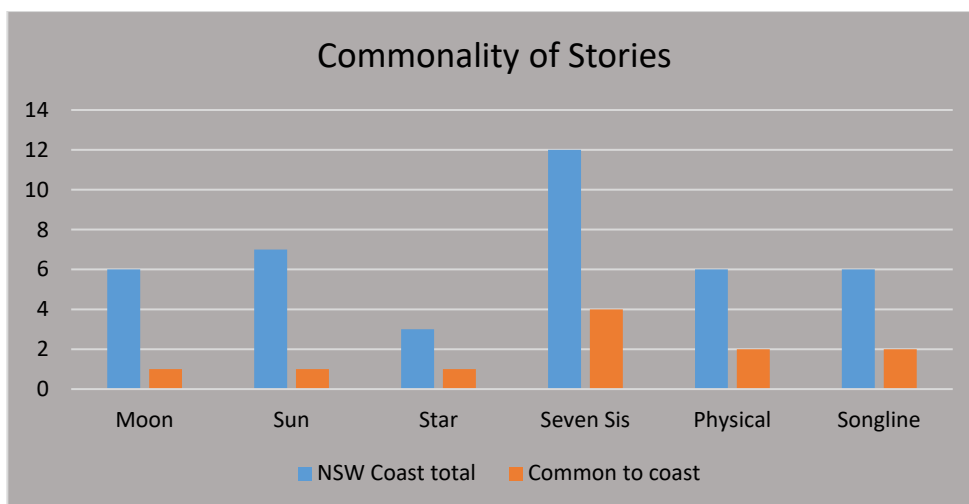


Figure 10.3 The commonality of stories vs total on the NSW Coast

This process began to show some trends in the commonality of stories, and being common, might permit a thick description to be attempted. It also might give me some sense of how the stories travelled on the NSW Coast.

How to write a thick description of 12 communities, each with their own culture, which were all disrupted by invasion and colonisation, and now have fragmented knowledge of their culture? Most thick descriptions based on ethnography are done from research notes and ethnographic observation of a single community with varying degrees of retention of the historical culture. The only way this can be done here is to drop the idea of a holistic ethnography, with its emphasis on all the features of the culture, including religion, economic and political systems, kinships and other relationships, and concentrate on one aspect of the culture, which in this case I will (as a good cultural astronomer) designate as ‘sky culture’. Sky culture is not a clearly defined field, even in cultural astronomy, and the closest I can find to this is Silva and Campion’s ‘Skyscapes’ (2015), which covers some subjects relating to cultural astronomy and archaeology. Nonetheless, sky culture, in the usage I intend, is a description of the cosmogony and cosmology of the described cultural group, with a more detailed description of the connection between the objects and stories seen in the sky, and the cultural standards of the group. This is particularly relevant to Australian Aboriginal sky cultures, with the strong belief in ‘what’s up there is down here’ (one of the final 14 themes). Using the final six themes and the commonality in the communities of this study, it is clear that three of the themes were significantly more common, being the Seven Sisters, songlines, and the physical description of features and the environment, and while the Moon, Sun, and stars had commonality in parts, only some aspects of that knowledge would contribute to the thick description.

In looking at the stories and knowledge collected for this study, on the surface, they show many differences, but drilling down into the information shows more similarities than differences. Language is a good way to examine this. Since I am concerned with sky cultures, I have picked one of the most common words concerning the night sky: ‘star(s)’. Using Wafer and Lissarrague (2008: 616-779), the following language groups were checked for the word for ‘star(s)’, and grouped by a rough phonetic similarity:

<u>Group</u>	<u>Language</u>	<u>Location</u>	<u>Word for ‘star(s)’</u>
1	Dhurga	S. Coast Bega to Jervis Bay	<i>djinggi</i>
1	Dharawal	S. Coast Jervis Bay to Sydney	<i>djindjingara</i>
1	Ngarigo	S. Coast (inland) Monaro	<i>dyinki</i>
1	Gundungurra	Sydney Blue Mts and south inland	<i>dyara</i>
2	Jiringayn	S. Coast west of Bega	<i>munawirra</i>
3	Sydney	Botany Bay to Hawkesbury to Blue Mts	<i>birrung, gimbawali</i>
3	Darkinjung	Hawkesbury to Hunter River	<i>giwanga</i>
4	Awabakal	Newcastle, Hunter River	<i>miri(yn)</i>
4	Gathang	Hunter River to Hastings River	<i>mirriyn</i>
4	Yaegl	mouth of Clarence River	<i>me:ri</i>
	Gamilaroi*	west of Dividing Range	<i>mirii</i>
5	Dunghutti	Hastings River to Nambucca River	<i>wupu</i>
5	Gumbayngirr	Nambucca River to Clarence River	<i>winda</i>
6	Bundjalung	Clarence River into QLD	<i>guyuhmgan</i>
	* not NSW Coast		

Table 10.1. ‘Star(s)’ word NSW Coast by language groups

Except the Jiringayn/Djiringanj, who seem to be an outlier in this grouping of star names (even AUSTLANG is a bit unclear about this Yuin language variant), there are five clear groupings in the phonetic examination of the star names, and they are geographically clustered. An interesting observation is that the Gathang/Awabakal/Yaegl grouping is very similar to the Gamilaroi *mirri*, and the Murawari *miingi* (the Murawari are west of the Gamilaroi). Both those language groups are located west of the Dividing Range, but previous research on the Gamilaroi suggested that they travelled to the edge of Gathang language country for ceremony in the Mt. Yengo region, so perhaps the usage spread in one direction or the other. It is well known that the Gamilaroi marriage system is the

possible source for the common system of four sub-sections and female descent (Howitt 1904: 199), so possibly the Gamilaroi were the source of some language on the NSW Coast.

10.3.6 The Thick Description - background

The Saltwater Aboriginal peoples of the NSW Coast, while not having completely unified cultures, certainly showed a strong commonality in cultures, particularly in their marriage and kinship systems, spiritual beliefs, and other elements. Their economic and resource management systems varied more, depending on their location and access to different resources. Languages, as reported since colonisation, and as have been recovered more recently, have been suggested by Wafer and Lissarrague (2008: 5-14) to have numbered around 35 for the entire state of NSW, and included possibly up to 120 dialects. Of these dialects, only the Bundjalung language group in the area of this study has had a detailed study. The 12 language groups included in this study have similarities in their language and dialects to their neighbours, with the implication that neighbouring communities would have had the ability to converse. These commonalities suggest that it was quite likely that many of the communities along the NSW Coast would have had connections, through marriage, ceremony, and, based on Kerwin's (2010) research, trade. Enright (1932: 102) who studied Aboriginal cultures on the North Coast, said 'Investigations made last month showed that a stream of culture was moving down our eastern coast', suggesting strong connections between the communities on the North Coast, at least (he was referring to historical movement).

The sky cultures of the Aboriginal peoples of the NSW Coast is the subject of this study, and a description of this specific aspect of culture requires some background. 'Sky culture' has already been defined, but some discussion of how unified the sky cultures are along the NSW Coast is necessary. The example of the language group names for 'star(s)' certainly shows geographical grouping (Table 10.1). The commonality analysis of the final six story themes (Fig. 10.3) also showed strong links between at least three of the themes, and these will be incorporated into this description. Looking at the literature, Howitt (1904: 426-508), in his chapter on 'Beliefs and Burial Practices', has probably the earliest summary of the sky cultures of Aboriginal peoples, mostly in the east of Australia. He described a universal belief that the Milky Way was a river in the sky, beyond which lay the 'sky-land' or 'sky-country' (ibid.: 432-433). This belief we know (and it appeared that Howitt understood) as fundamental to Aboriginal cosmology. Howitt also discussed

the ‘Tribal All-Father’ (ibid.: 488-508), and described the various names used by different communities, while suggesting that there was a unity in this belief, and that in many southeast Australia communities, the link to the All-Father was through the initiation ceremony, which is, itself, very similar throughout the area of this study. The All-Father was generally considered to be the Creator of the Aboriginal peoples, so this, along with the belief in other creator Ancestors who created the landscape, can be used to describe the Aboriginal cosmogony of southeast Australia.

10.3.7 The Thick Description

The Saltwater Aboriginal peoples of the NSW Coast had, before invasion and colonisation, similar cultures, with languages differing only slightly between neighbouring communities. Their cultural principles encompassed a wide range of practices, many of which were similar. These included marriage and kinship rules, many based on the Gamilaroi system, spiritual beliefs including ancestral creation of the landscape and an ‘All-Father/Sky-Father’ who created the people and gave them their Law. Their cosmology included a ‘sky-country’ and a river in the sky (the Milky Way) that variously was their origin, the current location for the ‘All-Father’, and either on it or behind it, their eventual place of spiritual rest. They had a strong belief that ‘what is up there is down here’, in that the night sky reflected the cultural rules, stories, and beliefs of the people, and could be used to teach and illustrate these to people who were learning their Law.

The sky cultures of the peoples of the NSW Coast reflected their beliefs and practices, and the many stories and descriptions of things that appeared in the night sky were directly descriptive of various belief systems. ‘People’ could come down from the sky and interact with each other and people on Earth. They could do things in accordance with Law, or they could break the Law, in which case they became an illustration of what not to do. In the latter case, they usually ended up back in the sky in a permanent position that told the story of their wrongdoing. People on Earth could also break the Law and end up in the sky to illustrate their wrongdoing. The sky was a storybook that was also a rulebook, and with an orally transmitted culture, what better way to maintain knowledge than to reference it to the unchanging night sky? Aboriginal peoples have lived under the same sky in Australia for at least 65,000 years, and before television, their entertainment in the evening would have been to look up at the sky and either teach or learn the lessons there.

The stories from the people participating in this study were many and varied and ranged from entertainment to serious illustration of Law. All Aboriginal stories have some message content, however much they are limited to the allowed knowledge of un-initiated persons. The many stories collected have been analysed for themes and condensed down to a short list, all of which have both practical and cultural purposes. The condensed list has been further analysed for commonality between the different language groups and communities of the NSW Coast, and a short list was determined. This list shows clear connections between versions of the knowledge contained in the stories between the groups and communities, but no clear evidence of transmittal between groups, much less any directionality.

The Seven Sisters stories showed the most commonality, and they had both illustrations of Law, and practical information to inform people about the seasons and resources. Information about songlines was also common, and the success in determining several long-distance songlines during the research indicated a connection between stories and travel up and down the NSW Coast. The description of the physical features and environment of the coastal region through the use of stories and knowledge in the night sky was probably a more local means of encoding knowledge about that specific Country but could also provide explanations for more general features of the environment.

10.3.8 A thin description

An interpretation of this ethnological description (as described by Geertz) of the Saltwater Aboriginal peoples of the NSW Coast is difficult, as the data is mainly historical, and there is practically no social discourse in the ethnography. A short (thin) description would be:

The Saltwater Aboriginal peoples of the NSW Coast had complex sky cultures which were fundamental to their belief systems about where they came from, what they should do and not do while on Earth, and where they will return after death. The night sky was a source of knowledge about all aspects of life and the Law and was used to teach and learn the correct way to live. Communities along the NSW Coast had similar beliefs and used similar stories to illustrate them, and no doubt, they exchanged stories and knowledge as a part of their cultural relationships with each other.

10.4 Mythological analysis

First, an apology to my participants and any other Aboriginal persons reading this thesis. The use of the words ‘myth’ and ‘mythological’ in this document is not in any way meant to deny the importance and reality of Aboriginal cultural stories to those to whom those stories belong. Western academic language can often appear to do that very thing when writing and discussing stories which are held important in First Peoples’ cultures, and the only reason that I am using these words in this study is that they clarify to those other academics just what I am talking about in regard to those Western academic disciplines. A second apology, just in case, is if I have inadvertently included any story or knowledge which may be considered secret-sacred to any reader. I had tried, through the Story Form used in the fieldwork, to ensure that participants can review any information given to me before I used it in my study.

In proposing mythological analysis as one of the two main methods of analysis in this study, I described the work by d’Huy using the phylogenetic methodology to analyse mythemes and trace their historical and geographical distribution. ‘Mythemes’ was explained in Chapter 2 as the product of Claude Lévi-Strauss’ research into myth, and his description of mythemes as ‘bundles’ within myths. d’Huy has cleverly used modern phylogenetic software to analyse myths, with the mythemes becoming the characteristics of the ‘genes’.

In the course of this study, I tried to understand whether d’Huy’s technique would apply to one of my objectives, which was to try and understand the movement and travel of culture along the songlines and travel routes of the NSW coast. Over the 3+ years of the literature study and fieldwork, d’Huy (and a new collaborator, Yuri Berezkin) have done further studies and published additional articles on both the methodology and the results, which have encouraged me to pursue this method. The most recent publication (d’Huy and Berezkin 2017) has expanded the method significantly, both through exploring several ‘world’ myths and by use of additional phylogenetic and correlational software techniques. In the 2017 case, they analysed 21 ‘motifs’ (according to Berezkin’s motif system), concentrating on the world myth/motif of the opposition between the Pleiades star cluster (Seven Sisters) and the Orion constellation. The main finding was that the ‘computational phylogenetic methods’ (ibid.: 120) are powerful tools to ‘study the evolution of mythology’, and in the case of the Pleiades/Orion motif, they strongly

suggest that the motifs spread out of Africa at the time of the early migrations. They also suggest that motifs are more frequently inherited (from previous generations) than borrowed from neighbours.

At the same time, I was getting some negative vibes regarding whether d'Huy's methods would be useful in analysing stories. At a cultural astronomy conference in 2017, I was told by a person considered to be one of the world experts in folklore that the methods would not work, which did not encourage me.

Finally, when it came to starting analysing the data, I felt I had little choice but to learn the methodology and the software, and attempt to see whether I could get any useable results. After a crash course via the manual and Help files of the phylogenetic software package, Mesquite©, I started trying to work out how my data would fit into a trial. To me, the most important aspects of the findings of the study were the long-distance songlines, but both of these described in Chapter 8 were connected only to two or three different stories, and there were simply not enough different characteristics to be extracted from the stories to make a suitable matrix to analyse. Phylogenetic mytheme analysis works on the same basis as what the software was designed to do; take a number of 'taxa' (which are individual organisms within a rank, such as 'phylum', which is a larger grouping), and using a number of 'characteristics' (such as colour, shape, etc) to create a matrix, which is then analysed using the software. Mesquite©, in this case, will create a phylogenetic tree, the tips of which are usually species and can show the correlation confidence in connections between the taxa (the nodes or 'branching'). In d'Huy's methodology, the taxa are the communities or groups of people who 'own' the different versions of the myth, and the characteristics are the different mytheme features of each version. The taxa in the case of my analysis would be 12 main language groups/communities in the study (two were left out due to lack of ethnographic investigation). The characteristics would be the individual features of the various versions of the same story. Given that the songline stories were not enough, I looked at all the stories collected through both the literature study and the ethnography, and it was quickly clear that the Seven Sisters was a common story from almost all communities involved in the study.

I then extracted 26 characteristics of the 33 data items (stories) from the literature and ethnography. These are shown in Table 10.2.

<u>Character</u>	<u>Number</u>
Winter stars	1
7 young women	2
man in love	3
bring frost/cold	4
one woman target	5
brings water & streams	6
brings warm weather & abundance	7
go into sky	8
man goes into sky	9
man becomes Alpha Tauri/red star	10
8 women, 7 return	11
red star looks after women	12
moon in love with	13
SS provide heat	14
SS go into ground, then sky	15
SS have initiation	16
SS are birds	17
Tree grows to sky	18
Magic digging sticks	19
7th sister banished	20
Wagalag sisters from Pleiades	21
SS going to dance, 7th late	22
SS stories come from the East	23
SS sing up whales	24
Gulaga elder sister to SS	25
Use Karambal character	26

Table 10.2 Mesquite© characteristics list for Seven Sisters stories

The matrix in Mesquite© was created, and as per d'Huy's original method, 500 iterations were analysed. The resulting tree showed promise, then it was discovered that two language groups, Awabakal and Darkinjung, did not have any reported Seven Sisters stories (which I am sure is simply an artefact of both the literature study and the limited/nil ethnography of those communities, and needs to be remedied in the future). They were removed from the list of taxa, and the matrix (Fig. 10.4) was analysed again (Fig. 10.5).

Taxon \ Character																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1 *Bundjalung	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	
2 Yaegl	0	1	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1		
3 Gumbayngirr	1	1	0	1	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	
4 Dunghutti	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5 Birpai	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6 Worimi	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	
7 Gai-maraigal	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
8 Gundungurra	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
9 Dharawal	0	1	0	0	1	0	1	1	0	0	0	1	1	1	0	0	1	0	0	1	0	0	0	0	0	
10 Yuin	0	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	1	0	0	1	1	0		

Figure 10.4 Mesquite© Ver. 3.6 Matrix table of Seven Sisters communities and characteristics

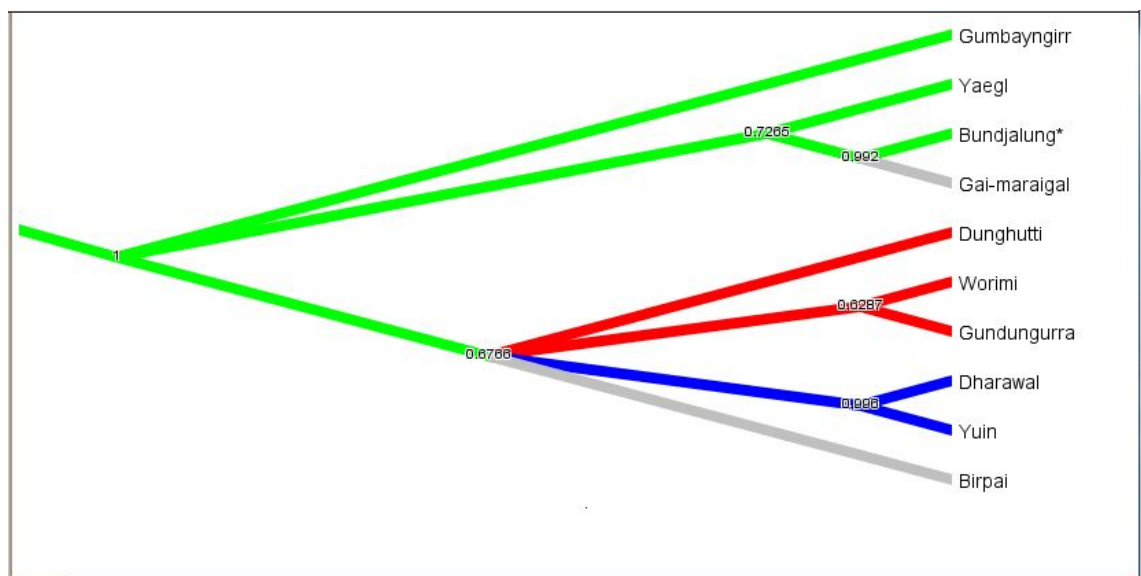


Figure 10.5 Mesquite© Ver. 3.6 Consensus tree Seven Sisters stories

This showed a clear grouping of communities regarding the characteristics of their Seven Sisters stories, with the Gumbayngirr version appearing to be the root version, and the surrounding Bundjalung and Yaegl community versions having a high consensus. I have left the Gai-mariagal version in grey because I believe the story I was told was the Bundjalung community version. The consensus from the North Coast communities then is about 67% with the other NSW coast communities. However, there is about the same consensus between the Worimi and Gundungurra communities, which do not have common borders but are only separated by one community (Darkinjung, for which there was no story). The Dharawal and Yuin communities have a 99% consensus in their versions, which was apparent from the raw data, and not surprising given the community

proximity. Re-looking at the data revealed that the Birpai did not have a version of the story in the data, after all (which is unlikely in reality), so they were also greyed out in the tree.

What does it all mean? It would be pretty easy to look at the consensus tree and say: ‘it looks like the story travelled from the Gumbayngirr community south along the coast to the other communities’. There is certainly a suggestion in the data that this might have been the case, but the consensus of 67% is not really strong enough to pin this down as fact, and there would probably need to be considerably more research into versions of the Seven Sisters story, finding the missing stories for some of the communities, and refining the characteristics to improve the consensus figures. For this study, however, the phylogenetic mytheme analysis does provide some suggestions:

1. Neighbouring communities seem to have similar versions of the story. This is not what d’Huy and Berezkin were saying in the study referenced; however, looking at their study in detail, ‘neighbours’ in the study were entire cultural areas, sometimes on the other side of the world. For example, ‘Australia’ is a cultural area in their study, and its neighbours on the tree are Southern and Eastern Siberia, Caucasus, and Turkestan. These cultural areas do not have as much connection in cultures as neighbouring communities within Australia.
2. The analysis appears to show that the stories originated outside the region studied, and possibly came to the Gumbayngirr community first, but I am sceptical about this and suspect it is an artefact of the high consensus of the stories on the North Coast. In order to prove the stories originated elsewhere, an expansion of the analysis to, say, the Gamilaroi to the west (who have similar stories) would have to be done.
3. The analysis also seems to show a ‘movement’ from the North Coast to the Sydney Basin and then on to the South Coast, but the consensus levels are not high, and this may also be an artefact of the analysis.

Where does that leave the mythological analysis of the data from this study? Given that the Seven Sisters story is not only ubiquitous throughout Australia (see Squire 1896, Tindale 1959, Johnson 2011, and Natale 2012), but is likely to be a world mythological theme, there remains a significant link between the Seven Sisters stories on the NSW

coast, and those of the rest of Aboriginal Australia. Such an analysis in itself would be another PhD study, but just the concept of the linkage between all Aboriginal cultural stories opens up the idea of cultural trading and sharing of stories, as suggested by Kerwin (2010: 37-50), particularly on the songlines/Dreaming tracks that are the basis of the stories. As discussed in Chapter 8, these songlines/Dreaming tracks were created by the Creators/ancestors who are the subject of the stories and must be travelled and sung to keep the story and the landscape renewed.

One consideration must be made in considering the use of the phylogenetic method for analysing the Seven Sisters stories, and that is that the majority of the versions of the stories used in the analysis are stories recorded by early ethnographers or researchers, and may have an inbuilt bias towards a specific structure of the story. It may even be that the recorders were biased by having heard similar stories from neighbouring Aboriginal cultural groups, and by recording what they 'expected' in the story. For this reason, the suggested results of the analysis may not be accurate.

While the combined effects of cultural and knowledge loss through invasion and colonisation have fragmented the stories still available along the NSW coast, there are non-quantitative signs that the connections in the stories are still there, if muted, today. The fact that I was able to make a case for a significant songline (Black Duck) up the South Coast, and with much less confidence, further up the coast and back via the inland, shows that it is still possible to analyse and recover some of the cultures from the NSW coast, and show that not only did some of the stories connect, but they travelled over long distances. Mythological analysis can be a contributor to the understanding of connections in stories, both in the sense of trading and travel, but also in the analysis of songlines, given enough data. In some parts of Australia, there likely remains enough cultural knowledge to make such analyses, but whether it is possible for the NSW coast is still unclear.

11

11 Discussion and Conclusions

11.1 Discussion

11.1.1 Major findings

There were eight major findings of this study into the astronomy of the Saltwater Aboriginal peoples of the NSW Coast, listed in order according to my estimation of importance:

1. The Black Duck songline and the Wauwilak Sisters connection, and The Black Swan songline (Chapter 8)
2. The results of the mytheme analysis of the Seven Sisters stories from the NSW Coast (Chapter 10)
3. Six important themes in the cultural astronomy on the NSW Coast (Chapter 10)
4. Four major themes in stories on the NSW Coast (Chapter 7)
5. The significance of landscape in the cultures of the NSW Coast (Chapters 5 and 6)
6. A thick description of the sky cultures of the NSW Coast (Chapter 10)
7. Local songlines in the NSW South Coast (Chapter 6)

11.1.2 Meaning of the major findings

When one is carrying out a study over a period of several years, it is all too easy to forget the excitement of finding unique bits of knowledge (unique to Western academia, that is), and then letting them get mixed in with the minutiae of the research process, where they just become more pieces of information to include in the reporting process. The most significant bits of knowledge to come out of this study are mainly related to the songlines

reported and proposed. In Chapter 8 I mentioned the dearth of published information on songlines, particularly of a scholarly nature, and other than the work done with the Seven Sisters songline, and the eventual showing of that knowledge through the exhibition at the National Museum of Australia, most knowledge is very local and very restricted to the community reporting the knowledge. My experience in putting together “local” knowledge from the North and South Coasts of NSW, as well as inland NSW and Sydney Basin, into a proposed “new” songline (once again, new to academia), has been exciting and has the potential to be useful in the following ways:

- Most importantly, the knowledge can be useful in Aboriginal community education and pride,
- this knowledge could be positive in the long-term aims of reconciliation between Aboriginal and settler communities, and
- several research disciplines, including anthropology, cultural astronomy, and cultural geography could benefit from this knowledge.

If the proposal for the complete circular route of the Black Duck songline eventually can be developed, then Taçon’s (2005: 6) suggestion that ‘there must once have been Dreaming Tracks across south-east Australia as significant and detailed as those of the north and centre’ could be confirmed, and might lead to further research into long-distance songlines in southeast Australia. While the Black Swan songline is not similarly supported in the data as is the Black Duck, the preponderance of short songlines on the South Coast would suggest that they similarly exist elsewhere on the NSW Coast, but may have been lost to cultural memory. Mowaljarlai and Malnic (2001), Kerwin (2010), and Taçon (2005) are but a few to suggest a crisscrossing of Australia by songlines, and surely that applies to the NSW Coast, as well.

The number of songlines identified or at least plotted in this study (from available information) prompts me to restate my understanding and admiration of the cultures of Australian Aboriginal peoples. While there is some research that suggests that “storylines” may be some basic feature of oral cultures worldwide, there has been no description that I have seen of such a widespread and complete accomplishment by First Peoples as the Australian songline network. If there were some way to nominate the songline network for World Heritage status, I would be gathering signatures, but in the

meantime all I can do is try and get the word out to the dominant society of Australia that we are sitting on the remains of one of the wonders of the ancient world, and we should be trying to save what is still known, and celebrating every bit of knowledge about songlines.

