THERE AND BACK AGAIN:
AN ARTIFACT TALE

by

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Cultural Resources Management

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THERE AND BACK AGAIN: AN ARTIFACT TALE

Thesis by
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ABSTRACT

Purpose of Study:

In an effort to preserve data for future research, artifact collections are diligently excavated and curated. The purpose of this project was to test the hypothesis that curated artifact collections hold invaluable research potential, even if they are examined under new archaeological paradigms.

Procedure:

This project used an artifact collection excavated in 1986 as a test case study. The collection from CA-SON-882, near Santa Rosa, is primarily made up of artifacts from the Southern Pomo Native Californian tribe. This collection was re-evaluated under new archaeological theoretical paradigm of hunter-gatherer complexity and compared to current research in the area to determine if the data remained valuable over time.

Findings:

Though excavated over twenty years ago, the artifact data from CA-SON-882 remains directly relevant to current archaeological theories, such as the emergence of hunter-gatherer complexity and the use of cost signaling by the Southern Pomo.

Conclusions:

Artifact collections do hold valuable data potential for future research, but only if researchers can acknowledge that artifacts are a product of those who excavate and process them. As time passes, artifacts travel on an intangible journey through theoretical paradigms. In order to be able to apply data from curated collections, archaeologists must be able to understand and reconstruct the artifacts' original theoretical contexts.

Chair:__________________________
Signature

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Preface

Before delving into a world of archaeological theory, Native Californian social complexity, and the curation crisis, I would like to take a moment to venture to a different world. The title of this thesis, *There and Back Again: An Artifact Tale*, is a play on the original title of J.R.R. Tolkien’s famous novel *The Hobbit*, or *There and Back Again: A Hobbit’s Tale*. *The Hobbit* tells the story of a creature named Bilbo Baggins who accidentally finds himself on the adventure of a lifetime. Tolkien writes that, “you could tell what a Baggins would say on any question without the bother of asking him. This is a story of how a Baggins had an adventure, and found himself doing and saying things altogether unexpected.”

Bilbo Baggins is whisked away on an epic journey. Having never left his home before, Bilbo is exposed to all sorts of new creatures and situations. His journey profoundly changes him. When he returns to his home in the Shire, he is not the same hobbit who had left. Though he may look the same on the outside, on the inside he is a completely different being with new purpose and meaning.

Through this project, I have discovered that artifacts are much like Mr. Baggins. There is an assumption that an artifact is a static object. It remains the same on the outside, and thus no matter when you reference it, you can always predict what it will tell you. You could tell what an artifact would say on any given research question without the bother of looking at it. However, such a conclusion is misguided.

While they sit quietly in their archive grade boxes, artifacts travel on an intangible journey as archaeological theories and methods change. These paradigm shifts cause the artifacts to transform and take on new meaning. This is a story of how an artifact collection had an adventure, and found itself doing and saying things altogether unexpected.

vi
# Table of Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>CA-SON-882</td>
<td>3</td>
</tr>
<tr>
<td>Research Design</td>
<td>4</td>
</tr>
<tr>
<td>Thesis Construction</td>
<td>8</td>
</tr>
<tr>
<td>II. Literature Review and Theoretical Background</td>
<td>10</td>
</tr>
<tr>
<td>The Curation Crisis</td>
<td>11</td>
</tr>
<tr>
<td>Social Complexity</td>
<td>17</td>
</tr>
<tr>
<td>Past Artifacts and Future Theories</td>
<td>31</td>
</tr>
<tr>
<td>III. Environmental and Cultural Context of CA-SON-882</td>
<td>32</td>
</tr>
<tr>
<td>Temporal Sequencing</td>
<td>32</td>
</tr>
<tr>
<td>Holocene Environmental Landscape</td>
<td>34</td>
</tr>
<tr>
<td>Native Californians</td>
<td>36</td>
</tr>
<tr>
<td>The Southern Pomo</td>
<td>40</td>
</tr>
<tr>
<td>Santa Rosa: The Landscape Post-1800</td>
<td>42</td>
</tr>
<tr>
<td>Context</td>
<td>44</td>
</tr>
<tr>
<td>IV. Previous Archaeological Work at CA-SON-882</td>
<td>46</td>
</tr>
<tr>
<td>Initial Discovery of CA-SON-882</td>
<td>48</td>
</tr>
<tr>
<td>Excavation and Initial Analysis of CA-SON-882</td>
<td>50</td>
</tr>
<tr>
<td>Relocation and Recording of CA-SON-882</td>
<td>55</td>
</tr>
<tr>
<td>Curation and Value of CA-SON-882</td>
<td>58</td>
</tr>
</tbody>
</table>
V. Catalog Methods........................................................................................................... 60

The Original CA-SON-882................................................................................................ 60

The Re-Cataloging of CA-SON-882.................................................................................. 62

Analytical Assumptions and Procedures.......................................................................... 66

Analyzing the Analysis...................................................................................................... 67

VI. Analysis of Artifacts and Summary of Findings......................................................... 70

"Shellfish transport, caloric return rates, and prehistoric feasting on the Laguna de Santa Rosa, Alta California"

(Hildebrandt et al 2009)..................................................................................................... 70

Artifact Findings from CA-SON-882................................................................................ 77

Darko 2010 vs. Hildebrandt et al 2009............................................................................. 85

Feasting and Social Complexity....................................................................................... 87

Concluding Analytical Thoughts....................................................................................... 90

VII. Conclusions and Directions for Future Research...................................................... 93

The past analyzed in the present affects the future.......................................................... 94

Artifact Analysis Summary............................................................................................. 95

Curation Crisis Recommendations.................................................................................. 98

Directions for Future Research at CA-SON-882.............................................................. 103

APPENDIX A...................................................................................................................... 105

APPENDIX B...................................................................................................................... 112

APPENDIX C...................................................................................................................... 119

References Cited............................................................................................................... 121
Table of Figures

Figure 1. Location Map of CA-SON-882 ................................................................. 47
Figure 2. Stradford's original site sketch of CA-SON-882 ............................... 49
Figure 3. CA-SON-882 excavation map ............................................................... 51
Figure 4. CA-SON-882 obsidian hydration data .................................................. 54
Figure 5. Sketch map of CA-SON-882 ................................................................. 57
Figure 6. Percentages of material types in CA-SON-882's collection .................. 79
Figure 7. Percentages of obsidian sources by weight (g) ..................................... 79
Figure 8. Percentages of bone types by weight (g) ............................................... 80
Figure 9. Shellfish percentages by weight (g) ....................................................... 82
Figure 10. Shellfish species percentages by weight (g) ........................................ 82
Figure 11. Percentages of shellfish by depth ......................................................... 83
Figure 12. Shellfish weights by depth ................................................................. 83
Figure 13. Shellfish weights by type and depth .................................................... 84
I. Introduction

The purpose of this project was to test the hypothesis that curated artifact collections hold invaluable research potential, even if they are examined under new archaeological paradigms. Through the case study of a Southern Pomo site, CA-SON-882, this project argues that artifact collections need to be more thoroughly documented and continually re-evaluated because they are potentially essential contributors to current archaeological theory. Artifacts’ prospective research value lies in researchers’ ability to reinterpret them through the lens of new or different archaeological theories. As artifacts sit on the curation shelf gathering dust, they travel on an intangible journey through archaeological paradigms. When future researchers return to study these artifacts, they may find that artifacts hold new meanings. Thus the future research value of artifacts can only be preserved through the artifacts themselves and their detailed contextual documentation.

Over the course of the history of archaeology as a field, millions, likely billions, of artifacts have been excavated, processed, and curated. But, what does “curated” mean? What happens to artifacts when they are curated? What should be happening to curated artifacts? As will be discussed throughout this thesis, curation, as it is currently practiced in the United States, is possibly the equivalent to an archaeological death sentence.

Since the 1970’s, the United States has seen a rapidly growing curation crisis. Archaeology sites are carefully excavated with the purpose of preserving potential research data for future archaeological studies. Curation is supposed to be the process by
which these artifacts are preserved. However, past archaeological funding, attitude, interest, and legislation have relatively ignored the curation aspect of archaeology. As a result, curation facilities lack the staff and resources needed to care for artifact collections properly. Additionally, countless artifact collections are not properly curated in a long term facility, and instead they remain in disintegrating boxes in the backs of Cultural Resources Management (CRM) offices, the basements of academic institutions, or archaeologists’ home garages.

Whether in a facility that cannot provide proper care, or hidden behind a water heater, artifacts are being left to die. This is not to say that artifacts have souls, or that they are on equal footing with living beings, because that is nonsense. In this circumstance, “death” means a loss of future data potential. Not only are the physical artifacts rotting into non-existence, but artifact collections are being separated from the contextual documentation that gives them meaning. Without artifact provenience data and information about the methods, theories, and research questions that guided the original excavators and researchers, obsidian becomes just another glass rock and broken bottles become nothing more than garbage.

This thesis argues that if artifacts are properly contextualized, artifact collections excavated and curated under outdated archaeological methods and theories have the potential to be invaluable contributors to current archaeological research. The curation crisis has not gone unnoticed by the archaeological community, and the last thirty years have seen the publication of numerous articles proposing solutions to the curation crisis. As solutions are suggested and implemented, researchers must keep in mind that artifacts
and artifact catalogs cannot be taken for granted. The value of artifacts exists only if they can be re-evaluated under new archaeological paradigms.

CA-SON-882

The case study of this project is CA-SON-882. The original research design of this project proposed to study the emerging complexity of the Southern Porno Native Californian group near Santa Rosa, California. The Anthropological Studies Center (ASC), at Sonoma State University, gave the author permission to explore their curation facility for artifact collections that could be used to examine Southern Porno complexity. The ASC houses hundreds of collections, many of which have been excavated from Native Californian sites in the Northern Bay Area. In search of a useful collection and data set, the author read numerous reports, poured over catalogs, and rummaged through artifact boxes. During this research process, the author came across CA-SON-882’s original report.

CA-SON-882 is a small, Southern Pomo archaeological site in Santa Rosa’s Bennett Valley, and spans across Matanzas Creek. As will be discussed further in Chapter IV, CA-SON-882’s report was clearly written by students in the 1980s. The site had been first identified in the 1970s, and was excavated in 1986 by Sonoma State University and Santa Rosa Junior College students as part of a field class. Between 1986 and 1994, various students processed and cataloged the collection. CA-SON-882’s excavation and documentation process had been a major source of archaeological education, and, unbeknownst to researchers at the time, CA-SON-882 still had much to teach archaeologists.
At first glance, the collection seemed like the perfect data set with which to test hypotheses about the emergence of Southern Pomo complexity at small archaeological sites. However, closer study of CA-SON-882’s collection took this project in a completely different direction. CA-SON-882’s reports and catalogs were poor representations of the collection. The artifact collection itself was in a state of disarray. The methods used to document collection and curate the collection were outdated and had possibly caused damage to the collection’s data potential. This thesis’ main research question became: can artifact collections excavated and curated under old archaeological paradigms be used to address current archaeological theories? CA-SON-882 became a case study in artifact re-analysis.

Research Design

Current archaeological literature widely addresses both the archaeological curation crisis and the emerging complexity of indigenous hunter-gatherer groups. Both topics have quickly become important issues within the last decade of archaeological study. The curation crisis has seen the rapid expansion of artifact collections in need of curation, and complex hunter-gatherer theories are being applied to more and more indigenous groups worldwide. Instead of excavating new archaeological sites and adding to the curation crisis, this project proposes that researchers should try to revisit curated artifacts to answer research questions about complex hunter-gatherers. Below, this project’s theoretical background will be briefly explained, the purpose and methods of examining CA-SON-882’s artifact collection will be detailed, and the limitations of this study will be addressed.
As will be discussed in depth in Chapter II, cultural resources management legislation in the United States has led to the accumulation of vast amounts of artifacts without providing for their proper care and maintenance (Childs and Sullivan 2004:7; Stankowski 2009:3; Stankowski 2007:25). While it is good that the United States mandates the preservation of its cultural resources, the fact that there is no proper legislation to account for curated collections has created a horrific curation crisis (Childs and Sullivan 2004:7; Stankowski 2009:3; Stankowski 2007:25). This crisis has been widely discussed and debated since the 1970s, and in the past thirty years, very little has been done to change the situation on a large scale (Childs and Sullivan 2004:8; Christenson 1979:161; Stankowski 2009:3-4).

In a recent Society for American Archaeology (SAA) volume, *Our Collective Responsibility: The Ethics and Practice of Archaeological Collections Stewardship* edited by S. Terry Childs (2004), various authors detail multiple aspects of the curation crisis and provide examples of possible solutions. Two of chapters in the volume, “Stewardship, Collections Integrity, and Long-term Research Value” by Alex Barker and “Back from the Brink – Renewing Research Potential” by Eugene Marino, explicitly address the issue of properly documenting artifact collections and keeping those records associated with each collection. As solutions to the curation crisis are realized, archaeologists must remember the true motivations behind curation: to provide adequate data for future analysis (Barker 2004:37; Marino 2004:43).

The discourse of hunter-gatherer complexity has also been widely addressed in recent literature on Native Californian groups. As will be unpacked further in later chapters, numerous volumes and articles have been published on the complexity of
Californian hunter-gatherers. Of note are *Prehistoric California: Archaeology and the Myth of Paradise* (Jones and Raab 2004) and *California Prehistory: Colonization, Culture, and Complexity* (Jones and Klar 2007). Such works emphasize the dynamic nature of Native Californians over time, and dismiss outdated theories that labeled such groups as simple and static (Hildebrandt 2007:83; Jones and Raab 2004:8-9; Milliken et al 2007:99). Complexity no longer equates to agriculture.

As ideas in archaeology change and new theories become dominant, the field of archaeology experiences a paradigm shift. The purpose of examining the artifact collection of CA-SON-882 is to determine if these new theories can be better understood through the analysis of curated artifact collections. Using the current literature mentioned above as a theoretical road map, CA-SON-882 was re-analyzed to address modern research questions. This project, however, focused on the re-analysis process. What information was necessary to apply this collection to the complex hunter-gatherer paradigm? Could that information be found? What could the contextual documents contribute to such an examination? Could the current catalogs be utilized? What would be the similarities and differences between the original artifact analysis and this project’s conclusions? Could this collection be used to test theories of complex hunter-gatherers?

In asking these questions, the author hoped to not only be able to use CA-SON-882 as a data set for complex hunter-gatherer studies in the Santa Rosa area, but to also generate recommendations to enhance proposed solutions to the curation crisis and to build recommendations for future artifact curation methods. If the purpose of curating artifacts is to preserve their future archaeological data potential, then archaeologists need to make certain that each collection has the data necessary to re-analyze it under future
paradigms. CA-SON-882 was excavated under 1980s theories, standards, and methods. The purpose of this study was to make that data useful to 2010 theories, standards, and methods.

This study faced a number of limitations. To begin with, the contextual data associated with CA-SON-882 was incomplete. Assumptions were made to fill in data gaps, such as the excavation methods and data processing timeline. The author also had to assume that the provenience information included with each artifact was correct.

More than anything, this project was limited by time and money. Being a thesis project, artifact re-cataloging and analysis needed to take place in a timely manor. Thus, just the basic information was noted in the catalog, and data was double checked on the fly. Also, this project was unable to construct a cultural landscape representing change over time in the Southern Pomo territory. The invaluable data this process would have provided this project was forgone as it would have taken months of research outside the project’s scope.

Because this project lacked a funding source, necessary data such as additional obsidian hydration dates or radiocarbon dating was not possible. CA-SON-882 lacks a proper chronological timeline, and much of the regional data it is compared to is grounded in chronological sequences. However, this project lacked the ability to pay for the testing needed to solidify the site’s chronology.

Despite these limitations, this project was able to successfully reconstruct CA-SON-882’s artifact collection. Enough data has been collected to know that these limitations merely provide an opportunity for future research at CA-SON-882. This
collection, and others like it, have the ability to continue to teach archaeologists and to answer future archaeological research questions.

Thesis Construction

This paper is divided into seven chapters, each designed to illuminate a different aspect of the project. Given the breadth of this project, numerous topics and discourses need to be addressed. Though they are divided and segmented, all of these elements must be woven together in order to generate an appropriate analysis. As a conclusion to this introduction, each chapter and the goals of that chapter will be briefly discussed.

Chapter II addresses the thesis’ theoretical background. Articles concerning the curation crisis and complex hunter-gatherers will be presented. There will also be a discussion on the origins of the term “paradigm.” Other elements of archaeological research that contribute to the complex hunter-gatherer paradigm, such as cultural landscape, will be analyzed. The goal of Chapter II is to provide the reader with a theoretical context within which to place this project.

Just as Chapter II provides a theoretical background, Chapter III provides cultural and environmental background for CA-SON-882. To understand archaeological information, one must first attempt to understand the artifacts within their original cultural context. This chapter describes how Native Californians are understood over time. There is a detailed explanation of chronological patterns, environmental changes, and an archaeological overview of the Southern Pomo.

Continuing the goals of Chapter III, Chapter IV provides a modern context for CA-SON-882. There is an explanation of the original discovery and excavation of CA-
SON-882. The methods employed by the original researchers are reviewed, and the author’s relocation and re-recording of CA-SON-882 is explained. The goal of this chapter is to contextualize CA-SON-882’s modern condition.

Chapter V describes the methods and standards used to catalog and analyze the artifacts of CA-SON-882, and Chapter VI will provide the findings and analysis of CA-SON-882’s artifact data. Chapter VI describes the data analysis performed by Hildebrandt, Rosenthal, and Gmoser (2009), for this is the information being used to compare CA-SON-882’s artifact data. Hildebrandt et al.’s methods and conclusions are detailed, and then compared to CA-SON-882. The goal is to test if data from CA-SON-882 agrees with or affects Hildebrandt, Rosenthal, and Gmoser’s results.

