

SOCIAL DIFFERENTIATION IN ANIMAL USE AND SUBSISTENCE:
A CASE STUDY OF THE MARANA PLATFORM MOUND

By

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DEDICATION

To:

My Family -

And I do mean all of them

TABLE OF CONTENTS

LIST OF FIGURES	8
LIST OF TABLES.....	9
ABSTRACT.....	12
CHAPTER I: INTRODUCTION.....	13
CHAPTER II: SOCIAL ORGANIZATION, THE MIDDLE - RANGE APPROACH..	20
1. <i>Food, Status, and Identity</i>	26
i. Food, Status, and Identity in Contemporary Societies, Some Examples.....	28
ii. The Ethnoarchaeological and Ethnohistorical Bridge (to Somewhere)	31
iii. Archaeological Examinations of Food	32
2. <i>Monumental Architecture</i>	39
CHAPTER III: THE HOHOKAM	42
1. <i>Environment</i>	44
2. <i>Formative Period</i>	46
i. Subsistence	47
ii. Architecture and Village Structure	48
3. <i>Pre-Classic Period</i>	48
i. Subsistence	49
ii. Architecture and Village Structure	50
4. <i>Classic Period</i>	51
i. Subsistence	52
ii. Architecture and Village Structure	53
5. <i>Post Classic Period</i>	54
6. <i>The Curious Case of Platform Mounds</i>	56
7. <i>Zooarchaeology in the Southwest</i>	61
CHAPTER IV: RESEARCH AT THE MARANA PLATFORM MOUND	63
1. <i>Social Organization, a Focus on the Classic Period</i>	64
2. <i>Marana Platform Mound Faunal Studies</i>	65
CHAPTER V: METHODS	70
1. <i>Defining the Assemblage</i>	70
2. <i>Quantifying the Assemblage</i>	78
3. <i>Measuring Diversity</i>	81
4. <i>Lagomorph Index and Artiodactyl Index</i>	84
5. <i>Sampling the Assemblage</i>	85
i. Compound 9 Proveniences	86
1. Compound 9, Exploratory Trench 1, 1989	86
2. Compound 9, Mound Borrow Pit	88

TABLE OF CONTENTS – *Continued*

3. Compound 9, Extramural Area East, Feature 1.....	89
4. Compound 9, Room 3.....	90
6. <i>Compounds 1 and 9: Methods for Choosing Previously Analyzed Proveniences</i> ...	93
i. Compound 9, Trash Mound 1	95
ii. Compound 1	96
1. Compound 1, Trash Mound 1	97
2. Compound 1, Trash Mound 2	97
3. Compound 1, Exploratory Trench	98
4. Compound 1, Plaza, Grid 329	98
5. Compound 1, Structure 8	99
CHAPTER VI: RESULTS	100
1. <i>Compound 9 Results</i>	100
2. <i>Results by Provenience</i>	106
i. Compound 9, Exploratory Trench 1, 1989	106
ii. Compound 9, Mound Borrow Pit	109
iii. Compound 9, Extramural Area East, Feature 1	111
iv. Compound 9, Room 3	114
3. <i>Kendall's Compounds 1 and 9</i>	116
i. Compound 9, Trash Mound 1.....	117
ii. Compound 1	119
1. Compound 1, Trash Mound 1	120
2. Compound 1, Trash Mound 2	121
3. Compound 1, Exploratory Trench	123
4. Compound 1, Plaza, Grid 329	124
5. Compound 1, Structure 8	125
CHAPTER VII: DISCUSSION	127
1. <i>General Observations</i>	128
i. Compound 9	128
1. Compound 9, Exploratory Trench 1, 1989	128
2. Compound 9, Mound Borrow Pit	129
3. Compound 9, Extramural Area East, Feature 1	129
4. Compound 9, Room 3	130
5. Compound 9, Trash Mound 1, Kendall	132
ii. Compound 1	133
1. Compound 1, Trash Mound 1	134
2. Compound 1, Trash Mound 2	134
3. Compound 1, Exploratory Trench	134
4. Compound 1, Plaza, Grid 329	135
5. Compound 1, Structure 8	135

TABLE OF CONTENTS – *Continued*

2. <i>Inter-Site Comparison with Muchas Casas and Los Morteros</i>	137
i. The Fauna from Muchas Casas	139
ii. The Fauna from Los Morteros	141
3. <i>Compound 1 Versus Compound 9: The Intra-Site Comparison</i>	142
4. <i>Los Morteros, Muchas Casas, and the Marana Platform Mound</i>	148
CHAPTER VIII: CONCLUSION	153
TABLES	158
APPENDIX A. ZOOARCHAEOLOGICAL ANALYSIS CODING SHEETS	178
APPENDIX B. AZ AA:12:251(ASM) MARANA PLATFORM MOUND SITE: ALL PROVENIENCES STUDIED IN COMPOUNDS 1 AND 9	190
APPENDIX C. AZ AA:12:251(ASM) MARANA PLATFORM MOUND COMPOUND 9: ALL ANALYZED PROVENIENCES SPECIES LIST.....	195
APPENDIX D. AZ AA:12:251(ASM) ROOM 3, COMPOUND 9: MNI AND NISP FOR STRATIGRAPHIC LEVELS.....	198
APPENDIX E. AZ AA:12:251(ASM): ALL PROVENIENCES STUDIED FOR COMPOUND 1: SPECIES LIST.....	204
APPENDIX F. DETAILED DIVERSITY TABLES FOR MARANA PLATFORM MOUND, LOS MORTEROS, AND MUCHAS CASAS.....	210
REFERENCES CITED	218

LIST OF FIGURES

Figure 1. Hohokam Chronology.....44

LIST OF TABLES

Table 1.	AZ AA:12:251(ASM) Mound Borrow Pit Proveniences	158
Table 2a.	Analyzed Proveniences in Compound 1.....	158
Table 2b.	Analyzed Proveniences in Compound 9	159
Table 3.	Proveniences with Faunal Data Available for Comparison	159
Table 4.	AZ AA:12:251(ASM) All Compound 9 Proveniences: Summary Table	159
Table 5.	AZ AA:12:251(ASM) All Proveniences Compound 9: Element Distribution (NISP)	160
Table 6.	AZ AA:12:251(ASM) All Proveniences Compound 9: Modifications (NISP).....	161
Table 7.	AZ AA:12:251(ASM) All Proveniences Compound 9: Percent Burned and Calcined by Taxon Total.....	162
Table 8.	AZ AA:12:251(ASM) Compound 9 Exploratory Trench 1-1989: Species List	163
Table 9.	AZ AA:12:251(ASM) Compound 9 Exploratory Trench 1-1989: Summary Table	164
Table 10.	AZ AA:12:251(ASM) Compound 9 Exploratory Trench 1-1989: Element Distribution (NISP)	164
Table 11.	AZ AA:12:251(ASM) Compound 9 Exploratory Trench 1-1989: Modifications (NISP)	164
Table 12.	AZ AA:12:251(ASM) Compound 9, Artifact Levels, Mound Borrow Pit: Species List	165
Table 13	AZ AA:12:251(ASM) Compound 9, Artifact Levels, Mound Borrow Pit Summary Table	166
Table 14	AZ AA:12:251(ASM) Compound 9, Artifact Levels, Mound Borrow Pit: Element Distribution (NISP)	166
Table 15	AZ AA:12:251(ASM) Compound 9, Artifact Levels, Mound Borrow Pit: Modifications (NISP)	166

LIST OF TABLES – Continued

Table 16	AZ AA:12:251(ASM) Compound 9, Extramural Area East, Feature 1: Species List	167
Table 17	AZ AA:12:251(ASM) Compound 9, Extramural Area East, Feature 1: Summary Table	167
Table 18	AZ AA:12:251(ASM) Compound 9, Extramural Area East, Feature 1: Element Distribution (NISP)	168
Table 19	AZ AA:12:251(ASM) Compound 9, Extramural Area East, Feature 1: Modifications (NISP)	168
Table 20a	AZ AA:12:251(ASM) All Levels Room 3, Compound 9: Species List	169
Table 20b	AZ AA:12:251(ASM) All Levels Room 3, Compound 9: Summary Table	171
Table 21	Proveniences with Faunal Data Available for Comparison	172
Table 22	AZ AA:12:251(ASM) Compound 9, Trash Mound 1: Species List	173
Table 23	AZ AA:12:251(ASM) Compound 9, Trash Mound 1: Modifications (NISP)	174
Table 24	AZ AA:12:251(ASM) Compound 1, Plaza: Modifications (NISP) ..	174
Table 25	AZ AA:12:251(ASM) Compound 1, Plaza: Summary Table	175
Table 26	AZ AA:12:251(ASM) Compound 1, Exploratory Trench, Grid 329: Summary Table	175
Table 27	AZ AA:12:251(ASM) Compound 1, Exploratory Trench, Grid 329: Modifications (NISP)	175
Table 28	AZ AA:12:251(ASM) Compound 1, Trash Mound 1: Summary Table	175
Table 29	AZ AA:12:251(ASM) Compound 1, Trash Mound 1: Modifications (NISP)	176
Table 30	AZ AA:12:251(ASM) Compound 1, Trash Mound 2: Summary Table	176
Table 31	AZ AA:12:251(ASM) Compound 1, Trash Mound 2: Modifications (NISP)	176