The mytheme analysis of the Seven Sisters stories of the NSW Coast using d'Huy's phylogenetic approach provided some interesting and provocative suggestions about origin and travel of major cultural stories, but unfortunately, no smoking gun. Like further research on songlines, there is an opportunity to expand this small study and use a much larger database of Seven Sisters stories to try and fit them into a picture of how this possible foundation story came to Australia and travelled around the continent. Like the Black Duck songline, I hope that I can continue to add to the knowledge in this area with further research. With the contacts developed through this study and previous studies, any future research studies should include participants as co-authors, as I have done with journal articles in the past.

While the themes identified in the thematic analysis and the discussion of major themes on the NSW Coast may seem self-evident when examining the stories and cultures of the Aboriginal communities in this study, there hasn't been, at least in my research through the literature, any attempt to identify the cultural linkage between stories and the sky cultures of the Saltwater Aboriginal peoples of the NSW Coast. This linkage, which has been confirmed in the themes from many stories and communities, shows that the connection between the night sky and the Earth and her people is close and on-going, also confirming the belief that 'what's up there is down here'. That expression did not make it into the final six themes by frequency, but I believe that it is such an accepted belief in Aboriginal cultures that it is not mentioned in stories as such. The resulting thick description of the sky cultures could be a useful tool for future researchers examining the cultural astronomy of the NSW Coast.

Finally, while some of my colleagues have been looking at the significance of landscape in Aboriginal cultures in their regions of study, the initial examination of the NSW Coast in this study has shown some very interesting examples of landscape and cultures, with plenty of room for future research into what are no doubt 'living landscapes' along the coast. Of interest would be further investigation into possible solar observatories used for ceremonial and resource purposes.

11.1.3 How findings relate to previous research

Previous research on the Saltwater Aboriginal peoples of the NSW Coast has been limited mainly to either archaeological research by McBryde (1963, 1974, 2000), Sharpe (1978, 1985) and others or general cultural/historical research. In the latter type can be found the work by Donaldson (2015, 2017), Bursill (2006, 2007, 2014), Kerwin (2010), Mathews (R. H.) (many 1897 to 1900), Organ (1993, 2014), and Steele (2005). My research, while complimenting some of the above, does not fall into any of those categories.

Rock art research has some significant connections to the findings of this study, and Bursill and Pankhurst have made very important contributions in this regard. Bursill had carried out a long investigation into the cultural aspects of rock art in the Royal National Park area and made the connection between the collection of rock art panels near Garie Beach and the Wauwilak Sisters cultural story from Central and Northern Australia. This connection was crucial to my understanding of the link between the Black Duck totem at Walaga Lake and the Wauwilak Sisters story that confirmed a songline that was subsequently proposed as transiting the NSW Coast, and possibly, the inland.

In respect to songlines research, Tonkinson (1972), Chatwin (1987), McBryde (2000), Mulvaney (2002), Donovan (2010), and Morrison (2015, 2017) all have contributed to the field, adding many different aspects of knowledge to this subject, but none had looked at songlines along the NSW Coast. Taçon (2005), as mentioned, suspected that there were long-distance songlines in southeast Australia, which encouraged my continued search for the evidence of such songlines.

The cultural astronomy of the Saltwater peoples of the NSW Coast had not been specifically studied before, but some researchers have included stories and other cultural features from this region in their wider research. These researchers include Gilmore (1932, 1934), Haynes (1966), Johnson (D.) (2011), Norris (2007, 2016), Fredrick (2008), Turner (2014), Leaman and Hamacher (2019), and Hamacher (2012). It was the work by these historians and cultural astronomers that made it possible to identify a need for research on the NSW Coast.

The actual findings relate to previous work in all the above categories:

- The findings add to the overall knowledge of cultural astronomy in Australia.

- The ethnographic data adds to, and fills in gaps, in the cultural stories known from Aboriginal cultures in southeast Australia.
- The findings on songlines, both long-distance and local, are all new to the field of songline research and provide a starting point for a more comprehensive study of songlines in the southeast.
- The connection of songlines, cultural stories, and rock art create a new approach to research in both anthropology and cultural astronomy, and the identification of the Wauwilak Sisters story in the rock art has significance in the study of Aboriginal religion in southeast Australia.
- The mytheme analysis of the Seven Sisters stories from the NSW Coast adds to d'Huy's study of the Pleiades/Orion theme worldwide and is also a baseline for the further study of this theme in Australia.

11.1.4 Limitations of findings

The findings of this study are, like most ethnographical studies, limited by the number of participants, and their cultural knowledge. In particular, the lack of support for ethnography in some of the language groups/communities, or lack of participants in a few communities, meant that some communities had no input into the data, other than through the literature study. As the literature was, in many cases, from early in the development of ethnological practice in Australia, this was not necessarily a bad result. Some of the early ethnographers, such as Mathews (1897, 1898, 1899, 1901a, 1901b, 1904) and Howitt (1904), had a clear understanding of the cultures they were working with and reported data on stories and cultures, which was particularly useful in this study. Balancing the literature source data with the ethnographical fieldwork data was both difficult and rewarding in this study. Not only were there conflicts between the two in respect of the same knowledge, but there was the problem of the 'filters' that existed in both cases. The literature source data was filtered in many cases through outdated ethnographic and anthropological theories, as well as the natural reticence of the historical Aboriginal sources themselves to reveal cultural knowledge. This same reticence applied to my own ethnographic practice, compounded by, in a few cases, participants having obviously limited cultural knowledge, or worse, distorted knowledge.

There is no getting around the fact that due to colonisation, marginalisation, and racism, the cultural knowledge of many communities in this study was limited. This has led to them having a reduced voice, not only in this study, but in the qualitative research processes that Smith (2005: 88) describes as needing decolonising. I have attempted to counter this reduction in voice by following Smith's suggested checklist (2012: 175-176):

- Trying to make the study relevant to the communities studied,
- Incorporating a 'giving back' component to the study,
- Attempting to balance any negative outcomes, such as creating conflict within communities about the 'right knowledge' with the positives of using all the knowledge gained to make new insights and reawaken some cultural knowledge,
- And, using an ethical research framework to make the process accountable to not only the university, but to the communities by giving a sense of owning the process.

Another aspect of the limitation of sources in this study can be described as the 'knowledge problem'. Gostin and Chong (1994) have, in the process of describing "Aborigines and the Environment", described the difference between the Aboriginal way of acquisition of knowledge, and that of European academic tradition. For Aboriginal people, knowledge was acquired through the 'collective wisdom of the group' (ibid: 148) which was often learned through Law, and through acquiring specialised knowledge in stages (often related to initiation). European knowledge acquisition is 'an individual search driven by specialist interests backed by open access to the accumulated knowledge of past generations stored in written form' (ibid:148). This difference is significant, and I can attest to feeling the difference when talking to Aboriginal people whose acquisition of knowledge was in the traditional manner (compared to my European approach). I can only marvel at the ability of such early ethnographers as Mathews and Howitt to bridge this gap, which, according to some suggestions, was possible due to their status as initiated men, and can only hope that I have done my participants justice in reporting their knowledge. Meyers (1986: 139) has described my relationship with the ethnographic participants in this study well:

In presenting [I]ndigenous informants as "teachers", most researchers express their humility as novices before the complexity of local understandings. This has produced something of an epistemological revolution. Anthropologists do not

pretend to complete comprehension of the subjects they discuss with Aboriginal people. Indeed, they are at pains to incorporate this fact into their theoretical positions, distinguishing analytic models from the metaphors and personal experience of their informants. Recent accounts take their strength from a sense of intimacy with Aboriginal people and the privilege of their friendship. The knowledge of individuals comes from long and continuing associations with communities. A feeling of the personal, emotional quality of Aboriginal life is increasingly present in ethnographic accounts and coming to take on theoretical priority.

In respect to the other source of knowledge, in the end I was not able to do more than just screen the literature sources in regard to the effects of colonisation on the recording of stories and knowledge. There may have been some bias in the writing of such stories as the Seven Sisters in the sense that the European recorders may have had pre-conceived ideas of what such a story contained, but there seemed to be enough difference in the details of the stories that pointed towards different versions in different communities, so it is possible that the bias may not have been enough to affect such analysis methods such as the phylogenetic analysis.

The aim of finding linkages between trade in stories and routes of trade, such as songlines and Dreaming tracks, was never fully realised in this study. While the stories were found, and evidence of a connection between communities in their stories (such as the Seven Sisters) was also found, there was, in the end, no way to connect the trade in stories to the songlines that were reported, except the phylogenetic connections in the Seven Sisters stories. This falls into the category of “surely that was the way it took place” with no real supporting evidence to prove the hypothesis. Hopefully, research in other areas of Australia may support this.

The other clear limitation of this study was the destruction of Aboriginal cultures on the NSW Coast by invasion and colonisation that was evident in the knowledge of the communities with which I was working. Stories were often fragmented, and in some cases, stories were clearly from other communities, which is not surprising, given how Aboriginal people were moved from their Countries and into mixed community situations like missions and boy’s homes. I was often quietly told about the history of the community I was visiting, including the massacres that continued even until the 1850s,

and which are still being documented along the NSW Coast today (Centre for 21st Century Humanities n.d.). The histories often included the dispossession of ancestors, and the more recent attempts to put back together the family histories, connection to Country, and stories connected to the community. As I have mentioned before, the destruction of cultures along the NSW Coast appears to be almost a direct relationship to the distance to Sydney, and the arrival of the First Fleet in 1788. In Chapter 2, Disciplines, Theory, and Methodology, I mentioned the difficulty in establishing the ‘authenticity’ of literature sources, given the effects of colonisation, and while I think I have done a reasonable job of weeding out stories and knowledge clearly falling into this category, there will no doubt be reviewers who will disagree with some of the stories and knowledge that has been used in the study, and while I might be convinced in some cases, I don’t think that this will change the major conclusions.

A consideration when examining the results of the ethnographic fieldwork could be a possible limitation of the findings. This concerns the power relationship between me, the researcher, and the participants. As Rose (1997: 310) says, quoting Katz (1994:69):

The fields of power that connect the field researcher and participants, the participants to one another, scholars in the field, and research participants and audiences as historical subjects who confront various but specifiable conditions of oppression, deserve critical scrutiny in the conduct of field research.

In Australia, there is a popular meme ‘Jack is as good as his master’ (Oxford Dictionary of Proverbs 2008), meaning there is a strong belief in equalitarianism built into the Australian psyche. As a ‘new Australian’ (migrant) who arrived 43 years ago from the United States, I was always a bit suspicious of this creed, knowing that the United States, for all its claimed equality, was class-ridden, divided by wealth. Over the following years, I found that this meme of equality was bit more the case in Australia, but that there remained serious walls in society based on wealth, education, and family history. The power imbalances are not so visible, however, unless one is including the First Peoples of Australia, in which case there are generally power imbalances with the rest of Australian society, with notable exceptions where Aboriginal Australians have accessed higher education and its resultant advantages. As I mentioned early in this thesis, most of the ethnographic participants in this study were modern, educated people living reasonably well within the dominant culture. In my relationships with participants, I often

sensed that had I not been educated in cultural competence (from my first reading of Linda Tuhiwai Smith in 2014), it would have been very easy to have taken advantage of the power relationship that being an academic researcher into Aboriginal culture creates. As it was, I frequently had to remind myself that the participant was the holder of the knowledge, and I was the supplicant, asking for that knowledge that Aboriginal culture allowed to be shared with outsiders. Hopefully, the results of this study show that cultural competence has resulted in the right outcome for both the researcher and the participants.

From a reflexive look back at the study, the difficulty in convincing some communities, and to a lesser degree, participants, to engage with this study was the most disappointing (and limiting) aspect of the research. While, throughout the ethnographical field work, I have met many outstanding people, and have become friends with many of them, I also found trying to get my message across within the various types of Aboriginal community organisations extremely frustrating. Somewhere along the way, a participant said: ‘if the Government wanted to find some way to create chaos and distrust within Aboriginal communities, they couldn’t have found a better way than creating the system of Local Aboriginal Land Councils’. Sometimes I wonder if that was the actual purpose, such as the difficulty I had getting a simple decision made about signing a Support Letter. On the other hand, Linda Tuhiwai Smith’s famous line (2012: 1) about ‘research’ is probably one of the dirtiest words in the [I]ndigenous world’s vocabulary’ is as valid as ever, and I only accepted the role of ‘anthropologist’ with people I knew well, otherwise, I was the ‘cultural astronomer’ (or, to some communities, ‘that star man’, which, as I have consequently learned, was a name given to a community elder with a responsibility to watch the night sky). In any case, this study was always done from an etic approach, as working with 21 communities, and 36 participants made an emic ethnography an impossibility. In doing 24 field trips (111 days fieldwork), I put about 30,000 km on my Nissan X-trail driving up and down the NSW Coast to meet people and hopefully, have a yarn. Any Australian ethnographer will know what ‘yarning’ is, and I have described this methodological approach in 2.3.1.6, but for someone not familiar, this is the way of having a ‘chat’ in Aboriginal Australia. Sometimes it calls for a lot of patience, but if the ethnographer can just ‘slow down’ and listen at the right pace, the knowledge is usually there for the understanding. While my ethnographic research methodology was not PAR-based, as explained in 2.3.1.6, I attempted through the use of yarning and a *Talanoa*-based approach to come as close to the principle of PAR as possible, while still maintaining an

etic standpoint. I will explain in 11.1.6 (future research) how PAR and Country-based research could be used.

The other aspect of ethnography I discovered, and have taken in gratefully, is the generosity of Aboriginal people to those of us interested in their cultures. Show respect, and one comes away with knowledge distilled from 65,000 years of living in Australia. That generosity is also common to those Aboriginal people who are working with their communities in the areas of language, history, family history, and ceremony. They were often the most enthusiastic about working with this study, and like myself, hope the results can be used for the betterment of their people and communities. That possibility will be discussed below.

11.1.5 Unexpected results

The limited possibility of the Black Duck songline being a true circular songline was unexpected, even when the initial signs of the songline appeared. The very long-distance songlines, such as the Seven Sisters, and the Emu and dingos, have always been located in the 'Centre', and I (and I assume others), did not imagine that such songlines if they ever existed, could be found again in southeast Australia. The full Black Duck songline is very provisional, of course, and there remains more work to confirm there is a full circular songline, but it warrants the research, and there is support from participants that other long-distance songlines exist (such as the Pelican) and may someday be confirmed.

The other aspect of the Black Duck songline was the story contained in the rock art at RNP, and the strong evidence that the story was that of the Wauwilak Sisters of northeast Arnhem Land. To find such a complex story depicted in the pictographs is in itself a major result, as much of the rock art in south-eastern Australia is simple figurative style, with no real 'story', other than that lost to time and colonisation. If the story is the Wauwilak Sisters story, then this is a major finding well beyond the aims of this study, as there is no previous evidence that this religious cult extended beyond the N.T., and Central and Western Australia. The prominence of the 'High Gods'/'All-father' religious beliefs in the southeast, reported by nearly everyone examining the question since the late 1800's is suddenly confronted by a likely late-comer in terms of the mythology, which Berndt and Berndt (1965: 218-19) describe:

Many myths reveal a mounting of incidents to a crisis or culmination that exhibits a cluster of meanings with a distinct moral quality. The initiatory rites all rose to a

tense crisis that brought about, or was supposed to bring about, a physical-moral-spiritual change in the initiates. The two types of crisis appear to have been symbolic paramorphs. In myth, an imagined crisis was dealt with by a spoken imagery. In rite, an actual crisis was dealt with by a gestural-visual imagery. In such cases the myths, although a sort of allegorical poesy, may have served as the implicit moral "theory" of the rites.

Whether the Wauwilak Sisters story in the RNP actually was connected to a religious cult in southeast Australia, with the implications for initiation and the *kunapipi* fertility ceremonies, will probably never be known, nor will the very fact of it coming to the southeast being a part of the religious eschatology/end-of-times change in Aboriginal religion and cosmology suggested by Macdonald's (1996) exploration of corroboree songs in New England, and Swain's (1993: 232) description of the effect of colonization on Aboriginal religion in the southeast:

If, however, we once admit the possibility that Aboriginal religions can rapidly adjust to a changing world, then surely we would do well to explore first the decidedly conspicuous climate for socioreligious innovation created by the processes of conquest.

In another aim of this study, the travel of stories along songlines, I had been pretty negative to the d'Huy phylogenetic mytheme analysis technique working with my data from this study, particularly after unsupportive suggestions from folklore specialists, so the fact that it did, at least, confirm 'groups' of Seven Sisters story versions, was a pleasant surprise. The results did not confirm that the stories travelled along the NSW Coast, but did provide some hints that this might be provable with more data.

One unexpected result which was very pleasing was the clear connection between science and social science that I hope is apparent in this thesis. Since I began working in the field of cultural astronomy nearly eight years ago, I have tried to heed the advice of my supervisors and colleagues, who have come from both the social science of Anthropology and the Western 'hard' science of Astrophysics. At times it has been difficult to walk the line between the two, with Western science saying, "prove it empirically", and social science saying, "take a theoretical approach". A good example of this is in Chapter 9; my attempt to demonstrate that Aboriginal cultural stories could be used to confirm hard data about astronomical events. This was originally a published article with a much

stronger conclusion about the likelihood of Peck's (1933: 85-86) description of the cultural story/astronomical event being researchable, with a suggested date of occurrence. The original article got a strong response from within the cultural astronomy community, pointing out some weak Western science arguments, and unsafe conclusions, so while incorporating it in this thesis as an example of Archaeoastronomy (in Australia), I have re-written it with much more emphasis on it being only *plausible*, and just illustrative of the methodology. As Lopez said, in Ruggles (2015: 350):

Ethnoastronomy may make use of the methodological reflections of the social sciences in order to derive deeper and systematic reconsiderations of the methods and topics. This is the way to construct an ethnoastronomy that is in dialog with science in general.

With my background in social sciences, there has also been a conflict when I have run into the subject of Aboriginal spirituality, primarily while engaged in ethnographic fieldwork. Within the various background sections of this thesis, I have tried to use the scholarly writings of such academics as Stanner (2009), Strehlow (1978, 2008), and Grieves (2009) to describe Aboriginal spirituality and its central role in cultures. When encountering this spirituality while engaging with participants and others in the community, I have had to keep in mind, once again, walking a line between my own beliefs, those of my collaborators, and the eventual readers of this study. I can say that my thoughts on Aboriginal spirituality, which were always sympathetic, have been challenged and changed during this, and my previous research, in a positive way.

11.1.6 Suggestions for further research

Cultural astronomy as a standalone discipline is still relatively new to Australia, and while there has been a surge in research over the last 20 years, the field is subject to the effects of a limited number of specialists, many of whom come from associated disciplines, such as astrophysics, and a very low number of new entrants into the field. There has been a concerted effort to get new academics, particularly those with Indigenous backgrounds, working in the discipline, and hopefully, some of the tertiary institutions will include courses (and eventually degrees) in cultural astronomy.

With the limited number of academics working in cultural astronomy, there will have to be a 'cost-benefit' approach to further research, as the current approach of picking a

geographical region which has not had recent study depends too much on the availability of researchers and, with limited funding, the ability to work away from their bases.

Ethnographic research in cultural astronomy, as practised in this study, is becoming rarer, as field anthropologists in Australia, by necessity, concentrate on other critical areas, such as land rights, family histories, and intellectual property. A new approach to recovering Aboriginal cultural knowledge may be needed, possibly along the lines proposed by Nakata et al. (2014), where communities could upload their stories to a central electronic database as a means to save them for future study, and to be made available for other Indigenous peoples.

There are four areas of research from this study which could be the subject of future research projects:

- Further research into both short and long-distance songlines along the NSW Coast would necessitate ethnographic fieldwork, as my literature study uncovered little information of this type. This fieldwork, as mentioned earlier, should incorporate Aboriginal researchers and participants as co-authors of any publications. In fact, a fully culturally competent study should also incorporate the idea of Country as a co-author. Country et al. (2015: 271), said:

(Country) is hence the all-encompassing authority of our research and this is recognized through its acknowledgement as the lead author of this paper. This is important as it decentres the privileging of human authors as the only beings able to control and create, as the sole deciders of content and structure, and opens up opportunities for reimagining and co-creating not only how we write but how we think and practise.

This research could also be conducted with a more PAR-like approach, as this is more likely to capture the interest of the relevant communities.

- Continuation of the phylogenetic analysis of Seven Sisters stories along the NSW Coast coupled with an investigation into Seven Sisters stories in surrounding Aboriginal communities, and eventually, across Australia. This could be done primarily as a literature study, with some ethnographic fieldwork, as necessary.
- There are strong suggestions of marriage connections between different communities along the NSW Coast, and some participants who have discussed

this point to possible connections going back before 1788. As Aboriginal family histories become more completely researched, there could be some value in looking at these early connections as a means of showing cultural connections on the coast. These could possibly lead to family connections to cultural stories that would be useful in the research.

- The Wauwilak Sisters rock art at RNP needs to be properly examined by experts and with the use of modern techniques, such as photogrammetry, to confirm the interpretations by Bursill and others.

11.1.7 Giving back

‘Giving back’, as explained in Chapter 1, is a way to thank everyone who supported this study in a way that contributes to their, and their community’s well-being. Rather than try to copy the approach used previously with my research in Gamilaroi/Euahlayi communities, my intention is to approach all the communities who were involved with this study and ask them what they would like to see done with the knowledge gained, and how it could be used to improve education, cultural pride, and reconciliation with the dominant culture in Australia. Based on the response, and limited by what is possible financially and physically, I will use the break during the thesis review period to start this process. The result could be educational material in the form of a booklet or pamphlet, possibly for young people like the school workbook *Astronomy of the Kamilaroi and Euahlayi Peoples and their neighbours*, produced as a part of the HEPPP grant during my MPhil study of the Gamilaroi and Euahlayi peoples. Another result could be a chapter or section in a popular book on cultural astronomy in Australia, possibly aimed at young persons, such as Bruce Pascoe’s *Young Dark Emu*.

Interest in the Black Duck songline among Aboriginal cultural persons with whom I have worked in this study and earlier has resulted in a plan, still in the early stages, to try and obtain funding for another documentary like *Star Stories of the Dreaming*, this time revealing knowledge of songlines along the East Coast where it is culturally appropriate.

Howitt and Stevens (2005: 46) said that “publishing’ to community-based audiences is often the most important element of cross-cultural research.’

I also intend to use parts of the results of this study in my own Indigenous reconciliation program, which is to publish in the ‘popular’ press, such as *The Conversation*, stories

about Indigenous science and knowledge, and to include the knowledge gained in my presentations and lectures to the public that come along periodically. Over the seven years since I commenced my MPhil, I have seen increasing interest by the general public in Indigenous knowledge, and I hope that this is a positive sign towards resolving the current impasse on national reconciliation.

11.2 Final Conclusions

This study looked at whether, on the NSW Coast, Aboriginal cultural stories were transmitted from community to community, and if so, were they transmitted along trades routes, including songlines? The results added significantly to the existing literature and public knowledge and identified one major coastal songline, which might be circular through the interior, and another, similar, songline with less certainty. That songline was identified with a significant rock art theme which may have implications for the study of Aboriginal religion in southeast Australia. The thematic analysis identified four major, and six important themes in the sky cultures of the NSW Coast, as well as significant landscape features. Phylogenetic mytheme analysis also suggested connections in Seven Sisters stories along the coast. The main study questions were not answered with complete certainty, but show promise for further research, which should include a larger sample of both communities and participants, which was one of the limiting factors of this study. This future research should concentrate on finding coastal songlines and their associated stories and should expand the phylogenetic mytheme analysis of the Seven Sisters stories to a wider number of Aboriginal communities.

