THE ROLE OF GEOMORPHOLOGICAL PROCESSES IN THE ACCUMULATION, PRESERVATION AND DEGRADATION OF ABORIGINAL SHELL MIDDEN SITES; NORTHERN NEW SOUTH WALES

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To my precious family, in appreciation for their support, laughter and love.

TABLE OF CONTENTS

FIGURES AND TABLES

FIGURES

Chapter 1

Chapter 2

Chapter 3

TABLES

Chapter 2

Chapter 4

Chapter 5

Chapter 6

Chapter 7

ABSTRACT

A combination of archaeological and geomorphic techniques was used to study erosion hazard at Aboriginal shell midden sites in the Northern Rivers region of New South Wales, Australia. In the absence of artifactual material, biological and taphonomic analyses were undertaken to determine the likelihood a deposit was anthropogenic in origin. These analyses were also used to gain an understanding of site formation processes.

The relationship between, and relative influence of, anthropogenic and non-anthropogenic erosive factors at shell midden sites in different geomorphic settings was used to formulate three erosion hazard assessment methods. Each method was designed to address the needs of a different stakeholder group. The archaeological method includes analysis of the effects of bank erosion, cultivation, anthropogenic and biological excavation, wind and wave erosion. Erosive factors are compared between sites and geomorphic settings. The rapid assessment technique designed for use by Aboriginal Land Councils and local Indigenous communities includes an Erosion Hazard Pro Forma and uses relatively simple geomorphic analyses which can be performed in the field. A handbook containing straightforward, user-friendly instructions on how to complete the Erosion Hazard Pro Forma is also included, along with a scoring system used to quantify erosion hazard and rank the study sites. A GIS model generated using soil, land use, vegetation and elevation data is also used to quantify erosion hazard and rank the study sites.

Agreement between results obtained using the three assessment methods, based on the relative influence of erosive factors, confirms their usefulness as cultural heritage management tools. Study sites at Sleeper Island, Minnie Water, Woombah Site A, Woombah Site B, Plover Island and Wooli are ranked, in that order, from greatest to least erosion hazard. Major factors contributing to erosion at Sleeper Island include boat traffic, steep banks, low site elevation and vegetation coverage and a history of farming. At Minnie Water unconsolidated dunes in close proximity to ocean swell, low vegetation coverage and high exposure to prevailing winds all

influence erosion. Human activity (historic cultivation and excavation) is the major factor causing erosion at the Woombah study sites. These processes have not only disturbed large portions of the midden complex, they have also had a negative influence on vegetation coverage and bank slope. Exposure to prevailing winds, coupled with its situation within a walking track, are the major causes of erosion and disturbance of the surface stone artifact scatter and *in situ* stone artifact deposit on Plover Island. Minimal disturbance at the Wooli Aboriginal shell midden deposit is due to its burial in a low energy environment, gentle bank slope, high vegetation coverage and minimal anthropogenic impact. Research findings indicate vegetation coverage and bank slope are the primary factors influencing erosion at estuarine sites. Elevation (above water level), exposure to prevailing winds and vegetation coverage were found to be the primary factors influencing erosion at coastal sites.

Two sets of conservation recommendations were formulated. The first set comprises general guidelines for management of sites based on their geomorphic setting. Secondly, specific guidelines for management and conservation of the study sites were formulated in accordance with the wishes of the Yaegl Local Aboriginal Land Council. Implementation of these recommendations will ensure effective cultural heritage management at these sites. Further application of the methodologies developed in this study would greatly increase the effectiveness of cultural heritage management at Aboriginal shell middens as well as other types of coastal archaeological sites.

STATEMENT

Unless otherwise acknowledged, all data and interpretations presented in this thesis are my own. I hereby certify that this thesis has not been submitted for the degree of Doctor of Philosophy to any other university or institution.

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