LIST OF TABLES – Continued

Table 32.	AZ AA:12:251(ASM) Compound 1, Structure 8: Summary Table	176
Table 33.	AZ AA:12:251(ASM) Compound 1, Structure 8 : Modifications (NISP) ..	177
Table 34.	AZ AA:12:251(ASM) Marana Platform Mound Diversity Indices and Sample Sizes	177
Table 35.	Los Morteros, Muchas Casas, and Marana Platform Mound Diversity Indices and Sample Sizes	177
Table 36.	Artiodactyl and Lagomorph Indices by Site	177

ABSTRACT

The Marana Platform Mound Community (AZ AA:12:251[ASM]) in the Tucson Basin of southern Arizona provides a unique opportunity to examine the mechanisms of social organization within an early Classic Period Hohokam community. The role of the platform mound for integrative communal ritual or segregated elite-controlled activity is examined through faunal remains from the platform mound and nearby residential localities. Taxonomic diversity, relative abundance, and element distribution are used to measure the extent to which the platform mound served to integrate or distinguish site residents. Subtle differences in the diversity of taxa, the quantity of deposited faunal remains, and the quality of portions and taxa are indicative of differential access to resources between residents at the Platform Mound and residents in sites further away in the Tucson Basin. The findings support the current hypothesis that a dual mode of network and corporate strategy was used to organize the community.

CHAPTER I: INTRODUCTION

Consumption is a highly politicized action in modern and historic societies. The act of consuming, as well as the goods consumed, can at once display to others one's social, familial, ideological, or political place in the spectrum of society (Farb and Armelagos 1980; Twiss 2007). To this end, the consumption of material goods has become the focus of recent archaeological interpretations in the Southwest as archaeologists have sought ways to identify social organization and differentiation. This has been a particularly salient discussion in the Hohokam region of southern Arizona, where the material culture evidence of status that is more accessible in other archaeological cultures is much less obvious (Pauketat 2007).

Studies of faunal remains from archaeological contexts have recently, and popularly, been incorporated into the discourse on consumption, especially as food resources are viewed as one way in which individuals and societies can reaffirm their social roles, and as Wills and Crown suggest, "create social relationships beyond the family" (2004:153). While much of this literature has focused on large scale and obvious feasting events (Dietler 1996; Dietler and Hayden 2001a; Hayden 1996; Welch and Scarry 1995), cross-cultural archaeological, ethnographic and ethnoarchaeological evidence suggest that attention must also be given to the day-to-day action of food consumption as a method of confirming social identity (Atalay and Hastorf 2006; Lokuruka 2006; Schmitt and Lupo 2008).

The Marana Platform Mound Community in the Tucson Basin of Southern Arizona, inhabited by the Hohokam, provides a unique opportunity to examine the mechanisms of social integration in a middle-range society. The site is the location of a Classic Period (A.D. 1150 to A.D.1450) platform mound occupied from approximately A.D. 1200 to 1300. This form of monumental architecture is both elevated above the ground surface to allow for the community to view the activities on the mound, but also enclosed by at least two sets of walls, thus restricting access, both visually and physically, to the activities taking place on top of the mound. Platform mounds throughout the Hohokam world have been interpreted as locales of social integration, contexts for ritual practice, and the residences for elite members of society (Elson 1998).

The cooperative labor investment necessary to construct a platform mound and the paucity of elite-associated wealthy burials have led to the current interpretation that the Hohokam of the Marana community were not organized by a system that allowed for aggrandizing behavior or the rise of a ruling elite class. A dual mode of organization where kin groups played into the division of access to ritual knowledge and political power and a corporate, or communal, strategy emphasizing group territorial affiliation has been suggested (Fish and Fish 2000). Artifactual evidence based on ceramics and exotic goods supports the argument that both strategies of organization were in place (Bayman 2002; Harry and Bayman 2000). The distribution of Tanque Verde Red-on-Brown ceramics, for example, reflects the exchange of goods between corporate groups at sites such as Los Morteros and the Marana Mound, while the absence of the ceramic tradition from contemporaneous sites still within the Tucson Basin suggests an

exclusionary system of exchange intended to solidify a specific group identity (Harry and Bayman 2000:152). The Marana Platform Mound likely served a variety of functions, however its most important role was as an integrative symbol of the territorially-organized Marana community, where the occupants of the platform mound compound acted on behalf of the community as a whole, but did so while residing and performing rituals separately from the general public (Harry and Bayman 2000; Yoffee, et al. 1999).

Like monumental architecture, food can be used to create community cohesion, as well as to create finer points of distinction between social groups (Farb and Armelagos 1980; Mintz and Du Bois 2002; Twiss 2007). The use of faunal remains to address social status and distinction builds upon previous zooarchaeological analyses in cross-cultural prehistoric and historic contexts (Crabtree 1990; Hirth 1993; Hockett 1998; Jackson and Scott 2003; Reitz 1987). Many of these studies, which will be discussed in greater detail below, provide three basic criteria for interpreting social identity through faunal assemblages: the quantity of food evidenced by the relative abundance of faunal remains, the inferred quality of meat based on the skeletal portions present, and the diversity of species present in the assemblage. Overarching and necessary to these points of analysis is the spatial distribution of production, consumption, and disposal of the faunal remains.

Van der Veen (2003) recently explored quality and quantity of food resources as luxury items that go beyond the basic needs of a person or social group. Quality foods may be exotic, rare, or difficult to procure and prepare, while quantity foods may be normal, daily-consumed foods prepared in excess and with special care and attention. In archaeological assemblages, van der Veen (2003) suggests the routine consumption of

food is indicative of social organization. A less formalized society will exhibit little to no difference between the foods consumed from one household to the next. Leaders may receive better cuts of meat, though still from the routinely consumed fauna. Feasts in such a society will present archaeologically as large-scale consumption events involving large quantities of food and incorporating many members of the community. Exotic, luxury foods will be consumed in special places and at special events, all of which will have distinct archaeological markers. Societies with more structured hierarchies will exhibit differences at the level of the household, where daily life is a reflection of social identity. In such structured and hierarchical societies, households associated with higher status social identities may incorporate large quantities and higher quality foods as part of their daily subsistence practices, including the exotic and luxury foods generally reserved for special situations in less hierarchical societies (van der Veen 2003).

Recent ethnoarchaeological work by Schmitt and Lupo (2008) has addressed the validity and appropriateness of food remains as status markers in middle-range and small-scale agricultural communities. They suggest that socioeconomic status should be reflected not only in abundance of foods, but also in the quality and types of foods consumed, given the assumption that members of the community had differential access to animal resources. They found that faunal remains did indeed reflect the socioeconomic and sociopolitical differences already in place in the two African villages studied. The households of the chiefs and religious leaders in both places had greater access to animal prey and therefore consumed the widest diversity of species, better quality of meat cuts, and deposited a greater total abundance of food remains. Schmitt and Lupo (2008) state

that small animal prey were an important part of all diets, regardless of status, and should be likewise viewed as important in archaeological contexts. They conclude that we can reasonably infer social status from the archaeological evidence of foodways, but that animal remains alone should not be used to address social organization.

Following Van der Veen (2003) and Schmitt and Lupo (2008), the faunal remains from the Marana Mound should be correlated with the social organization in place at the community. If the Marana Platform Mound indeed served as a point of social integration and community cohesion rather than social distinction, then faunal assemblages from the platform mound compound should be similar in *quality* when compared to the residential compounds surrounding the platform mound compound. Larger *quantities* of food items, isolated evidence of large-scale consumption events or the presence of unique food items should be present in the platform mound compound in special contexts and notably absent from surrounding compounds. This will especially be the case if the community came together at the platform mound for these events. Likewise, if the platform mound served as an integrative site for the entire Marana Community in the Northern Tucson Basin, a similar pattern of consumption and faunal distribution will be found in communities located further away from the platform mound. Additionally, the diversity of species represented should be similar between the platform mound and non-platform mound contexts. On the other hand, if social distinction was intended between those occupying the platform mound compound and the rest of the community, quality, quantity, and diversity of food resources should all be markedly different.

The hypothesis that social integration or distinction is reflected through faunal evidence at the Marana Platform Mound Community makes two comparisons necessary. First, at the intra-site level, the faunal remains from Compound 9, the locale of the platform mound, will be compared to the faunal remains from Compound 1, a neighboring compound interpreted as a residential locale. Next, at the inter-site level, the collective faunal remains from the Marana Platform Mound Community will be compared to the neighboring communities of Los Morteros and Muchas Casas, both interpreted as part of the larger Marana Community of the Northern Tucson Basin with occupation contemporaneous with the early Classic Period Tanque Verde Phase.