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Appendix 1 NSW Coast Astronomy Literature Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	comet	a koradji (wiringin) had been up with the fire in the sky (comet)	Threlkeld in Gunson (1974 Vol II: 192)	Awabakal
Vocab	heavens	warredya	Wilton in Gunson (1974 Vol II: 355)	Awabakal
Cultural	meteors	a sorcerer (wiringin) had been in the sky, and came down with a fiery meteor	Threlkeld in Gunson (1974 Vol I: 50)	Awabakal
Vocab	Moon	yellana	Maynard (2004)	Awabakal
Vocab	Moon	moe-la-khan (season of waning moon)	Maynard (2004)	Awabakal
Vocab	Moon	yalunya, yennada, kawang	Wilton in Gunson (1974 Vol II: 355)	Awabakal
Vocab	stars	manyi, birrong	Wilton in Gunson (1974 Vol II: 355)	Awabakal
Vocab	Sun	panyal, going, dugong	Wilton in Gunson (1974 Vol II: 355)	Awabakal
Vocab	Sun	panal	Arposio (2006: 83)	Awabakal

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Sun, Moon	The man in the Moon was called Pontoe-Boong and the Sun is a woman named Punnal. Long ago the Moon became increasingly jealous of the Sunwoman and tired of having to make his long journey across the sky in darkness, his discontent heightened by the fact that it was only on rare occasions that the mortal Aboriginal people could look into the night sky and see the fullness of his shining face. In comparison, Punnal, sun's glowing face, was open to the world's admiration every except when Yura the cloud spirit was making rain. Deep in meditation he began to cry and his tears began to fall day after day, and at length his tears formed a large lagoon. Next time he came close to the earth, the sad, lonely moon called out to the wise men among the Aboriginal people on the Redhead hills: 'Ha', he cried, 'now the people will be able to see me whenever they like'. He was overjoyed and at peace. Pontoe-Boong at once now happy, returned to the sky, but he never forgot his people of the lagoon. When he passed their way, he shown his brightest, lighting the area almost like day. At these times the Awabakal clans would gather and hold a corroboree at the lagoon to honour the moon man.	Threlkeld in Maynard (2004: 49-50)	Awabakal
Cultural	meteors	At Kurra-Kurran, on Lake Macquarie, there are many rocks scattered about. These were once part of a monolith that fell out of the sky and killed many of the people who had assembled there. The people had gathered at the command of a giant goanna who had come out of the sky. The goanna was angry that the people had killed head lice by roasting them in the fire. After everyone was dead, the goanna went back into the sky.	Threlkeld in Turbet (1989: 121)	Awabakal
Cultural	Sun, Moon	same story as Threlkeld in Turbet (1989: 121). Moon was called Pontobug and the Sun was female.	Threlkeld in Turbet (1989: 121)	Awabakal

Appendix 1
NSW Coast Astronomy Literature Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Vocab	stars	mirrai	Threlkeld (1892: xxxiii)	Awabakal
Vocab	heavens	moroko (the sky)	Threlkeld (1892: 225)	Awabakal
Vocab	Sun	punnal	Threlkeld (1892: 55)	Awabakal
Cultural	Sun, Moon, Stars	Awabakal told Threlkeld that the sun, moon, and stars came from when a man had thrown head lice into a fire and these had then become stars	Threlkeld in Turbet (1989: 121)	Awabakal
Cultural	meteor	Near Sugarloaf Mt, a meteor was an evil being named Putikan who will kill non-initiated men	Gunson (1974: 50)	Awabakal
Cultural	meteor	Also, at Sugarloaf Mt, a medicine man came down by meteor to initiate men	Gunson (1974: 50)	Awabakal
Cultural	Moon	Belmont lagoon was formed by Moon weeping	Hulley (1996: 44-46)	Awabakal
Cultural	Altair	Bibiga, the eaglehawk, is represented in the night sky by Altair	Needham (1981: 36)	Awabakal/Darkinjung
Cultural	directional	Estuarine Aboriginals, including Awabakal were strongly oriented north and south in contacts with other groups	Moore (1981: 422)	Awabakal
Cultural	whale painting	Haslam said there was a whale scene painted in the Wollombi district, which could only be painted by Awabakal	Haslam (1979: 12)	Awabakal
Vocab	Sun	Hastings - Dewcan (Brown) Eurokar, Tornee, Tocan (Curr)	Brown (1898: 88), Curr (1887: 341)	Biripi
Vocab	Star	Manning - Mirreen, Hastings - Merreen (Brown) Wilson - Merreen (Ryan) Merring, Wupu (Curr)	Brown (1898: 88), Curr (1887: 341), Ryan (1964: 290)	Biripi
Vocab	Stars	Hastings - Merring (Brown, Ryan)	Brown (1898: 88), Ryan (1964: 290)	Biripi

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Three brothers	In Dreamtime, three brothers of Biripi 'tribe' living near Camden Haven River where it meets the sea. Living in bush as part of initiation, and became concerned of health of mother, Gabaway, and father, Babagar. The youngest chosen to check on them. While travelling, saw witch-woman walking towards other brother's camp. When reached father, told him of this, and father said he must go quickly to keep witch-woman from eating other brothers. Father gave him special boomerang with magic to keep him safe. Reached brother's camp next morning but found witch-woman had killed and eaten them. She said she would kill him, but he used boomerang to kill her by splitting in half, one half he buried in the river, and the other half he threw in the sea. Gathered remains of brothers and buried them where North and Middle Brother mountains are today. He went to where South Brother is now, and killed himself. Spirits of Creation caused a mountain to arise where each brother lay.	Heath (2007: 9-10)	Biripi
Cultural	culture direction	Enright said that 'stream of culture' moving down eastern coast (in regards to marriage systems) to Manning River	Enright (1932: 102)	Biripi
Vocab	Constellation?	jarang	Sharpe (2002)	Bundjalung
Vocab	Moon	gibam	Sharpe (2002)	Bundjalung
Vocab	star	guyuhmgan	Sharpe (2002)	Bundjalung
Vocab	Sun	nyangga, yalgan	Sharpe (2002)	Bundjalung
Vocab	Sun	peekee, talyut, yelgun	Ryan (1964)	Bundjalung
Vocab	meteor	yuarioam	Ryan (1964)	Bundjalung
Vocab	Moon	kyibum, kip-up	Ryan (1964)	Bundjalung
Vocab	Sun	yalgan, nyunga, nyanga	Sharpe (1978)	Bundjalung
Vocab	Southern Cross	ginibi (swan)	Sharpe (1978)	Bundjalung
Vocab	Milky Way story	wayal, balun (river)	Sharpe (1978)	Bundjalung

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Vocab	Pleiades	warinehn, warinihnygan (winter stars, winter woman stars)	Sharpe (1978)	Bundjalung
Vocab	Canopus	wagahn (crow star)	Sharpe (1978)	Bundjalung
Vocab	Morning Star	gamaygan guyuhmgan (big woman star)	Sharpe (1978)	Bundjalung
Cultural	Binnungar and Gagadoo	story of Binnungar the frill-necked lizard who was supposed to deliver message to Gagadoo, the cockatoo, who passes it on to the Sky Spirits	Naputa (1996)	Bundjalung
Vocab	meteors	yahrum, gabuny (egg)	Sharpe (1978)	Bundjalung
Cultural	Three brothers	Long ago, Berrug, with his two brothers, Mommom and Yaburog, came to this land. They came with their wives and children in a great canoe, from an island across the sea. As they came near the shore, a woman on the land made a song that raised a storm which broke the canoe in pieces, but all the occupants, after battling with the waves, managed to swim ashore. This is how 'the men,' the paigal black race, came to this land. The pieces of the canoe are to be seen to this day. If anyone will throw a stone and strike a piece of the canoe, a storm will arise, and the voices of Berrug and his boys will be heard calling to one another, amidst the roaring elements. The pieces of the canoe are certain rocks in the sea. At Ballina, Berrug looked around and said nyug and all the paigal about there say nyug to the present day, that is, they speak the Nyug dialect. Going north to the Brunswick, he said, minyug, and the Brunswick River paigal say minyug to the present day. On the Tweed he said, gando and the Tweed paigal say gando to the present day. This is how the blacks came to have different dialects. Berrug and his brothers came back to the Brunswick River, where he made a fire, and showed the paigal how to make fire. He taught them their laws about the kippara, and about marriage and food. After a time, a quarrel arose, and the brothers fought and separated, Mommom going south, Yaburog	Livingstone (1892: 27) Threlkeld (1892)	Bundjalung (Byron)

Appendix 1
NSW Coast Astronomy Literature Database

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		west, and Berrug keeping along the coast. This is how the paigal were separated into 'tribes'.		
Cultural	The Twin Stars	story of twin boys of Gullibul (Gidabal?) 'tribe' who are seen as two stars traveling over the mountain-range (Castor and Pollux?)	Robinson (1965)	Bundjalung
Cultural	Southern Cross	story of Gineevee, the Black Swan (Southern Cross)	Robinson (1965)	Bundjalung

Cultural	Pleiades and Alpha Tauri (Aldebaran)	<p>On the Clarence River there once lived seven young girls who were sisters, named Wareenggary. They were from the Bunjellung 'tribe' and of the Wirrakan division. They were very clever women and they had yamsticks which contained charms in the end which protected the girls from their enemies. Every day they went out hunting for carpet snakes always taking their yamsticks with them. A young man, named Karambal, from the same 'tribe' fell in love with one of the girls and followed them wherever they went, but his love went unrequited. He watched them every day waiting for an opportunity, eventually one of the sisters strayed away from the others and was not carrying her yamstick with her. Karambal carried her off to his camp, but her sisters were very angry and upset and met to see what could be done to return her to them, as Karambal was of the wrong division and in fact her tribal brother. The eldest sister suggested sending a fierce storm to kill Karambal, but the others were worried that this would kill their sister too. One of the other girls suggested that they went away to the west, where they knew the winter lived, and bring the frost and cold winds to punish the man for what he had done. So they went away to the west and brought the winter, making it so cold that Karambal almost perished with the frost. The girl did not feel the cold, having secretly received her yamstick from her sisters, eventually Karambal allowed the girl to go back to her sisters. They were overjoyed to get her back and went away to the east to bring the summer because they did not want any more of their own people to suffer in the cold winter. After this the Wareenggary chose to leave the Earth altogether, but before doing so they went into the mountains and made springs at the head of all the rivers so that the people on Earth would always have plenty of water. The seven sisters then went into the sky and the constellation of the Pleiades represents their camp. They send the summer every year and then the cold winter as a reminder to the men that they</p>	<p>Original by Mathews (1899). Repeated by Mathews (1904), he says that the Pleiades go away to bring the cold weather and then when they return they are ushering in the warmer weather, and that Karambal is a red colour because he was burnt in the fire. Repeat by Haynes, (1992: 137 record 91). Repeated by Massola, (1968: 108) (from Fredrick 2008)</p>	Bundjalung (Yugumbirr dialect Tweed/Logan area)
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		<p>should always choose a woman from the correct moiety. Not long after the sisters left the Earth Karambal began to search for another girl, after a while he fell in love with a woman who he could lawfully marry. This girl was already united to another man, Bullabogabun, but she was persuaded to run away with Karambal. When the man found out that his wife had run away he was very angry and followed her to the camp of Karambal. In order to escape the anger of the husband, he climbed up a very tall pine tree. Bullabogabun saw him up there and placed a large amount of wood at the bottom and set fire to it, the fire raged up the tree, flames reaching out into the sky carrying Karambal with it. The flames put Karambal in a part of the sky near the Wareenggary and he became Aldebaran, so that he could follow the sisters continually as he had done in his youth.</p>		
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<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Pleiades	Legend of the Pleiades from the Chepara 'tribe' of Queensland tells story of Yunguipan, who became Aldebaran and the seven women	Peck (1925)	Bundjalung
Cultural	Moon	Javreen, the great boomerang thrower, was practicing for a contest, and lost best boomerang in the bush. Two little girls making flower chains near the riverbank found it for him. With the help of a weeun (clever man), he thanked the girls by putting one in the Moon, which is the face that can be seen, and the other, as the rainbow.	Roberts (1991, Side A, No 4)	Bundjalung (Northern)
Cultural	Sun	The pelican was jealous of the Emu, which had large eggs. He threw one of the Emu's eggs into the sky, where it broke, and became the Sun	Roberts (1991, Side B, No 5)	Bundjalung
Cultural	Three brothers	Three brothers created in the Dreaming; Yahberri, Mahmoon, and Birrum. Came by sea in bark canoes (hoop pine - goondool). Had grandmother in canoe. Came to river flowing into sea. Lived there for a while. Sailed back to sea (without grandmother), sailed north until came to place with many black rocks. Landed, one brother threw spear and where it hit sand, fresh water came out. This spring can be seen in the sands today. Sailed north again until saw headlands, and came ashore. One brother went north, one went west, and one stayed in the east, and this one gave law and bora rings to people who came there. When spring comes, the daughters of the brothers visit the Earth and come in the blue haze of the mountain.	Norledge (1968: 26)	Bundjalung
Cultural	Gemini	Twin stars traveling over the Northern ranges in winter(?). If Gemini, would see in winter only early morning, otherwise see below Orion in summer.	Robinson (1963: 175)	Bundjalung (Northern)
Cultural	red star	A time when there were no men, one sister created a male baby from a flower, which became a cleverman, then the Eaglehawk, and then went into the sky as a red star	Unknown source	Bundjalung?

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Vocab	Altair	Bibiga (Eaglehawk)	Threlkeld in Needham (1981: 36)	Darkinjung
Vocab	Moon	gundang	Jones (2008)	Darkinjung
Vocab	Orion's belt	gunggun	Jones (2008)	Darkinjung
Vocab	Pleiades	mirganda	Jones (2008)	Darkinjung
Vocab	star	gulang	Jones (2008)	Darkinjung
Vocab	stars	giwangga	Jones (2008)	Darkinjung
Vocab	Sun	yiluk	Kohen (2002: 16)	Darkinjung
Vocab	Sun	banal	Jones (2008)	Darkinjung
Cultural	Southern Cross	Baiaame originally created two men and a woman. One man was named Boobardy (or Wabbooe to the Wollombi blacks), and the woman was called Numbardy (Mulla Mulla), Baiaame put them both into a deep sleep, from which they awakened at the prime of life. Moreover, they were surrounded by game. The unnamed man refused to eat. so Boobardy shifted camp and he took Numbardy with him. Boobardy later returned to where the other man was dying, only to find that he had vanished. However, he soon found his footprints, and as he followed him, he developed a trackers' instinct. Although he did catch up to him. the unknown figure kept on going (toward the setting sun), until he finally climbed a tree whose foliage mingled with the stars. Boobardy thereupon began to retrace his steps, but on looking back he discovered that the tree had disappeared in a cloud of smoke. This beautiful tree is now the Southern Cross and the stars represent the notches in the tree whereby the spirits of the dead climb to Baiaame. These notches were pointed out as mundowa and the footprints are known as mundoes. The name means 'he who brought life from on high'. The mundoes disappear from rocks because Baiaame stepped back from them into	Needham (1981:71), Slater (1937)	Darkinjung

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		the high region from whence he came. This happened at Mt. Yango and the footprints or mundoes can still be seen on the surrounding ridges.		
Cultural	Sun, Moon	Description of a ceremony belonging to the Darkinung peoples of the Northumberland area. He explains that a tree with a twenty foot narrow strip of bark cut out in a wavy line, was representative of a tree struck by lightning; and that the track was ornamented with 'yammunyamun' (symbols and images cut into the ground) such as the sun with rays and the moon in the crescent and in the full.	Mathews (1897:4)	Darkinjung
Cultural	meteors	The Darkinung of New South Wales claimed meteors were a portent that something good was about to happen	Needham (1981:11)	Darkinjung
Cultural	Altair	Bibiga, the eaglehawk, is represented in the night sky by Altair	Needham (1981: 36)	Awabakal/Darkinjung
Cultural	Sun	There are three known burial grounds in the Wollombi region. Two are at Quorrobolong', near Cessnock, whilst the third is at Broke. There are several unconfirmed sites at Congewai and Murray's Run. All three known plots are under a tree or trees. The positioning and detail at one Quorrobolong site would suggest that the deceased was a person of some importance within the 'tribe'. This rectangular plot measures three metres in length by two metres wide. There is a raised mound at the site. At each corner of the plot there stood an iron bark tree. However, only two of these trees now remain. One was chopped down, and the other was struck by lightning. The site faces north. That is a feature consistent with the few known accounts	Needham (1981:38)	Darkinjung

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		of local aboriginal burials. According to Threlkeld, the corpse was placed so the sun could look at it as it passed each day.		
Cultural	Altair	The stones around the larger ring are probably of great significance. According to Threlkeld' such stone arrangements at the Bora ground of the Awabakal natives were placed there and arranged by the eaglehawk spirit. or the eaglehawk All Father. This bird was apparently the animal representation of this spirit. Threlkeld also states the Awabakal 'tribes' shared similar beliefs to their inland neighbours, i.e. the Darkinung. It is possible that the stone arrangements at the Watagan Valley Bora Ground held similar significance (or the Wollombi aboriginals. It is known that they also revered the eaglehawk. Mrs. Dunlop describes the bird as having snow-white plumage. The Wollombi natives referred to it as BIBIGA. This eaglehawk was represented in the night sky by the star Altair. This star is almost directly overhead in August, when the natives held such Bora ceremonies'. According to the Reverend Threlkeld, the eagle was the totem for the dominant class, whilst the crow depicted the subsidiary class. The crow traditionally lost to the eagle in struggles, but it was the benefactor in fire-legends. The crow was depicted in the sky by another star. Its identity is not known.	Needham (1981:36)	Darkinjung

Appendix 1
NSW Coast Astronomy Literature Database

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Vocab	Sun	wure	Mathews (1903: 276)	Dharawal
Cultural	Pleiades	Story of mullymoola sisters going into the sky	Turbet (1989)	Dharawal
Vocab	Orion's belt	dhungagil	Mathews (1901a)	Dharawal
Vocab	Orion's belt	burrara	Mathews (1903: 276)	Dharawal
Vocab	Sun	kun	Mathews (1901a)	Dharawal
Vocab	Moon	jillak	Mathews (1901a)	Dharawal
Vocab	Moon	dyedyung	Mathews (1903: 276)	Dharawal
Vocab	Pleiades	dhinburri	Mathews (1901a)	Dharawal
Cultural	Pleiades	story that Moon became enamoured of the Mullymoola women, who then went up into the sky	Organ (1990) from Mackenzie (1874)	Dharawal
Vocab	Pleiades	mullamullung	Mathews 1903, 276	Dharawal
Cultural	Milky Way story	story that sky tumbled and Milky Way was split, and broke up into Clouds of Magellan, followed by stars falling to Earth.	Organ (1990) from Peck (1933)	Dharawal
Vocab	Pleiades	mulumulung	Bursill (2014)	Dharawal
Vocab	falling star	duruga	Bursill (2014)	Dharawal
Vocab	Shooting star	jirrawullung	Mathews (1903: 276)	Dharawal
Vocab	Magellanic Clouds	bidiwamgung	Bursill (2014)	Dharawal
Vocab	Milky Way	warrawul	Bursill (2014)	Dharawal
Vocab	Moon	yunada	Bursill (2014)	Dharawal
Vocab	sky	burra, garrayura	Bursill (2014)	Dharawal
Vocab	star	birrung	Bursill (2014)	Dharawal
Vocab	stars	jingjingurra	Mathews (1903: 276)	Dharawal
Vocab	Sun	guwing	Bursill (2014)	Dharawal
Vocab	Orion's belt	Murumwirugan	Bursill (2014) from Mathews (1903)	Dharawal

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Vocab	Pleiades	Mamarrianda	Bursill (2014) from Mathews (1903)	Dharawal
Vocab	Aldebaran	Gwaiianbilla	Bursill (2014) from Mathews (1903)	Dharawal
Cultural	Alpha and Beta Centauri	Leslie Bursill was able to share with me the Dharawal Dreaming of the Wawalag Sisters during one of our interviews. This Dreaming he explains, 'is one that (I) have the most faith in, and that is quite common across Australia. (2014, pers. comm., 14 June). In relation to an engraving at the Garie Beach Ridgeline, this Dreaming accounts for the seven Wawalag sisters that correspond to the stars of the Pleiades constellation and while Bursill explained that he cannot go into extreme detail, he identified the seven sisters' male partners as 'the lightning brothers' who correspond to the double star Alpha and Beta Centauri of the Southern Cross	Turner (2014: 19)	Dharawal
Cultural	Pleiades	Another Dharawal Dreaming that relates to The Pleiades constellation can be found in Turbet (1989, p. 123) where seven sisters were out fishing at Poolinjirunga and were approached by the moon whose attention was caught by the sisters' beauty. However, before he could come near, they heard him nearing and went to Jindowla. The moon followed the singing voices of the sisters, but could not see them. He exclaimed: 'Where are they singing about me?', 'I hear them sing about me, singing in the gully. Let me have white clay to corroboree. Sing that song; let me dance'. The moon then threatened to spear them if they did not show themselves to him, but the sisters did not show themselves and instead, went into the ground and then up into	Turner (2014: 20)	Dharawal

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		the sky, becoming The Pleiades. This story is also repeated in Ridley (1875, p. 146) in both Dharawal ('Thurawal') and English.		
Cultural	Sun, Moon	Within both interviews with Dharawal Elders Leslie Bursill and Frances Bodkin, it was identified that the sun and moon are deities; and that the sun is a male and the father of the land, bringing it to life, providing warmth, and is the most powerful of the sky spirits; and the moon is a female, mimicking the 28 day women's menstrual cycle. Bodkin also described the special significance of the moon to her peoples; with the southernmost and northernmost rising points being commonly marked on rocks. She explained that when the moon rose at the southernmost point, and was at its largest, it intimated that 'a time of madness was coming, that there would be wars and killing, so the women would hide with the children' (2014, pers. comm., 10 June).	Turner (2014: 22)	Dharawal
Cultural	Orion's belt	Francis Bodkin discussed a Dreaming in relation to the star of The Three Sisters that form Orion's Belt. She explained that when 'the sisters danced in a line in the Western sky, it was time to prepare for the big law meetings' (Figure 17). She also recounts her mother telling her of a discussion she had had with a group from Northern Queensland, who had told her that this alignment of The Three Sisters indicated that it was time for them to travel to the south 'to the Land of Peace' for law meetings. Finally, Bodkin recalled a group of Indigenous peoples from Hermannsburg in the 1980's who had said that their	Turner (2014: 23)	Dharawal

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		great grandmothers had travelled to Dharawal lands by following the songline of The Three Sisters story.		
Cultural	Rising of stars	Leslie Bursill has described how for the Dharawal people, the rising of some star groups such as The Pleiades, The Orion Cluster, and some larger stars such as Aldebaran directly coincide with the blooming of plant life and flowers, changes in temperature or season, and abundance of fruit growth.	Turner (2014: 24)	Dharawal
Cultural	Climatic cycles	<p>Seasons and Climatic Cycles</p> <p>Stories from Dharawal regarding astronomy, seasons, and aurorae.</p> <p>According to Bodkin (2006: 70) the Dharawal people south of Sydney used the appearance of the aurora to announce the start of the 11-12 year Mudong weather cycle. The aurorae appear during the annual season of Ngoonungi. Ngoonungi is the period of gradual warmth, during September and October. The appearance of aurorae signalled the start of the first of the eight Mudong cycle phases: Gadalung Burara —the hot and dry phase. This season can last up to 20 complete lunar cycles ('20 moons') but no more (Bodkin, 2006:</p>	Bodkin and Robertson (2006)	Dharawal

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		<p>72). In an interview with CNN in 2003, Bodkin claimed that the 11-year Mudong cycle started in 2001 with the appearance of aurorae. This coincided with the peak in sunspots and the start of the last solar cycle (Figure 4). Bodkin stated that the aurorae are seen less frequently because of increasing light pollution.</p> <p>In some media interviews following the publication of her book on Dharawal seasons and climatic cycles, Bodkin claimed that during October aurorae were visible in the western skies as well as to the south. Historical records describe aurorae visible to the west from the Hunter Valley north of Sydney (Anonymous, 1846). It is worth noting that geomagnetic storms tend to peak in the months around the equinoxes, in particular March-April and September-October (Papitashvili et al., 2000; Stamper et al., 1999). This is when both hemispheres of the Earth are most uniformly exposed to the solar wind and its embedded interplanetary magnetic field. Accordingly, many of the aurorae identified in Aboriginal traditions were linked to auroral displays during, or around, these months, particularly September.</p>		
Cultural	Origin Story	Arrival in Illawarra of Dharawal (Thurrawal) 'tribe' as human creatures (animals) from another land beyond the sea. Mainly story of whale and starfish.	Mathews (1899: 7-10)	Dharawal
Cultural	Meteors	Shooting Stars story from Peck about Aboriginal king going down into the area with no basalt and finding the waratah but locals, presumably from the Waratah region south of Sydney discovered them and a big shooting star came down and killed the intruders	Peck (1925)	Dharawal (?)
Cultural	Sun, Pleiades	Baiaame created all the heavenly bodies, with Earth an immense plane, around which circle the Sun, Moon, stars. The Sun just provides light, while Pleiades provide warmth	Manning (1882: 55-73)	Dharawal

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Centauri	The Lightning Brothers correspond to Alpha and Beta Centauri	Bursill 2014 pers comm	Dharawal
Cultural	Pleiades	Seven Wagalag sisters correspond to the Pleiades	Bursill 2014 pers comm	Dharawal
Cultural	Moon and Pleiades	Seven sisters lived together and were the most beautiful pure women on Earth, they lived alone away from their community apart from their neighbour Thowra. They were much sought after in marriage but they refused all advances. Every morning Thowra went out hunting and the girls went fishing, one of them staying behind to tend to the fires. It was too much to expect Thowra to be immune to the women and he was in love with the eldest of the sisters, one morning instead of going hunting he hid in the grass and played to his human weakness. He put out his fire and waited for the girls to come and re-light it, the youngest two came back and lit it, but the other sisters refused, and eventually the oldest sister returned to tend to the fire. It was this sister that Thowra desired, so he ran out and caught hold of her, the sisters tried to stop him, but they could not pull him off so they threw burning branches at him. Thowra was badly burnt and the wounds never healed, but sent out an awful stench like that of a dead whale. The eldest sister had a daughter as a result, the young girl's hair grew at an immense rate, which the sisters hid from Thowra. Eventually they had collected enough hair to make a long fishing line which they threw up into the sky, they left the Earth and took the child with them. When Thowra returned he wondered what had happened to the girls, crying out their names asking where they were. They replied saying that they were up in the sky and that he could join them if he could climb up the rope. He began climbing and had reached a great height when the sisters cut the line and Thowra fell back down to Earth. The girls hated Thowra for what he had done and could not stand the stench. He was found	Brother (1897: 10-11)	Dharawal/Yuin?