The concluding chapter, Chapter VII, reviews the project as a whole and prescribes recommendations, such as a standard level of artifact documentation, as part of solutions to the curation crisis. Overall, this project provides an interesting study in the use of curated artifact collections. Artifact curation is important because it is a method of preserving the past, but curation not only preserves past artifacts, it also preserves past archaeological theories and methods. Collections need to be re-analyzed over time so that they might be applied to new archaeological paradigms. As such, it is essential that artifact collections be thoroughly contextualized with associated records and documentation. It cannot be assumed that artifacts will always hold the same meaning they did on the day they were created, buried, excavated, processed, or curated.
II. Literature Review and Theoretical Background

As a field, archaeology has once again recognized the crisis of curated artifact collections. It is important to understand how this crisis may affect future archaeological research, and in particular, how data excavated under previous research questions and theoretical paradigms can be made relevant to new research interests as the field evolves. For example, archaeologists world-wide are now examining hunter-gatherers through new theoretical orientations that stress emergent social and cultural complexity, and other socially defined questions. In California, this new research framework makes it increasingly important to determine how previously generated archaeological data fit into that paradigm. Implementation of the most appropriate methods for analyzing a specific archaeological site under this new complex hunter-gatherer paradigm comes from an examination of similar research performed on similar sites.

A large part of this project lies in exposing the potential for curated artifact collections, like that of CA-SON-882, to contribute to the larger discussion on the emergence of hunter-gatherer complexity. Simply put, this literature review will outline the consequences of the curation crisis and the links these issues have to the kinds of research questions and data domains now being used to examine complex hunter-gatherer societies. Additionally, it will offer both concerns for future artifact analysis, and examples of how other archaeologists are currently addressing sites, analogous to the CA-SON-882, within the new theoretical paradigm.
The Curation Crisis

For the past thirty years, archaeology and cultural resources management (CRM) have been debating solutions to what is known as the “curation crisis.” As was discussed in the introduction, the curation crisis is an almost universal problem that refers to the lack of space and poor preservation conditions in which artifact collection are housed. It has been collectively agreed upon that the catalysts for the curation crisis in the United States came about in the 1960’s, along with the birth of professional archaeology or cultural resources management.

Cindy Stankowski, S. Terry Childs, and Lynne Sullivan have all written extensively about the curation crisis’ origins and history. “Museums and repositories were inundated with another influx of artifacts starting in the 1960s with the passage of federal and state laws aimed at mitigating the loss of cultural and environmental resources, such as the National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Archaeological and Historic Preservation Act of 1974; California Coastal Act of 1976; and California Environmental Quality Act of 1970” (Stankowski 2009:2). Consequently, a lack of acknowledgement of the importance of the curation process and a lack of funding meant that curation facilities and storage areas were quickly reaching their limitations (Childs and Sullivan 2004:7; Stankowski 2007:25). Legislation demands (as it should) that cultural resources be protected, however, it does very little to address or fund the curation of those resources after they have been collected for preservation (Childs and Sullivan 2004:7; Stankowski 2009:3; Stankowski 2007:25).
In addition to the 1960 era cultural resource laws, current literature also cites two 1990 federal regulations as contributors to the problem: Curation of Federally-Owned and Administered Archaeological Collections (36 CFR 79) and the Native American Graves Protection and Repatriation Act (NAGPRA) (Childs and Sullivan 2004:8; Stankowski 2009:3-4). Both of these regulations address curation, but neither of them contain enough support or funding opportunities to rescue archaeological collections from the curation crisis (Childs and Sullivan 2004:8; Stankowski 2009:3-4). More than anything, attempts to comply with these regulations have brought to the surface the true extent of the curation crisis and created an increased awareness of the plight of artifact collections, but not the means needed to solve the problem (Childs and Sullivan 2004:8).

The curation crisis has many different elements including loss of collection accessibility, loss of associated documents, potential loss of data, lack of organization, and a lack of overall collection care and maintenance. In the 1970s, when the curation crisis was first identified, authors published articles calling attention to the importance of museums in CRM. One such article is “The Role of Museums in Cultural Resource Management,” by Andrew Christenson (1979). Even in 1979, Christenson had noticed the lack of consideration for collections after they left the excavation unit, and called for the future of archaeological research to be in museum work and artifact curation (Christenson 1979:161). Christenson was not alone, and by 1982 Marquadt, Montet-White, and Scholtz had published an article entitled “Resolving the Crisis in Archaeological Collections Curation.” They argued that the curation crisis could be resolved with the implementation of properly staffed curation facilities with adequate storage and environmental requirements met (Marquadt et al 1982:409). Like many of
those that would come after them, these authors demanded that archaeologists take responsibility for the artifact collections they generate.

In the 1990s, after the passage of NAGPRA and 36 CFR 79, museums were forced to examine and inventory their collections in order to determine if they had any artifacts in need of repatriation. Andrew Gulliford’s 1992 article, “Curation and Repatriation of Sacred and Tribal Objects,” notes that artifact collections, as they are now, are inherently disrespectful to the cultures they represent (Gulliford 1992:38). In accordance with NAGPRA, he demands that artifacts be repatriated to Native American groups so that they can be properly cared for by the tribe and placed in tribal museums and community centers (Gulliford 1992:38).

Also in response to the implementation of the NAGPRA regulations, S. Terry Childs’ article “The Curation Crisis” re-enforced the concept that, “once a site is excavated these materials are often the only remaining evidence of a past culture” (Childs 1995:12). Childs points out many flaws in the curation process. For example, facilities are often “provided little or no compensation or aid” from the agencies who donate collections (Childs 1995:12). Additionally, records are often separated from the artifacts, and once the artifacts have lost their provenience information they are almost useless (Childs 1995:14). Articles such as Gulliford and Child’s worked to once again raise awareness of the curation crisis, but no long term solutions were established.

Since the turn of the millennia, the curation crisis has once again become a widely debated topic. A crisis this large cannot be solved with one policy change or funding grant, and in response to that, archaeologists are now suggesting a multitude of ways to tackle the crisis from different angles. An article published in 2002, “Don’t Keep
Everything: Historical Artifacts Discard Policy,” recommended policies for reducing artifact collection sizes by deaccessioning non-diagnostic historical artifacts such as rusted metal cans and bags of broken glass (Praetzellis and Costello 2002:30). In response to this article, Greenwood and Hale published an opinion piece, “...But Let's Keep Enough,” that argued that Praetzellis and Costello were too “draconian,” and that their policies risked the destruction of artifacts potentially valuable to future archaeologists (Greenwood and Hale 2002:14-15). The debate between these two viewpoints continues in hopes of reaching a productive solution to be applied to collections. What is important to note is that curation crisis awareness is once again on the rise, and archaeologists are actively working to pursue all possible solutions.

In the current struggle to resolve the curation crisis, the Society for American Archaeology (SAA) has been a major advocate for the better care of collections. In 1999, the SAA developed a Curation Committee to address the issues of the curation crisis and the SAA Archaeological Ethics Principle #7: “Records and Preservation” (Childs 2004:v). Principle #7, along with the SAA’s Guidelines to Implement Ethic #7, calls for ethical archaeologists to not only focus on the preservation of artifact collections and their associated records, but to also promote these standards amongst other archaeologists and colleagues (Child 2004:vi).

After a 2002 paper session sponsored by the SAA Curation Committee, a 2004 volume, edited by S. Terry Childs, was published (Childs 2004). Our Collective Responsibility: The Ethics and Practice of Archaeological Collections Stewardship contains twelve articles from leading academics and professionals who are dedicated to caring for archaeological collections. The introductory chapter co-authored by S. Terry
Childs and Lynne P. Sullivan stresses the importance of both archaeological sites and artifact collections (Childs and Sullivan 2004:3). The authors argue that artifact collections are just as important as archaeological sites, associated collection records are just as important as artifacts, and that collections are just as non-renewable as sites (Childs and Sullivan 2004:4-5). Childs and Sullivan also outline six major issues pertaining to the curation crisis: ownership, costs, repository storage space, improved care for existing collections, deaccessioning, and access and use (Childs and Sullivan 2004:9-17).

Another chapter of *Our Collective Responsibility*, “Stewardship, Collections Integrity, and Long-term Research Value” by Alex Barker, stresses the importance of keeping contextual records with artifact collections (Barker 2004:37). Archaeologists should be, “sharing not just interpretations but data, the raw stuff from which interpretations are made” (Barker 2004:37). Researchers do not own the records they generate; those records are just as much a part of the collection as the artifacts are (Barker 2004:38). As Indiana Jones says, “artifacts belong in a museum,” and so does the paper work.

Similarly, Eugene Marino’s chapter in *Our Collective Responsibility*, “Back from the Brink – Renewing Research Potential,” argues that archaeologists need to avoid “separation.” Collections are being separated from their location by being shipped all over the country, and they are being separated from the intellectual world as they are not maintained or made available to other archaeologists or the public (Marino 2004:43). This leads to what he calls “translucency in data,” when archaeological information is unable to reach a large audience due to poor documentation (Marino 2004:44). Marino
concludes by stating that, “reducing an archaeological resource to a set of numbers or a compilation of attributes is a real and necessary step in the analysis process, but it can serve to devalue something that is unique and, in most instances, non-renewable” (Marino 2004:50).

Child’s volume demonstrates contemporary acknowledgement of the curation crisis and the need to adequately preserve these collections for future archaeological research. Since the publication of *Our Collective Responsibility*, there have been several more articles of note. Caitlin DeSilvey’s article, “Observing Decay: Telling Stories with Mutable Things,” argues that artifacts travel on a journey of decay, and as such, collaborative efforts are needed to interpret curated artifacts (Desilvey 2006:318). In 2009, Andrew Andrefsky wrote an article describing how stone tool analysis, typing, and interpretation has changed in recent years (Andrefsky 2009:65). Both articles stress the ever changing nature of the archaeological record, even after it has been excavated.

As recently as July 2009, a group of archaeological professors re-examined the artifact collection from the Combe-Grenal site in France (Dibble et al 2009). “The site of Combe-Grenal is arguably the reference site for the Mousterian of southwest France,” and the authors were curious to analyze the adequacy of the data and the resulting interpretive publications (Dibble et al 2009:2540). The collection had been originally excavated and cataloged in the 1950s. The authors were shocked to find that the collection was in a disarray and lacked proper documentation to be able to reorganize the artifacts. Additionally, the excavation methods and research questions had not been revisited or analyzed by researchers, and were thus never a contributing factor to the data interpretation process (Dibble et al 2009:2548-2549). The article points to the fact that
artifact collections are not always what they seem, especially if they were excavated under older theories and methodologies. It also reinforces one of the themes of Child's volume: artifacts are a product of their time, and thus should not be separated from their contextualizing documentation.

**Social Complexity**

It is important to understand artifacts' original theoretical contexts so that they can be adapted to new archaeological theories and contribute to future research. As mentioned above, archaeological research on hunter-gatherers has experienced a theoretical paradigm shift towards the study of the emergence of complexity amongst these groups. According to Thomas Kuhn, the originator of the “paradigm” concept, in the cycle of normal science, contemporary theories continue to be applied until a significant number of outlier conclusions, from these theories as practiced, arise (Kuhn 1996:12).

Once a large enough body of “outlier” data has been established, the contemporary body of theoretical assumptions, or paradigm, will experience a period of crisis (Kuhn 1996:12, 77-91). At the point of crisis, a scientific revolution occurs where a new paradigm is generated to account for outlier data ignored by the previous paradigm (Kuhn 1996: 77-91). Archaeologists at the forefront of hunter-gatherer research are well settled into the new paradigm of hunter-gatherer complexity, and current literature now calls for the re-examination of hunter-gatherer groups (Jones and Raab 2004:8). Every time there is an archaeological paradigm shift, new opportunities are created to re-examine previously excavated artifact collections.
Before explicitly discussing complexity in hunter-gatherer societies, it is necessary to mention two areas of research with which hunter-gatherer theory is intertwined. Feeding into contemporary literature on complex hunter-gatherers is the theoretical body of work concerning evolution of social structures and archaeology. In his 2008 review entitled “Evolution in Archaeology,” Stephen Shennan suggests, “that the greatest challenge for the future lies in finding ways of using archaeological data to address current major debates in evolutionary social science as a whole” (Shennan 2008:85-87). Witnessing the emergence of complexity of socially complex peoples through the archaeological record greatly contributes to researchers’ perceptions of evolution within all social sciences.

Another body of literature feeding into complex hunter-gatherer research addresses the use of the term “complexity” throughout archaeology. Complexity, though a useful concept, can often be a dangerous term because archaeology lacks an informed method of measuring complexity (Petersen and Meiklejohn 2007:188). The idea of “complexity” is in and of itself complex. The lines are blurred and there is no explicit doctrine on how to apply complexity to archaeological data, how to interpret complexity from archaeological data, or how complexity can be compared across social groups (Petersen and Meiklejohn 2007:181). Despite these faults, complexity remains a useful tool in describing and modeling social structure through the archaeological record.

Kenneth Sassaman’s 2004 article, “Complex Hunter-gatherers in Evolution and History: A North American Perspective,” presents a detailed summary of contemporary studies of hunter-gatherer groups. He concisely argues that, “recent literature is shaped by two fundamentally different definitions of complex hunter-gatherers: the view that
complex hunter-gatherers are basically non-agricultural chiefdoms (Arnold 1996) and the alternative that complex hunter-gatherers include any non-food producing society that deviates from the ethnographic model of primitive communism and its behavioral-ecology counter-part, generalized foraging” (Sassaman 2004:264). Overall, the future direction of complex hunter-gatherer research has a great deal to contribute to anthropologists' and archaeologists' understanding of the development of social structures, but archaeologists need to continue to work on how they define complex societies (Sassaman 2004:227). Sassaman concludes by noting that diachronic work on complex hunter-gatherer groups has created a space where long term work can be achieved on singular groups, and it is only through this continual research and re-evaluation that archaeologists will come, “close to knowing what happened in the past” (Sassaman 2004:266).

Among the current discourse surrounding hunter-gatherer complexity, the issue of variability frequently comes into play. The classification of complex hunter-gatherers has “ambiguous boundaries and even members” (Ames 2004:364). It has been recognized by many authors that the mere classification of complexity implies extreme variability, and thus researchers take hunter-gatherer groups on a case-by-case basis in order to evaluate the complexity of widely diverse groups (Ames 2004:370-371). While some believe this may lead to eventual “stagnation and irrelevance” of the field (Ames 2004:37), in the present, having a wide range of variables that can be attributed to cultural complexity allows archaeologists the necessary latitude needed to accurately assess the complexity of differing groups.
Flexibility in the definition of complexity is important. Agriculture has long been viewed as a necessary element to a complex society. Despite this trend, however, Rosenswig's research into the Soconusco of Mexico has shown that, contrary to previous assumptions, the Soconusco achieved political and social complexity long before the introduction of agriculture (Rosenswig 2006:349). Similarly, several other authors such as Ben Fitzhugh (2003) working in the Alaskan region, Tom Dillehay and his co-authors (2007) working in Chile, and Jose Iriarte and his co-authors (2004) working in southeastern Uruguay, have been able to argue that groups previously classified as simplistic and static were in fact complex cultures with varying subsistence practices and social structures.

Many native groups in North America were formally believed to have emerged as complex societies only after European contact. Using the application of the complex hunter-gatherer paradigm, however, archaeologists are now recognizing that multiple native groups were well established complex societies much before Europeans arrived (Arnold 1992; Arnold et al 2004; Ashley 2002; Cobb 2003; Dillehay et al 2007; Earle 2000; Gamble 2007; Hamilton et al 2007; Iriate et al 2004; Jones and Raab 2004; Lightfoot 2005; Sassaman 2004; Snead 2008; Walde 2006). A notable example is Dale Walde's research on the Northern Plains. He summarizes his findings by stating:

by adopting a communal bison-hunting subsistence system that included the construction of gathering facilities such as pounds and jumps, people were able to increase their food production capabilities while reinforcing their tribal social structure. These cultural changes would have occurred as a result of resistance to the expansion of apparently aggressive horticultural neighbors combined with acculturation to a changing world system of food production. The complex culture of Canadian plains peoples appeared well prior to the appearance of Europeans and is an indigenous development (Walde 2006:391).
Along those same lines, a 2000 article by Timothy Earle, "Archaeology, Property, and Prehistory," argues that such cultural concepts as property rights, as developed by many groups prior to European contact, can be used as a measure of the emergence of complexity among hunter-gatherer groups (Earle 2000:39). As the diachronic perspective demanded by the paradigm of cultural complexity is applied to native groups, archaeologists are gaining a more accurate image of the true nature of past native societies.

The nature of societal structures plays a large role in the defining of a group as complex. As such, many authors are challenging assumptions that the only complex social structure is that of the hierarchy (Crumley 1995:3). Most notably, Carole Crumley claims that complex societies can also be in a state of "heterarchy" (Crumley 1995). She convincingly argues that complex social structures can have power and wealth distribution not only from top to bottom, but also from side to side (Crumley 1995:3). While studying Chacoan society, archaeologists have successfully moved away from defining the peoples of Chaco Canyon as complex or non-complex via their social structure (Mills 2002). Instead, researchers have focused on trying to understand, "exactly how ritual, social, and political organization intersected," over time and space (Mills 2002:65). Variability is being defined not only through the definition of "complexity" itself, but also by means of societal characteristics. The further archaeologists take the complex hunter-gatherer paradigm, the more blatantly apparent the inappropriateness of cultural generalizations becomes.