Below the hypothesis that faunal remains reflect social organization at the Marana Platform Mound community is examined through zooarchaeological analyses completed by the author between 2004 and 2008. Because a large set of zooarchaeological data exists from previous analyses at the Marana Platform Mound Community, the research completed by the author will be combined with the results of previous research completed by students associated with the Marana Platform Mound Archaeological Field School and various Borderlands Archaeological Laboratory research projects. The thesis begins with a brief overview of middle-range social organization theory, followed by a discussion of the ways in which food resources have been used to inform theories of social organization in societies of various scales and temporal settings. Hohokam culture and chronology in the Tucson Basin are then presented, along with a review of current interpretations and ongoing research in the area, specifically in relation to the social function of platform mound architecture. Next, the results of previous zooarchaeological

research at sites from the Tucson Basin are presented and reviewed followed by a review of the history of research, interpretations, and site construction of the Marana Platform Mound Site. This is followed by a discussion of zooarchaeological methods utilized in this study, and the presentation of analysis results. The final portion of this thesis discusses the results of this research in the context of the above hypotheses concerning sociopolitical organization in the Marana Community.

CHAPTER II: SOCIAL ORGANIZATION, THE MIDDLE-RANGE APPROACH

The trajectories of complexity in archaeological societies have been historically theorized from a variety of viewpoints grounded in cultural anthropology including, but not limited to, functionalism, structural functionalism, and Marxism (Trigger 1989). Perhaps the most lasting and salient concept in archaeological thought is the development of society in terms of the evolutionary models of culture first put forth by Steward (1955) and White (1969) and elaborated by the neoevolutionary models of Fried (1967; 1968) and Sahlins and Service (1960 (1973)). Though these models have lost some favor among contemporary archaeologists, as will be briefly discussed, they have provided a solid foundation from which new theories of social organization have been developed, if not by building and elaborating on these evolutionary models, then by complete rejection and reformulation.

Evolutionary theories of cultural complexity are derived from scientific theories that address the development of complexity in biological and physical systems. Sahlins and Service specifically attempted to apply the concepts of “general” and “specific” evolution based on the idea that “...culture has diversified as it has filled in the variety of opportunities for human existence afforded by the earth” (1960 (1973):23). In their understanding of culture, they argue that cultural traits develop based on historically known sequences of adaptation, and that social systems as a whole develop to levels of complexity in a specific order. These “levels” are: pre-agricultural, chiefless *bands*; loosely organized by kinship, egalitarian and agricultural *tribes*; internally stratified,

highly productive *chiefdoms*; ethnically diversified but un-integrated *archaic states*; and technologically and industrially developed, territorially and culturally integrated *nation states* (Sahlins and Service 1960 (1973):37). In a similar method of classification, Fried (1968) suggests that societies can be further broken down by their method of compartmentalizing individuals. Specifically, he suggests three forms of society, including egalitarian societies, in which multiple persons have or are capable of having roles of prestige, ranked societies, in which fewer people have roles of prestige, though not necessarily power, and stratified societies, in which select people have differential access to prestige, wealth, and power.

Inherent to the evolutionary model is the idea that as cultures progress through the trajectory of complexity, individuals within the society necessarily become separated from one another in terms of their access to resources, whether those resources are subsistence-based, politically-based, or ritually-based. Inequality is viewed as one dimension of social complexity (McGuire and Paynter 1991; Paynter 1989). In summarizing thoughts on inequality, Paynter (1989:369) states, “Inequality exists when socially distinct entities have differential access to strategic resources, and this differentiation gives those with access the ability to control the actions of others.” The departure from strictly evolutionary thought arises from the discourse on inequality. In the next sentence in the discussion, Paynter says simply, “[d]ifferential access does not necessarily result in social inequality” (1989:370). Many known contemporary, historical, and archaeological societies do not fall neatly into the Sahlins-Service explanation of development; inequality between members of these groups is not necessarily an

indication of complexity, nor is complexity necessarily indicated by inequality. Ascribing the “traits” and testing models of organization that are founded on current interpretations of highly institutionalized states such as have been identified in Mesoamerica and Europe ignores the dynamics of those societies that fall somewhere in between nomadic hunter-gatherer groups and highly structured urban centers-- what Arnold (1996) calls intermediate and Lightfoot and Upham (1989), among others, have termed middle range.

In addition to making broad assumptions about inequality, the evolutionary perspective assumes unilinearity and ignores the role of individuals in a society, a criticism widely made in current research (Mills 2000; Price and Feinman 1995). Hegmon (2003) suggests that one result of archaeologists recognizing that people in the past were actively and intentionally participating in their culture, rather than being passive recipients of it, is a surge of research paradigms that reject the traditional models of conceptualizing society. Theoretical trends in contemporary North American archaeology today are more focused on the concepts that help create society in the first place, including gender, agency, symbols and meaning, material culture, and ownership of the past. These research themes rely on the creative application of social theories, political discourse, behavioral approaches, as well as topics of ecology and evolution. In combining this new focus on individuals, identity, and meaning, in addition to more typical processual approaches to archaeological theory, Hegmon advocates a “processual-plus” approach to archaeological inquiry.

Recognizing that individual actors play a tremendous role in the social, economic, and political relationships that direct the cultural manifestation that is the archaeological

record, archaeologists have come to embrace the concepts of agency and practice theory ala Bourdieu (1977) and Giddens (1984). The application of agency and practice in archaeological study is one of the major trends identified by Hegmon (2003), particularly in light of the fact that the prehistoric Southwest was free from institutionalized inequality, or strictly enforced social stratification. As Ortner (1984) explains, however, these concepts are merely a theoretical “orientation,” not a theory or method itself.

Bourdieu’s (1977) theory of practice states, in short, that the actions of the individual agent are inherently motivated, though the motivation behind the action is not always immediately known to the agent performing the action, nor the recipient. This is particularly important in what Bourdieu calls “uninstitutionalized societies,” where action, specifically political action, must be made to appear as though it reflects the greater good and accepted values of the collective group rather than the individual. Ritual and custom have a place in Bourdieu’s practice theory, particularly as it relates to the *doxa* of a social group, a shared understanding of the order of things. Giddens’ (1984) similar theory of structuration states that to be human is to be a purposive agent. Every action has a motive, though motivation itself is just the potential for action. Individuals have what is called agency, the capability to perform action in the first place (Giddens 1984:9). Giddens contends that the repetition of social actions can have unintended consequences, especially if action is used as a means to legitimize power.

Agency and practice theory are, at the core, a way to conceptualize power, both social and political, on scales less obvious than institutions. Silliman (2001) put forth a valuable application of practice and agency in the archaeological record. He applies

Bourdieu's *doxa* to several levels of inquiry, suggesting that *doxa* can be applied to circumstances, materials, and social relations, rather than Bourdieu's application of *doxa* to general existence. The focus of Silliman's work is to find the material correlate of a changed *doxa*, specifically in the face of historic colonialism, and how the practice of daily, mundane activities, or *habitus*, can also be used to negotiate political and social roles in both conspicuous and subversive ways.

Influenced by practice theory, Blanton et al. (1996) presented a theory of dual-processualism. They argue that a dichotomy exists between social relationships and the formation of differential power, particularly in terms of people-to-people and people-to-resource interactions. They suggest that there are two forms of leadership strategies in societies. Corporate power is legitimized by a collective group in which no one person takes control, rather a shared understanding of rules and roles provides for social cohesion. Network strategy focuses on the individual, who uses social networks to obtain material wealth and power. Feinman (2000) elaborates on this model, examining the historical and cross-cultural basis for these interpretations. In summary of the previous publication (Blanton, et al. 1996), Feinman outlines the basic tendencies of the corporate and network organizational strategies. He states that the corporate model emphasizes communal access and control, including that of "staple food production, communal ritual, public construction, shared power, large cooperative labor tasks, social segments that are woven together through broad integrative ritual and ideological means, and suppressed economic differentiation" (Feinman 2000:214). Corporate strategies lack a clear leader, despite the presence of monumental architecture that are often identified as evidence for

differential leadership roles. This is contrasted with the network model that emphasizes individual accomplishments including “personal prestige, wealth exchange, individualized power accumulation, elite aggrandizement, lineal pattern of inheritance and descent...particularizing ideology, personal networks, princely burials, and the specialized (frequently attached) manufacture of status-related goods” (Feinman 2000:214). Feinman stresses that unlike the unilineal models of evolution for explaining social organization, the corporate/network strategy is fluid and not necessarily exclusive; a society may utilize both strategies at different times or in different spaces, as has been shown in the Prehispanic Puebloan Southwest and Teotihuacan (Feinman 2000).

The interpretation of sociopolitical organization in the archaeological record requires what Binford (1989:21) refers to as “middle-range” research, that includes ethnographic, ethnohistoric, and ethnoarchaeological investigation combined with archaeological observations. To this end, social rank and organization has been investigated in terms of the identification of prestige goods as status markers (Bayman 2002; Potter 1992), the identification of burials with wealth (Binford 1971; Hodder 1982), and the spatial organization of domestic, ritual, and communal contexts within the boundaries of archaeological sites (Aldenderfer 1993; Hirth 1993; Schachner 2001). The work below focuses on two aspects of culture that may be instructive to the interpretation: food resources as they are used to negotiate status and identity and monumental architecture as it is used to integrate and differentiate. The focus on these two sources is in keeping with Blanton et al. (1996) and Feinman’s (2000) recognition

that monumental architecture and food resources are hallmarks of inclusive and exclusive organization strategies.