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
		<p>on Earth and two men helped him to recover by placing him in a bag on top of a high hill and bringing him food and medicine. Thowra went down the hill and met all the people on Earth and he was grateful for being healed again, he was told that he should not touch the man that had healed him but he could not resist, so touched him and turned into a boomerang. The healer took up the boomerang and threw it round the ring 5 times, no one else could throw the boomerang because it was as heavy as Thowra had been. A boomerang that no-one can throw is useless, so he threw it up into the sky for it never to come back. Thowra is the boomerang in the sky and he takes his male form when the Moon is full, sometimes you see a child very close to him, and the seven sisters remain in the sky as the Pleiades.</p>		

Appendix 1
NSW Coast Astronomy Literature Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Pleiades	Wunbula the bat and two wives were hunting but women were impaled on spears when in the water and went up into the sky to become part of Pleiades	Ridley (1875: 144-145)	Dharawal
Cultural	Sun and Moon	Both the Sun and Moon are solid balls of light made by 'him' and set into motion rolling across the sky. The Sun was made first and set on his journey and then the Moon was made, the two to engage in an endless race around the Earth. No explanation is given for the changing phases of the Moon.	Howitt and Clive (1881)? (unable to confirm)	Dharawal? (unable to confirm)
Cultural	Moon	Jannali (Sutherland Shire) is called the place of the Moon. Yennadi was a young woman who fell in love with a young man, even though she was given to another. She hid in the sky and became the Moon, with its 28 day cycle	Bursill 2014 pers comm	Dharawal

Cultural	Five islands	<p>The Story of the Five Islands. In the Alcheringa, Oola-boola-woo, the West Wind, lived on top of Merrigong (the Illawarra Range) With the West Wind were his six little daughters Mimosa, Wilga, Lilli Pilli, Wattle, Clematis and Geera. Sometimes the children's cousins, who lived in a seaside camp just north of Red Point, came up the mountain for a visit. The little children brought gifts of fish, pretty sea-shells, fruit and flowers, but Mimosa, an unpleasant child, was sulky and disagreeable to the visitors. When her sisters played and laughed with their cousins, Mimosa scratched and fought. Oola-boola- woo was so annoyed at his daughter's rude behaviour he snatched off the piece of the mountain upon which she sat, and threw it out to the sea. How strange to see a large piece of rock flying through the air with the little black girl, Mimosa, clinging to it! Plop! went the great rock into the sea, giving Mimosa a shower bath, which cooled her naughty temper. 'Whoosh, gurgle, goggle,' she cried, coughing and choking. She looked about and was startled to see she was some distance from the land. In fact, she was on an island, to which neither her sisters nor her friends could swim, for fear of sharks. Poor Mimosa! Too late she regretted her naughtiness. Day after day she sat on the island, until she turned into a mermaid, slid into the sea and swam about. Mimosa's fate should have been a lesson to her sisters, but, bye and bye, they grew lazy, careless and disobedient. One evening Oola-boola-woo, the West Wind, came home, at sunset, to find Wilga lying on a warm rock, playing with a pet lizard. She had not washed her face or combed her hair, nor had she tidied the house. Oola-boola-woo felt that his patience was at an end. He had had a hard day blowing up dust storms in the west and helped to fan a great bushfire, near Appin, so he was tired. Taking a big breath, he blew Wilga and her rock out to sea. How surprise the people in the camp were next morning, to see two islands in the sea, not far from the coast. It wasn't long until Lilli Pilli, Wattle and</p>	Organ (1997: 4)	Dharawal
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		<p>Clematis were blown out to sea, on pieces of rock so that there were five islands, with five little mermaids sunning themselves. So Geera was the only child left in Oola-boola-woo's home on the mountain top. How lonely she was! Her father was often away, so there was no one to talk to. There was no one to play with, for the children in the camp had long grown tired of climbing the mountain side to visit the unruly family, on the top. Geera sat hunched, with her arms around her ankles, gazing down at the smoke of the blacks' camp, or staring out at the Five Islands. Year after year she sat, so still and quiet she turned to stone. Dust and dead leaves fell upon her, grass and wild flowers grew over her, and so she became part of the mountain range. She is now known as Mount Keira.</p>		
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Appendix 1
NSW Coast Astronomy Literature Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Vocab	Pleiades	dhinburri	Collins (1798)	Dharug
Vocab	Orion's belt	dhungagil	Collins (1798)	Dharug
Vocab	Moon	julluk, jillak, condoen	Kohen (1993: 153)	Dharug
Vocab	Stars	kimberwalli, kimperwali	Kohen (1993: 153)	Dharug
Vocab	Orion's belt	dhungagil	Kohen (1993: 153)	Dharug
Vocab	Pleiades	dhinburri	Kohen (1993: 153)	Dharug
Vocab	Sun	keun, kyun, hun.yiluk, condoin	Kohen (1993: 153)	Dharug
Cultural	Pleiades and red star	One day eight girls went out gathering grubs (Toorgah) but only seven of them returned, the other girl was never seen again. The seven girls were placed in the sky as the constellation called Toorgah. The big red star called Jumbarrin looks after the seven girls.	Enright (1937: 194)	Dunghutti ?
Vocab	Moon	durrgan, gitayn	Lissarrague (2007)	Dunghutti
Vocab	Star	wupu	Lissarrague (2007)	Dunghutti
Vocab	Pleiades	matan	Lissarrague (2007)	Dunghutti
Vocab	Sun	dhunuwi	Lissarrague (2007)	Dunghutti
Vocab	Venus	wupu	Lissarrague (2007)	Dunghutti
Vocab	Morning Star	??'travelling star' - wupu manhatinun (also place called Bellbrook)	Lissarrague (2007)	Dunghutti
Vocab	meteors	Meteors are called duruga by the Eora/Dharug	Thieberger and McGregor (1983: 4.8)	Eora, Dharug
Vocab	Pleiades	Mulumulung mo-loo-mo-long	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Pleiades	miirrinmurrin, mullamullu	Ridley (187: 67, 112) (Turner 2014)	Eora

Appendix 1
NSW Coast Astronomy Literature Database

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Vocab	Magellanic Cloud	Boo-do-en-ong	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Magellanic Cloud (LMC)	Gnar-rang-al-le-on	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Magellanic Cloud (SMC)	Cal-gal-le-on	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Orion's belt	Dhungagil dhungagil	Mathews (1903) in Troy (1993: 46) (Turner 2014)	Eora
Vocab	Meteor	Tu-ru-ga	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Meteors (cluster)	Mulumulu molu-molu	Anon (1789) in Troy (1993: 45) (Turner 2014)	Eora
Vocab	Moon (coastal)	Yen-na-dah	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Moon (inland)	Dil-luck	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Moon	Yan-nă-dah	Dawes (c1790-1792 Book C: 16) (Turner 2014)	Eora

Appendix 1
NSW Coast Astronomy Literature Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Vocab	Full Moon	Murray yannadah	King (1790: 401) (Turner 2014)	Eora
Vocab	Sun (coastal)	Co-ing	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Sun (inland)	con-do-in	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Sun	kyun	Ridley (1875: 103-108) (Turner 2014)	Eora
Vocab	Star	Bir-rong	Collins (1798: Appendix XII) (Turner 2014)	Eora
Vocab	Star	kimberwalli	Ridley (1875: 105) (Turner 2014)	Eora
Vocab	Star	gimbawali kimperwali	Mathews in Troy (1993: 46) (Turner 2014)	Eora
Vocab	Sirius	Murray Nowey	King (1790: 400) (Turner 2014)	Eora
Cultural	Moon	Young woman who broke Law with young warrior who also broke Law eventually goes into sky and becomes Moon, with phases related to size of belly	Foley (2001: 44-46)	Gai-mariagal
Cultural	Moon	The Moon once lived on the Earth as a man, he was speared by another man and his bowels spilt out onto the land. This made him very dirty and his 'tribesmen' refused to carry him home. Two plant men, wintarn (blady grass) and Cummin-Guroon (ferns) took pity on him and carried him to his home. This kindness shown to the Moon	McDougall (1901:63) (Fredrick 2008)	Gumbayngirr

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
		by the two plant men accounts for their never dying and always being able to spring up first after a fire or drought. Had other men helped the Moon they may have lived forever too.		
Cultural	Moon	In the Dreaming there was no Moon in the sky until a great boomerang-thrower threw a boomerang into the sky where it stuck and thereafter was the Moon. The Moon became sick and could not walk, but only those with grass and tree totems would carry him. The Moon was dying but he wanted to go for a swim thinking that it would help him. He said to the grasses and trees that they would live forever as a reward for helping him when he was so ill.	Enright, (1937: 88) (Fredrick 2008)	Gumbayngirr
Cultural	Pleiades	There were once seven sisters who were inseparable, one day they decided to hold an initiation ceremony. At this time the men did not practice initiation rites, but they spied on the girls and decided to copy them. The girls discovered they had been seen and attacked the men, the women were then turned into swifts and flew up into the sky where they stayed, and the men turned into kingfish.	Enright (1937: 194)	Gumbayngirr

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Moon	All men and women were preparing to leave the camp and go to war, but they were held up by waiting for an old man, the Moon. The Moon finally arrived alone except for one dog. Two messengers were sent between the two fighting communities, but they are all still waiting for the Moon to turn up. The Moon is hiding behind them, he does not want to join in the fight from the start. Spears are thrown between the two groups and finally the Moon joins in but his spear misses all the enemy returning back to him on the buttocks. Something to do with the people spearing the fish as well, even though they are totemically related to the fish. The Moon asks if they killed the fish and then says that he is too injured and that he will need to be helped back to the camp. No one will help him though, because he was injured on his buttocks all his faeces are coming out and he smells bad, he is left alone. Everyone leaves him except some of the ferns and grasses, who agree to carry him back to the camp. The Moon sleeps all night as he is carried by each of the grasses and ferns, he is taken back to his home, an island just off the mainland. The Moon thanks the plants and invites them over to his island, while they are there he says that they will not die, and that like him when they die or are killed they will rise again.	Laves, (1929: 973-1008 of notebook) (Fredrick 2008)	Gumbayngirr
Cultural	Pleiades	The aborigines of the Clarence River have a story that the Pleiades, when they set with the sun, go away to bring the winter; and that when these stars reappear early in the evening in the eastern sky, they are ushering in the warm weather. They are supposed to be a family of young women, whose name was War-rIng'-garai, and who belonged to the section Wirrakan.'	Mathews (1904: 279-280) (Fredrick 2008)	Gumbayngirr (?)

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	A Tauri	Among the same 'tribes', a Tauri was a young man named Karambal, of the Womboang division, who absconded with another man's wife. He was pursued by the injured husband, and took refuge in a tall tree. His pursuer piled wood around the bole of the tree, which he then set on fire, and Karambal was carried up by the fierce flames into the sky, where he still retains the colour of the fire.	Mathews (1904: 280) (Fredrick 2008)	Gumbayngirr (?)
Cultural	Stars	After Birrugan was killed at Trial Bay, he was raised up by two sisters. Koala's guts turned into Seal Rocks south of Forster. Birrugan used myrtle sticks to vault over island. Myrtle tree turned into ladder and and he and two wives ascended into the sky (to become stars?)	Morelli et al (2016: 55)	Gumbayngirr
Cultural	Sun	The Sun is larger when rising and setting due to Yuludarla (Father) being with Birrugan (son) at these times. Otherwise Birrugan travels with the Sun alone.	Morelli et al (2016: 59-60)	Gumbayngirr
Cultural	Pleiades	Two sisters formed the sea and the coast. Eventually went up into sky and became Seven Sisters (two points of stars?). Note: could be the Hyades, as story talks about two crossed yam sticks, and Hyades is the 'V' of the horns of Taurus, which looks like two crossed sticks.	Morelli et al (2016: 78-79)	Gumbayngirr
Cultural	red star	The old man - Madaan. Story ends when old man and older sister go into sky and become stars (she became red star in Northern sky - Aldebaran?)	Morelli et al (2016: 90)	Gumbayngirr
Cultural	Moon	Moon man - Giidanyba. Giidany Miilarl special place for Moon. Coffs Harbour - Moon rising place is reef NW of Mutton Bird Is (Giidany Miilarl). Moon resting place is white rock in the surf East of Mutton bird Is	Morelli et al (2016: 263)	Gumbayngirr
Cultural	Sun, Moon	Moon regarded as masculine, and Sun as (generally) feminine. The female Sun is more sexually active in summer.	Morelli et al (2016: 304)	Gumbayngirr
Cultural	Morning Star, Evening Star	Birrugan is identified with Morning Star and mother Bawnggan with the Evening Star	Morelli et al (2016: 304)	Gumbayngirr

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Southern Cross	Birrugan is seen as the Southern Cross, and his two wives are the Pointers	Morelli et al (2016: 304)	Gumbayngirr
Cultural	Pleiades	Southern Gumbayngirr - the Pleiades are identified with the two sisters who made the sea; besides the common name of this constellation Janagan it is also called Ganay 'yam stick' appearing as two crossed yam sticks in the sky. This is just like the shape of crossed yam sticks that Split Solitary Is takes; the final resting place of these sisters in the Nymboidan tradition (from Coffs Harbour area).	Morelli et al (2016: 304)	Gumbayngirr
Cultural	Orion	Story in Laves concerning three brothers unmarried and three sisters unmarried. The idea of brother x sister exchange enters in. The six are stars visible in Summer. Darlalyurrurr composed of the three sisters: Bulagan.gidam and three brothers: Bulagurrgidam. The three boys are the three large stars of Orion's Belt.	Morelli et al (2016: 304-305)	Gumbayngirr
Cultural	Sun, Moon, Southern Cross, Orion, Evening Star, Morning Star	They call the sun Burryoogan, a female, while the moon is male, and called Thineburra. The Southern Cross is composed of five sisters in one family called Thaniken; Orion is three brothers named Thallan, Bullen, and Goorgiddem. The evening star is Bungoogin, and the morning star Kiwah Kurrgwindah (Kiwah is morning).	Palmer (1884: 292)	Gumbayngirr
Cultural	Pleiades	Group of sisters (magpies) digging for yams, and common black and white magpie rescued one, but sisters had to escape his charms by climbing tree into sky	Shepard (2003: 105-108)	Gundungurra
Vocab	Venus	Garandhalang	Mathews (1908a: 203-206)	Gundungurra

Appendix 1
NSW Coast Astronomy Literature Database

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Vocab	Alnilam	Wagulin (Crow) Middle star of Orion's Belt	Mathews (1908a: 203-206)	Gundungurra
Vocab	Alnitak	Wife of Crow (Outer star of Orion's Belt)	Mathews (1908a: 203-206)	Gundungurra
Vocab	Mintaka	Wife of Crow (Outer star of Orion's Belt)	Mathews (1908a: 203-206)	Gundungurra
Vocab	Theta Orionis	Dyoorutgang (Thrush)	Mathews (1908a: 203-206)	Gundungurra
Vocab	Crux	Dyin-yook (Black Swan)	Mathews (1908a: 203-206)	Gundungurra

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Vocab	Alpha Crucis	Head of Swan	Mathews (1908a: 203-206)	Gundungurra
Vocab	Muruai	Kangaroo	Mathews (1908a: 203-206)	Gundungurra
Cultural	Moon	Kubbadang the moon used to follow the Dyirrang, black magpies or jays, a family of young women, when they were out searching for yams kummee-ook and other foods wanting one of them to marry him, but they did not care about his attention. His camp was not far from theirs, and one day they told him they were going out in quest of grubs and invited him to join them. They had previously been out and put some evil magic upon the grubs in a certain tree. When they all got out into the bush, they pointed out this tree to Kubbadang as being a good one for grubs and took some other trees for themselves. When they had caught a sufficient quantity of grubs they cooked them. Kubbadang cooked his grubs at his own fire and all of them had a good meal. The girls went back to their camp and Kubbadang returned to his. Soon afterwards, however, he felt very ill and his stomach puffed up to a prodigious size, so that his body was quite round and he commenced groaning loudly. His friend Mulleum, the eaglehawk, was passing along a ridge near the place and hearing the awful groans, went to see what was the matter. Kubbadang told	Mathews (1908b: 203-206)	Gundungurra

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		him of the day's proceedings and said he blamed the Dyirrang women for working some spell upon his food. Mulleum at once set about counteracting the magic of the sisters and being a very clever sorcerer, succeeded in making Kubbadang well again, and he went up into the sky where he still remains. When the moon is full it represents the time when Kubbadang was swelled up, and the new moon shows him after he was cured by Mulleum.		

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Venus	In the gun-yung-ga-lung, or legendary times, there were two young men, named Bullun, great magicians as well as warriors, who roamed about Burraborang, on the Lower Wollondilly and Cox rivers. They were either brothers or very near relations and always went together as comrades or mudyaula. Some of their exploits are briefly described in the following notes. On another occasion the Bulluns were on an expedition in quest of some of their friends who had gone out hunting and not returned. They came upon a little boy sitting on a rock and spoke to him, but he would not answer them and began to cry. They thought to pacify him and offered him first one thing and then another, but he shook his head every time. At last the elder Bullun put his hand on the fleshy part of his own thigh and being a conjurer he pulled off a piece of flesh which he offered to the lad, who at once changed his tune from crying to smiling, and accepted the piece of human flesh as something he was evidently quite accustomed to. He immediately got on his feet and ran away towards a hole in an immense rock about 100 yards off, into which he jumped and disappeared. The Bulluns at once concluded that he belonged to the people who had been killing and eating their fellow 'tribesmen'. They walked all round the rock and found several other holes which had been used for purposes of ingress and egress. Every hole was then stopped up with a heap of dry wood, bark and other combustible materials. They now lighted each of these inflammable heaps, until they were a seething mass of flame, and hurried back to the hole into which the young cannibal had jumped. The cavern was soon full of a dense smoke and the inmates were beginning to suffocate. Presently they came running to the only exit available and rushed out one after another, but were at once knocked on the head and killed by the Bulluns, one of whom stood on either side. Only one	Mathews (1908b: 203-206)	Gundungurra

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
		of the gang escaped and he flew away right up to the sky, where he became a bright star called Ga-ran '-dha-lang, the aboriginal name for the planet Venus.		

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Pleiades	In Mathews (1908, pp.203-6), there is Dreaming relating to The Pleiades constellation belonging to the Gundungurra peoples of the Blue Mountains. It describes a group of sisters; one of which was being them together in a camp. However, Karrugang was very lazy, making the sisters do all of the work and as a result, and so they often tried to run away, but would always be caught by Karrugang and returned to the camp. This continued until one stormy day when Karrugang's wife made a shelter out of stringy-bark whilst her sisters sang a song to make the tree grow taller and taller until it was tall enough for them to reach the skies. The sisters climbed up the tree and can be seen today as The Pleiades.	Mathews (1908a: 203-206) (Turner 2014: 21)	Gundungurra

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Pleiades	Dyirrang is the black magpie or jay, which builds a mud nest on the upper side of the branch of a tree. There was once a family of daughters, about half a dozen or more. This group of sisters used to go out into the bush digging for yams and other herbs. Karrugang, the common or black and white magpie, was always dodging about after them, in the hope of making one of them his wife. It chanced on a day that one of the girls was digging for Kummeoook, an edible bulb which grows at the base of a kind of sedge growing on the margins of watercourses. She slipped out into the deep water and in her struggles became entangled in the weeds which impeded her swimming and she was drowning. Karrugang saw her danger and ran to her assistance, thus saving her life. For this gallant rescue she became his wife and the other girls came to live alongside of her camp. Karrugang was a lazy fellow and made the women do all the work. They often tried to steal away from him, but he always followed their tracks and brought them back. After some time, a storm was coming up one day and the women asked Karrugang to strip some bark to make a shelter from the rain, but he refused. His wife then began to strip a sheet of bark from a tall tree and got it off at the bottom in the usual native fashion. She then pulled it upward, separating it from the side of the bole, whilst her sisters sang a go or' -ree-al~lain, or charm song, to make her work effective, and also to cause the tree to grow higher and higher. She continued pulling and the bark kept stripping off as she climbed up after it. The other girls then hastened to her assistance and all of them kept holding on and stripping the bark right up to the sky, where they have remained ever since as the well-known constellation of the Pleiades. One of the Gundungurra women's stories of the Three Sisters at Katoomba is also a story concerning the Pleiades.	Smith (2003: 105-108)	Gundungurra

Appendix 1
NSW Coast Astronomy Literature Database

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Cultural	Milky Way	a giant turtle	Smith (1992:4)	Gundungurra
Cultural	place of dead	the place of the dead was at the end of the sky towards the sea. 'on arrival at the other side (the spirits of the dead) find a large bridge which they cross, and then dive down through a tunnel, at the end of which is a fiery mountain, they pass over this and then meet their friends.'	Feld in Smith (1992:84)	Gundungurra
Cultural	Pleiades	In Mathews (1908, pp.203-6), there is Dreaming relating to The Pleiades constellation belonging to the Gundungurra peoples of the Blue Mountains. It describes a group of sisters; one of which was being them together in a camp. However, Karrugang was very lazy, making the sisters do all of the work and as a result, and so they often tried to run away, but would always be caught by Karrugang and returned to the camp. This continued until one stormy day when Karrugang's wife made a shelter out of stringy-bark whilst her sisters sang a song to make the tree grow taller and taller until it was tall enough for them to reach the skies. The sisters climbed up the tree and can be seen today as The Pleiades.	Mathews (1908a: 203-6) (Turner 2014 2014:21)	Gundungurra

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Pleiades	<p>Karrugang and the Seven Sisters</p> <p>A story about the Pleiades from the Gundungurra people of the Blue Mountains</p> <p>In the Dreaming, a group of sisters were pursued by a magpie named Karrugang, who wanted to make one of the sisters his wife. One day, while digging for edible roots near a river, one of the sisters slipped into the river and became tangled in the weeds, drowning. The magpie saved the woman and made her his wife. The other sisters stayed at the camp with the crow and his wife. The magpie was lazy and made all the women do the work. The women frequently tried to escape, but the magpie would find and return them to his camp. One day during a storm, the wife pulled stringy-bark from a tree to make a shelter whilst her sisters sang a charm song. As the lazy magpie lay around, the sisters sang making the tree grow taller and taller. They quickly climbed the bark into the sky where they are seen today as the sisters of the Pleiades.</p>	Mathews (1908a: 203-6)	Gundungurra
Cultural	Three sisters	Language/cultural analysis of the names of the Three Sisters rock formation at Katoomba. Author shows that story may have come from the extreme east end of Gundungurra Country in the Kangaroo Valley	Illert (2003: 1-29)	Gundungurra
Cultural	Milky Way	Baiaame was sent down from the Milky Way by this mother (Earth mother) in his canoe. While paddling around he created all the rivers, creeks, and valleys, and head lit up the Sun. When he eventually left Earth he flattened Kariong Mt.	R. Pankhurst pers. comm. 2016	Guringai
Cultural	Betelgeuse	Person had to kill a native cat (Quoll) who was eating them. When they did, his spirit floated up into the sky with a red glow to become the star Betelgeuse	R. Pankhurst pers. comm. 2016	Guringai

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Aldebaran, Pleiades	<p>Back, a long time ago when the world was young there lived in the forests of Ourimbah seven beautiful sisters; these sisters had some magical powers but could only use them if they had their magic digging sticks which they all carried with them. Also in the forest there lived a young warrior who was in love with the eldest of the sisters but she did not want to have anything to do with him and rejected all his advances. In time he became desperate for her and one night he sneaked into the girls' camp and kidnapped her while she slept; she was powerless to stop him from carrying her away as she had dropped her magic digging stick in the struggle. He took her to his camp where he restrained her and kept her prisoner while he tried to get her to love him. The other sisters were worried when they found her gone and they knew something had happened because she had not taken her digging stick; they suspected that the warrior who lusted after her was probably responsible, so they sneaked through the forest to his campsite and they caught a glimpse of her in his Gunyah, but as he was a very skilful warrior and trained in the ways of the hunt he detected their presence every time they tried to get close and would launch spears at them very accurately. They tried several ploys using magic to try and release her but none were successful because she could not use her own magic until she was in possession of her digging stick. Using their most powerful magic they summoned up an extremely cold period where everything froze with ice and snow and the warrior was frozen solid and then they went into his camp and gave the elder sister her magic digging stick. Very soon using her magic she became unfrozen and escaped into the mountains with her sisters. They decided to leave the Earth and go up into the sky away from the warrior but before they did, using their magic, they created springs on the tops of all the</p>	R. Pankhurst pers. comm. 2016	Guringai

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
		hills which flowed with fresh water down the hill sides and formed creeks and rivers; then they all leapt up into the sky holding hands where they became the constellation Pleiades. To this day when this constellation sinks in the western sky at evening the Aboriginal people know that the sisters are going away to create the cold winter.		