An excellent example of the application of the complex hunter-gatherer paradigm can be seen in recent studies of the Mississippian "chiefdoms" in the southeastern United
States. In his 2003 article, “Mississippian chiefdoms: how complex?,” Charles Cobb questions traditional materialist and neo-evolutionary models used to describe these, as he says, “so-called chiefdoms” (Cobb 2003:79). Instead of placing them on a continuum or spectrum, archaeologists need to examine their variables independently in order to move, “from the how complex to the why complex” (Cobb 2003:79).

Archaeologist Keith Ashley has also been writing about the Mississippian groups. Focusing on the St. John II of Florida, Ashley is able to show that these groups, having once been written off as isolated and culturally immobile, living in a uniform landscape, were in fact dynamic and heterogeneous peoples who, overtime, interacted with other peoples of varying complexity while maintaining their own societal structure (Ashley 2002). The idea of social complexity has, and continues to, shatter well-established assumptions about the base characteristics of hunter-gatherer groups.

Current research on the Jomon hunter-gatherer peoples in the Aomori prefecture in Japan adds another example of a hunter-gatherer society whose mode of complexity is being reevaluated. According to Junko Habu (1996), until recently, it has been thought that the Jomon were a fully sedentary group year-round. Through a re-examination of the Jomon cultural landscape over time, Habu argues that although they were sedentary people throughout most of the year, there is evidence that shows that the Jomon did travel seasonally to different environments in order to gain access to various resources (Habu 1996:38). In a more recent article, Habu delves deeper into the nuances of Jomon society over time, and specifically references the site Sannai Maruyama as a case study (Habu 2008). Sannai Maruyama’s society breaks every rule of the perceived trajectory that complex hunter-gatherers should take. Their use of pottery and construction of
substantial residences is in direct contradiction to the normative model of seasonally mobile peoples (Habu 2008).

The Jomon continue to be an interesting case study in the emergence of social complexity and cultural landscape studies, and Habu's arguments are not the only theories surrounding the Jomon. Richard Pearson has also done extensive work on the Jomon. In “Debating Jomon Social Complexity,” he argues that, “the evidence from a few case studies concerning lacquer, elaborate pottery, and burials seems to show that while part-time specialization provided a wealth of rich material culture, sustained hierarchy was not achieved and there was an emphasis on exchange and solidarity, as in other middle-range societies” (Pearson 2007:388).

The more thoroughly and diachronically hunter-gatherer groups are explored, the more hotly and widely debated they become. Take, for example, the case of Keatley Creek (Hayden 2005; Prentiss et al. 2005). William Prentiss and his fellow researchers argue that the hunter-gatherer village at Keatley Creek, Canada, as seen through stratigraphic layers, “appeared late and somewhat unstable” (Prentiss et al. 2005:175). Hayden counters, arguing that the village emerged early and was highly stable over time: “large villages and house pits that emerged by 2600 BP, or earlier, were continuously occupied and corresponded more to the development of collector-based technologies rather than any climatic deteriorations or the introduction of the bow and arrow” (Hayden 2005:169). Such debates are important to the new hunter-gatherer paradigm because they signal the shift from assuming and ascribing a static, formulaic culture to all hunter-gatherer groups, and a shift towards not only understanding the true nature of these
groups, but also in the words of Sassamen, towards, “knowing what happened in the past” (Sassaman 2004:266).

Cultural landscapes are a useful tool being employed by many archaeologists researching hunter-gatherers. Barbara Bender’s recent article, “Landscapes on-the-move,” addresses the complex nature of migratory people and works to unpack the idea of “landscapes of movement” (Bender 2001:75). Though she mainly discusses diasporas, Bender demonstrates overall, that by looking at cultural landscapes as a whole and how migratory people connected with and experienced these landscapes of “routes,” one quickly recognizes that there is a, “dynamic and impact of people on the move,” in prehistory that is often missed by archaeologists (Bender 2001:76). Such understanding reinforces the complex hunter-gatherer paradigm, as can be additionally seen in Brian Boyd’s work in Levant (Boyd 2006). Boyd uses cultural landscape studies to challenge assumptions about sedentism among hunter-gatherers (Boyd 2006:164). By examining groups’ relationships to other communities and the environment, through the cultural landscape as a whole, Boyd convincingly argues that complex hunter-gatherers do not automatically lead into an agricultural society and that continuums that assume a connection need to be called into question (Boyd 2006).

Cultural landscapes can also help archaeologists to uniquely observe the interactions between cultural groups of varying complexity over time (Huffman 2009; Lightfoot 2005; Stalh 2004). Such groups can be aware of and interact with each other without one society shifting to be more like the other, and that social complexity ultimately allows for fluidity and mobility (Stalh 2004). In California, this can easily be seen in the colonial and post-colonial historic time periods (Lightfoot and Martinez 1995;
Diverse groups of complex societies from around the world generated an intricate web of heterogeneous interactions and relationships (Lightfoot and Martinez 1995; Lightfoot 2005).

Bringing the discussion back to indigenous groups, Thomas Huffman, in his article “Mapungubwe and Great Zimbabwe: the Original Spread of Social Complexity in Southern Africa,” discusses the interactions between Great Zimbabwe and Mapungubwe (Huffman 2009). He explains that the societies, as a result of their interactions, influenced each other over time, and implies that to understand the complexity of such groups archaeologists need to examine the broader cultural landscapes (Huffman 2009:53). These examples work to demonstrate that it is only through the use of cultural landscape studies that archaeologists can properly reconstruct the rich “mosaic” generated by complex societies (Stalh 2004).

Scale is also a major component of cultural landscape studies. Hunter-gatherers can no longer be examined strictly as isolates, and cultural landscape studies help to define the multiple spatial levels in which complexity can be understood (Hauser 2009). Archaeologists argue that analysis of landscapes and complex hunter-gatherers on a regional level is essential in fitting together all the bodies of data (Kanter 2008). However, this does not refer to, “simple mathematical and geographical procedures for representing spatial relationships. Instead, regional archaeology has matured into a diversity of multiscalor spatial and geostatistical techniques that inform many areas of archaeological inquiry” (Kantner 2008:39). Regional archaeology is now taking into account translocality and the undeniable plasticity of cultural landscapes. This allows researchers the ability to more accurately describe and define past human interactions.
Cultural landscapes and the consideration of regional archaeology are both essential tools to be used in further analysis of complex hunter-gatherers.

A number of current studies of Native Californian historical trajectories are also utilizing the complex hunter-gatherer paradigm. No discussion of California archaeology can begin without a mention of Michael Moratto’s seminal book *California Archaeology* (1985). His work was one of the first attempts to synthesize all archaeological research on Native Californian societies, and it is often used as a benchmark from which California archaeological research has moved forward. Of note was the recent article “The Archaeology of California” (Arnold et al. 2004). This synthesis reviews the myriad discourses surrounding contemporary Native Californian archaeology as well as noting California’s undeniable ability to contribute, “to archaeological studies of cross-cultural interest [through]...the theoretical and empirical examination of social political complexity (simple chiefdom political organization) without agriculture (Arnold et al. 2004:6). As is explored below, California has much to offer and much to be gained from the intricacies of the complex hunter-gatherer paradigm (Arnold et al. 2004; Jones and Klar 2007; Jones and Raab 2004).

In their 2004 volume, *Prehistoric California: Archaeology and the Myth of Paradise*, Terry Jones and Mark Raab explicitly call for an implementation of the complex hunter-gatherer paradigm in Californian archaeology (Jones and Raab 2004:8-9). They demand an end to the misleading myths of benign environmental determinism and ecofunctionalism that have plagued Native California research for the past century (Jones and Raab 2004:3-8). These efforts signal the end of past assumptions about Native Californian group’s simplistic and static nature, and instead demand nuanced,
diachronic archaeological perspectives on the diverse hunter-gatherer groups of California.

In addition to his 2004 volume, Terry Jones partnered with Kathryn Klar in 2007 to produce an edited volume entitled *California Prehistory: Colonization, Culture, and Complexity*. This volume is a culmination of the response in Native Californian archaeology to the complex hunter-gatherer paradigm. Throughout the entire volume, the overwhelming complexity and diversity of Californian Native groups is emphasized while the reader is walked through every region of the state (Jones and Klar 2007).

Within Jones and Klar’s volume, two chapters are of note: “Chapter 7: Northwest California” (Hildebrandt 2007) and “Chapter 8: Punctuated Cultural Change in the San Francisco Bay Area” (Milliken et al 2007). Hildebrandt’s chapter, though it is not an explicitly stated goal, discusses the causation that may have lead to past assumptions that Native groups in northwestern California (such as Sonoma County) were simplistic. Lack of archaeological data, in addition to theoretical paradigm shifts, in areas such as northwest California may have led archaeologists to believe that hunter-gatherers were culturally primitive and static (Hildebrandt 2007:83). In the last 20 years, however, areas such as Sonoma County have experienced a rapidly growing archaeological data set.

Hildebrandt discusses the wealth of environmental resources and potential of northwest California, and examines how the new archaeological data has altered archaeologists’ perspective of Native Californian groups (Hildebrandt 2007:83-84). As more archaeological data was recovered, researchers’ theories about Native Californian hunter-gatherers in that area developed. After outlining the different patterns and periods that have been identified in the archaeological record, Hildebrandt concludes by stating
that his chapter, "identifies numerous subsistence, settlement, and socioeconomic changes in prehistoric northwest California" (Hildebrandt 2007:95).

"Chapter 8: Punctuated Cultural Change in the San Francisco Bay Area," addresses the growing complexity of Native groups in the Bay Area (Milliken et al 2007). The authors detail archaeology's current understanding of change over time among hunter-gatherer groups surrounding the San Francisco Bay (Milliken et al 2007:99). Overall, the chapter emphasizes that Bay Area Native groups did experience shifts in economy, subsistence, settlement patterns, and technology. Milliken and his co-authors also identify that there is still much that archaeologists do not know about hunter-gatherer groups in the Bay Area, and researchers should not assume the answers to research questions based on incomplete data sets (Milliken et al 2007:118).

It is clear that hunter-gatherer groups in California are undergoing an extensive re-examination within a new theoretical paradigm. Another key example is the Chumash of southern California. One of the leaders in Chumash research is Jeanne Arnold who, in a 1992 article, outlines what she calls the "model of chiefdom emergence" and the rise of complexity among the Chumash (Arnold 1992:60). Arnold examines the archaeological record, in combination with ethnohistorical documents and other lines of evidence, for shifts in material cultural in order to determine periods of stress that would have led to "chiefdom organization," and thus possibly identify the emergence of complexity (Arnold 1992:78). A more recent work, Foundations of Chumash Complexity, takes Arnold's previous research strategy even further and presents multiple lines of evidence to support the emergence of Chumash social complexity (Arnold 2004).

In contrast, Lynn Gamble argues that environmental change did not lead to sharp
shifts in Chumash society because, “hunter-gatherer societies, particularly maritime hunter-gatherers, are more capable of coping with severe climatic changes than agriculturalist” (2007:101). Thus, in her opinion, archaeologists cannot apply the same paradigm of culture change, or evolutionary movement, to hunter-gatherers as they do to agricultural groups. Chumash society emerged into a complex society gradually over time.

Bringing the discussion back to the Northern California, it is necessary to describe the recent work of Hildebrandt, Rosenthal, and Gmoser (2009), because it functions as a direct comparative and guiding component in the artifact analysis portion of this project. The article, entitled “Shellfish Transport, Caloric Return Rates, and Prehistoric Feasting on the Laguna De Santa Rosa, Alta California,” opens by stating that, “over the last two decades, there has been increasing interest among archaeologists regarding the relative value of coastal versus terrestrial resources” (Hildebrandt et al 2009:56). As will be discussed further in Chapter III, the past twenty years of California coastal research has seen many significant theoretical shifts, such as the move from the “Clovis-first” model of the peopling of the Americans to the “coastal-migration” theory (Erlandson et al 2007b:53; Hildebrant et al 2009:56).

In comparing the similar and different values of resources found on the coast and inland, Hildebrandt, Rosenthal, and Gmoser questioned the large quantities of shell recovered from archaeological projects in inland areas such as Santa Rosa (Hildebrandt et al 2009:57). When applying the conventional optimum-foraging model, they found that subsistence wise, it was not economical for Native Californians in Santa Rosa to have been traveling to the coast and then returning with edible shellfish in tow (Hildebrandt et
al 2009:57). Instead, the authors apply “cost signaling theory” in which the shell is used as a feasting display to impress neighboring tribes (Hildebrandt et al 2009:72).

For the purposes of this chapter, what is important to note here is that the identification of different archaeological evidence is an intrinsic part of paradigm shifts. In the Sonoma County, shell was once thought of as a sign of subsistence patterns, but now it is more highly regarded as cultural status display used to “keep up with the Jones.” It is yet another example of how Native Californian groups are currently being examined as complex hunter-gatherers.

Worldwide, countless groups are being re-analyzed within this new theoretical framework. Complexity does not exist in a cultural vacuum, and thus this analysis requires the inclusion of a wide variety of site types, including non-central sites such as CA-SON-882, that have much to contribute to the current complex hunter-gatherer discourse. Through such research, archaeologists are effectively gaining new insights into the dynamic nature of hunter-gatherer societies. Theories that presented these peoples as unchanging and formulaic are being replaced.

Current literature clearly calls for the analysis of hunter-gatherer societies through the lens of the complex hunter-gatherer paradigm. Researchers are employing a more comprehensive paradigm that demands a diachronic approach and utilizes multiple lines of evidence explicitly and implicitly relevant to the culture at hand. In California, this means a re-examination of the archaeological record for such evidence as change over time, site type diversity, dynamic trade relationships, and possible spheres of cultural influence.
Past Artifacts and Future Theories

A re-examination of the archaeological record is directly connected to the issue of artifact curation and preservation. The literature ultimately shows that archaeological theories and methods change over time, and thus so does archaeological interpretation of artifact collections. Artifact collections need to be properly cared for and documented in order to make them relevant to future generations of archaeologists. When the curation crisis meets with a theoretical crisis, the relevance of archaeology as a field is threatened. If archaeologists excavate artifacts to be preserved for future research questions, but then once those research questions are realized the artifacts are so poorly cared for that they cannot be re-analyzed, one might start wondering what the was purpose of expending the time and cost to excavate the artifacts.
III. Environmental and Cultural Context of CA-SON-882

It is only through a clear understanding of how the site CA-SON-882 fits within the temporal, environmental, and cultural history that the site's connection to the broader California region, outside of Bennett Valley, can be understood. First it will be necessary to explain the temporal sequences established for Northern California. This will help to place environment and cultural characteristics within a set chronology. This chapter also describes the broad environmental context within which CA-SON-882 was likely to have been occupied, outlines the archaeology and ethnography of the Southern Pomo, and then briefly describes historic era Bennett Valley.

Temporal Sequencing

It seems as though time is a concrete and simple marker of the fourth dimension, but temporal sequencing in California has become quite complicated as new patterns and eras are defined. Milliken and his co-authors outline the various chronologies used in California (2007). It is an effective strategy for orienting a reader who might not be familiar with the complexities of California temporal sequencing. This discussion will focus on temporal sequencing relevant to CA-SON-882.

The two overarching geological time periods are epochs known as the Pleistocene, which dates from 2.6 million to 12,000 years BP, and Holocene, which dates from 12,000 BP to the present. Since archaeologists are in an overall agreement that California was first populated by people between 12,000-13,000 BP, only the Holocene will be addressed (West et al 2007:16). The Holocene is further broken down into three
periods: the Early Holocene, the Middle Holocene, and the Late Holocene (Milliken et al 2007:104).

David A. Fredrickson (1974 and 1994) defined time periods and patterns for the California North Coast Ranges and the San Francisco Bay. The first period is known as the Paleo-Indian Period, and dates between 13,000-10,500 BP, or the beginning part of the Early Holocene (Chartkoff and Chartkoff 1984:15; Fredrickson 1994; Fredrickson 1974:46; Milliken et al 2007:104). The subsequent periods are the Lower Archaic (10,500-5,500 BP), the Middle Archaic (5,500-2,500 BP), and the Upper Archaic (2,500-1,000 BP) (Chartkoff and Chartkoff 1984:15; Fredrickson 1994; Fredrickson 1974:46-47). The last period is the Emergent Period and it dates between 1,000 BP-present (Fredrickson 1994; Fredrickson 1974:48).

Finally, time has been additionally broken down and categorized by cultural and economic patterns (Fredrickson 1994:39-47, as cited by Milliken et al 2007:103). “Patterns represent a basic adaptation that may be linked to a single cultural group or shared by a number of separate cultures within a definable period of time” (Hildebrandt et al 2009:59). What is considered the Post Pattern lines up with the Paleo-Indian period, dating from about 11,500-10,500 BP (Fredrickson 1974:42,47; Milliken et al 2007:103, 104). The Borax Lake Pattern follows a gap between it and the Post Pattern, and dates from 8,500-5,500 BP (Fredrickson 1974:42.47; Milliken et al 2007:104). Next comes the Mendocino Pattern from 5,500-3,500 BP and the Berkeley Pattern from 2,000-1,000 BP. Between 3,500 and 2,000 BP is a transitional period from the Mendocino to the Berkeley Pattern (Fredrickson 1994; Fredrickson 1974: 44-47; Milliken et al 2007:104; Hildebrandt 2007:87).
When one examines the fact that these temporal sequences where each based on different environmental characteristics (cultural, geological, etc), it makes sense that they do not perfectly align with each other. Instead they weave in and out of each other as climate, environment, and traditions shift over time. This provides a reference point for understanding change over time as different environmental and cultural conditions unfold.

*Holocene Environmental Landscape*

Overall, California exhibits one of the world’s most uniquely diverse spectrums of environments and resources (Lightfoot and Parrish 2009:50). The region of focus here is what is commonly known as the California North Coastal Ranges. California’s microclimates and frequent variation make it difficult to create wide sweeping generalizations of change over time for the whole state or even one region. “It is an area of great topographic, edaphic, and climatic diversity ranging from high-elevation red fir forests to large areas of oak woodland and forests to dense redwood groves” (West et al 2007:21).