1. *Food, Status, and Identity*

Farb and Armelagos (1980) contend that eating is inseparable from all things human. As such, the role of food in society, from fulfilling the basic biological needs of humans to its manipulation for creating identity, establishing power, and supporting ideology has been the focus of many anthropological and archaeological studies. Mintz and Du Bois (2002) stressed the importance of food-related studies, suggesting that they have served to build theory across disciplines, and have helped increase our understanding of social constructions. This is highlighted by their discussion of the most commonly covered topics in food-based ethnographic studies: single commodities, social change, resource stress, ritual, and identity.

Status and identity, like food and foodways, have a long history of study in anthropological literature. Wiessner (1996:3) eloquently states that “ethnological concepts of status are more complex and ambiguous...since culture comes into play.” This is evidenced by Linton’s definition of status as the position of a person in relation to the total society, specifically the collection of rights and duties of an individual (1936 (1975)). Linton further contends that status is either ascribed – defined by and at birth, or achieved – the result of competition and individual effort (Linton 1936 (1975):189; see also Wiessner 1996). Wiessner (1996) carries this definition further, describing the

efforts of Goodenough (1965 in Wiessner 1996) to envision status as the rights and duties of the individual with regard to others. Status is also defined as social rank and prestige, understanding the human pursuit of which is the primary focus of anthropological studies (Wiessner 1996). The pursuit of rank and prestige is ubiquitous, however conscious or unconscious, and reaffirms Giddens' thesis that to be human is to be a purposive agent (Giddens 1984).

The concept of identity is closely tied to status, and is, at its core, the way in which individuals and communities conceptualize their roles within society, politics, and culture. Mills (2004b) and Ferguson (2004) provide notable contributions to the research on identity, particularly as identity is defined within societies. Ferguson defines social identity in the sense of Barth and Jenkins, stating that “[t]he dynamic recognition of similarities among the members of a group, and differences between the members of one group and other groups, is established and signified in social relations and material culture” (Ferguson 2004:28). He further argues that the embodiment of social identity by the individual combined with the collective action of individuals embodying similar identities create society. Identity is fluid, often negotiated between groups, and can be a powerful tool when manipulated for political agendas. Twiss (2007) suggests that the archaeological correlates of identity are often difficult to recognize *because* of the fluidity of social boundaries and individual identities.

In this contribution, status is defined as social position and prestige, and identity as the way in which individuals and collective communities envision their social position and prestige in comparison to one another and other groups. The anthropological

literature of food that focuses on identity and status is the most salient to this discussion, particularly the review of how food can integrate and separate individuals or communities. Literature from three subdisciplines of anthropology, ethnography, ethnoarchaeology, and archaeology are reviewed below for contributions to the study of food and identity/status. Ethnographic studies of foodways provide a way to formulate questions about the past and the future (Wiessner 1996). Ethnographic analogies cannot, or should not, be directly and uncritically transferred onto the past, but ethnoarchaeological studies provide a means of bridging the gap between the past and the present. Ethnoarchaeology is “the ethnographic study of living cultures from archaeological perspectives” (David and Kramer 2001). Archaeological studies focus on the material residues of cultural practices, providing physical evidence of how people acted in the past. The criteria and measures that are used to interpret archaeological remains are informed by both ethnography and ethnoarchaeology.

i. Food, Status and Identity in Contemporary Societies, Some Examples

Ethnographies of food are abundant, and a partial review of the classic ethnographies dealing with food and status and food and identity is presented in Mintz and Du Bois (2002). Two ethnographic studies are discussed below. The first is situated in Pohnpei where the interplay of food and space provides the most informative observations about social status and identity. The second study looks at the role of meat

in Turkana society, specifically how the distribution of it relates to prescribed social status.

Keating's (2000) study in the Micronesian chiefdom of Pohnpei took a four pronged approach to social stratification, looking specifically at the built environment, body symbols, language markers and food sharing as signals of status in the public arena. She argues that the arrangement of Pohnpei society is reflected in the practical actions that take place within the community feast house. Horizontal and vertical spaces are used to convey social differences (Keating 2000: 307) in both the construction of the feast house and the arrangement of the community members once inside the building. The feast house consists of a raised, u-shaped platform surrounding an earthen floor, with three enclosed sides and one side open to the outdoors. The highest ranked members of Pohnpei society -- the five hierarchically-ranked chiefs -- occupy the center platform, opposite the entrance, while lower ranked members arrange themselves according to their prescribed status on the side platforms or on the earthen floor. Likewise, body gestures convey status in the movement between horizontal and vertical space— to stand is to claim superior status, and to face a certain direction or enter through a specific door in the feast house declares one's social place. Food is distributed during the feast according to hierarchy and includes prepared or unprepared portions of meats and produce. Largest quantities and choicest portions of each food type are given to the highest ranked individuals first, which often results in the lowest ranked members of the society leaving the feast empty-handed. She concludes that the complex combination of the signs of status all serve to produce, reproduce, and negotiate the social system.

Lokuruka's (2006) study of meat consumption among the Turkana of Kenya looks at how the exchange and structured distribution of meat is used to reinforce social ties and status. The Turkana are a pastoral society organized by kinship group-based homesteads. Men are ranked by age in community-sponsored events, as well as within the homestead, while women are ranked by seniority in marriage. Meat and milk are consumed in daily activities, but the act of sharing meat is highly politicized. He observes that in times of resource stress, meat sharing serves both as a way to ensure the survival of all members of the community, and as a way to garner obligation from other households and neighboring communities. Two contexts of meat consumption are identified: the daily consumption of the homestead and males-only meat-feasts. In these contexts, meat is distributed on multiple levels. Within the household, age and the order of marriage are valued, while during males-only feasts, age, order of initiation, and wealth are valued. Every portion of the slaughtered animal has symbolic meaning, and is given to the beneficiary who exemplifies the same symbol in the community. For example, the right sides of the animal are considered desirable and of the highest quality, thus belonging to the heads of households, first wives, and eldest males, while the left sides and internal organs are lower quality belonging to youngest wives, children, and uninitiated men. He concludes that because livestock meat occupies the highest place in Turkana societal ranking of food, it is the only food that reflects the Turkana social constructs of gender, rank, respect, and status in the public sphere (Lokuruka 2006).

ii. The Ethnoarchaeological and Ethnohistorical Bridge (to Somewhere)

Central to middle-range theories of sociopolitical organization is the examination of the present through the eyes of the past, such as through ethnoarchaeological investigations. Anthologies of food and anthropology are replete with ethnoarchaeological comparisons, such as those put forward by Twiss (2007) and Dietler and Hayden (2001b), and provide valuable insight into the discussion. As discussed above, research by Schmitt and Lupo (2008) is a valuable ethnoarchaeological contribution to the discussion of the relationship between status and meat consumption. Additional research by Kirch and O'Day (2001; 2003) adds to this body of literature through an examination of the role of luxury foods in historic-period Hawaii. The authors examine the ethnohistoric record of protohistoric Hawaii for what they refer to as the "sumptuary consumption" of luxury foods as a symbol of status. Polynesia has more than thirty ethnographically documented cultures that range from small-scale groups to hierarchically differentiated chiefdoms, allowing for particularly informative cross-cultural comparisons. They focus their analysis on four households in Kahikinui, Maui, an area of the archipelago that remains undeveloped in modern times, and represents a marginal environment for the procurement of food resources in protohistoric times. This work builds on Kirch's previous analysis (2001) of feasting in three of these communities, which identified correlations between consumption and status, as well as his archaeological analysis of fauna from elite and commoner residences that found similar patterns of distribution related to status. The ethnohistoric record describes

symbolic associations between food, deities, ancestral spirits, social status, and gender. Flesh foods, such as pig and dog, were reported to be luxuries for elite consumption, as were fish. Shellfish consumption was restricted by taboos aimed at conservation, shellfish could only be taken when mature, and were given first to the chief, and then for the commoners. Rats were hunted for sport but, according to historic accounts, were not consumed. The zooarchaeological record showed that the luxury foods of pig, dog, fish, and mature shellfish were consumed by elites as expected. Commoners, on the other hand, ate fish and immature shellfish. Surprisingly they also consumed rats, a species thought to be taboo according to the ethnohistoric record. Kirch and O'Day conclude that although the elites and commoners shared a similar, marginal resource base, they differed in their access to specific items, as well as their exploitation of others.

iii. Archaeological Examinations of Food and Status

Archaeological examinations of food and status are likewise abundant. As with most material culture studies, the locales of production, distribution, consumption, and disposal are examined as a means for detecting changes and differences on intra-site and inter-site scales (Crabtree 1990; Gumerman IV 1997). Three types of archeological literature are examined here. First, the category of “special or not” is reviewed. Defining status and identity is tied to the recognition of differences between daily consumption and consumption of special items. In other words, it is necessary to identify the foods of *habitus* in order to recognize the foods of luxury. Next, I look at the categories of

archaeological study that explicitly examine status and identity, or those that take luxury and *habitus* (through the analysis of diversity, quantity, and quality) to the next level of investigation. Because much attention has been focused on the evidence for elite-sponsored feasting, or at least feasting events that may have been part of identity and community creation (Mills 2004a), feasting studies are briefly examined here. Feasts provide a look at the most overt expression of status and identity. The methods of zooarchaeological analysis used in these studies are applicable cross-culturally and cross-temporally, thus a variety of contexts are briefly discussed below.