Cultural	Orion	<p>A long time ago when all the creatures in the land still had human form, and they had not yet been turned into the various animals that they represented, there lived in a clearing near a billabong a fierce Native Cat (Quoll) man named Murryagang. He would ambush and kill any person who ventured near his camp and kill and eat them; the people of the clans were frightened of Murryagang but were too scared to go out and try to kill him, but something had to be done, as more and more people were vanishing almost daily and were being devoured by the Native Cat man. Messengers were sent out to rally all the surrounding clans for a meeting to try and come up with a solution to the problem. A large gathering of people assembled near the ring and suggestions were called for; some people suggested an attack by a large force on the Native Cat man's camp, but some of the elders who knew the ways of the Quoll said that it would not work because Quolls were so elusive and were also excellent bushmen with keen senses of hearing, smell and sight and that he would become aware of the impending attack long before it could be carried out. A wise old elder came up with a plan. He said 'Why don't we all get to work and dam up all the water holes and only leave one waterhole for the Native Cat man to come and drink from and we can get three of our best and keenest hunters to hide nearby to spear him when he comes to drink, as he surely must when he gets thirsty' All agreed that this would be a good plan. They then selected their finest hunters; they chose the Wedge Tailed Eagle man because of his keen eyesight, The Dingo man because of his sense of smell and the Death Adder man because of his lightning fast and accurate strike. A large number of spears were manufactured and these three warriors began to practice with them night and day until they could hit any target moving or stopped. Meanwhile all the other people began to dam up the rivers and drain the billabongs until there was only one source of water in the whole country. As night began to fall the three hunters hid themselves in the</p>	R. Pankhurst pers. comm. 2016	Guringai
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		<p>ferns and scrub around the water hole where they waited for their quarry. After a while the Dingo man detected the scent of Murryagang and soon the Wedgetail Eagle man saw him sneaking along the bank of the billabong in the moonlight. Murryagang was very wary and stopped every now and again and remained motionless, sniffing the air but all the while edging closer to the water. When he was sure there was no one nearby he bent down and cupped his hands to drink from the billabong, The Death Adder man struck him with the first spear and then they all began to rain spears into the body of Murryagang until he lay dead on the bank of the billabong. They crept up to the dead body of the Native Cat man and removed the dozens of spears penetrating his body and as they did the moonlight reflected silver on all the blood spots on his body and to this day all Quolls or Native Cats have silver spots covering their body, which acts as a perfect camouflage in the bush under the cover of darkness. As the triumphant hunters were walking away from the body Murryagang's spirit began to leave his body and it floated up into the night sky with a red glow where it became the star Betelgeuse in the Constellation of Orion. (Note: this story may also be shared with the Gundungurra people).</p>		
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Cultural	Milky Way/Baiame	<p>This is the story told to me about the legend of the man at the Bulgandry art site. This man should not be known as Bulgandry Man or Bulgandry as that name means 'boomerang in hand'. The man is probably Baiame or whatever he was known as down here.</p> <p>The man is shown with a large object across his stomach, a circular object in his right hand and a small crescent in his left hand, a larger circular object is below his left hand, the man has long hair. Below his body is a cigar shaped object about 4 m long pointed at the ends, the whole series of engravings is on a pock marked rock surface. This is the way the story was told to me. This is Baiame the great creator and across his stomach he has the paddle for his canoe which can be seen below him. Baiame's mother who is known as the Earth Mother lives in the Milky Way and she ordered Baiame to go from there to the earth which was dark and uninhabited and prepare the place for habitation and populate it with all animal, fish plants etc. Baiame left the Milky Way in his canoe and paddled through the stars, which can be seen all around him on the rock surface until he reached the earth where he paddled all around looking for a suitable landing place, while doing this he created all the rivers, creeks and valleys. He had the sun and moon with him which he threw up into the sky; from Baiame's head rays of light emanated and he lit up the sun with the light and caused the earth to be lit up. Now also on this uninhabited planet was an evil person who may have been Baiame's brother or near relative his name was said to be Koen or Kurrowen and he attacked Baiame and a terrible fight ensued and Baiame severely wounded Koen and left him for dead. Koen recovered and ambushed Baiame and killed him. When Baiame's spirit arrived back up in the Milky Way his mother scolded him and asked why he was back when he had not finished the task she had set him. She sent Baiame back to earth three days later and also gave him two wives named Gnalabal and Birraghnooloo to take back with him. After arriving</p>	R. Pankhurst pers. comm. 2016	Guringai
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		<p>back on earth he sought out Koen and killed him with the paddle of his canoe. He then set about to create humans which he did but he gave many of these humans the habits of animals, birds and fish and after instructing these creatures in the ways of life, how to build nests, diets etc. He then turned them into the animals that they represent and they went off to populate the earth with these creatures. The humans he gave intelligence to live and hunt and told them what they were allowed or not allowed to hunt or eat. The engraving of Baiame on the rock shows him with a mouth. This was important as with this mouth he taught the humans to speak and languages but more importantly he told the law and lore of the Aboriginal people.</p> <p>Many other episodes happened while Baiame was on earth but when he had finished his work he launched himself back up to the sky from the top of Kariong Mountain nearby and while doing so he flattened the top of the mountain which can still be seen as flat to this day. I don't know whether this would be any good for the paper on Sydney Basin. Similar stories are to be found up at Yengo only the names have been changed to protect the innocent. This is a Central Coast story though.</p>		
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<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Vocab	falling star cluster	The spurned warrior, after he had thawed out, went off to find another girl to court and one day he saw a beautiful young girl down at the creek catching yabbies; he watched her for a few days and then made his move on her, kidnapped her and carried her off. It happened that her husband was a very fierce and powerful warrior known all over the country for his skill and prowess. He soon tracked his wife down to the young warrior's camp where he attacked the young warrior with his waddy, but the young fellow was very nimble and climbed a large Eucalypt tree. Now in those days the trees were thousands of feet high and reached right up to the sky so the young warrior climbed up into the top reaches of the tree. The powerful warrior gathered up dead leaves, kindling and large dead trees and piled them around the tree his enemy was hiding in and lit them all; the fire began to burn the huge tree and the flames climbed higher and higher up the trunk until they reached the young warrior who was consumed by the flames. As the huge tree began to fall the burning body of the young warrior was seen to drift upwards into the heavens where it finally came to rest as Aldebaran, a red star near the Pleiades constellation, where it remains to this day.	Troy (1993)	Sydney
Vocab	Full Moon	marri yannadah	Troy (1993)	Sydney
Vocab	Moon when set	yannadah bura	Troy (1993)	Sydney
Vocab	Moon when new	yannadah barrigi	Troy (1993)	Sydney
Vocab	LMC	galgalyung	Troy (1993)	Sydney
Vocab	SMC	ngarangayong	Troy (1993)	Sydney
Vocab	Magellanic clouds	buduwang	Troy (1993)	Sydney
Vocab	Milky Way	warawal	Troy (1993)	Sydney
Vocab	Orion's belt	dhungagil	Troy (1993)	Sydney

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Vocab	Pleiades	mulumulung	Troy (1993)	Sydney
Vocab	Star	birrung	Troy (1993)	Sydney
Vocab	Sun	guwing	Troy (1993)	Sydney
Cultural	Moon	Story of man, Moonan, climbing very tall tree for witchetty grubs, reached top and could reach the Moon. Two boys shook tree and he climbed onto Moon. Boys tried to reach him, but couldn't and Moonan became man in the Moon. Boys kept trying, and eventually became opossums, and can be seen high in the trees under a full Moon.	Mansell (1952: Part 2, Class 4)	Sydney
Cultural	Sun	Story of big wind and fire that tried to blow the Sun from the sky. It than burned the Earth until it was red. The Sun (Euroka - Sydney word for 'sweat') . The people, who were sheltering from the wind, came out and found many colours not there before, including black and ochre which they used in painting.	Mansell (1953), in NLA MS 9197	Sydney
Cultural	Moon	The smaller one, I was informed, was shown to the youths who had been through the ceremony of the Kippara, and they were told that at one time there was no Moon and a great boomerang thrower threw his boomerang into the sky, where it remained and was thereafter the Moon. The stone illustrated the story (?).	Enright (1937: 1)	Worimi
Vocab	Moon	keewuk	Scott (1929: 19)	Worimi
Cultural	Pleiades	following story concerning the Pleiades. There were once seven sisters who were inseparable companions. One day they decided to hold an initiation ceremony. Now in those days the menfolk did not practice initiation rites. When, however, they saw what the sisters were doing they did likewise. The women discovered that they had been spied upon and thereupon attacked the men. The women could throw stones with as much skill as the men. The women were turned	Enright (1946: 265)	Worimi

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		into swifts and flew up into the sky, where they are still stuck. The men were turned into kingfish.		
Cultural	Pleiades	Toorgah, the name of a grub much sought after by the natives, is also the name of a group of seven stars.	Enright (1939: 194}	Worimi
Cultural	red star	The big red star, which is called Jumbarrin, looks after the children	Enright (1939: 194)	Worimi
Cultural	Southern Cross	Story from the Worimi/Birpai near Taree (Halliday's Point). Gulambarra was a spiritual person who got in a fight with a bad clever man and died. His mother, when she found out, started crying, and this can be seen as the weeping bark of a mangrove tree/crying tree at Shelly Beach. Gulambarra was taken by his two wives to an island off Seal Rocks, where they all went up into the sky, Gulambarra as the Southern Cross, and his wives as the Pointers.	Paulson (2017: MP3)	Worimi
Vocab	stars	munni, mereen	Scott (1929: 19)	Worimi
Cultural	stars	Paddy Tighie; Paddy was a very intelligent black; he knew all the fixed stars of any magnitude, as well as the planets in our hemisphere, and where to look for them at particular seasons; Each had its name, but unfortunately I can't find the record. I have it somewhere; when it turns up I will with pleasure give the names to the Society. I remember only two, those of Venus and Arcturus, the former called Tyndrema, the latter Quoinbelong.	White (1934: 224)	Worimi
Vocab	Sun	wingin, toocan	Scott (1929: 19)	Worimi
Cultural	Pleiades	One day eight girls went out gathering grubs (Toorgah), but only seven returned. The other was never seen again. You can see those	Enright (1939: 194)	Worimi

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		who returned as a group of seven stars. That group is also called Toorgah.		
Cultural	Emu in the Sky	There was once a beautiful girl, whom every 'tribesman' admired. One day she was abducted. Five or six of her own 'tribe' followed the culprits and pursued them into the sky. As they went up they put out their hands and she was turned into an emu. This girl was a great dancer and that is why the emu dances so well.	Enright (1946: 265)	Worimi
Vocab	Milky Way	dhun.giyn	Lissarrague (2006: 318)	Worimi
Vocab	Sun	dhuuni	Lissarrague (2006: 318)	Worimi
Vocab	Moon	gilayn	Lissarrague (2006: 318)	Worimi
Vocab	Moon	giwang	Lissarrague (2006: 318)	Worimi
Vocab	Pleiades	mirriyn manday (many stars)	Lissarrague (2006: 318)	Worimi
Vocab	Southern Cross	ngarlin bulawarr (elder sister - you two: two white spots in S. Cross - nebulae?)	Lissarrague (2006: 318)	Worimi
Vocab	Sun	win.gin	Lissarrague (2006: 318)	Worimi
Vocab	Star	wupa	Lissarrague (2006: 318)	Worimi
Vocab	Stars (unknown)	mayirigad	Lissarrague (2006: 318)	Worimi
Cultural	Moon	Man in the Moon story, prob. in Kattang. Possible story of phases of the Moon	Holmer and Holmer (1969: 36)	Worimi
Vocab	Sun	ngawray; ngayan	Morelli (2012)	Yaegl
Vocab	Morning Star	Nganggula	Morelli (2012)	Yaegl
Vocab	Evening Star	Nganggulaawan	Morelli (2012)	Yaegl
Cultural	solstices	Story from Dame Mary Gilmore about her father being shown that the local Aboriginal people could tell the solstices by means of certain rock formations near the headwaters of the Clarence River.	Gilmore (1935)	Yaegl
Vocab	Moon	Giidany; walaalgurr	Morelli (2012)	Yaegl

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Vocab	star	wilaaran.gan	Morelli (2012)	Yaegl
Cultural	Pleiades	The aborigines of the Clarence River have a story that the Pleiades, when they set with the sun, go away to bring the winter; and that when these stars reappear early in the evening in the eastern sky, they are ushering in the warm weather. They are supposed to be a family of young women, whose name was War-rIng'-garai, and who belonged to the section Wirrakan.' Among the same 'tribes', a Tauri was a young man named Karambal, of the Womboang division, who absconded with another man's wife. He was pursued by the injured husband, and took refuge in a tall tree. His pursuer piled wood around the bole of the tree, which he then set on fire, and Karambal was carried up by the fierce flames into the sky, where he still retains the colour of the fire.	Mathews (1904: 279-280)	Yaegl ?
Cultural	Stars, Moon	Yuin creation story - young couple (Toonkoo) come to Country on a star; later young man displeased spirit and was sent to Moon, where his face was seen by his wife.	Thomas (1981)	Yuin - Wallaga Lake creation story
Cultural	Sun, Moon	Sun is Grandfather Sun and Moon is Grandmother Moon. Former holds many stories: through time he has led the way for us to navigate over water and land. Latter pull water up into sky and holds it until it's time to water her garden, Mother Earth.	Harrison (2009)	Yuin - Wallaga Lake region

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Canis Major	<p>In Turbet (1989, pp.125-6) there are two other Dreamings that relate to Aboriginal Astronomy within the Sydney Region. The first tells of the creation of the stars in the Munowra that form part of Canis Major and originates with the Wandandian people of Nowra. This story describes how Wunbula the bat and Murrumbool the Brown Snake and Moondtha the Black Snake (his two wives) travel from Columbri to Monga where they set up camp. Whilst looking for wombats, they found a burrow and Wunbula and his dog crawled inside it. As Murrumbool and Moondtha waited outside, one said 'our husband makes us tired taking us about; we'll block up the mouth of the hole and go back to camp'. As Wunbula was trapped, he heard a fly buzzing and carried his dog as he followed the insect to small opening and then returned back to their camp. Upon arrival he said to his wives, 'Let's go for ant larvae, women', and they went off. However, due to the heat, Wunbula suggested that they all go for a swim; so they walked to the creek bank. Wunbula said 'Come on. Let's bathe - you on one side, you on the other and me in the middle'. As a result of barbed spears stuck in the bottom of the creek on the sides where the women entered, they were impaled and went into the skies with Wunbula to be known as the stars in Munowra, part of Canis Major</p>	Turbet (1989: 125-126) (Turner 2014: 21)	Yuin (Wandandian)

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	The Pleiades and the Moon	Seven sisters lived together and were the most beautiful pure women on Earth, they lived alone away from their community apart from their neighbour Thowra. They were much sought after in marriage but they refused all advances. Every morning Thowra went out hunting and the girls went fishing, one of them staying behind to tend to the fires. It was too much to expect Thowra to be immune to the women and he was in love with the eldest of the sisters, one morning instead of going hunting he hid in the grass and played to his human weakness. He put out his fire and waited for the girls to come and re-light it, the youngest two came back and lit it, but the other sisters refused, and eventually the oldest sister returned to tend to the fire. It was this sister that Thowra desired, so he ran out and caught hold of her, the sisters tried to stop him, but they could not pull him off so they threw burning branches at him. Thowra was badly burnt and the wounds never healed, but sent out an awful stench like that of a dead whale. The eldest sister had a daughter as a result, the young girl's hair grew at an immense rate, which the sisters hid from Thowra. Eventually they had collected enough hair to make a long fishing line which they threw up into the sky, they left the Earth and took the child with them. When Thowra returned he wondered what had happened to the girls, crying out their names asking where they were. They replied saying that they were up in the sky and that he could join them if he could climb up the rope. He began climbing and had reached a great height when the sisters cut the line and Thowra fell back down to Earth. The girls hated Thowra for what he had done and could not stand the stench. He was found on Earth and two men helped him to recover by placing him in a bag on top of a high hill and bringing him food and medicine. Thowra went down the hill and met all the people on Earth and he was	Brother (1897: 10-11) (from Fredrick 2008)	Yuin or Dharawal

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
		<p>grateful for being healed again, he was told that he should not touch the man that had healed him but he could not resist, so touched him and turned into a boomerang. The healer took up the boomerang and threw it round the ring 5 times, no one else could throw the boomerang because it was as heavy as Thowra had been. A boomerang that no-one can throw is useless, so he threw it up into the sky for it never to come back. Thowra is the boomerang in the sky and he takes his male form when the Moon is full, sometimes you see a child very close to him, and the seven sisters remain in the sky as the Pleiades.</p>		

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Moon	He indicates that these ceremonies last nine days, being the duration of the birth of the new Moon. I recommend that additional research be conducted on the relationship between the new Moon and male initiation on Barranguba Island.	Harrison (2009: 101) (in Ross 2014)	Yuin
Cultural	Sun	I also suggest that the motive for facing Yuin graves southeast, towards the rising Sun, be examined	Harrison (2009: 116) (in Ross 2014)	Yuin
Cultural	Moon	A version of The Story of the Waratah, recounted by the Yuin Elder Guboo Ted Thomas, is located in the NSW State Library. Thomas tells us that Toonkoo (also spelt Tunku) and Ngaardi (also spelt Ngardi) came from the sky, upon a star, to Earth. Toonkoo and Ngaardi learnt to live off the land by trapping animals and using the natural resources that surrounded them. The Great Spirit, Daramah, tried to teach Toonkoo how to hunt effectively but Toonkoo became enraged and threw his spear towards a star. In response, Daramah bent Toonkoo's spear into a boomerang and sent Toonkoo to live on the Moon. When Toonkoo failed to return from his hunting trip Ngaardi went in search of him. During her search, Ngaardi looked to the sky and saw Toonkoo's face in the Moon. Ngaardi tried to reach Toonkoo by climbing to the top of a mountain. When she reached the top, Ngaardi was exhausted and collapsed. Her tears became the rivers and creeks in the land and Ngaardi's broken heart became the red waratah.	(Guboo) Thomas (1997: 14) (in Ross 2014)	Yuin
Cultural	Meteors	Other sources from the Yuin Nation appear to verify that Yuin peoples observed meteorites. Hoskins talks about a traditional Aboriginal story from the south coast NSW referring to 'a huge mass of molten red heralding the decent of the stars and the movement of the sky.	Hoskins (2013: 71) (in Ross 2014)	Yuin

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>SOURCE</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Meteors	Besold's Dhurga transcripts record a sentence in Dhurga that makes reference to a falling star. The sentence 'Birriban [ngĩandyoon] [walban] jo'-am-bâ'dhoo', has been translated to 'the emu is running very fast'. The end of this sentence, 'djawambadhu', has not been translated. One possible translation that Besold gives for this word is - 'like a falling star'	Besold (2013: 111-219) (in Ross 2014)	Yuin
Cultural	Sky	Willey refers to a similar story where Yuin peoples believed that the sky might fall. Specifically, Willey tells us that Aboriginal peoples of the NSW south coast believed that wooden pillars were needed to hold up the sky.	Willey (1979) (in Ross 2014)	Yuin

Cultural	Baiame	<p>Baiame</p> <p>The Aborigines of the southern part of New Holland have a belief in the existence of a Supreme Being; and, from connecting circumstances, I am of opinion that the same creed upon religious subjects exists throughout the whole continent of New Holland. The God of their belief is called 'Boyma', who, they say, dwells at an immense distance to the north-east, in a heaven of beautiful and supernatural appearance, where the Almighty is represented by them as seated on a throne of transparent crystal of vast magnitude, which has its base in the great water, and rises to a stupendous height towards the stars.</p> <p>To Boyma is ascribed the creation of all the heavenly bodies. They believe the earth to be an immense plane, and fixed, the sun, moon, and stars revolving round it to give it light. On my representing the fixed position of the sun, the rotundity of this world, and its own diurnal and annual motions, he was quite amused at our strange belief, and endeavoured to convince me we must be wrong.</p> <p>The sun, they believe, is only the orb of light, and not the means of producing heat, or by the greater or lesser elliptical altitude of the earth producing the change of seasons.</p> <p>In endeavouring to undeceive my sable friend in this, too, I had the same difficulty as is the other instance of the earth's and sun's motions. In again ridiculing our assertions that the sun was the cause of all heat, he remarked that 'if the sun makes the warm weather come in summer-time, what for not make the winter warm as it is seen every day?' The influence that produces heat, in their belief, accompanies the Pleiades (mangudia). When the mangudia are visible at a certain altitude above the horizon it is spring (begagewog). When it rises to its highest altitude, it is summer,</p>	Manning (1882: 155-173) (in Organ 1993)	Yuin
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		<p>'winuga', and upon this cluster of stars sinking again towards the horizon in autumn, it is 'domda'. In winter, when the Pleiades are barely visible or lost to view altogether, it is then winter (magur) and cold. The ordinary stars (miunga) have no kind of influence on the seasons, but simply the Pleiades. The constellation Mungudia is retained by God during the night, and both are sent to give light and heat during their respective seasons. The clouds that obscure the sun in all seasons equally obscure the influence of heat from the Pleiades, and therefore they have no belief in the power of the sun's rays to produce heat, but only light.</p>		
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Appendix 2 NSW Coast Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Songlines	Black Swan - Newcastle wetlands	Worimi/Awabakal?
Cultural	Story	Look for two sisters story in Threlkeld ('Mulon Bulla') (in 'Reminiscences'). Also, Birriban was Chief in the Awabakal.	Awabakal
Cultural	Whale	Whale and starfish story (Dharawal). Whale came into Botany Bay and transported starfish (Dolls Point to La Perouse). Something wrong with whale, but carried starfish because it made it feel better.	Bidigal
Cultural	Dolphins	Dolphins (porpoise) came into Bay end of Sep-early Oct. Could be related to fishing	Bidigal
Cultural	Fishing	Mullet run around Easter to May. Caught with nets.	Bidigal
Cultural	Songlines	Mt Ousley (Bulli) is part of songline of three peaks - Ousley, Coolangatta (Culunghutti), and Dromedary (Gulaga).	Bidigal
Cultural	Songlines	Black Duck dreaming/songline - Royal National Park songline South (to Walaga?); Black Swan goes North	Bidigal
Cultural	Hairy men	Doolagah - hairy man with red eyes. Mum would say: 'don't go near caves on beach' (Summercloud Bay, Wreck Bay) due to the Doolagah	Bidigal
Cultural	Rocks	Don't pick up rock from other Country, bring home, get sick	Bidigal
Cultural	Three sisters	Three Sisters is Katoomba story	Bidigal
Cultural	Three brothers	Three Brothers Dreaming - story from Gumbayngirr (Uncle Ted Buchanan). Evil woman version told to Ray Kelly Senior. Maybe Auntie Marion's version is woman's story	Birpai

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Songlines	Stories travel on songlines. Features on songline tell the story. Coming from the Manning River you see the Three Brothers Mts.	Birpai
Cultural	Seagull story	Stories taught people how to act. Young boy 4-5-year-old camping on beach. Old men repairing fishing net. Young boy in rockpool, spearing fish. Grandfather watching, boy spears fish, heaps of fish, puts them in fire, when cooked, eats by self (greedy), Grandfather watching, boy's belly full, has sleep. Men catch lots of fish, put fish in fire, cooking, aroma of fish. Boy wakes up to younger men doling out fish to everyone but him. Ask parents, who ignore him. Worked himself up so much, he turns into a seagull. They behave that way now (story might be from Arnhem Land - coastal).	Birpai
Cultural	Eaglehawk and Kingfisher story	Connected to Milky Way. Eaglehawk and Kingfisher having a fight. EH throws firestick at KF, who catches fire. KF goes to shoreline, which has no waves (during creation time). Sticks one foot in water, calls in waves, one foot in Milky Way, called down rain. This is why the Milky Way has a 'smokey' appearance.	Birpai
Language	Baiaame	Gulumburr	Birpai
Cultural	Fish traps	Fish trap at Point Plomer	Birpai
Cultural	Dolphins	Dolphins bringing in fish. Women called them sitting on shore	Birpai
Cultural	Dolphins	Two Aboriginal people (man and woman), wrong skin, ran away, dived into water. The man was speared, and the woman dived after, both were drowned. Both turned into dolphins.	Birpai
Cultural	Dolphins	Dolphins called in, in language, to get fish in	Birpai
Cultural	Fish traps	South end of Shelly Beach. This was also a stone implement area, further around are axe grooves and boomerang sanding places towards Miners Beach. They also used the sandpaper fig	Birpai
Cultural	Fish traps	Fish traps around Rainbow Beach (Bonnie Hills)	Birpai

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Navigation	Uncle Goola (Koala) (Bill) Holton (David family) knew how to tell direction by the stars	Birpai
Cultural	Three brothers	Long time ago, when land was flat, there were three brothers, Dooragan (oldest), Mooragan (middle), and Booragan (youngest). Mother was spirit of the lake. When they were to have initiations, fostered out to other Birpai clans. Dooragan fostered to Stingray people and started walking north to meet them. Mooragan was fostered to Crab people and started walking along the lake towards the sea to meet them. Booragan went south to the Shark people. Mooragan tried to persuade Dooragan to help him kill Booragan, but Dooragan refused. Mooragan ran south and killed Booragan. The Willy Wag Tail saw this and flew to the mother and told her. She was angry and condemned both brothers for killing Booragan. She was sad later for the mistake. The Gumal, head of the Birpai, was responsible for punishment. He turned the brothers into what is now the Three Brothers (North Brother; Dooragan), (Middle Brother - Mooragan), and (South Brother - Booragan). The Gumal saw Dooragan as the innocent brother and now North Brother splits the two lakes (Watson Taylor and Queens). By doing this, the Gumal split the mother's spirit in two. (this is story from Marion Hampton)	Birpai
Cultural	Totems	Dolphin - Port Macquarie, Bass - Rollins Plains, Wedgetail Eagle - Mt Cairncross (round mountain), Stingray - Point Plomer, Shark - Harrington, Crab - Laurieton/Camden Haven, Paddymelon - Comboyne	Birpai
Cultural	Creators	Baiaame - creator of land, Dolphin - creator of ocean, Bass fish - creator of rivers	Birpai
Language	Birpai	Birpai language is separate from Gathang	Birpai
Cultural	Whales	Whales coming up and going down the coast identify North Brother Mt as halfway point	Birpai
Cultural	Freshwater lakes	Freshwater lakes behind dunes connected to the foothills and the kangaroo	Bundjalung
Cultural	Fish traps	Fish traps at East Ballina and Prospect (?) Lake	Bundjalung
Cultural	Dolphins	Entrance to Ballina shaped like a dolphin.	Bundjalung

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Clever men	Uncle 'Lefty' Ferguson was clever man (weeun) from Grafton who flew across Country. Seen as eagle, then black dog that comes from the bush.	Bundjalung
Cultural	Observing	Star observing sites in certain areas of Wardell/Woodburn	Bundjalung
Language	'Bah'	'Bah' means 'place of'	Bundjalung
Language	'Bil'	'Bil' means 'many of'	Bundjalung
Rock art	Three brothers	Cabbage Tree Creek (Rappville) rock shelter - pictograph of three brothers and canoe from origin story	Bundjalung
Rock art	Lightning brothers?	Cabbage Tree Creek (Rappville) rock shelter - pictograph of two 'carrots with stripes'	Bundjalung
Rock art	Wandjinas?	Cabbage Tree Creek (Rappville) rock shelter - possible pictograph of Wandjinas	Bundjalung
Cultural	Dolphins	Ballina mob closely associated with the dolphin (one of their totems)	Bundjalung
Cultural	Whales	There is a whale dance (ceremony) that uses short steps	Bundjalung
Language	Gooyumgun	Stars	Bundjalung
Language	Yelgun	Sun (Lismore)	Bundjalung
Language	Sun	In Ballina, Sun is male ('Father')	Bundjalung
Language	Babar	Up above (name for God), also Papa (old people)	Bundjalung
Cultural	Dolphins	Roland Robinson has a Bundjalung dolphin story	Bundjalung
Language	Bundjalung language	Given by the King Parrot	Bundjalung
Cultural	Whales	Whale dreaming was sung at East Ballina, near Missingham bridge. There is/was a big rock in the North wall (of the break wall). The song was to sing the whales into the beach.	Bundjalung
Cultural	Whale and dugong story	Ballina story. Both came down to East Ballina together. Versions are of whale and female dolphin OR whale and female dugong. Story was probably about wrong skins, shouldn't have been together.	Bundjalung