In California, the transition between the Pleistocene and the Holocene epochs was striking with extreme shifts in vegetation, temperature, and climate (West et al 2007:19). The very beginning of the Holocene period experienced cooler conditions, but data indicates that overall, Early and Middle Holocene California (11,000-4,500 BP) were much warmer and drier then at the present. Summers were marked by long droughts, and vegetation such as herbs, pines, and especially oaks were on the rise (Dowdall 2004:284; West et al 2007:20).
The Late Holocene saw temperatures cooling and thus yet another shift in resources. The modern California forests began to develop during the Late Holocene, and although pine began to rise at the very start of the Late Holocene, it was quickly overcome by oak and Douglas fir (Dowdall 2004:284; West et al 2007:21-22). All of these changes meant that the people of this region were forced to have a “diffuse economy” and rely on multiple and diverse kinds of resources (Chartkoff and Chartkoff 1984:76-75).


Currently, Bennett Valley receives about 30 to 45 inches of rainfall annually and the climate is mild (Miller 1972:90; Piland 1988:N.p.). The median temperature is 59 degrees Fahrenheit with cool, wet winters and warm, dry summers. It is located in what Michael Morratto (1984) refers to as a “transitional zone.” The area’s vegetation is consistent with two vegetation types. One is mixed hardwood forest (Arbutus–Quercus), which is made up of low to medium-tall, broad-leaved evergreen, broad-leaved deciduous, and needle-leaved evergreen trees (Küchler 1977:18). The other is Valley Oak Savanna (Quercus-Stipa), which is similarly made up of tall, broad-leaved deciduous trees (Küchler 1977:22). Vegetation includes Blue oak, the Californian redwood, and Bigleaf maple (Küchler 1977:22; Piland et al. 1994:N.p.; Schoenherr 1992:271-272).
Native Californians

The current general theory on the populating of California argues that about 14,000-13,000 BP people travelled down the Pacific coast of North America by boat (Lightfoot and Parrish 2009:41-42; Erlandson et al 2007a:163). Around 14,000 BP conditions would have been ripe for “rich marine and shoreline habitats and may have enticed people to land-hop down the Pacific coast of North America” (Lightfoot and Parrish 2009:41). Jon Erlandson has famously referred to this as the “Kelp Highway” (Erlandson et al 2007a). This replaced the previous theory, the Clovis-first model, which assumed peoples had come to North American in one large migration through an “ice-free corridor” (Chartkoff and Chartkoff 1984:30; Erlandson et al 2007:53; Lightfoot and Parrish 2009:41). The Clovis-first model placed people in central North American around 13,000 BP, and placed people on the coast around 5,000 BP (Erlandson et al 2007b:53).

Due to recent data such as coastal site dates and artifact typologies, researchers now theorize that North America was peopled by multiple migrations from northeastern Asia over thousands of years (Erlandson et al 2007b:61). The Americas were not necessarily populated from the inside-out (Erlandson et al 2007b:53; Lightfoot and Parrish 2009:41). The earliest dated archaeological site is located on the Channel Islands, just off the California coast, and has been dated to 13,000 BP (Lightfoot and Parrish 2009:42). This new model is known as the coastal migration theory (Erlandson et al 2007b:53). Using obsidian hydration dates, it is estimated that people have inhabited the Santa Rosa region since about 8,000-6,000 BP (Fredrickson 1989:20).
The archaeological discourse on Native Californians recognizes that between the Pleistocene Ice Age and the arrival of the Spanish, Native Californians were not simplistic, but were instead diverse, distinct, and complex (Jones and Raab 2004:1-2). Though Native groups in California did not practice active agriculture, they were not frozen in the hunter-gatherer myths of benign environmental determinism or ecofunctionalism (Jones and Raab 2004). Current data and research has refocused California archaeology, and archaeologists are now building towards demonstrating that, “California Indian societies have been evolving and changing for over 13,000 years” (Lightfoot and Parrish 2009:48). As previously mentioned, time in California has been broken down into three major periods: the Paleo-Indian period, the Archaic (lower, middle, and upper) Period, and the Emergent Period. Here, each time period will be generally discussed as it relates to the San Francisco Bay Area and Northwest California.

The Paleo-Indian period (13,000-10,500 BP) is the least documented period as there have not been many archaeological discoveries dating to that time (Chartkoff and Chartkoff 1984:38), and, for now, archaeologists assume that the Paleo-Indian period saw, “Clovis big-game hunters, [and] then initial Holocene gatherers” (Milliken et al 2007:114). Native Californians at this time may have also utilized coastal resources such as fish and shellfish (Lightfoot and Parrish 2009:42).

The Lower Archaic (10,500 -5,500 BP) has only slightly better documentation than the Paleo-Indian period, and it is generally characterized by a diffuse mobile foraging economy focused on the collection and processing of plants and seeds (Chartkoff and Chartkoff 1984:74; Fredrickson 1974:46; Fredrickson 1994; Milliken et al 2007:114). Recent archaeological research indicates that peoples of this time also had a
sophisticated understanding of marine resources and made use of boats (Lightfoot and Parrish 2009:44). Artifact types from the Lower Archaic include specialized tools such as millingstone technologies and large leaf-shaped, wide-stemmed projectile points (Chartkoff and Chartkoff 1984:77; Fredrickson 1974:46; Fredrickson 1994; Milliken et al 2007:114).

The Middle Archaic (5,500-2,500 BP) brought with it some distinct changes. Though the Northern Bay Area retained the forger economy pattern, though the number and type of utilized resources greatly expanded, other parts of California saw the advent of a more sedentary life style (Chartkoff and Chartkoff 1984:75; Milliken et al 2007:114-115). This can be seen in the introduction of different ground stone technologies such as the mortar and pestle, and other artifacts associated with the Borax Lake tradition (Chartkoff and Chartkoff 1984:109; Fredrickson 1974:46; Fredrickson 1994; Milliken et al 2007:115). It was also during the Middle Archaic that peoples began to use pyrodiversity (seasonal controlled burns) as a way of increasing plant productivity (Lightfoot and Parrish 2009: 112-113). Change can also be seen in Native Californian land use as many groups began producing shell mounds and shell middens and associated burial complexes that suggest inhabitation over longer periods of time (Milliken et al 2007:115).

The Upper Archaic (2,500-1,000 BP) saw a rise in social complexity and sedentism, but also the continued use of Middle Archaic technologies such as the mortar and pestle (Fredrickson 1974:48; Fredrickson 1994; Milliken et al 2007:116). However, additional technologies and ornamentation began to appear, such as basketry awls and bone tools (Milliken et al 2007:115). Towards the end of the Upper Archaic, large
mortars start showing up in the archaeological record and there is an increase in seed data recovery from middens that date to this period (Milliken et al 2007:116).

During the Emergent Period (1,000 BP-present), “culture moved up a notch in complexity, from that of collectors who buried their dead with diverse, numerous, but fairly simple ornaments to collectors who invested large amounts of time in the creation of finely wrought wealth objects” (Milliken et al 2007:116). Native Californian societies were becoming increasingly complex (Chartkoff and Chartkoff 1984:146-147; Fredrickson 1974:48; Fredrickson 1994). Native Californians, though not living in agricultural societies, began to modify their environment in order to produce more abundant subsistence resources (Fredrickson 1974:48; Fredrickson 1994).

Archaeological evidence, such as funerary remains, help support the theory that Native Californian societies were becoming increasingly stratified (Fredrickson 1974:48; Fredrickson 1994; Milliken et al 2007:117). This period also saw the generation of the hopper mortar, the toggle harpoon, an increase in sedentism, and “arrow-sized projectile point types” such as the Stockton serrated series and the plan corner-notched points (Milliken et al 2007:117).

It should be noted that at the time of Spanish settlement and missionization of the Bay Area, archaeological and ethnographic data seem to indicate that, “another upward cycle of regional integration was commencing” (Millken et al 2007:118). The Spanish did not walk into a land of primitive people, but instead entered a complex region of tribal and linguistic interaction, mixed with environmental diversity that was partially crafted by its inhabitants (Lightfoot and Parrish 2009:9-10). Native Californian groups were (and still are) changing, and by studying those changes over time and the emergence
of complexity, archaeologists will be better able to place their data and findings into an accurate environmental and cultural context.

*The Southern Pomo*

The seven Pomo language groups, Southeastern, Eastern, Northeastern, Northern, Central, Southern, and Kashaya are a subfamily of the Hokan phylum (Golla 2007:78; Kroeber 1925:222; McLendon and Oswalt 1978:274; Moratto 1984:480). Though their dialects belong to the same language family, each Pomo tribe has its own discrete territorial boundary and distinct cultural practices. Additionally, each Pomo language family was broken into more than 34 individual dialects (Fredrickson 1989:1). The Southern Pomo are direct neighbors of the Central, Eastern, and Kashaya Pomo. It is through the Eastern Pomo and Kashaya Pomo territories (along with the Wappo and the Coast Miwok territories) that Southern Pomo people would have had to travel in order to reach specific resources like marine foods, such as shellfish, and obsidian sources, such as Mt. Konocti.

The Southern Pomo ethnographic territory is located around Santa Rosa, south to Sebastopol, to the west of Guerneville, north through the Dry Creek area, and their territory connects to the coast just above Stewart’s Point. The language family is broken into seven dialects: Yotiya, Hiwalhmu, Makilkaune, Makamotcemei, Kataictemi, Konhomtara, and the Bitakomtara (Fredrickson 1989:1; Steward 1943:51-54). The Bitakomtara were located on about 200 square miles of land in the Santa Rosa region, and are the tribelet associated with CA-SON-882 (Barrett 1908:212; Fredrickson 1989:2; Steward 1942:53; Wickstrom 1986:4). “About 75 percent of Bitakomtara territory
consisted of valley and marshland, with the remaining uplands covered with deciduous oak, buckeye, and manzanita with stands of conifers” (Fredrickson 1989:4).

Ethnographic data show the nearest major village to Bennett Valley was Hukabetawi, which was located in the area of the modern city of Santa Rosa (Barrett 1908:222; Kroeber 1925:233; Wickstrom 1986:4). Like many other Northern Californian tribes, ethnographic information indicates that the Southern Pomo practiced a seasonal round, staying close to major villages in the winter and then branching out to satellite camp sites during the summer months (Fredrickson 1989:5; Wickstrom 1986:4). “Special purpose sites, such as hunting stations, food processing camps, quarries and manufacturing locations, and places of religious significance, were distributed throughout the territory” (Wickstrom 1986:5).

Ethnographies suggest that the basic social unit was based in kinship, and during the winter months people would live in multi-family houses, while in the summer months people lived in single family homes (Bean and Theodoratus 1978:294). Dwellings were usually constructed out of willow frames and roofs of thatch that were replaced yearly (Stewart 1943:54). The chief was the principal leader of a village, though kinship groups could also have lesser chiefs at the family level (Bean and Theodoratus 1978:295; Fredrickson 1974:1-2; Stewart 1942:54; Wickstrom 1986:5). The principal chief maintained control of the major village and the surrounding land (Stewart 1943:54).

Subsistence was that of hunter-gatherers, and included the collection of plants, the hunting of mammals and birds, and fishing (Bean and Theodoratus 1978:290; Fredrickson 1989:4; Wickstrom 1986:5). Ethnographic data state that important plants included blackberry, manzanita, clovers, and acorns (Fredrickson 1989:5; Wickstrom
animals were hunted with bows and arrows, often utilizing obsidian and chert points (Wickstrom 1986:8). Hunted game consisted of smaller animals such as rabbits and squirrels, as well as bigger game such as antelope, deer, and elk (Bean and Theodoratus 1978:290; Wickstrom 1986:5). There are no major rivers through the Bitakomtara territory, so most fishing was done in creeks and the Laguna de Santa Rosa (Stewart 1943:53).

Ethnographically, year round, the Southern Porno made trips to the coast for the gathering of marine resources such as shellfish, fish, and seaweed (Stewart 1943:53). In order to do so, the Southern Pomo would need to receive permission from their neighbors, such as the Kashaya Pomo or the Coast Miwok, to pass through their territory (Fredrickson 1989:5; Steward 1943:53). The Southern Pomo were invested in the manufacturing of bead money (Stewart 1942:53; Wickstrom 1986:6). Clamshell would be obtained from the coast, then worked into bead blanks, and then finally into stringable beads used as money in trade (Kroeber 1925:249; Wickstrom 1986:6). The Southern Pomo participated in trade and trade feasts with the Native Californian groups in the surrounding territories (Bean and Theodoratus 1978:298).

Santa Rosa: The Landscape Post-1800

The Russian settlers at Fort Ross to the northwest and the Mexican settlers to the south and east were both aware of the Southern Pomo (LeBaron et al 1985:2). With the arrival of the Mexicans, the Southern Pomo experienced only partial “missionization” (Kroeber 1925:233). However, they suffered great losses to diseases such as small pox and measles. The first known non-Native American people began to settle the Santa
Rosa area in the 1830s. This would start what is known as the Mexican period in the Santa Rosa. General Mariano Vallejo encouraged his mother-in-law and her children to come to what would soon be known as Santa Rosa (LeBaron et al 1985). In 1837 Ranch Llano de Santa Rosa was granted to Joaquin Carrillo, a brother-in-law of General Mariano Vallejo. This grant was passed to his eldest son, also named Joaquin, in 1844 (Gudde 1998:349; Hoover et al. 1990:479-480).

In 1852, the post office of Santa Rosa was established to serve a larger rural community, so that there was no need for an urban center. More prosperous at first was the nearby planned community of Franklin, envisioned by a French trapper on 640 acres purchased from Julio Carrillo. Franklin soon boasted a public house and store, a blacksmith shop, and a hotel. Then three German-born business partners—Barney Hoen, Ted Hahman, and William Hartman—purchased and operated the tavern and store at the Carrillo Adobe, from which they sold groceries, cattle, and real estate.

They soon devised a plan to make the town of Santa Rosa a county seat. Local settlers nominated Bennett Valley pioneer James N. Bennett for the state legislature, with the unstated goal to wrest the county seat away from the city of Sonoma to a more central location. Bennett won and promptly presented a bill calling for an election for the fall of 1854. The promise of a modern town and the rejection of the old Mexican lifeways typified by the town of Sonoma turned the vote. According to Carrillo’s wish, however, the town was laid out with a central plaza like a Hispanic city. A store, a saloon, and a Masonic hall were built by the spring of 1854, and in the fall the first court session was held. The businesses, and even some of the buildings, of the town of Franklin were
moved to the new town of Santa Rosa, and Franklin was soon forgotten (LeBaron et al 1985:23; Durham 1998:698).

At the point of the California gold rush, Sonoma County and Santa Rosa turned into agricultural lands providing food to the thousands of hungry new settlers and miners (LeBaron 1985:56). Santa Rosa entered the railroad age in 1871. Though the towns people were eager to get a railroad through Santa Rosa, overly invested businessmen and railroad politics made it a difficult endeavor (LeBaron 1985:41-43). Once a section of railroad was constructed, Santa Rosa became a place of booming real estate, and Santa Rosans experienced both the positives and the negative of railroad prosperity. Santa Rosa became one of the classic examples of a 1890’s boom town (LeBaron 1985:43, 102).

CA-SON-882 is specifically located in southeastern Santa Rosa in Bennett Valley, named after James N. Bennett (Durham 1998:601). Within Bennett Valley, the site rests across the Matanzas Creek. The creek’s name first appears on a map of the Cabeza de Santa Rosa Rancho land grant, given in fall 1841 (Gudde 1998:56,230). The creek also appears on a map of Los Guilicos Rancho (Gudde 1998:230). Matanzas is Spanish for “slaughter,” and the creek was given its name after the Rancho’s annual cattle drive and slaughter along the creek (LeBaron 1985:3).

Context

What has been present here is not meant to be a comprehensive examination of Northwest California since the Pleistocene, but instead designed to give the reader a rough sketch of the complexity of the Santa Rosa area over time. A detailed review of
every culture, pattern, and archaeological find throughout the Holocene in California is outside the scope of this project. To be taken away from this environmental and cultural context review is the idea that the Californian environment and native cultures were not static throughout time, that Native Californian’s socio-political and economic structures were of ever-increasing complexity, and that Native groups, such as the Southern Pomo, were in constant interaction and negotiation with the other California tribes surrounding them.
IV. Previous Archaeological Work at CA-SON-882

As discussed in Chapter II, archaeology suffers from a monumental curation crisis. Artifacts are excavated, cleaned, packaged, and then sent to live on a shelf in a warehouse, never again to be thought of or examined by trained archaeologists (for those who are familiar, this is aptly illustrated in the concluding scene of the film *Raiders of the Lost Ark*). A large part of this project revolved around the assumption that data collected under an old archaeological paradigm can be reapplied to current paradigms. Part of the project’s research questions ask if the artifact collection excavated from CA-SON-882 in 1986 can be re-interpreted under the complex hunter-gatherer paradigm, and thus contribute to archaeologists’ understanding of complexity among Native Californian groups. In order to discuss the validity of the re-examination of the artifacts at hand, it is necessary to understand from where the artifacts came.