As previously discussed, the concept of luxury is defined by van der Veen (2003) as any item that goes beyond the daily needs of the individual or household. From a zooarchaeological perspective, Ervynck et al. (2003), suggest that this definition is too simplistic and that faunal remains should be examined by four criteria: nutritional needs; individually, socially, or culturally defined needs that are not necessarily essential; affluent consumption that goes beyond basic nutritional and culturally defined needs; and luxurious consumption that is limited in quantity, nutritional contribution, and availability. Affluence is therefore measured by the quantity of goods consumed and luxury is measured by the quality of goods consumed. Structured within a framework of optimal foraging theory, they examine luxury foods in medieval European contexts. Luxury foods are considered to be those with direct or indirect costs that are substantially higher than necessary (Ervynck, et al. 2003:431). These include rare foods that occur in low abundances and require high time and energy investment to procure or produce, or import or trade, foods well outside the geographic region of focus, foods that are

otherwise restricted to other members of the community or society, prime quality portions of meat that are present more often than lesser quality portions, a higher than normal diversity of species, and foods that are consumed before they have reached peak age.

The identification of luxury items in the archaeological record is constrained by the limitations that affect all interpretations of faunal materials, including sample size, bias, and recovery technique (Ervynck, et al. 2003; Reitz and Wing 1999). Ervynck et al. (2003) and van der Veen (2003) all contend that an understanding of the contexts, both temporal and archaeological, from which faunal remains are recovered can aid in the recognition of quality items. While historical sites studies benefit from access to written documentation, prehistoric sites can be more fully understood if, prior to seeking luxury, status, or identity, the daily expected assemblage is first studied. Atalay and Hastorf (2006) have recently presented a well-rounded examination of the daily uses of foodstuffs at Çatalhöyük, including butchering practices, cooking methods and locations, and the seasonally-constrained distribution of faunal and botanical resources. From this multi-faceted approach, they are able to conclude that general equality is observed from one household to the next in terms of daily consumptive practices. Gendered differences in food consumption are identified by isotopic signatures in human bones, and occasional communal feasting events are easily recognized by dense concentrations of wild taxa that, while uncommon in the daily assemblage, show markedly different cooking techniques.

Though focusing on the botanical assemblage, Turkon (2004) takes *habitus* a step further, asking how social identities are created in every aspect of life, including daily activities of food preparation, presentation, and consumption in the Malpaso Valley of Zacatecas, Mexico. Using expectations of domestic activities within domestic space, she argues that elite participation in daily life should be limited in the residues of food preparation in domestic contexts and instead show greater diversity and quality in consumption. The archaeological record revealed that food preparation features were not completely absent from any context, suggesting that all members of society participated in some level of food preparation. Elite diets were more diverse than lower status diets, but the diversity indices were less definitive between households that had been previously defined as low and intermediate status by the presence of prestige goods. She suggests that the location of the Malpaso Valley away from the rest of Mesoamerica allowed the inhabitants to express their identity and status in different ways than expected, particularly by the acquisition and accumulation of foods rather than prestige goods. She concludes that people in Malpaso Valley society distinguished themselves by daily activities and food consumption; social organization was more complex than a simple elite-or-commoner dichotomy based on economics and instead may have been based on ideological power.

Hockett (1998) structures his examination of sociopolitical organization at the Fremont site of Baker Village within the framework of spatial distribution. Looking at quality and quantity of faunal remains, he hypothesizes, based on theories of sociopolitical organization of middle-range societies, that differential numbers of species

will be found in ceremonial structures and leader-associated residences, though quality portions of meat may not follow the same lines of distribution if the leader did not have exclusive access to resources. Random distribution of faunal remains would indicate a more egalitarian society, while ordered distribution in particular locales could represent the presence of feasting, and therefore more formalized inequalities. Indeed, Hockett defines the fill debris of the Central Structure in Baker Village as a large scale feasting event, thus concluding that inequalities were likely present and based on influence and persuasion from a single individual or group.

The food remains from Moundville, Alabama have been examined by both Welch and Scarry (1995) from a paleobotanical perspective and Jackson and Scott (2003) from a zooarchaeological perspective from different contexts throughout the site. Welch and Scarry (1995) examined pottery and plant remains from two prehistoric farmsteads, a single mound center, and Moundville itself, all within the Moundville chiefdom, and all within contemporaneous contexts, in an effort to better understand the foodways of the Moundville community. They find evidence that indicates status-related variation in food preparation, consumption, and disposal; differences were observed from one farmstead to the next, as well as between the mounds and farmsteads. They suggest there may have been a system of food preparation in which lower-status individuals or households contributed food to higher status households or individuals.

Jackson and Scott (2003) build on Welch and Scarry's conclusion of disparity in status at Moundville, analyzing instead the faunal remains from two exclusively elite and mound-associated contexts. They suggest that the expected assemblage of elite

households would be directly related to the elite's reliance on followers to provide food through "gifts, tribute, or systematic provisioning" (Jackson and Scott 2003:552). They also suggest that food preparation practices will reflect conspicuous waste – meat will be grilled instead of boiled to retain fats, and bones will be discarded without extensive processing for marrow extraction or grease rendering. Elite assemblages will also contain a diversity of species that reflect either preferential or exclusive access to certain species, some of which may be related to the ideology and cosmology of the community. Their results highlight subtle and unexpected differences between the elite-associated mounds, in the presence of unusual taxa and higher bone fragmentation from one mound to the next, and the existence of large scale feasting events. They conclude that zooarchaeological studies should be added to the "list of artifacts categories" useful for identifying subtle differences in social status (Jackson and Scott 2003:568).

The archaeological and ethnoarchaeological studies above highlight that an important aspect of status and identity creation is through the act of communal consumption. Indeed, the ethnographic studies discussed focus on the *public* performance of eating. Feasting as a topic has been extensively covered elsewhere (Bray 2003; Dietler and Hayden 2001b; Mills 2004a) and case studies of archaeological assemblages abound. Heavily cited for their work on feasting, Hayden and Dietler provide the most inclusive definition of feasting as the "communal consumption of food and/or drink" (Dietler and Hayden 2001a) outside of the context of daily eating or the simple exchange of foods without consumption. Interestingly, the authors diverge in their definitions; Dietler argues that feasting is a ritual and political activity while Hayden argues that feasting is any

“unusual occasion accompanied by an unusual shared meal” (Dietler and Hayden 2001a:4). Being more specific, Potter (2000:472) defines feasts as consumption events that integrate and differentiate through communal or competitive action. Ultimately feasting is a political act, that serves to establish or maintain power dynamics within a society (Dietler 1996; Phillips and Sebastian 2004; Potter 2000; Potter and Ortman 2004).

As Potter asserts (2000:475), not all feasts are created equal – this is supported by the categories of feasting outlined by Hayden (2001) and Dietler (1996). The archaeological signatures of feasting as listed by Hayden and reproduced by Wills and Crown (2004) suggest that the identification of these signatures is relative to the context. In terms of faunal remains, the supposed “signatures” of the feast may be rare taxa that are difficult to prepare or procure, unique combinations of foodstuffs, unusually large quantities of food remains, concentrations of bones, or wasted portions, all potentially found within the context of specialized structures, vessels, or facilities associated with cooking or food preparation (Wills and Crown 2004:155). Of course, as Wills and Crown state, the archaeological signatures of a feast in one archaeological context may be completely different in another context.

The identification of feasting events in the archaeological record is similar to distinguishing social identity and status. It is first and foremost dependent on a thorough understanding of the assemblage in question. This includes knowledge of all possible species that may account for daily consumption; in other words, knowing the foods of *habitus* as differentiated from the foods of luxury. It is also important to understand how foodstuffs are distributed between individual contexts within a site, whether from

excavation units, features, or residences. Finally the diversity of taxa must be examined closely. Measures of diversity are closely tied to sample size (Reitz 1987) – smaller samples may show inappropriately high diversity. Additionally, ritual deposits, evidence of craft production, or curation of select elements may also skew diversity, and, therefore, the interpretation of archaeological feasting events.

2. Monumental Architecture

Blanton et al. (1996) and Feinman (2000) suggest that monumental architecture, like food resources, are one expression of social organization. Monumental architecture, by Trigger's (1990) definition includes large houses, public buildings, and special purpose structures. He states that the "principal defining feature is that its scale and elaboration exceed the requirements of any practical functions that building is intended to perform" (Trigger 1990:119). Though structuring his analysis through systems theory, Trigger also acknowledges that the construction of monumental buildings requires not only the ability to plan and engineer, but a labor force from which to enlist help. Monumental architecture is, essentially, a public display of communal effort, either by coercion or cooperation, which also served to establish identity.