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Language	Ballina	Ballina name was 'Nyangbul Nyangbul'	Bundjalung
Cultural	Whale	Migaloo - white whale - spirit of someone who has come back (Migaloo is Sydney name - Yiraleegan is Bundjalung. Uncle Lewis Walker has more	Bundjalung
Cultural	Whale, Moon	Man fishing, killed wrong thing, maybe dolphin, swallowed by whale, spouted up to the Moon. Sitting on the Moon, had to wait for a bird, but still waiting (man in the Moon).	Bundjalung
Cultural	Moon	Magpie got taken to the Moon, had to wait for certain bird to take back to Earth	Bundjalung
Cultural	Moon	Moon with ring - dirty flood coming	Bundjalung
Cultural	Dolphins	Gwandi - dolphin totem in Ballina - beach opposite RSL is dolphin djuribil (increase site)	Bundjalung
Cultural	Woodburn story	Woodburn - on left, big water tank on hill - called Lang Hill over bridge in direction of Tucki Tucki (back road to Lismore). Ridgeline ahead is 'Moonim' (meaning?). Story is that Baba/Baiame/God when Clarence and Richmond mobs were fighting, he threw a handful of blue rocks and this became the boundary of the Clarence and lower Richmond mobs.	Bundjalung
Cultural	Songlines	Black swan songline continues from Grafton North to Tabulam, Casino, and Ballina. Gnibi/Gineegee story but only has basic story.	Bundjalung
Cultural	Dolphins	Dolphins round up fish for people, who their spears on the ocean. The dolphins would round up, people would take what they wanted. Used to happen in Ballina, also Evans Head. Would have been ceremony on a regular basis	Bundjalung
Cultural	Boras	Casino was centre of Bundjalung culture. The biggest bora was there. Tucki Tucki bora. Sacred site in the gully (near). A young woman went and spied on men's ceremony and told women in the camp near the lagoon. The men told the old women, who killed the young women.	Bundjalung

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Seven Sisters	Can see 6th and 7th very dull. That one banished from the 'tribe'. Story is that curlew (bird) was old woman in community, but couldn't get on, so they banished her and left her in the bush, crying. They said 'stop crying', but kept on. 'Tribe' made her whistle. Now that is the curlew.	Bundjalung
Cultural	Seven Sisters	Guiding light. Tells winter/summer in different place.	Bundjalung
Cultural	Morning star	Can see in midday if down in mine.	Bundjalung
Cultural	Moon	tells you if it was going to rain or not. (when crescent laying over to the left; holding water. When crescent is to left, but upright, will rain)	Bundjalung
Cultural	Songlines	Casino to Kingaroy - Bunyas (go via Beaudesert and Ipswich)	Bundjalung
Cultural	Dolphins	Dolphins still deliver fish on the beach. Dolphin Dreaming across to the Kimberley	Bundjalung
Cultural	Songlines	Local mob First (Light) People. Dolphin songline to Kimberley turns into Brown Snake, then Emu man chasing Seven Sisters	Bundjalung
Cultural	rainmaking	Desert people came East every 10 years for rainmaking ceremonies, ended up as standing stones at Mullumbimby.	Bundjalung
Cultural	Women's business	Women from South Coast came up with medicine tree, exchanged for local trees. Women's site Boulders (?) Beach, Goanna birthing site.	Bundjalung
Cultural	Songlines	Songline - Bunya Mountains to Wollumbin is canyon. Down to Nimbin Rocks, mountain near Coraki/Woodburn, to Goanna headland (Evans Head), then Rain Cave (Evans Head?). Bora ring there had three gold nuggets.	Bundjalung
Cultural	Songlines	Nimbin Rocks very important place. Goongan = clever woman. Evans Head ceremonies only for clever men. Very important place for all 'tribes' in Australia. Songline from Nimbin Rocks to Nightcap Mountain. Lennox Head also important for initiation every 4 years.	Bundjalung

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Spiritual life	I saw strange objects (in the sky), someone up there - Bubara. I believed in the spiritual life. Seven Sisters - old people. Milky Way - big hole in Milky Way (near Cross), people went there when they died.	Bundjalung
Cultural	Dolphins	People could talk to whales and dolphins. Went to beach, hit the water, dolphins brought fish in. Put net around, throw some back to dolphins. Went out fishing at night, but didn't need a line. On Richmond River, point off Cabbage Tree Island, sitting in middle of river. Two dolphins came up river. Rowed towards bank, dolphins followed, mullet jumping into boat. Mullet crossed river, dolphins followed, then waiting for boat. Gave fish to dolphins.	Bundjalung
Cultural	Dolphins	Ballina story, back when island, across from RSL, old lady left with kids, fell asleep, kids swimming. Man came across in canoe and stole a young girl, old lady woke, chanted, hit water, big wave came, tipped the canoe. Two dolphins came out. Now, only see two dolphins in river. The sandbank in front of the RSL is the dolphins, which is an increase site.	Bundjalung
Cultural	Whales	Whales passed, sometime stranded. Heard that people talk to whales.	Bundjalung
Cultural	rainmaking	Cabbage Tree Island, only well water. There was a bad drought. Cracks in ground in cane field. Old people went to Evans Head (Rain Cave) and rain poured down.	Bundjalung
Cultural	Language	Nyangbul Nyangbul = Ballina	Bundjalung
Cultural	Songlines	Two possible traveling routes/songlines: Razorback Ridge - Tweed/Dunoon to Casino via Kyogle and Nyngan. Old route to Queensland (Bunya Mts): Mullumbimby - Murwillumbah - backway to Beaudesert - Ipswich	Bundjalung
Cultural	Birrugan	Gumbayngirr/Bundjalung/Yaegl crossover culture on the Clarence River. More than one Dirrangun on the Clarence River. Lots of witches. Trapped in areas - don't go there! Birrugan was real person in Gumbayngirr Country.	Bundjalung/Gumbayngirr/Yaegl

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Three brothers	Three brothers story - Ballina and Yaegl - story mixed up with Dirrangun story on the Clarence. Dirrangun gets left behind on Clarence, got angry, canoe with son and children sand, rock at Ballina	Bundjalung/Yaegl
Cultural	Three brothers	Three brothers story - Evans Head (brothers have no names). They were not the original people. Came along and organised clans, travelled North, South, and West. Didn't have a Mother in the story, mixed up with Yaegl story. They came from the South - there are no stories of Three Brothers from Queensland. Gumbayngirr have Three Brothers story (Auntie Rita Bryant, Wadi Clan, Nambucca).	Bundjalung/Gumbayngirr/Yaegl
Cultural	Three brothers	The Three Brothers only had to go North, South, and West to organise. To maintain status, had to have own story, as Australia was already populated at the time of this event. They just told the people their names and languages.	Bundjalung
Cultural	Uluru	Story from Uluru - people encountered when Aboriginal people coming to Australia were very warlike, and the animals savage in New Guinea. People got to the Northern Territory close to New Guinea on canoes. To keep people from New Guinea from coming across, old clever man and sons stayed back there. The clever man turned into a large tortoise, and the sons smaller ones, and they pushed Australia away from New Guinea. Afterwards they were very tired, climbed on to Australia, went to the Centre, where the clever man became Uluru, and sons became Kata Tjuta (The Olgas). Story not specific about New Guinea, could be Indonesia.	Bundjalung/general
Cultural	Marriage	There was a strong connection between the NSW South Coast and North Coast due to having to go North to get wives. The Mumlbers, Donovans, Hoskins, Walkers, Moylans, and the Shepards did this.	Bundjalung
Cultural	Marriage	Inland people came down to Coolangatta (near the Airport) for marriage, stories, resources (Mullet run). Brought stones for tools. Outcrop of obsidian West of Mullumbimby.	Bundjalung
Cultural	Dolphins	Dolphins called in for fishing	Bundjalung

Appendix 2

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Whale	There were killer whales at Byron Bay	Bundjalung
Cultural	Horizons	F1 going South, approaching Gosford turnoff, look ahead and see woman on back - Darkinjung woman's site	Darkinjung

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Rock art	Wagilag Sisters	<p>In 1986 the Sutherland Council asked me to catalogue the Aboriginal rock art sites in the Shire. There were some records, but no photos. There was a \$5000 budget, and I advertised in the offices & libraries, etc., coming up with a team of 17 persons, including Lionel Baker, who knew of 78 or 79 sites. I researched Joseph Birdsell about finding sites. The Fred McCarthy paper on Aboriginal campsites described techniques of using plants to find sites. I flew over the Royal National Park twice to spot different foliage. I considered the meaning of Aboriginal words: Dharawal means 'cabbage palm', and had strong association with campsites. We started uncovering many sites; 300+. By the early 90's we had a group of people who were just discovering sites for the sake of it. I started learning Dharawal so I could understand the indications of what was being found at the sites. I found a site with an association with 5 dancing men, an old man, 2 women and a child, and oriented axe grinding grooves. In 1995 Corrective Services started employing Aboriginal councillors found around communities, but they had little understanding of our own Aboriginal culture. I flew to Central Australia, and met with Craig San Roque, a spiritual man from Alice Springs. I went out and visited remote communities and visited several old men. I produced some photos/drawings of rock art in the Royal National Park, and they said it was part of the Wagilag story, but was missing the 'Black Snake Dreaming' element. There should be a large serpent and the Lightning Brothers. I later found that there is a snake engraving about 2 km from the Wagilag site. Lionel Baker found two men (engraving) 'tumbling' in the bottom of a waterhole (reflecting the sky). The engravings had all the parts. The Wagilag Sisters had an illicit arrangement with the Lightning Brothers (wrong skin). When they became pregnant, the Lightning Brothers became scared and left them. The engravings at Royal National had all the characters, but why the 5 men and the old man. The men shown dance at the Blacksnake Dreaming site; 5 men and old man, who is the knowledge holder. The dancers are calling on the snake to punish the women and send them back into the</p>	Dharawal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE</u> <u>GROUP/COMMENTS</u>
		sky. They came down to Earth after the Snake. The Snake is the primal giver/creator of the Earth.	

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Pleiades	When looking at the Pleiades, the women there represent the flowers, honey, fruit, trees (general resources), in other words, renewal (called: increase). Every September, they are called to come down, the Snake to come; start-up everything. The women are enticed to come down when the old men were sharpening axes in the rock pool, which protected the afterbirth of the child there. The axes sharpening grooves point to the Pleiades rising in September. This is the same idea as the desert Arrernte people.	Dharawal
Cultural	Pleiades	(there is a map of the sites on Les' Powerpoint presentation on the subject – I have this) The men dancing in the engraving are looking towards the Pleiades. The Blacksnake is the creation serpent.	Dharawal
Cultural	Black swans	Black Swan all up and down the East Coast (both the bird and stories)	Dharawal
Cultural, Rock Art	Wagilag Sisters, 2 Brothers, Pleiades, Pointers	Dreaming is called Black Duck down here. In the Wagilag engraving, the women have duck bills, and one has web feet. Why the Duck element? Yuin Dreaming. It is variation in the story – primary animals change with location (Arnhem Land – File Snake; Central Australia – Blacksnake; South Australia – Goanna; Southeast Australia – Diamond Python). In some Wagilag stories, the Snake swallows the Sisters, in others, the Sisters plus their dog (Dingo). The Sisters are vomited up by the Snake, which is a form of regeneration.	Dharawal

NSW Coast Astronomy Ethnographic Database

Cultural	Wagilag Sisters/Two Brothers/Black Duck Songline	<p>Two Brothers engraving at Royal National Park (RNP) are known to Dharawal elders as 'Shorty' and 'Talley'. They are connected to the Wagilag sisters. They were the wrong men (marriage system) and got both sisters pregnant. One child in the rock art is grown with duck bill and webbed feet (in the rock art to the left of the Sisters). In the rock art the other sister's water has broken. The two sisters are Boaliri and Garangal in the Pleiades, and have come down to Earth, fluttering down as black ducks. The sisters are 2 of 10 (in the Pleiades), get bored, come down to unformed Earth, meet up with the Brothers, travel around with them, get pregnant. Brothers get scared, run away and leave Sisters. Sisters stop and give birth. First does, then gets fearful. Move to RNP, second Sister says 'time', squats, water and urine. Great Snake (Diamond Python to the Dharawal) lives on next ridgeline (South). Python and kangaroo get angry, come across, creating the landscape, kangaroo follows Python, and where it lands, grass grows, opening up the Country. A reptile is primary in stories around Australia, associated with the kangaroo. Different reptiles, including snakes, crocodiles, lizards. In the rock art with the Sisters, the big Python is there. In the story, the Sisters hear the Python coming, get frightened, (1) gather dogs into camp, start to sing, dance to keep Python at bay. They used bullroarers to keep the Python away. After 24 hours, fell down exhausted, Python crushes them, swallows them and dogs, (2) other versions without dogs. The sisters being eternal, the Python cannot digest them, vomits (creates) them, they go back to sky, flying as black ducks, leaving 2 children on Earth. The Placental Pool at RNP is where, once a year, men have ceremony, sharpen their axes (the axe grooves point Northeast, where the Pleiades rise in Sept/Oct), sing Sisters down, which brings the Python and the kangaroo who bring abundance. In the rock art, men are telling the Sisters story and dancing, while an old man is watching the others dance (checking on them). Other men are dancing at the Python engraving to bring back the Python (connection to water/rain). This is a Black Duck dreaming site, as women have duck bills and webbed feet, so this may be the Black Duck dreaming story. The one child in the rock art also has duck bill and webbed feet. The Black Duck dreaming track/songline may come from Lake</p>	Dharawal/Yuin
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NSW Coast Astronomy Ethnographic Database

		<p>Illawarra, up the Wodi Wodi track through Wollongong up to Bulli and on to the rock art in the RNP. It then may go through to Sutherland. The Brothers were the Pointers in the Southern Cross and came down. The Python flipped them back into the sky to return as the Pointers.</p>	
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NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Clever men	Clever men often swallowed parts of animals, then regurgitated those parts to show that they can 'give birth' like woman (women were more sacred through their ability to create through birth, and men had to show they could also do so).	Dharawal
Rock art	Rock art	The campsites in the Royal National and Illawarra escarpment had clear divisions of purpose – the valleys and walls of valleys were for family and communities; the ridge lines were for sacred stories. The book/article 'Art in the highlands' says that art is always in high places	Dharawal
Cultural	Whales, Orcas	Botany Bay/Port Hacking story: Engravings in this area are all Orcas and sharks. Gurrawal - Orca dreaming. Whales come up the Coast. Old men set young boys to watch for them, whales and Orcas coming up. Old men held ceremony to get them to come into the bay (Port Hacking). When they came into the bay, young men tell old men when they come up. Old men get on point near Maianbar, the Orcas drive the whale calves ashore. Men cut off tongues and feed to Orcas. The Orcas beach themselves, when it is assumed, Luma Luma comes ashore. Everyone feasts for several weeks. At a certain point when the food runs short, Luma Luma, who has been bad with young girls, declares the remaining food <i>Mariejn</i> (sacred), then people drive Luma Luma away by spearing him traditionally.	Dharawal
Cultural	Whales, 5 Islands	Whale stories are only 5 Islands (Wollongong/Wodi Wodi). Whale and starfish story figures in several 5 Islands stories; Orca stories are only Port Hacking and Botany Bay. The Wodi Wodi go down to Kiama; beyond there is Ooaree/gal to the Shoalhaven.	Dharawal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Porpoise, Rock art	Old man sitting on rocks, very sad, porpoise surfaces and asks 'why?'. The man said his people were hungry. Porpoise said if you only take what you need, then they would help by jumping and alerting people that there were fish. The next day the old man saw the porpoise jumping and directed women to go out and catch fish, which they did OK. Another day the old man was sitting on the rock, and the porpoise surfaced and said they were impressed, and thereafter they would continue to help people. There is rock art in RNP showing porpoise and fish.	Dharawal
Cultural	Bullroarer	Bullroarer/Turndun story: Mamunna (clever woman) – Dharawal women were great users of medicines. They became so powerful that they thought they could resurrect people who had died. Mamunna had 3 daughters. She said they were to go out and entice young men to her camp with offers of sex. When young men came and were involved with the daughters, she would hit them on the head and kill them. This went on for a long time and 5 or 6 were killed. She would use medicines to try to resurrect them, and eventually would use green ants to try to sting them back to life. Daughters got worried, but the Mother kept going. One day a group of men came looking for a young warrior who had vanished. When they found Mamunna and the daughters and the bodies, they became incensed. When Manunna saw the men, she tried to hide, but the men struck her with their bundies, and struck her so hard that blood came out and fell on the gum trees around the camp. Today, when you cut a gum tree, the red sap that comes out is the blood of Mamunna. When you cut a bullroarer out of a gum tree, the red sap is Mamunna, and she cries to come out when you use the bullroarer. The bullroarer is used to drive away evil. Daramulan is called by bullroarer because he is a tree spirit (also an Emu). His wife is an Emu, and in one story, Baime lusts after her. She runs away. Daramulan and Baime chase her from Port Macquarie. Every time Baime crosses a river, he changes the local language, so when Daramulan arrives, no one can understand him.	Dharawal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Rock art	Baime - Uloola Falls figure in rock art with headdress is Baime. Also possible canoe (5 Island story).	Dharawal
Rock art	Orcas	Rock art sites heralded movement of people in the Deeban Jibone (Geebung fruit) and Port Hacking areas. Mid-September when the Wattle is blooming people came together at Warrumbul Point (<i>is that 'Graham Point' at the end of Warrumbul Road in the Royal National?</i>) for ceremony. Maybe 150-200 people. The old men on the coast would call for Orca to come into the bay, driving whale calves, fish, dolphins, and seals, which would be harvested by the locals. People fed the Orcas with offal. When the ceremony was going on, the Orca would beach themselves. The Dharawal said the Orca whale spirit emerged. The whale spirit goes right up each coast. The Orca spirit has an enormous penis (bifurcated), and took over the ceremony, and settled disputes. As the resources dried up, he would declare the best food was 'mareiin' (sacred). He started molesting the young women. At the end of the ceremony he was ritually speared and driven back into the sea. At Maningrida in Arnhem Land, the Orca is Luma Luma, and in art, has 3 protuberances on his head. There are drawings of Luma Luma in the Arctic; Orca in the Columbia River of Washington State, USA. The Loma Loma/Luma Luma ceremony is presumed to be a celebration of the Pleiades.	Dharawal
Cultural	Moon	Yennadi ngura – Moon place. Yennadi was a young woman, promised to an old man as 3 rd wife. She didn't want to marry him. She fell in love with a young warrior, and it was a tempestuous affair for some time. She realised she was pregnant, and the time was coming to marry the old man. She runs away from the old man, and people chase her. In desperation, she climbs a tree and launches herself into the sky. Instead of falling, she is drawn into the sky and becomes the Moon. Her pregnancy shows as each month becoming the full Moon, and then giving birth. This is why women and the Moon have 28 day cycles.	Dharawal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Language	Dharawal dialect names	Norongera-gal = Woronora valley	Dharawal
Language	Dharawal dialect names	Gwea-gal = Kurnell (means fire)	Dharawal
Language	Gunnamatta-gal	Gunnamatta = duck	Dharawal
Language	Wadiwadi-gal	Wollongong (many clubs)	Dharawal
Language	Oeara-gal	creek people (Gerringong)	Dharawal
Language	Dhagare-gal	Bundeena	Dharawal
Language	Dharug	western shore of Botany Bay (yam people)	Dharawal
Language	Morning star	Bellbrook language - 'wupumanhatinani' means 'walking star'. Could be Morning Star seen from Bellbrook or nearby, and could be because Venus rises different places in East	Dunghutti
Cultural	Whale	Stan Moylan (Dunghutti?) went worming with father-in-law (clever man) Lambert Wadi. Stan bought a whale bone from Crescent Head, but it was the wrong sex (female).	Dunghutti
Cultural	Moon	Would tell you about fish, pippies.	Dunghutti
Cultural	Initiation	Initiation ceremonies - young ones spent time in bush. No scarring or tooth evulsion. Level of degree related to time spent in bush away from family. Woman's Bora at Crescent Head. Men's Bora at Greenhill Mission.	Dunghutti
Cultural	Sun	Anderson Sugarloaf at Bellbrook (Burrallbalayi). Story of man who ran away with the Sun (Sunset?).	Dunghutti
Cultural	Black swans	Wetlands near Kempsey Racecourse (now drained).	Dunghutti
Cultural	Boundaries	Dunghutti Country - Coastal from Grassy Heads (near Yarrahappini) South to Point Plomer, West to a point near Yarrowitch and then on to and including Walcha, NE towards Ebor (South of), behind Nambucca and Bowraville, Eungai, and back to Yarrahappini.	Dunghutti

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Tracks	Track from Belgrave Falls to Golden Hole (near Fisherman's Reach)	Dunghutti
Cultural	Totems	Principle totem of Dunghutti is Gurrigyn (Praying Mantis). Participant's is Wagan (Black Crow).	Dunghutti
Cultural	Marriage	Dunghutti skin names are Wabuung, Wiruung, Gaarrgan, and (?)	Dunghutti
Cultural	Koala story	Nuni (fresh....no good) person was whistling after two sisters (Mother with them). They came from the East (from the ocean). Sisters cut head off a Koala ('Gulla' or Grandfather) and cooked it. Nuni had two dogs. Site on Yarrapinni (Mt) is a clear path. Sisters threw head down the mountain, dogs took off after the head, Nuni followed. Sisters and Mother ran, got away from Nuni. got to place called Kookaburra, Mother not well. They covered her over, then buried her when she died. She then manifested as burning coal. Place 'Nithan Dhallugun' (Guiin - sacred). Could mean 'nothing or sacred' (could this be Burning Mountain at Wingin in Hunter Valley?). Word for 2 (sisters) is 'Bulla', for 'more' is Buulau, 'to go' is 'yarri'. Yarrapinni could be jumping off place ('Wulumpurra' for Creator).	Dunghutti
Cultural	Country	Carpet Snake is the snake that created the Macleay River. Serpentine Creek is an area of higher learning. A gathering in the 1860's was 500 men from far away as Bundjalung, Dunghutti, and Gumbayngirr.	Dunghutti
Cultural	Spiritual life	Great leader of Gumbayngirr, when passed, Mother Earth said he would be their spiritual leader (<i>Birrugan?</i>)	Dunghutti
Cultural	Kin system	Stone arrangements can show kin system. Enter in 4 skins by right kins, right way. (see drawing)	Dunghutti
Cultural	Songlines	Fireflies carried fire over high peak to (maybe Gumbayngirr), maybe Dorrigo ('Dorrigin' means 'making track, all came back'). Passed fire off to little lizard.	Dunghutti, Gumbayngirr

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Evening Star	Bellbrook: 'Wupu man-arri-noni' - 'go/move that him'. When star in evening - call 'mayirri' in evening (Evening Star). 'Away' because it goes away in evening. Star is female? 'Mayirri Wuu' - Creator (Mother) source: Shepard.	Dunghutti
Cultural	Sun	Nulla Nulla Creek: Used to call it Nulla Nulla sunrise. 'Euroka' - 'up above us (Sun)'. South Kempsey - sunrise names very common.	Dunghutti
Cultural	Sun	Sun is female. Moon - 'Gitay Mirray' is male.	Dunghutti
Cultural	Morning star	Morning star is female.	Dunghutti
Cultural	Resources	'Gayyai' - 'abundance' (resources) centres - weren't allow to dip water there.	Dunghutti
Cultural	Story	Underneath Southwest Rocks Bowling Club there is a big hole - the Muurrbay tree was taken into the sky here (check Gary Williams). Birrugan was speared and buried nearby. His Mother took his belt ('Bulmai') off and put sacred clay on Birrugan. He put the clay on the 'Bulmai' and hung it on a forked stick.	Dunghutti/Gumbayngirr
Cultural	Southern Cross	Fred Bugg (Kempsey) talks about Hawks Head (Hawks Nest) spots there. Story about the stars in the Southern Cross that He (Christ) is coming again.	Dunghutti
Cultural	Sky and Earth	Mother Earth and Father Sky	Dunghutti
Cultural	Morning star	Dunghutti are Sunrise people/Morning Star. Tiger Buchanan story about Dunghutti responsible for sending the Sun over (story taped in Gumbayngirr?)	Dunghutti
Cultural	Bellbrook	Cultural centre. People went there for safety in 1880's.	Dunghutti
Cultural	Songlines	Heatherbrae (Raymond Terrace) - wetlands with Black Swans on left approaching from North (drained now)	Dunghutti
Cultural	Tribal	Thunghatti (freshwater people to West) - more pure language and knowledge	Dunghutti
Cultural	Ceremonies	Very special ceremonial sites further back up in hills (higher up - more sacred)	Dunghutti

NSW Coast Astronomy Ethnographic Database

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Cultural	Stone arrangements	Serpentine Creek site - stone arrangements aligned N/S and E/W. Now a Reference Group with NPWS and Elders. There will be a Management Plan.	Dunghutti
Cultural	Songlines	Songline runs West next to Bellbrook. Mt Yarrapinni - Dunghutti name (Koala Dreaming).	Dunghutti
Cultural	Middens	Clybucca midden is approx. 10000 years old	Dunghutti
Cultural	Dialect groups	Dunghutti dialect groups - see Stanner and Elkin	Dunghutti
Cultural	Language	Clybucca: bucca = crooked cly = tree	Dunghutti
Cultural	Language	Nambucca: nam = river	Dunghutti
Cultural	Language	Vowels: 'a' on end of words, 'l' on end of words	Dunghutti
Cultural	Resources	Clybucca held fresh water in drought	Dunghutti
Cultural	Resources	Clybucca midden - pippies source of iodine and zinc. Also oysters - had to seasons to harvest/eat - the Moon told them	Dunghutti
Cultural	Resources	Tools - quarries and beaches had raw material for tools	Dunghutti
Cultural	Resources	Calcium - Southwest area is rocky	Dunghutti
Cultural	Resources	Kaolin - white clay for face paint - big deposit on current Golf Course	Dunghutti
Cultural	Ceremonies	Family dance - cooroboree = entertainment. The Brolga dance came about Easter	Dunghutti
Cultural	Dolphins	came up creek to Hat Head - old people trained them clicked river shingle. Trained to go out and bring fish (whatever). Nets made of kurran and bark (women plaited them).	Dunghutti
Cultural	Family/initiation	Participant's area is Southwest Rocks - coastal and upland. In 1910 people still practising traditional ways. Middle Head noted in Creamer. Place of selecting initiates. When selected, they separated the girls from the boys. Girls selected at first period, boys cut and circumcised. There was a feast after selection (under a fig tree). There is a forked tree at Clybucca (centre of culture). His Auntie's brother	Dunghutti