Before the commencement of this project, CA-SON-882 had already been examined multiple times. As previously mentioned, CA-SON-882 is located at the southern end of Bennett Valley, in Santa Rosa, California (Figure 1), and, although the property is currently owned and maintained by the City of Santa Rosa, it formally had been private property. CA-SON-882 was originally recorded in 1976 and subsequently excavated in 1986. Once excavated, the artifacts recovered from the site were cleaned, organized, and cataloged between 1986 and 1994. At which point, the collection was curated at the Anthropological Studies Center (ASC) on the Sonoma State University campus.
Map Removed for Confidentiality
Initial Discovery of CA-SON-882

At the start of this project, the Northwest Information Center, at Sonoma State University, was used as a primary resource to gain a clear picture of the history of archaeology at CA-SON-882. NWIC archives indicated that CA-SON-882 had been previously examined twice. The site was originally recorded on 17 April 1976 (Stradford 1976:1). Richard Stradford notes that the site contains a shell midden mound (which is most intact on the eastern edge of Matanzas Creek) and a modern jeep and foot trail that follows along the western edge of the site (Figure 2). He observed material remains including obsidian cores, obsidian and chert projectile points and scrapers, fire-cracked rock, ocean shell, and possible mortar fragments. No house pits were noted, and Stradford estimated that the site was at least over 1m deep (Stradford 1976:1).

At the time, the current resident of the area was Paul Judge, and the owner of the property was Jane Turner and the Bruggerman Estate. Stradford notes that there is a historic-era structure on the property that could be a potential nominee to the National Register of Historic Places. No previously known work had been done at the site and Stradford determined that the site was in moderate to high danger of disturbance or destruction due to creek erosion and future development plans for Bennett Valley (Stradford 1976:1). Stradford’s “Archaeological Site Survey Record” indicates that he did collect obsidian specimens, with the Accession No. 76-4. Those artifacts were relocated at the Anthropology Studies Center and they are now included in the collection’s catalog.
Map Removed for Confidentiality
Excavation and Initial Analysis of CA-SON-882

By 1986, CA-SON-882 was owned by the City of Santa Rosa. It came to the attention of David Fredrickson and Tom Origer that the site was under immediate threat from Matanza Creek erosion and pending City of Santa Rosa development projects (Sandlin et al 1988; Piland et al 1994). The City planned to extend the recreational area of Bennett Valley, and construct a practice fly-fishing pond adjacent to CA-SON-882. Today, the Bennett Valley Golf Course is directly north of the site, and to the northwest of the site is Dan Galvin Community Park, complete with baseball fields, soccer fields, bathrooms, ample parking, and a separately fenced dog park. Given the future plans for the area, and the danger of growing erosion, it was determined that the CA-SON-882 was to be excavated and the artifacts collected were to be analyzed in hopes of learning more about the site before the data was lost (Sandlin et al 1988; Piland et al 1994).

David Fredrickson, of Sonoma State University, and Tom Origer, representing Santa Rosa Junior College, decided to combine their efforts and institutions in order to organize a substantial recovery operation at CA-SON-882. The excavation was offered as a field school in the Spring and Fall of 1986. Students from both SSU and SRJC excavated a combine 19 1m by 2m excavation units (Figure 3). The excavation units running north or south of the datum were completed by Sonoma State University students, while the units excavated east or west of the datum were completed by Santa Rosa Junior College students (Sandlin et al 1988; Piland et al 1994). Units were excavated with arbitrary 10cm levels, and final unit depths ranged from 30cm-80cm. It does not appear that units were excavated until sterile soil was reached. Presumably this was due to time and labor constraints and a need to cover more area. Unfortunately,
Map Removed for Confidentiality
however, that lack of data leaves the site with no absolute antiquity.

Before launching into the initial analysis of the archaeological data recovered from the excavation of CA-SON-882, it is necessary to understand the context in which the generated data and analysis was born. There are two surviving reports reviewed here, and to date, they are the only documents pertaining to the excavated artifacts housed at the ASC collections facility. They are both student-produced reports, and while they do suffer some omissions, overall they provide a good overview of the excavation, analysis, and their purpose. The two reports are unclear on whether or not Southern Pomo Native American tribe (or any other Native Californian tribe) was contacted before, during, or after the excavation. Additionally, intricacies of how the scope of the excavation, the boundaries of the site, the selection of excavation units, the laboratory methodologies, and the systems of analysis used also remain unclear.

Despite these discrepancies, the CA-SON-882 artifact collection remains a rich assemblage. According to the two reports, the field school excavation recovered over 330 artifacts. These included: bone, shell, obsidian and chert lithics, basalt groundstone, quartz, architectural daub, historic debris, and two baked clay figurines (Sandlin et al 1988; Piland et al 1994). Interestingly, no structural remains were found (Sandlin et al 1988). Obsidian lithics included bifaces, projectile points, drills, and a wide range of edge-modified flakes. Groundstone artifacts were items such as hammerstones, handstones, pestles, and fragments of possible mortar bowls. Bone artifacts were mainly mammal, and were assumed to be associated with subsistence debris. Several species of shell were present and some of the shell fragments were identified as beads or bead blanks (Sandlin et al 1988; Piland et al 1994).
In an effort to conclusively date the archaeological deposit at CA-SON-882, several obsidian samples were sent for obsidian hydration analysis. Because of the site’s proximity to Annadel State Park (approximately 1 km to the east), and thus the Annadel obsidian source, it is not surprising that the vast majority of the obsidian tools anddebitage found at CA-SON-882 were visually sourced to Annadel. However, there was a significant amount of obsidian visually sourced to Napa Valley.

Eleven samples in all were sent for analysis: six Napa Valley obsidian artifacts and five Annadel obsidian artifacts (Sandlin et al 1988). Two of the Annadel samples were unable to return hydration readings. The obsidian hydration analysis returned dates of 2,500-1,000 BP, 1,500-1,000 BP, and 500BP-Eurocontact. Four samples returned as the Archaic period (8,000-1,000BP), one sample was returned as the Lower Emergent period (1,500-500BP), and four samples returned as the Upper Emergent period (500BP-Eurocontact) (Fredrickson 1974, 1994; Sandlin et al 1988; Piland et al 1994).

It is noted in one report that there was no pattern in the depth of the obsidian samples and their corresponding obsidian hydration dates (Sandlin et al 1988). Examining the obsidian hydration results and the provenience of the tested artifacts, this conclusion is glaringly obvious (Figure 4). The oldest sample, which dated to the Middle Archaic period (6000-3000BP) was found at the 0-10cm level in unit S0W8. Two samples who shared the provenience of 40-50cm in unit S0E6, differed widely in the dates they returned: one dating to the Upper Emergent period (500BP-Eurocontact) and the other dating to the Upper Archaic period (3000-1000BP). This suggests that the site had already been highly disturbed prior to the excavation, and that the arbitrary artifact
depths should not be assumed to be associated with a clear deposition timeline. This issue will be further discussed in Chapter V.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Depth</th>
<th>Source</th>
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<th>Estimated Date</th>
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</thead>
<tbody>
<tr>
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<td>1.4</td>
<td>500BP-contact (Upper Emergent)</td>
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<td>30-40cm</td>
<td>Annadel</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>0-10cm</td>
<td>Annadel</td>
<td>2.1</td>
<td>1500-500BP (Lower Emergent)</td>
</tr>
<tr>
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<td>10-20cm</td>
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<td>500BP-contact (Upper Emergent)</td>
</tr>
<tr>
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<td>40-50cm</td>
<td>Annadel</td>
<td>1.1</td>
<td>500BP-contact (Upper Emergent)</td>
</tr>
<tr>
<td>S0E6</td>
<td>40-50cm</td>
<td>Annadel</td>
<td>2.3</td>
<td>3000-1000BP (Upper Archaic)</td>
</tr>
<tr>
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<td>0-14+cm</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>3.0</td>
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<tr>
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<td>0-10cm</td>
<td>Napa Valley</td>
<td>3.9</td>
<td>6000-3000BP (Middle Archaic)</td>
</tr>
</tbody>
</table>

Figure 4. CA-SON-882 Obsidian Hydration Data

Neither report provides an explicit conclusion drawn from analysis of the artifacts, but they do produce some assumptions based on the layering of the artifacts.

Even with the disturbed nature of the soil, there is a pattern of artifact density. The majority of the artifacts came from between 10-20cm and 30-50cm (Piland et al 1994). The two baked clay figurines received attention (though no in-depth analysis) because of their rarity in the Southern Pomo territory. It is also noted that the shell is from the California coast and could indicate a wider trade network or foraging strategy between the Southern Pomo and other Native Californian tribes (Sandlin et al 1988; Piland et al 1994).
Relocation and Recording of CA-SON-882

After reviewing the archaeological site records archived at the Northwest Information Center in February 2009 (mentioned above), it was determined that CA-SON-882, for the purposes of this project, needed to be examined and re-recorded. Given that the site is located on City of Santa Rosa property, it was necessary to obtain permission from the city to survey the area. The City of Santa Rosa was contacted and permission to survey the site was given by Richard Hovden, the City of Santa Rosa Park Planning and Development Manager.

On March 1, 2009, an initial visit to the site was made in the company of Tom Origer. The site was re-located on the southeastern edge of the Daniel Galvin Community Park. Origer was able to provide insight into the changes the site had experienced since the 1986 excavation. The completion of the park and the construction of the practice fly-fishing pond caused extreme damage to CA-SON-882 (Tom Origer, personal communication 2009). Dirt removed from the construction of the pond might have been piled atop the western half of the site, and drainages built to prevent the area from flooding had torn through the middle of the site.

Before recording the site, The State of California Native American Heritage Commission (NAHC) was asked to review the Sacred Lands file for information on Native American cultural resources in the study area. Their review of their sacred land files did not show any Native American cultural resources within the project area. Nick Tipon, representative of the Sacred Sites Protection Committee of the Federated Indians of Graton Rancheria, was also contacted and he agreed to be the FIGR representative on site and to monitor the archaeological survey.
CA-SON-882 was visited a second time to officially record the site. The field crew consisted of the author, Nick Tipon, and two graduate students from Sonoma State University (see Appendix B for DPR forms). The crew conducted a cultural resources field survey of the study area (Figure 5). Field methods consisted of an on-foot survey conducted on 10 meter wide linear transects moving from north to south across and around the last known location of the site. The ground surface visibility was fair, as the area was covered with grass and clusters of oak trees. Archaeological remains were flagged and used to establish the current site boundary. Unfortunately, the area of the site located on the eastern side of Matanzas Creek appears to still be on privately owned land. It is this area that, according to Stradford’s 1976 map, contained a midden mound. Because access to the land had not been obtained from the owners, the private property was noted though not surveyed.

Though the area has been highly disturbed by the construction of the adjacent fly-fishing pond, CA-SON-882 is still clearly visible. The construction of the pond led to extreme changes in the topography, and most likely the stratigraphy, of the site. It is also possible that backfill from the pond construction was placed on top of the site, creating a mound. Between the pond and the site’s current location, a deep drainage was cut, and there appears to be evidence of grading across the surface of CA-SON-882. Vegetation at the site included grasses, live oak, willow, red bud, and eucalyptus trees. Buckeye was located just outside of the property boundary. The surveyor crew found 48 obsidian flakes, 19 clam shell fragments, 6 chert flakes, 2 fragments of fire-affected rock, and midden soil. The obsidian was visually sourced to Annadel (38 flakes) and Napa Valley (10 flakes) obsidian sources. As previously discussed, the large amount of Annadel
Map Removed for Confidentiality
obsidian is logical because the Annadel obsidian source is just northeast of CA-SON-882.

_Curation and Value of CA-SON-882 Artifacts_

CA-SON-882 falls into the category of valuable collections that have the potential to answer contemporary research questions about the past but it was orphaned and forgotten on the dusty shelves. The goals and methods of the excavation may not be perfectly clear, but that does not take away from the value of the artifact collection. It is a situation where the “baby with the bathwater” cliché comes to mind.

CA-SON-882 is not the only poorly recorded excavation that nonetheless retains its potential to contribute to the archaeological community at large. Combe-Grenal (mentioned in Chapter II) is an archaeological site in France whose data remains valuable despite problematic curation practices. Over a thirteen year period in the 1950s and 1960s, the site was excavated and, “generated a large collection of lithics and fauna from a deep series of 64 Lower and Middle Paleolithic levels” (Dibble et al 2009:2540). The site and the recovered artifacts are of great importance to the understanding of the Middle Paleolithic in the southwestern region of France. The data generated has been actively utilized and studied by researchers since its original date of excavation over forty years ago (Dibble et al 2009:2548).

However, what has not been re-examined over time is the context with which the artifacts were excavated, catalogued, curated, and originally analyzed. “Recently, [researchers] undertook a project to inventory and analyzed these collections along with the documentation of their archaeological context” (Dibble et al 2009:2540). Unexpectedly, what the researchers found was startling. To begin with, when Combe-
Grenal was originally excavated, new stratigraphic techniques were being implemented, and the newness and relative complexity of the techniques lead to high levels of artifact provenience error. Poor documentation has left researchers unable to reconstruct the exact nature of the excavation. Additionally, since the collection has been in a state of active use for over four decades, the collection itself is in a state of disarray. Since artifacts used to be mainly labeled on their container, in some cases contextual information has been lost (Dibble et al 2009:2548-2549).

It is suggested that future artifacts and excavation records need to be maintained and updated over time. Just as the artifact data is re-referenced over time, so must the collection’s documentation and conservation status be re-examined and updated over time (Dibble et al 2009: 2549). The authors conclude by stating that, “given that the archaeological record is a non-renewable resource, both the archaeologists who generate collections and the repositories who take care of them must assume the responsibility of making sure that their potential for future research is preserved” (Dibble et al 2009: 2549).

Along with the many lessons to be learned from Combe-Grenal and CA-SON-882, hear it must be emphasized that even mismanaged data has value. The perception of archaeology as a “digging” science leads to quick and dirty analysis, a shelving of artifacts, and then archaeologists move on to the next project. Artifacts are shelved in order to be valuable to future archaeologists’ research questions. However, instead of going back to the artifacts, archaeologists often simply revisit the quick and dirty analysis. In doing so, archaeology is potentially creating a climate of misinformation and false conclusions. Theories and methods become outdated, artifact collections do not.
V. Catalog Methods

Given that this thesis focuses on the use of new methods applied to already excavated and processed material, it is important that the research steps of this project are made clear. Originally this project proposed to digitize the hand written catalog for CA-SON-882 and then analyze the resulting data in order to observe change over time and describe the possible emergence of complexity among the Southern Pomo. However, CA-SON-882’s original catalog proved inadequate and the site lacked a usable chronological time line.

This chapter will describe the process employed by this investigation and the methods used to catalog and analyze the artifact collection from CA-SON-882. It will also discuss assumptions made in order to complete the project efficiently. Issues with the original cataloging of CA-SON-882’s collection will be briefly discussed, followed by a detailed description of re-cataloging methods, and finally a review of analytical procedures and assumptions.

The Original CA-SON-882 Catalog

The original CA-SON-882 catalog was actually three separate catalogs written in the late 1980s and early 1990s. One had been typed and printed, and the other two were hand written on form catalog sheets. From signatures on the catalog sheets, it appears that multiple students from both Sonoma State University and the Santa Rosa Junior College contributed to the catalogs over an eight year time period (1986-1994). The original laboratory methods used to process and identify the artifacts were not included in
any of the collection’s documentation. It is unclear if the artifacts were washed, how they were identified, or if any standards were used to classify and describe the artifacts.

The first step of the research design was to combine all three catalogs into one digital file. Because of its universal accessibility and compatibility with the Anthropological Studies Center (ASC) cataloging system, Microsoft Office’s Excel program was chosen to create the new artifact database. The Excel database mimicked the original catalog forms (see Appendix C for an example of the original catalog form), which did not yet take into account current ASC standards and practices. The goal was simply to get the data into a digital, manipulable form. As data was entered line-by-line, catalog number by catalog number, several problems became evident. Firstly, many of the catalog numbers had been used multiple times, thus one number could refer to as many as three artifacts. Additionally, many catalog numbers had been skipped over, meaning that there were gaps in the cataloging system. Lastly, the catalog information was written mainly in abbreviations, to which there was no key or notes that may have indicated what the authors had meant.

Given these issues, it was determined that every artifact in the catalog would have to be double checked against the catalog and given a different catalog number where necessary. The examination of the artifacts gave way to an entirely new list of dilemmas. Artifacts were organized not by unit, as is the current practice, but by artifact material type. A large portion of the collection had not been assigned artifact numbers, and many of the artifact numbers that had been assigned in the catalog did not correspond with artifact type it referred to. Furthermore, the artifact bags and catalog number tags did not meet current archival standards. The bags were disintegrating and the catalog tags were
smeared and yellowing. These conditions threatened the retention of the artifacts’ provenience information, and thus the future potential research value of the collection.

*The Re-cataloging of CA-SON-882*

The research design of this project shifted as it became clear that a large portion of time would have to be spent re-organizing CA-SON-882’s artifact collection. One positive aspect of the collection was that, although catalog numbers were incorrect or absent, each artifact had an individual tag that included the artifact’s provenience information and original classification. This meant that CA-SON-882’s artifact collection could possibly be reconstructed. The curation portion of this project began to focus on a researcher’s ability to reprocess and re-catalog the previous work of others.

The first step was to physically re-organize the artifacts so that they were grouped by unit and then by depth. Each unit received a large artifact bag, and within each of those, artifacts were bagged by depth and then by artifact number. All original tags were kept with their respective artifacts. Artifacts with bags that had already broken apart were carefully collected and placed in new archival bags. The artifact unit bags were then placed back into the archival boxes. It should be noted that this simple, initial, re-organization process cut the collection size down from nine archival boxes to seven.

A new cataloging form was created using *The ASC How-to Manual* (2002). Chapter three of *The Manual* details the proper classification protocol for prehistoric artifacts (2002:3.1 – 3.17). The catalog form was based on *The Manual*’s “Artifact Tagging, Cataloging, and Data Entry” section (2002:3-13). The catalog included the
obligatory fields such as accession number, context number, catalog number, site trinomial, unit, and depth.