While monumental architecture in more stratified societies may serve as a symbol of coercive ability (Trigger 1990), Adler and Wilshusen (1990) suggest that monumental architecture in non-stratified societies had a social integrative function. Specifically, they define social integrative facility as "...a structure or prepared space that is socially

acknowledged as a context for integration of individuals above the household level” (Adler and Wilshusen 1990:134). Using ethnographic data from around the world, they find there is a direct correlation between community size and the presence of large-scale community architecture. They find that the specialized structures, even the smaller communal structures, are built by cooperative effort of the community and are often expressions of ideology. Both ritual and non-ritual activities may occur in these structures, including daily, non-ritual consumption, though some structures function more specifically for integrative ritual. Contrasting the archaeological record of kivas in the Puebloan southwest, Adler and Wilshusen note a similar pattern of integrative use. For the earliest times, they suggest these structures may have served general uses – secular and non-secular – but became more restricted to only non-secular use in later periods (Adler and Wilshusen 1990).

Joyce (2004) discusses the intended and unintended consequences of building monuments in Formative Period Mesoamerica, specifically how these activities led to “structuration” – the process through which agents use practical and traditional knowledge to create new forms of society. She argues, based on evidence from Honduras, that the first monuments were built using traditional technologies and with simple functions in mind, particularly as supra-household spaces (Joyce 2004:19) for activities that were likely already happening within domestic spaces (i.e. feasting, dances, games, etc.). Joyce concludes that the first monuments had a lasting, unintended effect on the Formative landscape: stratifying space through traditional knowledge, thus giving way to the sacred ancestral mountains of the Classic Maya and Postclassic Aztec.

Johansen (2004) ties monumentality to ritual, and ultimately to complexity, in his examination of ashmounds in Neolithic South India. He states that the ritual behavior associated with cattle pastoralism gave rise to the construction of ashmounds, features made of burned cattle dung, dirt, and cultural fill. He further argues that the ashmounds are sites of public, repetitive, and ceremonial expressions of rituals because of the permanence, scale, ubiquity, visibility, and centrality of the structures (Johansen 2004: 323). He concludes that the ashmounds served to reinforce the complex network of socio-symbolism in agro-pastoral lifeways.

The examples above have shown how studies of foodways and studies of monumental architecture have been used to understand social organization in ethnographic and archaeological societies. As human agents seek to establish their identity and social status within a society, certain mechanisms are imbued with the power to create, establish, and reaffirm these social roles. Food can be manipulated to differentiate and integrate people in a community in subtle and symbolic ways. Structures can serve the same function in a more overt manner. The Hohokam of the Southwest present an opportunity to examine how both food and monumental architecture can be used in the interpretation of social organization, specifically if faunal remains from the Hohokam community at Marana reflect the current interpretation of the Marana Platform Mound as a site for community integration.

CHAPTER III. THE HOHOKAM

The Hohokam represent one of the four major archaeologically defined sedentary farming groups of the Southwest (Bayman 2001; Crown 1991). Located in the Basin and Range province of the Sonoran Desert, the Hohokam are generally divided into two groups: the “core”, those who inhabited the Salt and Gila River valleys in the Phoenix Basin with higher population densities and relied on large-scale irrigation, and the “periphery”, those who inhabited the Tucson Basin along the Santa Cruz River, as well as those in the San Pedro, the Verde, the Agua Fria, and Hassayampa River valleys and the Tonto Basin with smaller population densities and relied on small-scale irrigation and other agricultural techniques (Bayman 2001). The Hohokam were first identified as a distinct culture group by Frank Hamilton Cushing and Jesse Walter Fewkes in the late nineteenth and early twentieth centuries, an observation reaffirmed by Alfred Kidder’s 1924 ceramic analysis which initially defined the Hohokam as the “red-on-buff culture,” (Reid and Doyel 1994:195). Harold S. Gladwin was one of the first archaeologists to thoroughly document the Hohokam, and with the help of his wife, Winifred, and a young Emil Haury, he defined the hallmarks of Hohokam culture, including ceramic typologies, lithic technology, architecture, and village structure. The majority of these observations came from the site of Snaketown, one of the most extensively excavated Hohokam sites in the Phoenix Basin, which served as the type site for Hohokam culture in both the core and the periphery (Gladwin, et al. 1937; Haury 1976; Wilcox, et al. 1981).

The chronology of the Hohokam world has been a much debated subject beginning with the first investigations at Snaketown that prompted Haury's reinvestigation of the site in 1964 (Haury 1976). Subsequent recalibrations based on new dating techniques, additional excavations, and semantics have created a complicated schema of periods and phases. The already complicated schema is made even more so by the addition of distinct regional chronologies for the Tucson Basin and the Phoenix Basin. Several publications are particularly useful in providing both visual representations and discussions of the Hohokam periods and phases, including those put forth by Crown (1991:229), Schiffer (1995:154), and Bayman (2001:264), though these chronologies are based on the seminal chronology developed by Dean (1991). For the purposes of this research, chronological sequence of the Hohokam world (Figure 1) is considered as discussed in Rebecca Dean's dissertation and related publications (Dean 2003, 2007), but also as classified by Bayman in his overview of Hohokam prehistory (Bayman 2001). Discussions of the Hohokam cultural sequence below are based on Bayman's recent synthesis, and thus utilize his regional classification system of Formative (1000 B.C. – A.D. 700), Pre-Classic (A.D. 700 – A.D. 1150), Classic (A.D.1150 – A.D. 1450), and Post-Classic (A.D. 1450 – A.D. 1650). Below, I briefly touch on some of the major organizational topics of the Hohokam culture through time, specifically subsistence strategies, architecture, and village structure.

Dean 2003					Bayman 2001	
Date	Phase		Period		Regional Period	
	Phoenix Basin	Tucson Basin	Contact Period		Historic	Post-Classic
A.D. 1650						
	Polvoron	?	Post-Classic		Proto-historic	Post-Classic
A.D. 1450						
	Civano Soho	Tucson Tanque Verde	Classic	Late Early	Classic	Classic
A.D. 1150						
	Sacaton	Late Rincon Middle Rincon Early Rincon	Sedentary		Preclassic	Pre-Classic
A.D.950						
A.D.750	Santa Cruz Gila Butte	Rillito Canada del Oro	Colonial		Preclassic	Pre-Classic
	Snaketown Sweetwater/Estrella Vahki	Snaketown Tortolita	Pioneer			
A.D.650					Preclassic	Pre-Classic
	Red Mountain	Agua Caliente	Early Ceramic Period			
A.D. 1					Archaic	Formative
	Late Cienega Early Cienega San Pedro		Early Agricultural/Late Archaic			
800 B.C.					Archaic	Formative
1200 B.C.	Chiricahua		Middle Archaic			
3000 B.C.					Archaic	Formative
	Sulpher Springs		Early Archaic			
8000 B.C.					Paleoindian	Formative
10,000 B.C.	Paleoindian		Paleoindian			

Figure 1: Hohokam Chronology (Based on Dean 2003, Figure 2.3, p 56, and Bayman 2001, Figure 4, p 264).

1. *Environment*

By the end of the Pre- Classic period, the Hohokam sphere of influence, interaction, and exchange likely exceeded 100,000 square kilometers (Doyel and Fish

2000), but was no less than 73,000 square kilometers (Bayman 2001, citing Doyel 2000). This wide range of landscape use meant that the Hohokam were well acquainted with many environmental life zones. In fact, five biomes have been identified in the Sonoran desert alone, two of which, the Lower Colorado River Valley biome and the Arizona Upland biome, are associated with the Hohokam range of occupation (Masse 1991). Archaeological evidence further supports that the Hohokam were able to best utilize the resources available in elevation ranges below 3,500 feet (Fish and Nabhan 1991).

Fish and Nabhan (1991, see also Lowe and Brown 1982) have extensively described the Sonoran Desert habitat in which the Hohokam thrived, suggesting there is a direct correlation between the extent of the Hohokam occupation and the extent of the Sonoran Desert, particularly between the distribution of saguaro cactus, mesquite trees, and people. Daily living activities likely occurred on the floors and *bajadas* (slopes) of the basins, while most hunting and gathering activities likely took place in the desert mountains. Fish and Nabhan (1991) posit that once the Hohokam became more sedentary, the abundance of the Sonoran Desert meant that foraging expeditions could be completed within a single day, with the weight of the water necessary to make the journey being replaced by the resources collected for the journey home.

The Sonoran Desert is characterized by a bimodal rainfall pattern, one season in the winter and early spring, and one in the late summer. This allowed the Hohokam several options for farming and gathering. For those who lacked large scale irrigation features, floodwater farming, water table farming, run-off farming, and dry farming could

be employed to catch precious water for crops, or to simply supply water to known sources of wild vegetation (Doolittle and Mabry 2006).

The Hohokam were adept farmers and foragers, able to effectively utilize resources from both the modified and unmodified landscape. Although recognized as a sedentary farming group, wild plant and animal resources were an integral part of the Hohokam subsistence economy. As previously stated, the Sonoran desert provided rich supplies of wild resources that could be gathered and stored for long periods of time. The fauna of the Sonoran desert played an important role in nutrition, tool manufacture, ornamentation and ideology. Expeditionary hunting forays into the surrounding mountain ranges would have provided the Hohokam with ample supplies of deer, big horn sheep, and pronghorn meat and bones for crafting of awls, needles, hair pins, and jewelry (Griffitts and Waters 2005; Olsen 1979).