NSW Coast Astronomy Ethnographic Database

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		went at 15, came back at 21. Equivalent to primary, secondary, graduates. Older men were clever men.	
Cultural	Travel/songlines	Trails to different places. There were Bunya trees in Dunghutti Country. There was a Macadamia trail to Lismore (then on to Bunya Festival). (check Yugambeh Museum at Logan).	Dunghutti
Cultural	Travel/initiation	One trail was Anderson (Mt Sugarloaf near Bellbrook). Nonwoc (?) for initiation, bora at Walcha for clever man initiation.	Dunghutti
Cultural	Bora/initiation	Richardsons (Crossing) near Crescent Head has a bora ring.	Dunghutti
Cultural	Massacres	Ovens (massacre) up on Karria (?) (Marysview?).	Dunghutti
Cultural	Resources	Twins well (water) men only. Volcanic tube. (is this twin water holes?)	Dunghutti
Cultural	Placenames	Walcha - sunny spot? (Yarrowitch), Euroka - sunny spot?, Yarrahapinni - Koala rolling down mountain	Dunghutti
Cultural	Tribal	Tribal fights (Middle Head). Between Gumbayngirr and Dunghutti	Dunghutti
Cultural	Black swans/Black ducks	Source of food. In stories. Feasting on eggs, cygnets. Frogmore Swamp (?), Clybucca, North St Kempsey, were places for waterfowl. Black Duck there as well.	Dunghutti
Cultural	Story	Wonga Pigeons took fig tree up to heavens - left cavity at Hat Head. Birds and tree are up in the sky (where).	Dunghutti
Cultural	Creators	Bubba/Baiame (same) talks to Elders - like Genesis, give you one treasure of Earth - fresh water to cleanse, salt water to harvest (Dolphins).	Dunghutti

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Resources	We were taught about trees and seasons. Certain trees when in full bloom: Melaleuca - mullet running; predatory fish (Tailor) following; scavenger fish (Brim) following. Also time for wild honey. Acacia (wattle); Black Wattle (pioneer tree): witchetty grubs, followed by eucalypts.	Dunghutti
Cultural	Resources	Fish traps: Crescent Head, Point Plomer	Dunghutti
Cultural	Boundaries	Barrenjoey (Kangaroo foetus - totem) to North Head (Car-rang-gal - Pelican place, also totem) to Harbour to Lane Cover River to Lane Cove catchment to creeks West of Hornsby to Hawkesbury to Barrenjoey	Gai-mariagal
Cultural	Kangaroo joey story	Long Island East of Brooklyn where train line runs across East end: head of snake at the Brooklyn end, tail other end. Bulge is kangaroo in python snake when fight was going on; mother kangaroo lost her baby, washed down river to Barrenjoey. The hill going up the Hornsby; the old people put the mother under rocks; she still stirs and causes tremors.	Gai-mariagal
Cultural	Moon	The top of the cutting on the F1 freeway where there is an 'island' of rock in the middle was a ceremonial site where the 'Moon canoe' was carved in the rock (timber canoe). The 'Moon canoe' and the Moon phases (12 or 13 in rock engraving) are linked across country to St Ives (Moon Rock) to rock art near the Bahai Temple to North Narrabeen (rock art gone) to Long Reef (rock art gone).	Gai-mariagal
Cultural	Moon	The Moon phases rock art from Long Reef to here is about young girl (Moon and Brown Snake story - see lit review). Moon and Brown Snake story is continuous. Brown Snake keeps going up to Moon and getting girl pregnant, but children come down on shooting stars. Children not connected to Brown Snake, which is despised.	Gai-mariagal
Cultural	Milky Way	Old cultural man from the NT recognised this part of the rock art -elders riding canoe to Sky Camp. Different to Brown Snake story. Rock art sites used by different generations, but F1 site was for clever men only. Elders going to sky as	Gai-mariagal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
		group limited to big changes (1788, sea level rise, ?). Stories from F1 site are interwoven.	
Cultural	Boundaries	Kur-ring-gai NP and surroundings were ceremonial country. People lived around Sydney Harbour and rivers. Fights over land and resources. Dharug were partners, Guringai were outsiders from up North.	Gai-mariagal
Cultural	Songlines	Radiate from Car-rang-gal (North Head). Pelican story follows Warrigal (Thylacine) songline N. Head, W. Head, Yengo, NNW through Gomerioi Country, into QLD W. of Goondiwindi, arcs left through QLD and West to Attila (Mt Connor near Yulara), Warrigal Rock/Dingo Hill, up the MacPherson Range and into cave where it was buried, then through Heavitree Gap, Olgas, Lake Eyre. (map search for pelican route to Lake Eyre - on Web). Another Pelican songline starts Lake Eyre, arcs through SA, VIC, up to Mt Tywnam and Carruthers Peak in the Snowy Mts, then Nowra and the coast back to Sydney Harbour. This is the return route. These connections to the inland/Dead Centre from Nowra are marriage connections.	Gai-mariagal
Cultural	Songlines	Black Swan songline (shared) goes up coast via lakes to Grafton, and starts around Maroubra. In winter, Bull sharks disappear and go to Northern rivers to breed/have babies. Satellite tags have confirmed this. Swans and sharks linked by going to same areas. Shark totems share songline.	Gai-mariagal
Cultural	Songlines	Black Duck songline (shared) starts at Mascot and goes South to Walaga/Mallacoota (could go to Great Lakes)	Gai-mariagal
Cultural	Horizons	Car-rang-gal (N. Head)- setting Sun look West to Blue Mts, looking at woman's body, sets at head in winter, breast in summer. Could be used as a resource indicator. Best seen from Chester Hill - very clear.	Gai-mariagal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Ceremonies, Sun, Venus,	Also Car-rang-gal, bonfires used to indicate ceremony coming. Both men's/woman's sites. People would come from all around the region. Baiame/Daragulan/Daramulan sat on Ca-rang-gal for first ceremony. Can see where they sat cuddling Pelican, which had been created. Baiame is female, gave birth Daragan, birth water and tears created oceans. Baiame self-created Daragulan, then made woman to be his mate (from clay). Daragulan and mate killed animals, so Law was made. Yia (Sun) was Baiame's sister. Had twin children (Venus), Yoohlay = morning star, ? = evening star. Both were female.	Gai-mariagal
Language	Sun	Yia (female)	Gai-mariagal
Language	Venus	Yoohlay = morning star, ? = evening star	Gai-mariagal
Cultural	Venus	Yoohlay - when arrives in Eastern sky (when can see in morning daylight), men should stay away from women. ? = evening star - when in daylight prepare for corroboree.	Gai-mariagal
Cultural, language	Moon	Nargaree = Moon. Moon is female (pregnancy, Brown Snake)	Gai-mariagal
Cultural	Bora/tooth evulsion	Not for everyone, just higher degree. Up to three circles; cutting circle for scarification (hidden, water should be near, also soap tree and antiseptic tree; numbs cut area). Scars were in threes (human world, sacred world*, spiritual world*) * look after land, lore, Law. Cutting circle was generally South of dance (public) circle. Male initiation sites in the Sydney are have female emu engravings (Elvina track?).	Gai-mariagal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Orion	Three sisters story - Ngarigo (shared) story. Ngarigo close to Gai-mariagal due to mullet festival. Ngarigo were once a large mob, even out West. Pushed back to mountains by robust people from down the Murray. Ngarigo ended up on the peaks only. A chief had three daughters, very pretty, had ice in their hair. When the chief's family ended up in the mountains, there were only six of the 'tribe' left. One brother threw the three sisters into the sky, and they are now three bright stars in Orion (belt); ice in their hair is the twinkling. The father was badly injured, and was thrown up into Orion as a red star, pulsating slowly (Betelgeuse?). The strongest brother was thrown up, and is the brightest star in Orion (Rigel?). He leant down with his spear and pulled the other (younger) brother up, who became the dimmest star (Bellatrix?). This story was told to encourage respect, defend sisters' virtue as own. At age 14-15 the male takes on role of protector of old people.	Gai-mariagal
Cultural	Orion	The three sisters also represented the three qualities of life: the human world, sacred world, and spiritual world (three scars on body, three marks on rocks). Also in face painting of adult male, the three vertical lines represented the three values. The top horizontal line represented Baiame. When welcoming guests, ochre was applied to their faces as three dots, which represented the spotted pardalote (small bird). Face paint with red/yellow stripes represented baby emus, and was used for funerals/weddings.	Gai-mariagal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Dolphins	White-headed dolphin story - Mallacoota to Bribie Island. Old guy (fisherman) with long white hair and beard. Dolphins helped him fish, and he always gave best back to dolphins. He passed away, and the dolphins were upset; his family wrapped him in possum skins, placed in a canoe, and pushed out to sea towards the morning Sun. The dolphins disappeared, and the fish also disappeared. After several seasons, the dolphins came back with a big school of fish. The lead dolphin had a white head (like the old man). This story was heard at Eden, Narooma, Pambula, Yamba, and Stradbroke, and told to me as a child. Quite a few stories about people buried by putting into a canoe and sending out to sea. Dolphins were only used for beach fishing, not in rivers and harbours.	Gai-mariagal
Cultural	Dolphins	Creation story. Sandbank at Palm Beach. Man saw baby dolphin trapped on sand bank, being circle by sharks, went into the shallow water to protect baby dolphin. He was trapped in deep water (when tide rose), sharks approaching, when adult dolphins protected him. This is when the connection between dolphins and the Gai-mariagal was made. There is also a story about a man saving a dolphin when it couldn't breathe. He rammed a spear on the top of the head, creating a breathing hole. and it became a dolphin with a blowhole (Gold Coast story, could be Yuggera, and it is also a Stradbroke/Quandemooka story). Also, the red ochre on the Gold Coast is from the blood of the dolphin which is located near the site.	Gai-mariagal

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Whales	Whales in Sydney Harbour. Engraving of man inside (Balls Head) is actually whale riding, final stage of initiation of the Cameraygal clan. The Cameraygals were a warrior clan around Chatswood. Right Whales, Humpback Whales went up beyond the Harbour Bridge (around Balls Head, which is very deep); other whales, such as Sperm Whales and Killer Whales waited in the main Harbour. The Balls Head environs was a birthing area (for whales). The whales would know the songs of the old people, male and female. The persons riding them would be introduced to them over several seasons. Whales birthed in Sydney Harbour and Moreton Bay, and moved to Harvey Bay due to whaling. Women would sing sick whales into Manly Cove. Floating carcasses would wash up on Collins Beach. If sick whales were coming up the coast, fires would let women know.	Gai-mariagal
Cultural	Moon	Full Moon, July to October, were ceremonial months. When the (bright) stars on the left, then aligned on the right, it was the best night of the full Moon for ceremony. It was also the coldest night. A 'Blue Moon' was four full Moon nights in a row.	Gai-mariagal
Cultural	Platypus	Cross between Wood Duck and Water Rat. Water Rat kept Duck prisoner and raped it	Gai-mariagal
Cultural	Crocodiles	Crocodiles in the Sydney area. Fuller's Bridge is where the last one lived. Could be same as Garjon, a monster with red eyes, smelled bad, growled, like huge goanna. Small round petroglyphs in Sydney area - rub sand over them, and they look like crocodile, warning not to sleep here (cave).	Gai-mariagal
Cultural	Gubjya	Little hairy men. First European sailors looked like hairy men, hence 'gubbas' - which is a Dharug word. Known for their smell - they rubbed excrement over their bodies; ran backwards at incredible speed. Had magic small spears and climbed trees fast. They were fascinated with young 5-8 year-old blonde children.	Gai-mariagal
Language	Comets	Gumbayngirr name in Muurrbay dictionary	Gumbayngirr

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Language	Evening, Morning Star	Birrugan is also the Morning Star	Gumbayngirr
Language	Yuludarla	'shining like the Sun'	Gumbayngirr
Cultural	Moon	names for phases related to resources	Gumbayngirr
Cultural	rainmaking	old people wanted rain, got children to play in sand on beach; happy = rain	Gumbayngirr
Cultural	Eastern Quoll	'Baaliigin' created all sea animals while creating sea. Quoll site at the mouth of the Bellingen River. Also skin Marrung.	Gumbayngirr
Cultural	Sun	Story about why Sun is so big at sunrise/sunset. Sun is Birrugan, but father, Yuludarla, helps him rise and set (and pass behind the Earth). If Yuludarla was to stay with Birrugan all day, the Sun would be too strong, and would burn everything on Earth	Gumbayngirr
Language	Ngayan	Sun (female)	Gumbayngirr
Language	Giidany	Moon (male)	Gumbayngirr
Language	Yuludarla	also Sun, but makes the rivers	Gumbayngirr
Language	Birrugan	Southern Cross and Morning Star. Two sisters become the Pointer stars (see Birrugan's last battle)	Gumbayngirr
Language	Wirriiga	sisters - Seven Sisters (making of the sea)	Gumbayngirr
Language	Gawnggan	Evening Star - she Mother of Birrugan	Gumbayngirr
Cultural	Whale	Whale Dreaming - Taylors Arm, dead pool, spirit of whale in there. Possibly the same at Orara River near Coffs Harbour.	Gumbayngirr
Cultural	Stingray	(Repton???) (freshwater) increase site cave where it lived near where train crosses Bellingen River	Gumbayngirr
Cultural	Songlines	Fireflies carried fire over high peak to (maybe Gumbayngirr), maybe Dorrigo ('Dorrigin' means 'making track, all came back'). Passed fire off to little lizard.	Dunghutti, Gumbayngirr

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Story	Underneath Southwest Rocks Bowling Club there is a big hole - the Muurrbay tree was taken into the sky here (check Gary Williams). Birrugan was speared and buried nearby. His Mother took his belt ('Bulmai') off and put sacred clay on Birrugan. He put the clay on the 'Bulmai' and hung it on a forked stick.	Dunghutti/Gumbayngirr
Cultural	Songlines	Black Swan - Newcastle wetlands	Worimi/Awabakal?
Cultural	Emus	Was looking down beach at Flat Rock (beach South of Yamba) and saw what looked like people fishing, but turned out to be emus. Footprints on beach were human, turned to emu on the dunes	Yaegl
Cultural	Pleiades	Seven Sisters were going to a dance or place. One was always late, and was held up - that's the big star apart	Yaegl
Cultural	Dolphins	Some people knew how to get them to herd fish. The fish trap at Angourie, Wood Heads, some are natural, some man-made. Brooms Head, as well. On the beach, old men talk to porpoise to head mullet to beach, where men would catch them. Old men then tell porpoise to get in and have their share.	Yaegl
Cultural	Dirrangun and stone canoe	Mother, son, and three grandsons came from Iluka. They stopped at Yamba, and the Mother went digging for yams, while the son and grandsons went to build a new canoe. They came back with a new canoe, but couldn't find the Mother, so they sailed out to sea. The Mother came back and saw them out to sea, and tried to get their attention, but they were too far away. She raced down to Yamba Beach, and hit the water with her digging stick, and caused the sea to get rough. The canoe sank, and one of the grandsons/brothers ended up at the fish trap near Angourie, and other ended up on the Southern bank of the Richmond River at Ballina (he is now a rock). Not sure where third brother ended up. The canoe ended up at Green Point (North of Angourie), as a stone canoe, which is still there.	Yaegl

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Fish traps	There is still an Aboriginal stone fish trap at Angourie, at the South end of the beach from Green Point (North of the Blue Pool). (there is also a fish trap at the South end of Angourie Back Beach - confirmed by locals. The fish trap near the Blue Pool is not clear, as locals also said there was one on Angourie Point).	Yaegl
Cultural	Stars	Saw Eaglehawk before Christmas (straight overhead pattern of three stars). Also could see pattern of three stars which was the Sea Eagle later in the year - this was the Page family totem from Lismore. The Sea Eagle could also be a rooster.	Yaegl
Cultural	Moon	Moon story - man swinging axe	Yaegl
Cultural	Fishing	Mullet season - when see hairy grubs	Yaegl
Cultural	Moon	Moon gets circle - next day windy	Yaegl
Cultural	Rock art	Rock art under waterfall at Ashby	Yaegl
Cultural	Dolphins	Uncle Billo (Wallace) - go fishing - he'd sing out to dolphins. Later on dolphins herded brim at Harwood (Carmel was 8 yo)	Yaegl
Cultural	Navigation	Go from old camp in Yamba - use stars to work out time to flying fox, possum, go fishing. Use stars to navigate back home to camp.	Yaegl
Cultural	Navigation	Gave stars names of family. Evening star tells way home.	Yaegl
Cultural	Pleiades	Seven Sisters - North Coast story. Wiringin after eldest sister. Had 7 penises for sisters. Went out West, turned himself into different fruits to attract the women. The eldest sister said 'No'. Went through Country from East coast to West coast, then to Top End. Stories come from East.	Yaegl
Cultural	Songlines	Yaegl have Ngaragan (Swan) story. See Southern Cross as Ngaragan - sign of birds travelling - Dreaming track. Southern Cross points to time to collect Swan eggs (Bungawalbyn Swamp). Also points South in Winter as Swans fly South.	Yaegl