There was also a field for the artifact's former (original) catalog number. Since the artifacts had already been cataloged, and many of the artifact collection's problems originated from confusion of catalog numbers, it was determined that a new numbering system would be implemented. Where possible, however, the former catalog numbers were included with the artifact's new number and information in order to create a reference point to tie all of the catalogs together and to prevent more confusion in the future. The original catalogs used the numbers 001 thru 999, whereas the new catalog used a numbering system with an additional digit: 1001-2394. Along with a new catalog number, each artifact received a new bag and tag that complied with current curation standards.

*The ASC How-to Manual* also provided artifact classification standards. Following these standards, new classification fields were added to the catalog. These fields included material, category, class, type, part, count, weight (in grams), and a field for remarks about the artifact. Both *The Manual* and ASC co-workers were consulted in the identification and classification of artifacts. These actions were taken to ensure that the new CA-SON-882 catalog met with current cataloging standards and that it would be comparable to other ASC collections in the future. Below, each artifact material type will be briefly discussed so that assumptions and classification strategies can be made transparent.

Obsidian was mainly classified as "flaked stone." All of the collection's obsidian had been sourced by the original catalogers, but their work was double-checked through
consultation with ASC co-workers and in some cases corrections were made. Artifacts included projectile points, scrapers, bifaces, modified flakes, drills, and cores. Due to time constraints, the only flake artifacts separated from the obsidian debitage were edge-modified flakes (EMF). All of the debitage from each source from each level was given its own catalog number. Samples used for obsidian hydration testing bore the tell-tale missing square of material, and those were noted in the catalog “remarks” field.

Chert artifacts had a number of problems. The original excavators appeared to have kept every piece of chert rock uncovered at the site, whether or not it was an identifiable flake or artifact. Compounding the problem, those who had cataloged the collection grouped the chert by pieces with cortex, pieces without cortex, and cores. A de-accessioning of the non-culturally modified chert was considered and rejected. So much of the site’s documentation and data had already been lost, that keeping the original collection intact seemed like the best way to preserve the mind set and methods of the original researchers. Chert pieces remained as they had been originally classified and received new catalog numbers. With the exception of a few cores, no chert artifacts were identified.

CA-SON-882 held few ground stone tools. Ground stone artifacts were mainly made out of basalt rock. They were categorized as handstones, milling slabs, mortars, pestles, and unidentifiable fragments. Whether they had been purposely shaped and the completeness of the artifact were also noted. Daub, a clay subsistence sometimes associated with architectural features, had been collected and cataloged by the original researchers. Though its cultural relevance is unclear, the daub from each unit level was kept and given a new catalog number.
A small number of historic artifacts were found at CA-SON-882. Historic artifacts were classified first by their material type and then by their artifact category. These included several iron square nails, wire nails, unidentifiable rusted metal fragments, broken glass, and a .22 caliber bullet. Many of the historic artifacts had been misidentified by the original catalogers, and were thus re-classified in the new catalog. With the exception of the bullet, none of the historic artifacts contained any diagnostic information.

Bone had already been separated by type: mammal, bird, fish, and unidentified. Once again, the work of the original catalogers was double checked, and in this instance, the author found almost no misidentification. Bone was further classified by modification such as butcher marks or polishing. Almost no bone was large enough to have been identified as a specific bone in the body.

Though CA-SON-882’s original catalogs and reports did not contain any references to shell beyond shell beads and a few catalog numbers listed as “shell fragments,” the collection housed a significant number of shellfish remains. The shell had already been separated by species, but had never been given catalog numbers. The species identification was checked using the National Audubon Society Field Guide to North American Seashells (Rehder et al 1981) as each bag of shell was counted and weighted. No shell species misidentification was found. Shell catalog numbers represent a species within a level within a unit at CA-SON-882.

The goal of the re-cataloging process was to guarantee that each artifact was adequately represented and that the catalog met with current curation standards. The errors realized at the beginning of this project were corrected. These steps would ensure
that the collection would be comparable to other archaeological collections. It was also necessary to generate a digital version of the catalog so that it might be easily analyzed through statistical calculation, illustrations, and comparisons.

Unfortunately, due to time and financial constraints, the author was unable to take additional obsidian hydration dating samples or radiocarbon dating samples. As discussed in Chapter IV, ten obsidian hydration readings were taken, but they could not establish a chronology for CA-SON-882. Additional dates will be needed in order to construct a firm timeline. It is also possible, given the disturbed nature of the site, that more concrete dates would prove unhelpful.

Analytical Assumptions and Procedures

Research questions about Southern Pomo interactions, site type or function identification, and a comparison to other archaeological research in the area required that the artifact information represented both qualitatively and quantitatively. The focus of this project was on the quantitative data derived from CA-SON-882. This is not to say that CA-SON-882 does not hold valuable qualitative artifacts. Qualitative artifacts were examined and are briefly discussed, but an in depth analysis of CA-SON-882's qualitative artifacts is outside the scope of this paper. The concentration was on the larger picture of regional site comparison. For the analytical portion, and so that the data could be compared to current research conducted by Hildebrandt, Rosenthal, and Gmoser (2009), the catalog information needed to be calculated into meaningful statistics.

The data needed to be compatible with the data analyzed by Hildebrandt, Rosenthal, and Gmoser (2009), but the data also needed to broadly represent the site as a
whole. Key variables of the catalog were identified: material type, weight, and depth. Material types that were identified are obsidian, shell, bone, basalt (ground stone), chert, and other. Percentages were calculated using artifact weight (grams) instead of artifact number because artifact count is often a poor representation of artifact quantity. Fragile artifacts, such as shell, are apt to break into multiple pieces, and artifacts such as obsidiandebitage can present a count of 600 but only actually represent a tiny amount of obsidian. Weight is a more reliable constant and thus a more meaningful measure of material quantities.

As will be seen in the analysis presented in the following chapter, the collection is discussed as a whole and each artifact type is analyzed. Analysis included both an in depth statistical comparison, as well as a brief qualitative explanation. Statistical significance was based on percentage amounts and comparison to Hildebrandt, Rosenthal, and Gmoser's data (2009). In places where artifact types were not included due to their low percentage value, those artifacts are identified, and, were necessary, those they are briefly discussed. Conclusions were based primarily on the larger statistical analysis of shell quantities as they compare to the model provided by Hildebrandt, Rosenthal, and Gmoser (2009).

Analyzing the Analysis

The most important aspect of this process was the conversion of a seemingly useless collection into a functional archaeological database. Steps taken here may seem basic in some areas, but such basic steps were essential to making CA-SON-882 into a usable collection. Detailing the motivation behind the steps taken to analyze CA-SON-
882 is also essential because future archaeologists, who need the collection to work for them, will have to build on this analysis or start afresh to ensure that the data is relevant to their research questions.
VI. Analysis of Artifacts and Summary of Findings

As this project focuses on the value of curated artifact collections, it is necessary to demonstrate the potential contribution of artifacts to new archaeological theories. When compared to the body of contemporary research on Native Californian sites in the Santa Rosa area, the artifacts recovered from CA-SON-882 yielded surprising results. The analysis of CA-SON-882’s artifact collection was based on a comparison to Hildebrandt, Rosenthal, and Gmoser’s article “Shellfish Transport, Caloric Return Rates, and Prehistoric Feasting on the Laguna De Santa Rosa, Alta California” (2009). Because of its poor documentation, Hildebrandt, Rosenthal, and Gmoser may not have been aware of and did not have access to the data recovered from CA-SON-882.

How do the artifacts recovered from CA-SON-882 compare to the data used by Hildebrandt, Rosenthal, and Gmoser? How might their conclusions be affected by the data from CA-SON-882? When the data from CA-SON-882 is analyzed, are their theories challenged? Keeping these questions in mind is important because they speak to the research value of artifact collections excavated and processed under old archaeological methods and theoretical paradigms.

Using this 2009 article as a guide, artifact analysis for this project focused almost solely on shellfish remains. The basic research question being addressed asked why large amounts of oceanic shellfish remains are discovered at inland sites in California’s Northern Bay Area. Hildebrandt, Rosenthal, and Gmoser (2009) ask whether shellfish simply used as a form of supplemental subsistence, or were there larger cultural factors at play? This chapter will outline the method and conclusions of Hildebrandt, Rosenthal,
and Gmoser's original work, describe the analysis of shellfish remains from CA-SON-882, and conclude by comparing the data recovered from CA-SON-882 to theories suggested in their article.

"Shellfish Transport, Caloric Return Rates, and Prehistoric Feasting on the Laguna De Santa Rosa, Alta California" (Hildebrandt et al 2009)

Hildebrandt, Rosenthal, and Gmoser's article examines potential motivating factors that can be interpreted from the large volume of shellfish remains discovered at inland archaeological sites in California during the Upper Archaic. At first glance, a researcher might conclude, as many archaeologists have, that the shellfish were related solely to Native Californian subsistence strategies. However, the authors demonstrate that this assumption falls apart when optimum-foraging theories are applied to the data and fail to provide logical results (Hildebrandt et al 2009:55, 57, 72). Using a variety of mathematical calculations and caloric return and expenditure averages, they were able to show that the shellfish caloric return rate was easily surpassed by the caloric expenditure needed to gather and transport the shellfish, especially when taken into consideration with the vegetation and game readily available to inland Native Californians (Hildebrandt et al 2009:58, 66-70).

Hildebrandt, Rosenthal, and Gmoser begin their study by discussing previous assumptions made regarding Native Californian settlement and subsistence patterns overtime. Though archaeological theories formerly predicted that Native Californians first lived inland and then migrated to the less economically viable coast, recent discoveries have led researchers to believe that the coast was a rich resource and was
inhabited before the Californian inland. As discussed earlier in Chapter III, this is known as “coastal migration theory” (Erlandson et al 2007b:53; Hildebrandt et al 2009:56). It has also been observed that there are many more early archaeological sites along the southern Californian coast compared to the northern California coast, and the Hildebrandt-Levulett hypothesis was developed to explain this anomaly (Hildebrandt et al 2009:56). The hypothesis reasoned that, “the latitudinal differences in coastal use are largely a function of the productivity of adjacent terrestrial habitats” (Hildebrandt et al 2009:56).

Theories such as the Hildebrandt-Levulett hypothesis and optimum foraging theory are based on the assumption that Native Californians acted solely on the basis of what food supplies would produce the highest caloric return. However, the Hildebrandt-Levulett hypothesis, as well as the wide spread application of optimum foraging theory, are being called into question by Hildebrandt, Rosenthal, and Gmoser:

The caloric return rates for collecting and transporting shellfish, and their relationship to the costs associated with obtaining terrestrial game have never been extensively studied. The purpose of this study is to conduct a more detailed analysis of these relationships using archaeological data from a discrete costal-interior transect...this approach reveals archaeological patterns not anticipated by the Hildebrandt-Levulett hypothesis or simple uses of optimal foraging theory. Instead, they are best understood through a broader application of human behavioral ecology, including costly signaling theory (Hildebrandt et al 2009:57).

The main argument here is that neither the Hildebrandt-Levulett hypothesis nor optimum foraging theory can explain the large amounts of shellfish remains found in the Santa Rosa area of Northern California. Because Santa Rosa is separated from the coast by mountainous terrain, it would be logical to assume that the large amounts of shellfish remains found at archaeological sites in the area represent a greater caloric return rate obtainable through shellfish consumption. Hildebrandt, Rosenthal, and Gmoser show that
is not the case, and they argue for the development of new interpretations in order to explain shellfish found in Santa Rosa (Hildebrandt et al 2009:57, 70-73).

Using various sources and multiple lines of evidence, Hildebrandt, Rosenthal, and Gmoser explored the caloric value to be gleaned from the most prevalent types of shellfish along the northern California coast, the percentages of shellfish types found at inland archaeological sites, the caloric expenditure in traveling from the California inland to the coast, and the ultimate caloric returns provided by the shellfish types found most commonly at inland sites (Hildebrandt et al 2009). Their ultimate goal was to answer the question, “did the acquisition and transport of marine foods to the interior make energetic sense in the current study area, or were there more socially driven currencies at play” (Hildebrandt et al 2009:66)? Below, each of the four main variables of their calculations will be briefly discussed and ultimately compared in an effort to address this question.

The key shellfish included in the study were California mussel (*Mytilus californianus*), basket cockle (*Clinocardium nuttalli*), rock cockle (*Protothaca staminea*), gaper clam (*Tresus nuttalli*), and Washington clam (*Saxidomus nuttalli*) (Hildebrandt et al 2009:67). These shell species were, “then ranked according to Kcals that could be obtained per one hour of labor (Kcals/hr)” (Hildebrandt et al 2009:67). By far, mussel had the highest Kcals/hr, with 470 Kcal/hr.

This may lead researchers to believe that the most abundant shellfish species found at Santa Rosa archaeology site should be mussel. However, Keswick (1990) examined assemblages from the Bodega Bay and Santa Rosa areas, and, “found that California sea mussel was the dominant species used coastal peoples but, surprisingly, [Pacific] gaper clam was more important in the interior” (Keswick 1990, as cited in
Hildebrandt et al 2009:62). Hildebrandt, Rosenthal, and Gmoser’s own figures also reflect this conclusion. While mussel shell dominates coastal sites across all time periods (from the Lower Archaic to the Emergent)(Kennedy 2004 and Greengo 1951, as cited by Hildebrandt et al 2009:68), the Pacific gaper and Washington clams dominate all time periods at nine sample inland sites (Hildebrandt et al 2009:68).

Before any archaeologists race to the conclusion that clam was a more important shell to inland Native Californians because of clam shell disc bead trade, Hildebrandt, Rosenthal, and Gmoser remind researchers that timing is everything. The main period of time being examined is the Upper Archaic, and clam shell disc beads were not made until the Upper Emergent Period, some 1,000 years later (Gmoser et al 2007, as cited in Hildebrandt et al 2009:63). “This finding clearly indicates that the added value of clam shell for bead manufacture was not the primary reason they were moved to the interior. Instead, keeping the mollusks alive in their shell may be have been the purpose” (Hildebrandt et al 2009:63). This begs the question, why did Native Californians collect and transport a shellfish species that produced a relatively lower Kcal/hr return rates?

Before answering this question, Hildebrandt, Rosenthal, and Gmoser examined multiple factors in the transportation of shellfish. Examining the terrain of the Northern Bay Area, along with ethnographic data and archaeological literature, they concluded that shellfish found in the Santa Rosa area was gathered just southwest on Santra Rosa, at Bodega Bay. To simplify their calculations, the authors only focused on mussel. As mussel has the highest Kcal/hr rate, if mussel could not produce a caloric profit after transport, it stood to reason that neither could any of the other shell species.
In order to calculate the caloric expenditure involved in traveling to Bodega Bay and returning to Santa Rosa, the authors ran GIS simulated trips assuming that a person walked to Bodega Bay with an empty burden basket, for every 10 hours of travel there was a 14 hour rest period, collected 34 kilograms of mussel (the estimated maximum holdings of burden baskets), and returned to Santa Rosa (Kennedy 2004, Pandolf et al 1977, Tobler 1993, and Zeanhan 2000 as cited in Hildebrandt et al 2009:67-69). Travel round trip to the Laguna de Santa Rosa took 3.2 days and 9,543 Kcals, resulting in a net gain of 8,767 Kcals. Travel round trip to Bennett Valley took 4.8 days and 15,916 Kcals, resulting in a net gain of 2,395 Kcals (Hildebrandt et al 2009:69). The authors are quick to point out that, “although a net caloric gain can be realized by this behavior, it is necessary to determine the opportunity costs of the activity; that is, what could have been achieved by staying in the interior and pursuing other forms of meat” (Hildebrandt et al 2009:69).

Hildebrandt, Rosenthal, and Gmoser briefly explore this avenue of inquiry, and explain the potential caloric return rates for hunting and gathering in each area. For the Laguna de Santa Rosa area, gathering produces 342 Kcals/hr and small game hunting (not including large mammals) produces at least 2,100 Kcals/hr. For Bennett Valley, gathering produces 62 Kcals/hr and small game hunting produces at least 2,100 Kcals/hr (Hildebrandt et al 2009:69). Given these figures, along with the percentages or artifacts representing these activities, they conclude that, “transport of shellfish to the Laguna was not a profitable enterprise, and that some currency other than calories may have been at play” (Hildebrandt et al 2009:69).
In summary, Hildebrandt, Rosenthal, and Gmoser’s data point to two unexplained phenomena: 1) Native Californians from the Santa Rosa Area were not focused on collecting shellfish with the highest caloric return rate, and 2) that, in comparison to subsistence options closer to home, it was not calorically profitable to transport any species of shellfish from Bodega Bay for subsistence purposes.

The first phenomenon is easily explained by what the authors all call a simple observation:

Gaper clam produces almost three times as much meat as mussel when transported in the shell, while other estuarine taxa are also better than mussel, but only marginally so. This simple observation indicates that once the decision is made to carry shellfish whole (for whatever reason), gaper clam is the best once the shellfish are in the burden basket. Although gaper clam requires much more pursuit time than mussels, it appears that these added costs are compensated for by better returns when they are transported, particularly if they are carried across great distances (i.e., gaper clam return rate increases relative to mussel the longer they are carried (Hildebrandt et al 2009:70).

Transporting Pacific gaper clams in the shell over long distances means that you are transporting more meat than if mussels had been collected instead. While California mussel may be preferable for easy collection and on-site processing and consumption, Pacific gaper clams in their shell are actually a more logical choice for those traveling long distances (Hildebrandt et al 2009:70). However, they do also note that Pacific gaper clams still produce a much smaller caloric return than local hunting and gathering (Hildebrandt et al 2009:71).