2. Formative Period

The Formative period (1000 B.C.-A.D. 700), as described by Bayman (2001), represents one of the least known time periods in the Hohokam chronology. It is during this time that archaeologists debate the origins of the Hohokam. Some argue that a migrant group from Mesoamerica arrived in the region with prior knowledge of agriculture and irrigation technology, which spurred the growth of the Hohokam (Haury 1976; 1994:447). However, Whittlesey (1995) suggests that the Early Formative period represents an “initial stage of cultural development” in the southern Southwest, within

which no distinct cultural group existed. She cites Di Peso's cultural tradition, the O'otam, as the group from which all of the distinct groups were derived. This is supported by the fact that plain ware ceramic horizons in regions defined as Hohokam and Mogollon share very similar cultural patterns. Regardless of the actual origins, the term Hohokam is used for this time period because the first traces of the later cultural tradition are identified, including pit house villages and the beginnings of a craft economy.

i. Subsistence Practices

The Early Agricultural Period (1200 B.C. – A.D. 1) is considered part of the Formative Period (Dean 2003); it was during this time that the cultural group acquired and began to rely upon domesticated plants. The first irrigation and water control features are identified in the region. Prior to and during the early parts of the Formative Period, the peoples of southern Arizona were mobile groups who depended on foraging for wild plants and animals for subsistence (Dean 2003).

Although it has been recently proven that maize was introduced into the region nearly 4,000 years ago (Mabry 2005), paleoethnobotanical and zooarchaeological remains suggest that the domesticate had little impact on their hunting and gathering lifestyle. This has led some to refer to the introduction of maize into the Southwest as “one of the biggest, most important non-events to happen” (Minnis 1985). Archaeological evidence suggests that early groups were already becoming sedentary

before agriculture, likely utilizing the abundant resources of the Sonoran desert (Fish, et al. 1990). It is also possible, as Doolittle and Mabry (2006) suggest, that many varieties of native plants, such as amaranth, were being manipulated by humans in the region before maize was fully adopted, albeit not on the same scale as emerged with maize agriculture.

ii. Architecture and Village Structure

As maize became a staple of pre-Hohokam diet, mobile groups were forced into more permanent settlements and a greater commitment to agriculture. Residential architecture consisted of ephemeral, square-shaped houses-in-pits, with mud and brush walls. Villages were arranged in small clusters of pit houses with extramural storage facilities, all arranged around a central plaza (Crown 1991; Doyel and Fish 2000; Haury 1976). Large structures identified in Formative period sites are interpreted as locales for ceremonial, ritual, or communal activities (Mabry 2000).

3. *Pre-Classic Period*

During the Pre-Classic period, approximately A.D. 700 to 1150, the “robust archaeological signatures” associated with the Hohokam are found (Bayman 2001:270). Key Hohokam material culture is noted, including the construction of ball courts, large-scale canal systems, cremation of the dead, and red-on-buff and red-on-brown ceramics

(Wallace, et al. 1995). It was during the pre-Classic that the Hohokam reached their greatest spatial extent. The concept of the Hohokam “regional system” also develops from the observations made during more recent archaeological excavations and archival research (Crown 1991; Doelle and Wallace 1991).

i. Subsistence Practices

By the Pre-Classic period, agriculture was in full swing. Canals first built in the Formative period were expanded and used to water several types of cultivated crops, including maize, cotton, beans, and squash (Gasser and Kwiatkowski 1991). Agave cultivation is also identified by the presence of rock pile mounds in open fields near large roasting features with paleoethnobotanical remains (Fish, et al. 1985). Foraging continued to be important, and harvesting efforts focused particularly on seeds and beans from trees and shrubs and fruit from cacti (Bayman 2001).

Zooarchaeological evidence from the Pre-Classic reflects a greater dependency on agriculture. Szuter (1989) suggests that the cultural modification of the environment for agricultural practices would have greatly affected the habitat of certain species, including varieties of lagomorphs, as well as affecting meat acquisition potential. A “garden hunting” strategy was likely employed, meaning that the animals most likely found in agricultural fields would have been taken with greater ease and abundance, as part of the daily diet and as means of pest control (Linares 1976). The faunal record throughout the Hohokam shows, for most sites, a greater reliance on small animals such as rabbits and

rodents that were easily captured in agricultural fields. While large prey such as deer and bighorn sheep are still observed in upland sites, Szuter argues that the presence of artiodactyl remains in other sites is likely a result of ceremonial activities, bone tool production, and limited subsistence activities, an observation similarly made by Dean (2005a).

ii. Architecture and Village Structure

Residential architecture was characterized by individual pit houses. These were true pit houses, constructed by excavating pits in to the ground, then covering the pit with a superstructure made of interwoven branches covered with mud. Houses were more formally placed around communal plazas called courtyard groups. Villages were comprised of several courtyard groups, and as noted by Bayman (2001:271), are identified in the literature as “village segments” or “precincts”. Citing Doyel (1991), Bayman suggests that courtyard groups may be formed on the basis of kinship, and often shared cemeteries, roasting pits, and trash middens. Pre-Classic villages are generally located along canal branches, leading some to suggest a communal system of land ownership similar to those in other ethnographic communities that rely on irrigation agriculture (Hunt, et al. 2005).

The Pre-Classic period gives rise to the use of monumental architecture. The most notable architectural development during this time is the construction of ball courts. In a survey of 165 Hohokam sites, Wilcox (1991) notes that 206 ball courts are recorded. The

actual function of these structures is debated, although, as their name suggests, most authors presume that these features were used as ball-playing courts; however, it is clear that massive labor investment was required for their construction, and that they had great significance in pre-Classic villages. Ball courts likely served as a major social integrative space where public ceremonies of some type were carried out (Wilcox 1991).

The site of Snaketown typifies Hohokam life during the Pre-Classic period. At its height, the village of Snaketown occupied over one square kilometer. A ball court near the central plaza at Snaketown is one of the largest in Arizona, measuring sixty meters long with an earthen berm that stands over five meters tall (Haury 1976). Additional *monumental* architecture was identified at Snaketown: caliche-capped mounds. Interpreted as dance mounds, they stood only a meter tall, and were likely part of the ceremonial activities at Snaketown (Crown 1991).

4. *Classic Period*

The Classic period is defined by the years between A.D. 1150 and 1450, and is generally divided into two subperiods, the “Early Classic” and the “Late Classic.” As Bayman aptly states, “unprecedented changes in patterns of settlement, technology, material culture, and ideology took place during the Classic period” (2001:281). Populations that were once evenly spread across the Hohokam world became more compact and centralized near monumental architectural features including irrigation canals and platform mounds. The reasons for this shift likely include the fact that

irrigation farming had reached its peak and was a highly reliable subsistence technology. Environmental stresses, political and ideological reorganization, demographic pressures from in-migration, and warfare may also have served as catalysts for aggregating communities (Dean 2005b; Fish and Fish 1994; Fish and Fish 1991; Wilcox and Haas 1994).

i. Subsistence Practices

Agricultural practices diverged between the Phoenix and Tucson basins during the Classic period. While the canal system along the Gila and Salt Rivers expanded to over 500 linear kilometers (Masse 1991), farmers in the peripheral areas focused their efforts on advancing dry-land agriculture. Agricultural specialization in agave cultivation is observed in the Tucson Basin by the use of over 500 hectares of rock piles and alignments, as well as water control devices to control run-off by the early Classic Period (Fish and Fish 1992; Fish and Fish 2006).

Rebecca Dean (2005b) presents an insightful cross-temporal study of zooarchaeological remains from the Hohokam region. She argues that the zooarchaeological data reflects site-use intensity, specifically through the increased occurrence of non-prey taxa that rely on habitats and foods that are manipulated by humans. Using NISP, ubiquity, and statistical analyses, she notes an increase in rodents and birds that would have been attracted to anthropogenic environments from the Hohokam Formative through the Classic Periods. She suggests that the rodent and bird

data indicates that there was greater manipulation of environments in the later periods. The Early Agricultural period, with less evidence of rodents and birds, was likely a time of seasonal occupation, lower populations, and overall lower site-use intensity. Her study raises the question of how large game utilization changed during these time periods; specifically if an increase in large taxa suggests more freedom for expeditionary hunts or if a decrease indicates labor intensification in fields and therefore a “forced” reliance on small game.

ii. Architecture and Village Structure

Classic period architecture reflects the shift in community consolidation and exclusion. Pit houses were built using the longer-lasting method of coursed adobe construction. Although courtyard groups persisted, the groups now constructed adobe walls around their houses creating formal “compounds.” In the Tucson Basin, northern Sonora, and the Papagueria, villages were sometimes built on terraced hillsides, though their function as war refuges or efficient agricultural communities is still debated (Bayman 2001:281; Wilcox and Haas 1994).

Ball courts were abandoned during the Classic period, giving way to two new types of monumental architecture: the Early Classic period Platform Mound, and the Late Classic period Great House. Over 40 platform mounds are documented in the core area that date to the Classic Period (Crown 1991). Adobe construction used in house construction technology was also used for both new building types. Platform mounds

began as a series of retaining walls (made of coursed adobe) that were then filled with earth or refuse and sometimes capped with caliche (Gregory and Nials 1985). Some evidence suggests that platform mounds were constructed on preexisting structures, such as the mounds recorded at University Indian Ruin and Martinez Hill (Fish and Fish 2006). Though habitation structures were then built on top and walls were built around the mounds to restrict access; the meaning of this action is debatable. Similarly, Late Classic period Great Houses, like the one still standing at Casa Grande, resemble present day, multistoried apartment buildings and were built using blocks and courses of adobe. Towers are also observed atop platform mounds and associated with great houses (Bayman 2001:289).