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Sun	Every Good Friday gets up early and watches over ocean - Sun dances - only time of year it dances.	Yaegl
Cultural	Moon	Grafton - Waterview Heights - full Moon rising; can see Clarence River shining (Golden Eel).	Yaegl
Language	Dolphins	Dolphins - Wuy Wuy	Yaegl
Cultural	Sun	Grandfather Sun – old fella comes up in the morning; plants open up to greet him. He puts light and strength into them. I saw plant opening, Pop said when Grandfather Sun goes down, the plant will close and rest. It's not about heat – Grandfather Sun gives light.	Yuin
Cultural	Moon	Grandmother Moon – moves water. We watch her at different stages. If we didn't have the woman's cycle, we wouldn't exist. Grandmother Moon brings our nurturing and creation. Lots of stories.	Yuin
Cultural	Moon, Sun, Earth, Sky	Up there is down here and vice versa. Moon and Sun can give us reflection down to Mother Earth (through Father Sky). If look up at night at sky, we can see stories from down on Earth. Old people never separated sky, stars, Sun/Moon.	Yuin
Cultural	Sky	Many years ago, some of the mob was in the highlands, and the sky was low, touching the top of the mountains. Some of dancers/warriors had to crawl over the mountains to reach the coast for ceremony, brushing off their ochre in the process. They asked Father Sky to lift up, but he wouldn't be bothered – he wanted to be on Mother Earth. Everyone stuck their spears into Father Sky, so he lifted up. The ends of the spear tips became the stars. If you look close, you will see in the Milky Way the ochre rubbed off the warriors. This is about unity, working together, making pathways so can do ceremony on high Country or Coast Country.	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Emus, Bunan	If you look at a topographic map of Kosciusko area, you will see an emu. The emu used to be on the coast. I used to sing them up on the Shoalhaven where some bends in the river look like emu feet. Emu are connected to the Bunan ceremony. Bunan sites could have up to 5 sacred rings interlocked (like the Olympic rings) – boys and men mix in these rings; some examples are in the Bega valley. There is a big Bunan ring at Camel Rock/Walaga Lake. Most rings are on the east slope because the people danced up Grandfather Sun.	Yuin
Cultural	Creators	Baime was not important to the Yuin. Daruma is the creator of the Yuin people. Daramulan is the creator of some stories, but is not the same. Daruma (neither he nor she) created nature, then humans. The first was Ngaardi (woman) at Gulaga (Mountain), who was first created from Mother Earth. Daruma then created the male, Toonko (who was a penis). He gave two gifts, a rock by Ngaardi, and tree by Toonko. These are all on Gulaga. There are also 3 rocks on top of each other. The bottom comes from the Earth, the middle is here and now/present, and the top points to the sky (the spirit leave the body). Keep going back to the bottom, where we came from. The middle tells us stay in 'now', which is why we were hunter and gatherers just for the day.	Yuin
Cultural	Gulaga Mt	Gulaga is a pregnant woman; on her is a rock woman (midwife); all about childbirth. The next place on Gulaga is the baby being nurtured, the next place is a teaching rock (told about totems – there is a dugong, shark, rainbow serpent, and a whale breaching). Further along is a woman's area, down to the birthing rock at Central Tilba.	Yuin
Cultural	Biamanga Mt	Biamanga – west side is men's business; east side is woman's business. The sacred pool is for after initiation. Biamanga is the serpent. The rocks blown up for the TV tower were its eye; the tail is in a swamp near Tathra. Biamanga is also called Mumbula (after Percy Mumbula).	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Mountains, songline	There are two other mountains in the area, Maleema (strong woman) and Wadgadang (young girl). The panoramic view is to those two, then Gulaga, then the two sons (Barunguba and Najanuga?). That is a songline. The mountains are a creation story and the continuation of the people.	Yuin
Cultural	Star Maps	The Yuin used star maps to teach people to travel – they sang stories at each waypoint which gave the direction to the next. The sung stories/songline will have information about what the sky looked like when you reach the destination.	Yuin
Cultural	Landscape	There are stories all along the coast. You look at the landscapes as a guide to travel (stories are about the landscape). They are known up and down the coast, but may be known by different names. An example is Pidgeon House Mountain. Down south it is known as Bulgin, up near the Shoalhaven it is Dithal. It means 'breast/nipple'.	Yuin
Cultural	Whale dreaming, dolphins	Many years ago, when the sea was lower, there was land bridge between Tassie and the mainland, which was a mountain range. People were coming from the South Pole; they saw the water rising, and looked for higher ground. The first mountain was Tasmania, so they got on a high hill in Tassie. They were a language group from Cape Barren to Yuin Country; some of their language got into Yuin and Gunai (Kurnai). They were worried that they wouldn't be able to communicate with the whales. They asked other tribal elders if they could go on to the continental shelf and become part of the whale 'tribe' (this was the sea/Gadoo 'tribe'). Elders said it was OK, but they had to make a songline to travel, and a condition was that they must come on shore and regurgitate their Law, which meant give themselves up so that others could feast. They also had to take the dolphin mob with them. Dolphins are whales connected by songline. This was agreed by most everyone in the southern part.	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Whale dreaming, dolphins	The whale/dolphin songline north shows the path of the Yuin journey. The spirit of Yuin is in the whale, so is the Yuin songline. The whale industry in Eden disrupted the connection to the whale. Before that, there was a whale dance (celebration of the whales going north to give birth). The whale dance/ceremony was in May. The Seven Sisters were part of it – they were singing up the whales. The movement of the Milky Way was also a signal, and also a star which pointed to the north/northeast. There was also a ceremony when the whales came south later in the year. In the whale watching time, the dolphins are inshore. Dolphins were the whale bodyguards.	Yuin
Cultural	Orcas	The orcas separated from the whales, but it was good to have knowledge of the orcas. The Yuin didn't have to hunt whales, who came to shore of their own accord (their Law). Also, discussed possible orca ceremony near Bundeena. Maybe it was to ask the orcas not to kill whales.	Yuin
Cultural	Fish traps	The Mystery Bay fish traps (near Gulaga) were built where two parts of the ocean joined. Grandmother Moon was part of this, because when they built the fish trap, they had to know how to place the rocks so that when the Moon lifted the sea, the fish were there and trapped. The Yuin understood the relationship between the Moon and the tides, which was the relationship between the phases of the Moon. Full Moon, big in and out (tides). Also, connection to woman's time (cycle) – this is why Moon is Grandmother. This is also the connection between the Moon and water coming to the Earth.	Yuin
Cultural	Orion	Orion doesn't figure in Yuin culture	Yuin
Cultural	Emu	Emu in the sky - mountain near Kosciuszko where 3 birds argue. Daramulan said to birds, 'do your own thing. You, Emu, go North and West. Go to high mountain (Kosciuszko) and leap into the sky at this time of year (May)'. Left image on Kosciuszko - look for emu footprint or image on top. Eagle had to oversee land - eyes of Daramulan. The Lyrebird had the most difficult job, to go out into the bush, learn dance and languages. Today it is the bird of many languages.	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Pointers	Daramulan's eyes at night are the Emu's eyes (the Pointers)	Yuin
Culture	Songlines	Three major songlines: Two big ones are the boundaries of the Yuin nation - Snowy River in the South, Shoalhaven River in the North, part of the Murrumbidgee. It is a map, but it is also sung.	Yuin
Culture	Songlines	Another songline is the Death Adder songline running from Biamanga (birthing Country) to the Great Divide. <i>Bulgin</i> (breast) songline part of <i>Gadoo</i> (ocean) songline. Water comes down into Clyde River (Shoalhaven?), over mountain range, waterfall into Shoalhaven River (near Nerriga). All connected to <i>Gadoo</i> Dreaming.	Yuin
Culture	Songlines	Umbarra (Black Duck) songlines runs up coast through all the lagoons; same as Black Swan - goes to Western Australia.	Yuin
Culture	Songlines	Dolphin Dreaming - Jervis Bay to Eden. Sing up dolphins by slapping water (north of Batemans Bay, south of Durras). When fishing with dolphins, call up <i>curricurri</i> (West wind) spirit to flatten waves.	Yuin
Culture	Songlines	<i>Gulaga</i> is the centre - songlines go through Maeema (?) out from Cobargo, Peak Alone - <i>Waddagadang</i> (?) (young girl) - <i>Gulaga</i> (mother mountain) - <i>Nadginega</i> (?) (little son) - <i>Barenguba</i> (Montague Is).	Yuin
Language	Emu	the Emu in the Sky is the sky without voice. The language on the ground without voice is the bush, tree, etc.	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Culture	Songlines	Umbarra - Wagalag story in rock art at RNP. Placental/birthing pool - this is just an axe grinding workshop, with the pool being the water source. The two women (with one child) came down from the Northwest, but afterwards they went up into the sky to become part of the Seven Sisters. The serpent near the woman in the rock came to bring them back to where they belonged. The large serpent to the South several km is not related to this story. The two men (tumbling) could be Talley and Shorty, who were assassins. Story of the women at RNP is the Wagalag story brought down to Yuin Country, and is also the story of the Umbarra (Black Duck) songline. The women have duck bills and webbed feet for this reason. Umbarra is an important totem of the Yuin people. Nobody eats it, as Umbarra can show people the way to water, even in the dry Interior. The Umbarra songline zigzags up the South coast using the wetlands and high points. The engraving in RNP is there to ensure that they (the sisters) are identified as Yuin.	Yuin
Culture	Songlines	The Umbarra story and the sisters has a counterpart at Whittakers Creeks between Narooma and Bodalla, where the Two Sisters and their dog are large rocks. They had marriage arrangements which they broke. They got caught up with the wrong men. Talley and Shorty were sent to get them back. They were turned into stone, and serve as a warning to everyone like an electricity substation (Warning: 240,000 volts). They were turned into ducks at RNP.	Yuin
Culture	Songlines	Discussed the larger Umbarra/Black Duck songline as it may go up the North coast, across the Narran Lake, down to the Snowy Mts, and the Snowy River to Gippsland, then back up to Walaga Lake. Was told that the songline looked like a 'duck egg' (a full circle shaped like an oval duck egg).	Yuin
Culture	Songlines	Discussed black swan on the South coast. Yuin call it Goonu and there could be a songline from Moruya (where they have a black swan story) down to Merimbula.	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Culture	Songlines	A songline runs from Gulaga to Biamanga. Partway along this route there is a spot near Bermagui where you stand to see things. You can see Biamanga, Gulaga, Peak Alone, Muleema (Strong Woman), Wadagudarn (Range), Nadjinooka, Barranguba from this spot (and sing them).	Yuin
Culture	Songlines	There is a story of a mountain woman and a girl who come from a serpent which is the Eastern head of Biamanga. When the girl is initiated they go to a waterhole on Biamanga. Blood runs down to salt water (mura). Spirit of girl and woman. They sing the story at Bermagui on the Biamanga to Gulaga songline, but they sing it <u>off</u> the songline.	Yuin
Culture	Dreaming	Brown Mountain (should be called Nimmitabel) means 'place of many waters'. It's the head of the Shoalhaven and Bombala Rivers (Platypus Dreaming).	Yuin
Language	Daramah	Creator. Came from 'dark space' and just 'is'	Yuin
Culture	Cultural men	Uncle Percy Mumbler was the last initiated man at Biamanga. Also, Guboo Ted (Thomas) was chosen at the age of 5 to be a leader. He was watched and taught through life by medicine men and women. Uncle Max (Harrison) had some teaching later in life from Guboo.	Yuin
Culture	Biamanga Mt	Mumbula/Biamanga is a man lying down. Can be seen from Baronda (Tathra).	Yuin
Culture	Biamanga Mt/Gulaga Mt	Many rocks on Biamanga and Gulaga are related to Dreaming stories and songlines. On Biamanga there is a rock formation representing a mother and child (image); another standing stone on Biamanga is a compass (N/S, E/W) (image); another on Biamanga is the face of duluga (yowie) faces East to sea and will come back. There is also Goobay, a teaching rock, on Biamanga. On Gulaga, there is a Rainbow Serpent rock formation.	Yuin
Culture	Landscape/brothers	Biamanga is one of Gulaga's male children. Another is Barranguba, or Montague Is. A possible third brother is Wandella (there is a place about 12 km West of Wallaga Lake called Wandella).	Yuin
Culture	Landscape	Nadjinooka is a small peak near Gulaga, another child (gender?)	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Culture	Bunan (bora)	Bunan sites faces East	Yuin
Culture	Burials	People at Wallaga were buried facing East. Burials from ancient are buried sitting up with knees up to their chins facing the East (Sun).	Yuin
Culture	Sun	Elders down the South Coast did not call Sun Grandfather, Sun was female. Participant said she had never heard of this , neither had old people before her, and men in the community.	Yuin
Culture	Spirits	Maleema - wild bush spirit, woman (tall, long black hair). Ask Ken Campbell at Wallaga. She sings (like siren women), attracts men. Floats above the ground.	Yuin
Culture	Landscape	Mystery Bay fish traps - see at low tide near end of road to picnic area.	Yuin
Culture	Whale	Cave at Mystery Bay (old lava tube) near camping area. In the evening at the top of the rocks looking down, there is a face looking down into the water. Whales came, story of boy who fell in love with a whale but couldn't be together (wrong skin). Whale went into the cave and sang; can still hear today. Dreaming story.	Yuin
Culture	Language	Whale = Moo-ree-i-ra	Yuin
Culture	Whale/songline	Whale rocks on Gulaga are the end of a songline to Eden (see ABC podcast)	Yuin
Culture	Songlines	Songlines were marked by trees (possibly flowering trees or wattles, trees shaped specifically.	Yuin
Culture	Whale	Whale dance - short steps	Yuin
Culture	Whale	Tree with red sap - when it comes out of the tree, whales going up the coast. When sap starts to pile up below the tree, whales coming down.	Yuin
Culture	Dolphins	Called in by singing dolphins after slapping water, singing and speaking in dolphin language. Story in ABC podcast.	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Culture	Songlines	Black Duck (Umbarra) songline goes North to Sydney. Songline goes from Mallacoota border along coast to Hawkesbury River (North Side). Engravings identify black duck passage way, like the Dreaming, songline from Wallaga Lake to Bundeena sandstone outcrops where duck feet engraving are. Dean Kelly can show duck feet engravings and the passage to the Sydney area on high ground behind Wollongong. The duck feet engravings were the end of the Umbarra Dreaming track from Wallaga Lake. With the connection on the Northern side of the Hawkesbury, there was an old man there who was a midwife, and there is rock art there (check connection to Gai-maraigal story about mother kangaroo).	Yuin
Culture	Language	Umbarra - King Merriman's name. Biamanga - Jack Mumbler's name. Both culture men in the past.	Yuin
Culture	Connections	There was a connection between Guboo Ted and Arrernte people, who visited every 10 years for ceremony. Very tribal people - clever men (called Talley and Shorty).	Yuin
Culture	Language	Birr-ong-mut-tung (biirong mutung) - proud and strong. Jindah - kiss of morning dew and Sun (creates the sparkles from water droplets)	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Story of the Waratah	In the Dreamtime there came from the sky a young couple on a star. And their names were Toonkoo and the woman's name Ngaardi. They came to this beautiful land. It was the beginning of all creation. When Ngaardi laughed the wind blew and the thunder sounded. This was the beginning of all life. They together learned to live in the new surroundings. Toonkoo learned to trap animals to give them their names he learned all about the trees, the grass and the flowers and everything that grew and swam. He went to hunt and because he was not experienced enough the Great Spirit came to walk with him. Toonkoo became angry and grabbing the spear. Aiming at a star he threw the spear and the spirit caught it, bent it and threw it back. This was the beginning of the boomerang. He was taken away by the Great Spirit to dwell in the moon. Ngaardi waited back at the gunyah at the bottom of the mountain wondering where Toonkoo was. As she swatted by the fire she told the children about the kookaburra and how he laughed, and how the animals came to live there. Then Ngaardi went to look for him by herself. As she looked up she saw the stars rising in the clear crystal sky and moon coming over the mountain. To her surprise she saw Toonkoo's face in the sickle moon. Her arms stretched out she climbed the mountain. When she reached the top she was that exhausted she just fell down and cried. And the tears ran down her cheeks. Down the sides of the mountains. Her tears were so sad that they formed the creeks and rivers. That's why today the creeks sing so peacefully as they rush by into the rivers. When she sighed the wind blew and the light of creation appeared. Dawn came and if he should ever return she left her heart on the mountain to find. Today it is the Waratah.	Yuin
Cultural	Story of young women	Whitaker Creek (Brou Lake - N. of Narooma) - story of two young women who ran away with two men. Two large rocks plus one small one (child). Eagle rock in background. Could be Wagalag story?	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Songlines	Boundary of Black Duck songline could be two boomerang engravings (back-to-back) on the Hawkesbury River. There was a woman's birthing place on the Northern side. There was an old man (Mr Walker, he was a tribal man) who was midwife (to the Black Duck?).	Yuin
Cultural	Family/totems	Connection to Dunghutti-Birpai/Biripi: participant's Mum was White Pointer from Old Bar (Manning River) at Purfleet Mission, Taree. This connects Gulaga through the White Pointer Shark totem and kinship group (collection of same stories and marriages between the groups) there.	Yuin
Cultural	Dialect groups	Wandandian - goes up to Pidgeon House (Mt) area (travels along the ridgeline and onto Pidgeon House (Dithol or Bulgarn). Sits up in gorges, up to left is Castlereagh. Near Durras, gorge comes on to coast. Pine trees (Durras Mt). There was an old establishment built there in the early exploration times. Bunan rings there.	Yuin
Cultural	Songlines	Participant remembers when she was young about a Black Duck constellation in the sky.	Yuin
Cultural	Language	Gunyoo - Black Swan in Yuin (Dhurga).	Yuin
Cultural	Black Swan	Cheryl Davison - artist - did Facebook story of Black Swan, includes story of hunter.	Yuin
Cultural	Songlines	Dreaming tracks go into sea. At Mimosa National Park, follow along the boardwalk and is revealed only just on dark.	Yuin
Cultural	Songlines	Brian Egloff map of route from Gulaga, around Biamanga, to Bega, Tandewingalo (?), to Eden, probably whale songline	Yuin
Cultural	Black Duck	The Black Duck is a summer constellation. You can see it and the Emu in May, low in the Western sky near Orion. It looks like a duck with the beak to the left, body to the right, and feet under	Yuin
Cultural	Songlines	Black Duck songline/route to Sydney is from Lake Illawarra via Illawarra Highway to Picton; look for lagoons and high ground to the West. This will lead into Sydney area.	Yuin

NSW Coast Astronomy Ethnographic Database

<u>CATEGORY</u>	<u>SUBJECT</u>	<u>STORY or INFO</u>	<u>LANGUAGE GROUP/COMMENTS</u>
Cultural	Orion	Three stars in Orion (Orion's belt) . Connected to ceremonies.	Yuin
Cultural	Emu	Emu is important in culture and ceremonies.	Yuin
Cultural	Pleiades	Gulaga - Mother mountain. Connection to Seven Sisters. Gulaga is elder sister to Seven Sisters, when she was on land she got caught and stayed.	Yuin
Cultural	Gulaga Country	Biamanga is the father of Gulaga's children. There were four children, represented by four hills/mountains. Barunguba (Montague Is) is a boy, Najanuga (Little Dromedary) is a boy, a girl is a small hills inland (could this be Peak Alone in Wandella?), and second girl is an underwater mountain between Barunguba and Mystery Bay which was a volcano that blew up and sunk beneath the sea.	Yuin
Cultural	Stars/Orion	Black Duck (totem) in sky - from Walaga Village look over Gulaga to see it. Summer time late evening - this is Orion.	Yuin
Cultural	Songlines	Cultural story about the Black Duck, but secret/sacred.	Yuin
Cultural	Songlines	Swan story from Moruya - flew west - eagle story with feathers plucked. Connection to Wagga Wagga (means 'crow' - 'waggera').	Yuin
Cultural	Canis Major	Story: Wunbulla the bat, Moodtha the Black Snake lady, and Murumbal the Brown Snake lady. End up in Munowra (Canis Major).	Yuin
Cultural	Whales	Whales - travelled to ceremonies when whales come back down the coast. Birth/rebirth, boys to men/whale births.	Yuin
Cultural	Songlines	Dulugar's track from Gulaga to Eden - not a whale songline (that Dulugar/yowie would go along the coast)	Yuin
Cultural	Ceremony	Talking about connection to Hawkesbury River; Gulingal (Yuin for ceremony) is probably the same as Kuringal, which is a suspect name for people of Northern Sydney. Both probably mean 'ceremony', as 'gal' means 'place of'.	Yuin

Appendix 3 NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Awabakal</u>	<u>Birpai</u>	<u>Bundjalung</u> (Bandjalang)	<u>Darkingung</u>	<u>Dharawal</u>	<u>Dharug</u>	<u>Dunghutti</u>	<u>Gai-mariagal</u>	<u>Gumbayngirr</u>	<u>Guringai</u>
Sun	panyal (1) (21) dunna, going, dugong (1), panal (4), punnal (5), pun yul (19)	djuukan (34), eurokar, tornee (36), tocan(3 7)	yalgan (35), nyangga (38)	yiluk (18), banal (7)	kun (9), guwing (10), wure (8)	guwing (23), co- ing (11), quen (24), co-in (25), kuñ (8), kyun (13), bukurong (31), condoin, hun.yiluk (42)	dhunuwi (35)	yia (44)	ngayan (32)	con-do-in (11), bunyell, punyal (26)
Sun set	pillatoro (to set) (5), pilaTurr (to set) (21)	barrang a (34)				dyarra murrama guwing (23)			ngayan- bunggigam (32)	
Moon	yellana (2), yalunya, yennada, kawang (3), molakan (waning) (5),	giwang (34)	gibam (35), kyibum, kip-up (39)	gundang (7)	dyedyung (8), yunada (10), tedjun (30), dowera, djuddjing (29), jilluk (13)	yanada (23) (11) (24) (25), djilak (8) (13), ya- nă-dah (15), julluk,	gitayn (35), durrgan (41)	nargaree (44)	gidany (32)	dil-luk (11), yellowra, yunaga (26)

Appendix 3

NSW Coast Astronomy Vocabulary

	kuNTung, yaNaka, puNTupan g (21), pontoe- boong (2), yum aga (19)					jillah, condoen (42)				
<u>English word or concept</u>	<u>Awabakal</u>	<u>Birpai</u>	<u>Bundjalung</u> (Bandjalang)	<u>Darkingung</u>	<u>Dharawal</u>	<u>Dharug</u>	<u>Dunghutti</u>	<u>Gai- mariagal</u>	<u>Gumbayngirr</u>	<u>Guringai</u>
Full Moon	gibbuni karadallen (5)					marri yanada (14), dilluk yanada (15)			jagiin.gula m (32)	
New Moon					marriyandad a (10)	yanada barragi (23)			junuygulam (32)	
Moon when set						yanada bura (23), yanada poo-ra (14)				

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Awabakal</u>	<u>Birpai</u>	<u>Bundjalung</u> (Bandjalang)	<u>Darkingung</u>	<u>Dharawal</u>	<u>Dharug</u>	<u>Dunghutti</u>	<u>Gai-mariagal</u>	<u>Gumbayngirr</u>	<u>Guringai</u>
little Moon (crescent)	gumundall en gibbim (5)								junuygulam (32)	
star	maNay, mika, miri (21)	manay (34), mirrilyn (34), mireen (36)	guyuhmgan (35)	gulang (7)	birrung (10), jinjinuurun (30), djingee (29)	birrung (14), birrong (11), kimberwa lli (13)	wupu (35)		birraarl (32), winda (32)	
stars	mirrai, buddu (5), manyi, birrong (3), kulang (21)	manay (34), mirrilyn (34), merring (36)		giwangga (7)	jingjingurra (8)	birrung (23), birrong (11), borong (24), gimbawali (8), kimberwa lli (13)				gowlang, goowindia (26)
Milky Way		dhun. giyn (34)	wayal, balun (40)		warrawul (10)	warrawal (11)				

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Awabakal</u>	<u>Birpai</u>	<u>Bundjalung</u> (Bandjalang)	<u>Darkingung</u>	<u>Dharawal</u>	<u>Dharug</u>	<u>Dunghutti</u>	<u>Gai-mariagal</u>	<u>Gumbayngirr</u>	<u>Guringai</u>
Sky	burra, narrawan, ura (3)	naatiyn (blue) (34)	marahr (35)		burra, garayura (10)	burra (11)	yurra (35)		garaala (32)	
Magellanic Clouds		murgay ? (34)			buduwan- g (10)	buduwan- ung (14), boo-do- en-ong, mo-loo- mo-long (11), bu- do-nong (15)				
Magellanic Cloud (LMC)						galgalyun- g (23) gnar- rang-al-le- on (11)				

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Awabakal</u>	<u>Birpai</u>	<u>Bundjalung</u> (Bandjalang)	<u>Darkingung</u>	<u>Dharawal</u>	<u>Dharug</u>	<u>Dunghutti</u>	<u>Gai-mariagal</u>	<u>Gumbayngirr</u>	<u>Guringai</u>
Magellanic Cloud (SMC)						cal-gal-leon (11)				
Pleiades/ Seven Sisters		Mirrilyn manday (34)	warinehn, warinihygan (40)	mirganda (7)	mulumulung, mamarrianda (10), mullamullung (8), mullymoola (28), dhinburri (9), mungudia (29)	mulumulung (11), dhinburri (8) (11), miirrinmurrin, mullamullu (13)	matan (41)		Janagan (32), Daarril (32), Ganay (32), wirriiga (45)	
Orion's Belt				gunggun (7)	burrara (8), dhungagil (9), murrumwirugan (10)	dhungagil dhungagil (8) (11)			Bulagurrgidam (32)	
Aldebaran					gwaianbilla (10)				Murrawurra (32)	
Alnilam										

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Awabakal</u>	<u>Birpai</u>	<u>Bundjalung</u> (Bandjalang)	<u>Darkingung</u>	<u>Dharawal</u>	<u>Dharug</u>	<u>Dunghutti</u>	<u>Gai-mariagal</u>	<u>Gumbayngirr</u>	<u>Guringai</u>
Altair	bibiga (eaglehawk) (20)			bibiga (eaglehawk) (20)						
Canopus			wagahn (40)							
Crux	burre (?) (5)		ginibi (40)						Birrugan (32)	
θ (theta) Orionis										
Pointers (stars)										
Sirius					kurumul (30)	murray nowey (16)				
Venus			gamaygan, guyuhmagan (morning) (40)		burara (30)		wupu, wupu manhatinu m (evening) (41)	yoohlay (44)	Birraarl (32), Birrugan (morning), gawnggan (evening) (45)	

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Awabakal</u>	<u>Birpai</u>	<u>Bundjalung</u> (Bandjalang)	<u>Darkingung</u>	<u>Dharawal</u>	<u>Dharug</u>	<u>Dunghutti</u>	<u>Gai-mariagal</u>	<u>Gumbayngirr</u>	<u>Guringai</u>
meteor/ shooting, falling star			yahrum, gabuny (40)		jirrawullung (8), duruga (10)	duruga (12), tu- ru-ga (11)				
meteor/ falling star cluster			yuaroam (39)			mulumulu , molu- molu (23)				
bright star (name or characteri- stic?)	barradamb ang (5)									
night	tukuy (14)	guraa (34)	jubuny (35)			minak (14)	ngunmar (35)		ngunmarr (32)	minning (26)
set (sun, moon, stars)	pilaTurr (14)	barrang ga (sun) (34)								
comet									gumugan (32)	

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Gundungurra</u>	<u>Worimi</u>	<u>Yaegl</u>	<u>Yuin</u> (Dhurga)
Sun	bunyal, bundil (27)	djuukan (34), wingin, toocan (43), dhuuni (21)	ngawray (33), ngayan (33)	bagaranj (35)
Sun set		barranga (34)		
Moon	tyeluck (27), kubbadang (17)	giwang (34), keewuk (43), gilayn (21)	iidany (33), walaalgurr (33)	djadju(ng) (35)
Full Moon				
New Moon				
Moon when set				

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Gundungurra</u>	<u>Worimi</u>	<u>Yaegl</u>	<u>Yuin</u> (Dhurga)
little Moon (crescent)				
star		manay (34), mirrilyn (34), wupa (21)	wilaaran.gan (33)	djinggi (35)
stars	cuangy, jerra (27)	manay (34), mirrilyn (34), munni, mereen (43), mayirigad (21)		
Milky Way		dhun. giyn (34)		

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Gundungurra</u>	<u>Worimi</u>	<u>Yaegl</u>	<u>Yuin</u> (Dhurga)
Heavens (maybe the same as the Milky Way)				mirriwar? (35)
Sky		naatiyn (blue) (34)	ngunarr (33)	mirriwar (35)
Magellanic Clouds		murrgay (34)		

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Gundungurra</u>	<u>Worimi</u>	<u>Yaegl</u>	<u>Yuin</u> (Dhurga)
Magellanic Cloud (LMC)				
Magellanic Cloud (SMC)				
Pleiades/ Seven Sisters		Mirrilyn manday (34)		
Orion's Belt				
Aldebaran				
Alnilam			Wagulin (crow) (17)	
Altair				
Canopus				
Crux	Dyin-yook (black swan) (17)	Ngarlin bulgwarr (21)		

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Gundungurra</u>	<u>Worimi</u>	<u>Yaegl</u>	<u>Yuin</u> (Dhurga)
θ (theta) Orionis	Dyoorutgang (17)			
Pointers (stars)	Muruai (kangaroo) (17)			
Sirius				
Venus	Garandhalang (17)		Nganggulaawan (evening) (33), Nganggula (morning) (33)	
meteor/ shooting, falling star				
meteor/ falling star cluster				

Appendix 3

NSW Coast Astronomy Vocabulary

<u>English word or concept</u>	<u>Gundungurra</u>	<u>Worimi</u>	<u>Yaegl</u>	<u>Yuin</u> (Dhurga)
bright star (name or characteristic?)				
night	burri, burrie (27)	guraa (34)		dhabura (35)
set (sun, moon, stars)			barrangga (sun) (34)	
comet				

Notes and Sources

Notes

* Collins (1798) refers to the Hawkesbury dialect, presumably Guringai

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Refer to Bibliography for full details

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Appendix 4 Total Coding List for the NSW Coast

Theme number	Community	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Something falling out of the sky		X													
2. Culture hero angry about roasting lice in the fire			X												
3. Moon				X											
4. Sun					X										
5. Culture hero ascends back into the sky						X									
6. Killing a large number of people										X					
7. Moon jealous of Sun				X	X										
8. Tears of Moon fall as rain				X											
9. Ceremony to honour Moon-man				X			X								
10. Eaglehawk/All-father			X												
11. Eaglehawk – Altair			X				X	X							
12. Crow subservient to Eaglehawk															
13. Baiame created man and woman			X						X						
14. The first man to die climbs a tree to Heaven								X							
15. Mundoes are Baiame's footprints			X												
16. Baiame stepped off flat-top mountain back to the sky						X									
17. Quartz crystal associated with Baiame in Bullima			X												
18. Carvings in ground							X								
19. Sun looking at buried dead				X			X								
20. Young man desires the wrong woman										X					
21. Wrong use of resources													X		
22. Moon origin is a woman who wants wrong marriage			X							X					
23. A young man desiring a woman in (22) turns into a brown snake										X					

Appendix 4

Total Coding List for NSW Coast

Theme number	Community	1	2	3	4	5	6	7	8	9	10	11	12	13	14
24. Moon who was wrong woman group with child water breaks no water – brown snake			X							X					
25. Sisters pursued by the wrong person										X	X				
26. Sisters climb jump thrown into the sky											X				
27. Moon man swells due to various reasons			X												
28. Bad people eat human flesh										X					
29. Burn out bad people										X					
30. Venus was a bad person										X					
31. Milky Way is a giant turtle												X			
32. Holes/tunnels often lead to places like Bullima												X			
33. The story explains the marking/nature of animal												X			
34. Spirit with red glow floats up and becomes Betelgeuse								X							
35. Seven Sisters controlled cold ice and snow											X	X			
36. Seven Sisters created creeks and rivers											X	X			
37. Spirit (burned) becomes Aldebaran								X							
38. Earth is flat plain with Sun Moon and stars revolving around				X	X							X			
39. Sun produces light only (no heat)					X							X			
40. Seven Sisters produce heat											X	X			
41. Lightning Brothers and Alpha/Beta Centauri								X							
42. Baiame created Country and Law			X												
43. Sun is male					X										
44. Moon is female				X											
45. Moon was boomerang				X											
46. Resource connection to objects in the sky													X		
47. Baiame travelled with a canoe			X												
48. N48. Animals supposed to communicate with the sky-spirits			X									X			
49. N49. People become stars								X							

Appendix 4

Total Coding List for NSW Coast

Theme number	Community	1	2	3	4	5	6	7	8	9	10	11	12	13	14
50. N50. Person put in Moon becomes face				X						X					
51. N51. Creation of the Sun					X				X						
52. N52. Moon won't die rises again				X								X			
53. N53. Sun's size depends on who is travelling with the Sun					X										
54. N54. Two sisters made the sea became the Hyades star cluster								X							
55. N55. Girl chased into the sky becomes emu								X							
56. N56. Aboriginal people observe movement of the Sun				X				X							
57. S57. Man sent to Moon for doing the wrong thing					X					X					
58. S58. In the story a group of animals (totems) end up as stars in the sky															
59. S59. People were buried facing the rising Sun					X		X								
60. S60. The sky was held up with wooden pillars												X			
61. S61. The Seven Sisters sing the whales up and down the coast											X				X
62. S62. The Emu jumped from Kosciuszko (Mt) and Daramulan's eyes are the Pointers								X						X	
63. S63. Stories connect to a songline															X
64. S64. There is a Black Duck constellation in the summer sky								X						X	X
65. S65. Orion's Belt has a connection to ceremonies							X	X							
66. S66. Things seen "up there" are seen "down here"														X	
67. S67. When the sky was too low people used spears to lift which became stars								X					X	X	
68. S68. Star Maps were used for travel on songlines								X					X		X
69. S69. Yuin understood the relationship between tides and the Moon				X								X			
70. S70. Landscape with story is connected to the Seven Sisters											X		X		X
71. S71. Navigation using stars								X				X			
72. S72. Weather forecast from Moon or sky				X									X		

Appendix 5 Theme List for NSW Coast

1. Something falling from the skies
2. Culture heroes
3. The Moon
4. The Sun
5. Ascent of a culture hero to the sky
6. Ceremony
7. Characteristics of individual stars
8. Creation stories
9. Breaking Law has consequences
10. Seven Sisters
11. Description of physical features and the environment
12. Resources
13. “What’s up there is down here”
14. Connecting songlines to stories