As for the second phenomenon, the large amounts of shellfish found inland despite their inferior caloric profits, Hildebrandt, Rosenthal, and Gmoser also provide a reasonable explanation. The authors turned to human behavioral ecology’s cost signaling theory (Hildebrandt et al 2009:72). Cost signaling theory tries to identify how illogical
behaviors actually play a key role in social display (as applied by Bliege Bird and Smith 2005, cited in Hildebrandt et al 2009:72). The behavior is a form of communication between both the “signaler” and the “observer,” both of whom, can profit from the behavior. The signaler is able to communicate their prestige and power, while the observer is able to identify which signalers are best fit for social and political interaction (Hildebrandt et al 2009:72).

The cost signaling activity identified by Hildebrandt, Rosenthal, and Gmoser is the social display of feasting as described in ethnographic literature:

Given the poor return rates for gaper clams compared to deer and elk (which are abundant in interior sites), coupled with the need to consume them immediately after transport, it seems possible that gaper clams and other shellfish were luxury items associated with large-scale feasting events...The ability to generate large amounts of such items for a feasting event is thought to enhance the symbolic capital or prestige of the producer, thereby signaling their wealth or other desirable characteristics to the large audiences attending these events (Bliege Bird et al 2001; Hayden 2001). The items used in these contexts were usually highly valued due to their non-local origin and the quantity of labor required to produce them (Brumfiel and Fox 1994; Hayden 2001). Gaper clam seems to fit this bill because they were not an everyday food along the coast, required great costs to obtain and transport to the interior, and were unavailable in inland settings. While gaper clams were probably not the only thing consumed at these gatherings, they were no doubt a specialty food item for people living in the interior (Hildebrandt et al 2009:71-72).

Essentially, Pomo groups would hold feasting celebrations for surrounding groups and use that social interaction to display their power and greatness. Being able to provide “exotic” foods would immediately signal to the observer stature and high social standing of the hosting group. Though Pacific gaper clams may not have been calorically logical, they could have easily provided social gains unobserved by the archaeological record (Hildebrandt et al 2009:72).

The main point of Hildebrandt, Rosenthal, and Gmoser’s article should not be lost in caloric calculations and shellfish percentages. The application of theories based on
optimal foraging assumptions do not always explain or predict archaeological findings. Though optimal foraging theory is extremely useful in many areas of archaeology, it is not the ultimate answer to all questions about indigenous peoples. Where optimal foraging fails to account for outlying data, archaeologists are able to identify and observe intangible culture (Hildebrandt et al 2009:72-73). Large amounts of Upper Archaic shellfish remains in the Santa Rosa area do not fit within the optimal foraging model, but that simply means archaeologists need to turn to social explanations.

Artifact Findings from CA-SON-882

All of the above calculations and conclusions made by Hildebrandt, Rosenthal, and Gmoser are both relevant and applicable to the archaeological remains from CA-SON-882. CA-SON-882 is located in Bennett Valley, its artifact collection contains surprising quantities of shellfish, and it was occupied during the Upper Archaic. Before delving into a comparison between the findings of Hildebrandt, Rosenthal, and Gmoser and the data from CA-SON-882, it is first necessary to present the artifact data complied from CA-SON-882’s collection catalog.

The excavation of CA-SON-882 produced a large and diverse artifact collection. Its re-cataloging, as part of this project, revealed several new observations. It should be noted that all calculated statistics are based on the weight (in grams) of the artifacts. This is because weight is a universal factor and more accurate representation of the artifact quantities. If a stone tool or shell fragment breaks in half while in transport or in storage, it still remains the same weight. Additionally, as discussed in Chapter IV, obsidian hydration samples demonstrated that the site has no firm chronology (see Figure 4).
The collection is dominated by lithics, as they comprise 83% of all artifacts (Figure 6). Chert comprises 32% and basalt comprises 5% of the artifacts. Basalt artifacts include a small amount of ground stone fragments from possible mortar bowls and pestles. Obsidian is the largest group of lithics, representing 46% of the entire CA-SON-882 collection. An examination of the obsidian sources shows that 93% of the obsidian came from Annadel State Park and only 7% came from the Napa Valley obsidian source (Figure 7). A statistically insignificant amount of obsidian was sourced to Mount Konocti and Borax Lake. Since CA-SON-882 is only about a mile or so from Annadel State Park, it is not surprising that the obsidian was almost entirely sourced to Annadel.

Bone made up a relative small 2% of the collection. 74% of the bone was mammal, 2% of the bone was bird, 24% of the bone could not be identified, and an statistically insignificant percentage of the bone was fish (Figure 8). Much of the mammal bone was identified as small rodent, such as gopher. Considering the poor chronological data at CA-SON-882, it is safe to assume that in addition to human activity, there may have also been some bioturbation disrupting the site.

The smallest percentage of artifacts in the collection is classified as “other.” This includes many artifacts whose materials or functions were individually statistically insignificant, though that is not to say that the artifacts themselves are insignificant. Included in this classification are historic artifacts such as a .22 bullet, broken glass, and square nails. There were also small amounts of other stone materials such as schist and stealitite.
Figure 6. Percentages of material types in CA-SON-882’s collection.

Figure 7. Percentages of obsidian sources by weight (g).
By far the most interesting artifact type included in “other,” is baked clay. The CA-SON-882 collection contains two baked clay figurines. The first is catalog number 86-10-1061, found in unit N0 E6 between 0-10 cm, and the second is catalog number 86-10-1309, found in unit N7 W0 between 30-40 cm. They are a rarity as there have only been thirty discovered in Southern Pomo territory (Nick Tipon, personal communication: 2009). Nick Tipon has speculated that they were ritual fertility dolls carefully crafted in the female form (personal communication: 2009). Though these clay artifacts are worthy of much further discussion, such an in depth examination is outside the scope of this project.
Shell comprised only 14% of CA-SON-882's artifact collection. There were only 34 (14.2 g) shell beads, 7 of which were Olivella beads. The rest of the shell beads were either clamshell beads or unidentifiable, but assumedly clam shell beads.

Shell is divided into 33% mussel, 53% clam, and 15% other (Figure 9). Again, “other” consists of a range of shell types that were represented by statistically insignificant percentages: cockle, barnacle, crab, Olivella, oyster, chiton, limpet, snail, and unidentifiable fragments. Of the mussel, 31% was California mussel (*Mytilus californianus*), and the other 2% could not be identified, though it is safe to assume it was also California mussel (Figure 10). Clam was broken into five different species: Littleneck clam (*Protothaca staminea*) at 5%, Pacific gaper clam (*Tresus nuttalli*) at 11%, Horseneck clam (*Tresus capax*) at 12%, and Washington clam (*Saxidomus nuttalli*) at 24%. Other types of clam were not statistically significant.

Though depth has been show to be a poor marker of chronology at CA-SON-882, it is still important to note how shell was distributed at the site at the point of excavation. The majority of the shell was found between the arbitrary levels of 0-10 cm and 10-20 cm (Figure 11). Between 30cm-80cm, the shell weights begin to steadily decrease (Figure 12). At every depth, with the exception of 40-50cm, clam represented the highest percentage of shellfish. This is especially true for 0-10 cm and 10-20 cm (Figure 13). If there is a pattern to be seen in these arbitrary levels, it is that over time clam shell rose in popularity, while mussel diminished in popularity. However, given the chronological lacking of CA-SON-882 stratigraphy, such observations need to be questioned.
Figure 9. Shellfish percentages by weight (g).

Figure 10. Shellfish species percentages by weight (g).
Figure 11. Percentages of shellfish by depth.

Figure 12. Shellfish weights by depth.
Overall, CA-SON-882's artifact collection contains a rich assemblage of Southern Pomo culture and heritage. Once properly cataloged and examined, it is clear that CA-SON-882 has much to offer archaeological research not only in the Santa Rosa area, but in all of Northern California. CA-SON-882 has the potential to not only speak to the local Native Californian community activity in Bennett Valley, but also to the larger cultural landscape of site types, trade, and interaction.

Looking at the obsidian found at the site, it would be interesting to investigate how, considering CA-SON-882's proximity to Annadel State Park, the surprisingly high 7% of the obsidian is from Napa. Examining the origins of the clay figurines found at this site and comparing them to others found in Southern Pomo territory and the surrounding area could also prove to be enlightening. For now, however, this project focuses on CA-
SON-882's shellfish remains and how that data compares to the recent findings and theories provided by Hildebrandt et al (2009).

**Darko 2010 vs. Hildebrandt et al 2009**

In comparison to the findings of Hildebrandt, Rosenthal, and Gmoser (2009), CA-SON-882's artifact collection yields some surprising similarities and differences. Following the model developed by Hildebrandt, Rosenthal, and Gmoser, during the Upper Archaic (2,500-1,000 BP), Native Californians traveled from Bennett Valley to Bodega Bay and back in order to gather shellfish to present at trade feasts. This is evidenced by the fact that traveling to Bodega Bay and back was not calorically efficient when compared to the subsistence resources in the local area. Thus, the shellfish collection went beyond pure subsistence needs. Additionally, the main type of shellfish collected was Pacific gaper clam, instead of the more easily collected and coastily preferred California mussel, because of its high meat to shell ratio. The use of shell as a cost signaling tool helps to explain the large amounts of shellfish, specifically clam shell, found at inland Native Californian archaeological sites (Hildebrandt et al 2009).

Given this model, one would expect to find the shell deposits dating back only as far as about 2,500 BP. Additionally, one would assume that shell, though important, is only a small percentage of the collection when compared to the remains of other forms of subsistence such as mammal or bird bones. Hildebrandt, Rosenthal, and Gmoser discussed that archaeological assemblages used in their study were 88-89 % mammal bone (Hildebrandt et al 2009:69). One would also expect to find that of the shell
uncovered at the site, the largest percentage would be Pacific gaper clam, followed by Washington clam, and trailed by California mussel (Hildebrandt et al. 2009).

CA-SON-882 generally resembles the findings predicted by this model, but it does not match perfectly. In another words, if this theoretical model were a dress, CA-SON-882 would be able to put it on, but not be able to zip up the back. All of the elements are there, but they are slightly off from those described by Hildebrandt, Rosenthal, and Gmoser. As discussed below, this may be an indication that CA-SON-882 is a different site type than those used the original researchers. It may not be that their conclusions need to be readdressed, but that CA-SON-882 simply shows how their theories are represented at smaller, non-village sites.

It is difficult to draw a line in the stratigraphy of CA-SON-882 and declare everything below the line pre-2,500 BP and everything above it Upper Archaic. Obsidian hydration dates indicate that the site was utilized from the Middle Archaic until European contact. Without further obsidian hydration samples or radiocarbon dating, it is impossible to more precisely date the shellfish remains and thus establish a chronology for shellfish utilization at CA-SON-882. It is unfeasible to establish which shell remains came from the Upper Archaic, and which are representative of the time periods before and after the Upper Archaic. Because of this, all of the artifacts are examined on equal chronological footing, and thus a key element of Hildebrandt, Rosenthal, and Gmoser's model is missing.

Surprisingly, shell far outweighs bone at CA-SON-882. While shell is 14% of the artifact assemblage, bone is a small 2%. This percentage is nowhere close to the 88-89% mammal bone discussed by Hildebrandt, Rosenthal, and Gmoser. CA-SON-882 only
contains a small amount of bone, much of which may be associated with modern rodents causing bioturbation. The percentage may also be low because only a section of CA-SON-882 was excavated. Mammal bone from big game kills may have been processed elsewhere at the site, or the function of CA-SON-882 may not have been associated with hunting activities.

As for the amount of Pacific gaper clam expected to be found at CA-SON-882, Washington clam exceeded Pacific gaper clam in an overall comparison of shell recovered from the site. Washington clam made up 24% of the shellfish remains, while Pacific gaper only made up 11%. Mussel surpassed both Washington clam and Pacific clam, representing 31-33% of the collection's shellfish. However, overall, clam outweighed mussel 53% to 33%, respectively. Examining the return rates and meat to shell ratios complied by Hildebrandt et al, Washington clam has a meat to shell ratio of 1:0.5, almost double that of California mussel (1:0.3). Washington clam also is classified as having a high caloric return rate; it is still less than California mussel, but it is almost five times more than Pacific gaper clam.

Given the parameters of Hildebrandt, Rosenthal, and Gmoser's model, the amount of Washington clam relative to other kinds of shellfish does not make CA-SON-882 an outlier to their conclusions. What it does do is draw attention to the type of site, and what a small area like CA-SON-882 might represent in juxtaposition to larger village sites.

Feasting and Social Complexity

Evidence of possible feasting at CA-SON-882 brings into view several new possibilities. Feasting is generally defined as, "events essentially constituted by the
communal consumption of food and/or drink,” and is outside of, “everyday domestic meals and from the simple exchange of food without communal consumption” (Dietler and Hayden 2001:3). However, generally speaking, the definition of feasting is often a contested concept. Feasting has only recently become established as a social interaction observable through the archaeological record, absent of specific knowledge of the event (much like the social interaction of trade) (Dietler and Hayden 2001:7-8). Much of the literature on hunter-gatherer feasting practices does not directly relate to this specific research project, and is thus outside the project’s scope. However, a small amount of recent publications do discuss the evidence of feasting found at smaller scale, non-village sites, and the implications that may have about hunter-gatherer complexity.

The concept of luxury foods and feasting is frequently a marker of social complexity and socioeconomic stratification (Adams 2003:56; Hayden 2009:597; van der Veen 2003:405). The two main categories of feasting are “solidarity feasting,” where feasting is used to promote solidarity within the group or between allied villages, and “promotional feasting,” when feasting is used as a tool promote a certain family or group as having a high sociopolitical standing (Adams 2003:62-63; Plunkhahn 2006:280). Marijke van der Veen writes that, “here the consumption of luxury foods takes place primarily at communal feasts, which create or enhance a feeling of social bonding and cohesion. Leaders of such societies use feasts to convert their economic capital into symbolic capital” (van der Veen 2003:420). While Hildebrandt, Rosenthal, and Gmoser call it cost signaling (2009:72), Hayden famously refers to this as “paleopolitical ecology” (Hayden 2009:597).
Feasting is generally thought of as a large-scale event held at a central village location and meant to serve the highest levels of society (Hayden 2001:47; Pluckhahn et al 2006:263-264). Where do site types like CA-SON-882 fit? There is clearly a high amount of luxury saltwater shellfish present, but the site is not believed to be a major village site and shows no signs of long term habitation structures. What types of feasts were held at CA-SON-882? Who was invited, and how far did they travel? To whom were these Southern Pomo people signaling?

It has been suggested that, “we might expect small-scale feasts to take advantage of fauna that are locally or seasonally abundant, or which otherwise might be procured in large quantities by relatively small task groups...smaller feasts might be expected to include large numbers of one or two animal species” (Pluckhahn et al 2006:265). This is possibly applicable to CA-SON-882 since a small party could have been sent to carry the baskets of shellfish back from the coast, and because only mussels and clams are largely represented in the collection. Unfortunately, much of the literature on small-scale feasts discusses much more detailed artifact assemblages (Hayden 2001:47-53). Studies of small-scale feasting generally relied many more lines of evidence than the collection of CA-SON-882 can provide, and thus it is difficult to precisely classify the use of shellfish at CA-SON-882.

It maybe conjectured, however, that CA-SON-882 was a seasonal a satellite camp from the main village, Hukabetawi (see Chapter III). Southern Pomo may have lived at CA-SON-882 during the summer, and may have traveled to the coast for shellfish that could enhance their reputation at feasts held among other seasonal camps in the area. The same family could have returned to CA-SON-882 for hundreds of years, and thus
contributed multiple deposits of lithics and shellfish. Theories on small-scale feasts are rapidly expanding, and in the near future, analysis of CA-SON-882 may contribute to or benefit from such theories.

Concluding Analytical Thoughts

The data represented here plays an essential role in archaeologists' understanding of Native Californians. Hildebrandt, Rosenthal, and Gmoser's work has shown that shell, once thought to be just another sign of subsistence, is in reality part of complex social interaction, and thus adds another layer to the emerging complexity of the Southern Pomo. Artifacts excavated from CA-SON-882 directly relate to Hildebrandt, Rosenthal, and Gmoser's conclusions. The site exists in the same chronological time period and local addressed by these authors. Analysis of CA-SON-882's shellfish remains directly contributes to current theories about Native Californian interactions with each other, resources, and the landscape.

CA-SON-882 supports the observation that large amounts of calorically inefficient shellfish remains are found at inland Southern Pomo sites in the Santa Rosa area. The fact that clams with a higher meat to shell ratio dominated over mussel with a lower meat to shell ratio enforces the theory that cost signaling feasting was the motivation behind shellfish collection and transport. CA-SON-882 also helps to expand Hildebrandt, Rosenthal, and Gmoser's conclusions because it brings into play the possibility of different kinds of site types being represented as elements of feasting practices.
As with all data, however, the artifact data analyzed from CA-SON-882 contains human error and lacks some key elements. Though it was carefully checked, shell may have been misidentified. It may be possible that bone, for whatever reason, was not as easily identified and collected by excavators, leading to it comprising only 2% of the collection. Since only a portion of the site was excavated, it may also be possible that other areas would have contributed data that greatly changed the content of the present assemblage. Further obsidian hydration or radiocarbon dating (which are unfortunately outside the scope of this project) may yield a clearer site chronology. More information about the excavation strategies and laboratory methodologies from the original researchers may have also reshaped this project’s conclusions.

There might also have been other social reasons for Southern Porno peoples to collect and transport shellfish. For example, it may have been prized for its taste and exotic nature simply within the local villages, and not necessarily something reserved only for impressing the neighbors. In contemporary America, sushi is over priced and gives one little food compared to other meals, yet sushi bars are flooded with customers. Mussel may have been favored by coastal groups because it was easier to collect and thus had a high caloric return rate. It is possible, that to be able to collect shell at Bodega Bay, the Southern Pomo had to agree to only collect the more difficult clams and cockles.

Data and theories can always be expanded and improved. However, this does not negate current information. Hildebrandt, Rosenthal, Gmoser present a strong argument for cost signaling theory as an explanation for inland shellfish remains. Using their model, CA-SON-882’s artifact collection both supports and expands the conclusions of Hildebrandt, Rosenthal, and Gmoser. Being able to observe and research seemingly
intangible Native Californian culture contributes to current worldwide literature on the emerging complexity of indigenous groups.
VII. Conclusions and Directions for Future Research

Curated artifacts are valuable to current and future archaeological research, however, this conclusion comes with a “but” attached: to be valuable to current research, artifact collections must be re-evaluated under current archaeological methods and theoretical paradigms, and in order to perform such an evaluation, the original excavation and curation methods, theories, and research questions must be made explicit. As the curation crisis continues to mount, carefully excavated and processed artifact collections remain in an archaeological purgatory. It has been widely discussed in current literature, such as articles in the volume *Our Collective Responsibility* (Childs 2004), that for the last thirty years curated artifact collections have overwhelmed unprepared curation facilities. Archaeologists view collections as an important key to the past. Researchers dedicate large amounts of money and time to excavate, process, and, sometimes, curate artifacts. At the same time, however, most of the effort remains focused on field work and additional excavation.

Lack of interest and lack of funding have led to the mishandling of collections and the loss of valuable archaeological data (Childs 1995:12; Stankowski 2007:25; Stankowski 2009:3-4). As solutions to the curation crisis are put forward, archaeologists need to keep in mind the potential research value curated collection hold for future archaeological theories and methods, and that that potential can only be reached if collections are properly documented.

This thesis has shown that previously excavated and curated archaeological collections, such as the artifacts from CA-SON-882, have the potential to directly address
and affect contemporary archaeological paradigms, but only if they can be re-examined through new methods and theories. Though CA-SON-882 was excavated over twenty years before the start of this project, the data from its curated artifact collection has the ability to speak to research currently being conducted by Hildebrandt, Rosenthal, and Gmoser (2009), and possibly other future study. This concluding chapter will briefly summarize the highlights of this project, the conclusions reached through artifact analysis, the author's recommendations for the study and curation of other artifact collections, and directions for future research at CA-SON-882.

*The past analyzed in the present affects the future...*

As a field, archaeology, world-wide and in California, is constantly in paradigm flux as new data are gathered and new theories are established. It is clear that as new paradigms emerge, old archaeological data need to be re-examined. As theoretical paradigms shift, curated artifacts travel on an intangible journey, at the end of which previous assumptions no longer apply and new meanings may be interpreted. The case study of CA-SON-882 utilized the analysis of shellfish remains that had not even been cataloged in any detail. Originally assumed to be part of Southern Pomo subsistence patterns, shellfish analysis was glossed over by the previous researchers. In the context of the contemporary complex hunter-gatherer paradigm, Bay Area shellfish remains found as far inland as Santa Rosa are instantly flagged as an anomaly requiring special research attention.

As discussed by Terry Jones and Mark Raab, in their edited volume *Prehistoric California: Archaeology and the Myth of Paradise*, previous archaeological paradigms
have falsely labeled Native Californian groups as static, unchanging, simplistic peoples (Jones and Raab 2004:3). In the past decade, countless archaeologists have challenged these labels and have successfully shown the true dynamic, complex, and diverse nature of Native Californian cultures (Arnold 1992; Arnold et al. 2004; Erlandson et al. 2007b; Gamble 2005; Gamble 2007; Hildebrandt 2007; Hildebrandt et al. 2009; Jones and Klar 2007; Jones and Raab 2004; Milliken et al. 2007). As a result, the emerging complexity of Native Californian groups, such as the Southern Porno, has been come one of the main foci of study in Californian archaeology.

Review of curated collections has the potential to strongly contribute to this new archaeological conversation. During the proposal and implementation of curation crisis solutions, the present and future data potential of these artifact collections needs to be remembered.

Artifact Analysis Summary

CA-SON-882 is a small, Southern Porno archaeological site in Bennett Valley, Santa Rosa, California. It was originally excavated, cataloged, and curated in the 1980s and early 1990s. Nine boxes of artifacts were removed from CA-SON-882, and for the purposes of this project, the entire collection was re-cataloged. Saltwater shellfish remains comprised a staggering 14% of the collection (by weight). Given the state of the collection's original catalogs, this may have never been realized by archaeologists. CA-SON-882's true data potential only came to light after the collection was re-processed and re-cataloged to meet current curation standards provided by the Anthropological Studies Center, at Sonoma State University.
After the artifacts had been identified and re-cataloged, the data were entered into Excel spread sheets. Using tools available in Excel, the data was compressed into understandable, quantifiable statistics. The collection contained large amounts of obsidian, chert, basalt, and shell. Other artifact types were statistically insignificant on their own, but together they formed a large fifth category called “other.” Though all artifact types found at CA-SON-882 hold research potential, this project focused on shellfish remains.

The shellfish data from CA-SON-882 was compared to the recent findings of Hildebrandt, Rosenthal, and Gmoser (2009). They examined the timeline of different shellfish species found inland, near Santa Rosa, California, during the Upper Archaic (2,500-1,000 BP). Their main research question asked whether or not it was calorically efficient to collect and transport shellfish inland from Bodega Bay, and if not, why are large amounts of saltwater shellfish being discovered at inland archaeological sites. Hildebrandt, Rosenthal, and Gmoser (2009) found that the Southern Porno collection and transportation of any species of shellfish was not calorically efficient, especially when compared to the subsistence options, such as hunting game and gathering vegetation, that were widely available closer to home (Hildebrandt et al 2009:69).

The shellfish data from CA-SON-882 closely resembled that presented in Hildebrandt, Rosenthal, and Gmoser’s article (2009). A major problem with the CA-SON-882’s data are that they lack a chronological time line. Though obsidian hydration dates have been taken, there is not enough information to create a site chronology. If anything, the data indicate that the site has been highly disturbed and that it may be
impossible to establish a timeline. Despite the lack of dated material, conclusions can still be drawn from CA-SON-882's shellfish data.

Comparing the quantities of different shellfish species, CA-SON-882 contained much more Washington clam than Hildebrandt, Rosenthal, and Gmoser's model would have predicted. This does not negate their conclusions, but does expand the range of possible outcomes. CA-SON-882 is a relatively small site and may have been used for a specific purpose. This data may speak more to CA-SON-882's site type and function, than to the potential inaccuracy of Hildebrandt, Rosenthal, and Gmoser's model (2009). It is also possible that because only a small section of CA-SON-882 was excavated, the sample of artifacts shown here does not fully represent CA-SON-882.

Either way, CA-SON-882 does reinforce Hildebrandt, Rosenthal, and Gmoser's conclusion that shellfish do not represent subsistence strategies, and instead are possibly a part of Southern Pomo feasting practices. They found that traditional models, such as optimum-foraging strategies, could not explain the Southern Pomo's seeming illogical and inefficient use of shellfish (Hildebrandt et al 2009:72). Instead they suggest that archaeologists turn to human behavioral ecology and employ the use of "cost-signaling theory" (Hildebrandt et al 2009:72). Here, shellfish is seen as an exotic good to be presented to other groups at trade feasts. Though not calorically economical, this action would produce intangible status upgrade for the presenting group, and would help the observing group decided with whom they want to do business (Hildebrandt et al 2009:72-73).

The large amounts of clam shell found at CA-SON-882 are consistent with Hildebrandt, Rosenthal, and Gmoser's analysis. Such observations recognize the
emerging complexity of hunter-gatherers, like the Southern Pomo, but these observations also show how social complexity can be represented differently depending on the indigenous community and site type. In Chapter II, Carole Crumley’s work on complex social structures is briefly discussed. She argues that complex social structures can include not just an established hierarchy, but also a system of heterarchy. At CA-SON-882, archaeologists can understand how complexity, in this case feasting, can be seen at a small site type, and how it compares to the activities of larger village sites. There is no formula to the evaluation of complexity, thus archaeology’s definition of complexity is every changing. Such findings allow archaeologists to infer intangible culture that may otherwise have been lost. Curated collections hold valuable data, but that potential can only be realized if the collection is reinterpreted under new archaeological paradigms.

Curation Crisis Recommendations

The re-evaluation and analysis of CA-SON-882’s artifact collection has provided insight into some key curation problems that need to be kept in mind as curation crisis solutions are implemented. Artifacts are excavated and curated because of the value they hold for present and future research, but all of that value is lost if the artifact’s context is lost. Here, context does not mean just the artifact’s site location and provenience data, but the mentality, research questions, methods, theories, and motivations of its collectors. Though CA-SON-882 continues to hold valuable data potential for future research questions, it is impossible to imagine the untold amounts of data that have been lost due to poor record keeping. As briefly touched upon in Chapter IV, anyone examining the collection is at a loss as to even understand the original research questions, who
participated in the excavation, the project’s funding source, the standard sampling
methods participants implemented, and so on. The name of the principle investigators
and associated academic institutions were even difficult to find, and had to be inferred
from the examination of multiple documents.

The context of artifact collections must be properly documented, and this project
recommends that one solution to the curation crisis could be the implementation of
federal documentation standards. Artifact collections need a standard level of metadata,
or data about the data. Collections are currently being mismanaged, unmaintained, and
overall neglected by the archaeological community that created them, and an undeniable
element of the curation crisis is the recognition that collections consist of both excavated
artifacts and their records (Barker 2003:75; Barker 2004:25; Childs and Sullivan 2004:4;
Drew 2004:55; Marino 2004:43; Sullivan and Childs 2003:2; Trimble and Marino
2003:100).

Contextual documents generally provide information about the artifact’s in situ
location, the excavation methods used to recover the artifact, the archaeologist’s
sampling strategy, the research questions that guided the excavation and subsequent
interpretations of the artifact, and so on. This information can come in the form of field
and laboratory notes, research proposals, final reports, maps, photographs, and digital
files. Curated cultural materials are not only artifacts of the past, but they are also
artifacts of the theories and methods by which they were excavated, catalogued, and
curated. As such, this project argues not only for a maintained connection between
artifacts and records, but also for the implementation of a standard level of collection
documentation to be maintained for all archaeological collections.
As discussed in Chapter II, current federal legislation, such as the Curation of Federally-Owned and Administered Archaeological Collections (36 CFR 79) and the Native American Graves Protection and Repatriation Act (NAGPRA) are making positive step to reform curation standards, but neither is strong enough to effect significant change (Childs and Sullivan 2004:8; King 2008:277; Stankowski 2009:3-4; Sullivan and Childs 2003:26-27). Many arguments have been made for possible amendments to these regulations in order to make them more universal, enforceable, and well funded. However, a crisis this large cannot be solved with one policy change or funding grant (Childs 1995:15; Childs and Sullivan 2004:9). In response, archaeologists are suggesting a multitude of ways to tackle the crisis from different angles (for example, see Praetzellis and Costello 2002). In an effort to retain data and give curated collections potential for future examination, researchers are insisting that associated documents be curated along with artifact collections (Barker 2003:75; Barker 2004:25; Childs and Sullivan 2004:4; Drew 2004:55; Marino 2004:43; Sullivan and Childs 2003:2; Trimble and Marino 2003:100).

The documentation of collections is not just an issue of legislation, but it is also an issue of ethics. In addition to the previously mentioned Collective Responsibility (Childs 2004), the volume Ethical Issues in Archaeology contains two articles addressing archaeologists’ responsibility to artifact collections: “Archaeological Ethics: Museums and Collections” (Baker 2003) and “Archaeological Curation: An Ethical Imperative for the Twenty-first Century” (Trimble and Marino 2003). Both articles stress the maintenance of artifact records. Barker shows that without proper documentation, artifact collections lose all of their "meaning and significance" (2003:75). Trimble and
Marino point out that legislation, like 36 CFR 79, also protects both the artifact collections and the artifact records: “the documents are no less important than the objects and no less protected by the legislation” (2003:100). It is irresponsible and unethical to remove artifacts from their context (Baker 2003:75; Trimble and Marino 2003:100).

Both of these volumes demonstrate contemporary acknowledgement of the curation crisis and the need to adequately preserve these collections for future archaeological research. Archaeologists are ethically bound to not separate artifacts and their contextual documentation. Additionally, however, part of the curation crisis solution needs include the implementation of documentation standards. There is little discussion of what should be explicitly included in these “documents.” Even in instances where all of the available documentation has been curated in direct association with an artifact collection, it is often the case that the documentation itself is so poor as to be relatively useless in future interpretation of the artifacts.

Previously mentioned in Chapter II, another good case study comes from the archaeological site of Combe-Grenal, France. In 2009, a group of archaeology professors published the results of a review of the artifact collection from this site (Dibble et al 2009). Originally excavated in the 1950s, Combe-Grenal has become a major archaeological site for the Mousterian in France and, over the last fifty years, has been subsequently referred to by numerous researchers (Dibble et al 2009:2540). The authors of this article were astonished to find that key data inferred from this collection could not be substantiated because of the collection’s mismanaged condition.

Contextual documents, such as field notebooks and stratigraphic data, remained associated with the collection, but were not sufficient to rebuild the stratigraphic integrity
of the artifacts (Dibble et al 2009:2549). At the time of the excavation in the 1950s, the original archaeologist, Francois Bordes, was testing new stratigraphic methods (Dibble et al 2009:2549). He and his field crew did not adequately document their methods, leaving the reconstruction of their activities almost impossible (Dibble et al 2009:2549). Without the necessary information needed to put the humpty-dumpty like pieces of the collection back together again, the value of Combe-Grenal’s artifact collection and all subsequent research has been called into question.

In order to truly ensure that archaeological collections maintain their future research potential, federal standards for artifact collection documentation need to be established. Geographic Information Systems (GIS) data is almost always accompanied by a set of metadata that is universally formatted to comply with The Federal Geographic Data Committee’s “Content Standard For Digital Geospatial Metadata” (CSDGM) (Bolstad 2008:166). GIS metadata is an electronic document that is included in most GIS software packages such as ArcGIS, it consists of both mandatory and optional data sections, and includes by whom and when the data was created, how the data was created, what research questions were used in the creation of the data, how the data has been manipulated by others, and so on (Bolstad 2008:166).

CRM legislation demands the proper curation of collections, CRM ethics demand that collections remain associated with contextual documents, and it is argued here that contextual documentation needs minimum standards. Clear and explicit data about the artifacts are the key to unlocking artifacts’ future data potential. In addition to ensuring the retention of artifact’s research value, documentation standards and keeping documentation curated with collections may also help alleviate fears of other curation
crisis solutions such as the deaccessioning of artifacts. The use of documentation standards would also give curators recourse in requesting additional contextual data from a collection's original researchers. In order to ensure the research value of curated collections, the artifacts need to be well documented and those documents need to remain associated with the collection.

Directions for Future Research at CA-SON-882

The artifact collection excavated from CA-SON-882 is rich with possibility. Given its location and likely time period, CA-SON-882 has much to contribute to research on Native Californians in the Bay Area. Most notable of all of CA-SON-882's artifacts are the two, small baked clay figurines. These two clay figurines represent a rarely seen ritual. There are only thirty such figurines associated with the Southern Pomo. As mentioned in Chapter VI, the clay figurines are thought to represent a fertility ritual. It would be useful to examine each of these figurines, compare their provenience, and additionally compare them to other clay figures created by surrounding Native Californian groups.

The fact that CA-SON-882 lacks a chronological timeline is another example of an excellent research opportunity. This project had neither the scope or a funding source large enough to generate a proper timeline of CA-SON-882. Over one-hundred random obsidian samples should be used for obsidian hydration testing. Additionally, shellfish and other organic remains should undergo radiocarbon dating. These two lines of evidence would help either establish a solid stratigraphic timeline, or they would confirm
this study’s notion that CA-SON-882 is too highly disturbed for the generation of a site chronology.

In addition to obsidian hydration dates, researchers should explore the possibilities of CA-SON-882’s position in broad obsidian trade networks. Obsidian from distant sources such as Napa Valley and Borax Lake have been visually identified among the large quantities of Annadel obsidian found at CA-SON-882. Being so close to the Annadel obsidian source, it is possible that Southern Pomo living at CA-SON-882 used the obsidian as a trade resource. It is also possible that, although they had large amounts of Annadel obsidian, peoples at CA-SON-882 were willing to trade for the better quality Napa Valley Obsidian.

Finally, a comparison of the Santa Rosa and Northern Bay Area cultural landscape, and how it changed or shifted over time, would prove invaluable to Native California research. Though outside the scope of this project’s analysis, the cultural landscape of the Southern Pomo and their interaction with surrounding groups holds rich research opportunity. Territorial boarders, trade networks, resources sites, ritual sites, villages sites, small sites, seasonal sites are all link and can all contribute to the history of California. CA-SON-882 is just a small piece of the much larger puzzle of emerging hunter-gatherer complexity among the Southern Pomo.
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APPENDIX B
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<td>7/7g.</td>
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<td></td>
</tr>
<tr>
<td>524</td>
<td>Perforated Wood</td>
<td>P. Wood</td>
<td>N10/0, 0-20cm</td>
<td>19/915g.</td>
<td>LWM</td>
<td>N</td>
</tr>
<tr>
<td>525</td>
<td>Mixd. Stone</td>
<td>Mixd</td>
<td>N10/0, 0-20cm</td>
<td>19/915g.</td>
<td>LWM</td>
<td>N</td>
</tr>
<tr>
<td>526</td>
<td>Univ. Material</td>
<td></td>
<td>N10/0, 0-20cm</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>527</td>
<td>Obsidian Nod.</td>
<td>Obs.</td>
<td>N10/0, 0-20cm</td>
<td>387/993g.</td>
<td>LWM</td>
<td>N</td>
</tr>
<tr>
<td>528-30</td>
<td>Not Used</td>
<td></td>
<td></td>
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