5. Post Classic Period

The Post Classic period is signaled by the “collapse” of the Hohokam around A.D. 1450 and ends with the arrival of the Spanish in 1540. Unfortunately, not much is known about the century before Spanish contact. Hohokam communities became invisible in the archaeological record. In fact the largest excavated “village” that supposedly dates to this period had only eight structures (Sires 1984).

Like the early Formative period, this period is highly debated among archaeologists. As Bayman (2001:290) explains, the Polvoron phase was originally thought to be the last vestiges of the Hohokam world, characterized by jacal pit house structures, Salado polychromes, yellow wares and obsidian. However, Henderson and

Hackbarth (2000) argue that the Polvoron phase, despite suggestions that it represents the illusive Postclassic occupation of the Southwest, is actually a late Classic phenomenon contemporaneous with the Civano phase. Although this further complicates the issues of sociopolitical organization in the Classic period, archaeologists are now recognizing the presence of households on the peripheries of some sites. Polvoron pithouses outside of platform mounds may represent immigrant groups escaping distress in their homelands that were seeking to attach themselves to a community. The implications for this finding, in addition to indicating that this time period was one of major upheaval throughout the Southwest, are two-fold: that social relationships prior to contact were more complex than originally thought, and that Classic period platform mounds were more integrative than exclusive in function. They stress the need to recognize variability as human response to events, and that strict temporal definitions narrow our view of the archaeological record.

Explanations for the demise of the Hohokam range from dramatic environmental shifts that created periods of long droughts and episodic flooding (Waters and Ravesloot 2001); warfare (LeBlanc 1999); and disease (Reff 1991). Hill et al. (2004) attempt to account for the 'disappearance' of the Hohokam by presenting a model of coalescence in the region. They argue that through time, the number of sites on the landscape drops as the size of sites increases. Essentially, they contend that the Hohokam moved from smaller, dispersed settlements into larger, aggregated sites. This may have been caused by changes in fertility and mortality, migration and in-migration that required increased

centralization, emphasis on kin-groups, or security, and environmental changes that affected agricultural practices.

Fish and Fish (2006) and others have raised concern regarding the timing of the Hohokam collapse and the arrival of the Spanish in the Southwest. In several cases, European artifacts have been recovered from in situ contexts with late Classic period artifacts. If these instances, combined with the lack of accurate tree-ring dates for the region and the admittedly inaccurate chronology of the Hohokam, were to be carefully scrutinized, a new chronology for the Hohokam may bridge the gap between the end of the Classic period and the arrival of the Spanish. Likewise, the documents left by Europeans may provide Hohokam archaeologists with some understanding of what was happening in the Hohokam region prior to contact. Responses like the coalescence of communities (J. B. Hill, et al. 2004) may be even more plausible if we can establish that, for example, the epidemic diseases that decimated populations in Mesoamerica, arrived in the Southwest before the Spanish.

6. The Curious Case of Platform Mounds

The construction of monumental architecture, regardless of the society in which it occurs, symbolizes a collective participation in a group identity that can only take place once a certain level of complexity has been achieved. From the massive canal systems of the Phoenix Basin to the ball courts found throughout the region, the Hohokam must have been able to organize themselves and their labor to meet common goals. Because the

Classic period experienced the unprecedented changes described by Bayman (2001) the architectural shift from ball courts to platform mounds observed in the Classic period represents the most visible sign of social differentiation and/or incorporation in the Hohokam world. As such, it also represents one of the most highly debated architectural features of Hohokam archaeological sites. Platform mound studies take several approaches, including ideological and socio-functional as discussed below.

Ideological studies tend to focus on the actual meaning of the mound itself and how it reflects or is reflected in the rituals of the mound-building society. Jacobs (1992) argues that there is an ideological basis for the particular layout of platform mounds in the Tonto Basin. He observes that the particular configurations of platform mound walls and entries restrict access to the activities on top of the mound, all the while requiring people to move in a certain counter-clockwise fashion in order to gain access. He argues that this ritual movement is translated onto pottery in the form of counter-clockwise design elements, further supporting his idea that ideology and ritual practice are imbedded in many aspects of Hohokam life.

Likewise, Howard (1992) takes a holistic approach to his interpretation of Salado Platform Mounds, suggesting that the features of the mound must be included in analysis of the mound. He argues that certain features of the platform mound are patterned, and reflect the segregation of activities and the restriction of access. These features – entryways, public plazas, and isolated rooms, serve to divide the mound into three discernable spaces, public, ritual and ceremonial. He asserts that the visibility of people on the mound was more restricted than originally interpreted, potentially refuting theories

that platform mounds were used as a way for elites to exhibit self-aggrandizing behavior or conspicuous consumption.

Elson (1998) looks at ethnographic examples of middle-range, platform-mound building communities as a basis for interpreting platform mounds in the prehistoric Southwest. Elson noted that cross-culturally, descent groups, well-defined leaders, and suprahouseholds have a significant role in the construction and maintenance of platform mounds, and that ceremonial activities are tied directly to the construction and use of platform mounds, though their exact function may change over time. From this analysis, Elson asserts that at least three types of mounds existed in the Southwest: elite residential centers in the Phoenix Basin, centers of corporate leadership in the Tucson Basin, and multipurpose features in outlying regions.

Platform mounds in the Phoenix basin are magnitudes larger, occur in greater numbers, and began to appear much earlier than in the rest of the Hohokam world. Elson attributes this to several factors, including larger population size and a sophisticated irrigation-based agricultural economy. He argues that the Phoenix basin mounds are associated with canal systems, and likely represent the elite center for descent groups who operated the canal. The size of the mound may have had a direct correlation with the rank of its residents.

In the Tucson Basin and part of the Tonto Basin, mounds functioned in a corporate manner, and likely were the property of an entire descent group, even if leaders existed. In the outlying regions, mounds were found to be short lived and associated with smaller settlements. He interprets these mounds as roughly emulating Phoenix Basin

mounds, and notes that the rise of outlying mounds in the Tonto and San Pedro region corresponds with major environmental disturbances. In these situations, mounds were multifunctional and served to mark and consolidate territory, to integrate immigrants, and to be the center of resource distribution and feasts (Elson 1998). Elson reiterates throughout his analysis an important point: that platform mounds served different functions in every place that they existed.

Elson's final point is reasserted when specific mounds are analyzed in terms of architecture, associated artifacts, and underlying social organization. Downum and Bostwick (2003) examine the social function of one of the largest and most extensively studied platform mounds in the Hohokam world, Pueblo Grande. Platform mounds appear at Pueblo Grande beginning in the Sedentary Period. Episodes of reconstruction and expansion reflect the changing function and importance of the mound through the Late Classic period. Downum and Bostwick employ several lines of evidence, including stratigraphy, to argue that the platform mound was not used for long term residential activities, though it may have served as a short term occupation site for the preparation of ceremonies and the carrying out of special activities. Interestingly, they assert that the Pueblo Grande platform mound functioned differently for each of the multiple social groups that utilized it. The architecture of the mounds suggests that groups using the mound could not easily interact with each other, but activity on the mound was not limited to a select group of people. Artifact assemblages and features suggest the use of the mound for ceremonial, ritual, feasting, and food storage activities. The implications

for these conclusions suggest a sociopolitical organization less focused on elites and leaders within the community and more on the roles of groups.

In contrast to the Pueblo Grande model of shared access to the platform mound, Harry and Bayman (2000) analyze the Marana Platform located in the Tucson Basin in terms of power dynamics and clear leadership roles. The Marana Community had one central platform mound to serve the entire population; they argue that institutionalized leadership was necessary to facilitate the distribution of water and the maintenance of canals. Unlike the platform mound at Pueblo Grande, Harry and Bayman assert that access to the platform mound at Marana was reserved for the leaders residing within the mound compound who would have exercised control over ritual, ceremonial and other social or political events carried out on the mound. Harry and Bayman restate the three-tiered settlement hierarchy put forth by Fish, et al. (1992) and compare the artifact assemblages from nine sites within the community, including the Marana Mound. By analyzing the distribution patterns of high value goods such as certain types of local and exotic pottery, shell, and obsidian, they determine that wealth differentiation occurs between large and small sites within the community, but that access to high status goods was not necessarily restricted by elites. What is important to note about the sociopolitical organization of the Marana Community is that the occupants of the platform mound manipulated the structure as a symbol of exclusion, despite apparent continuity in wealth distribution.

7. Zooarchaeology in the Southwest

Faunal studies in the American Southwest have matured in the last few decades as archaeologists, instead of sending bones to zoologists, have taken on the task of specializing in the identification and analysis of animal remains from archaeological sites. Faunal studies contribute to our understanding of prehistoric diet, land use patterns, and environmental interactions. Szuter and Gillespie (1994) observed five major trends in the study and interpretation of faunal remains from southwestern archaeological sites: 1) small animals were important to prehistoric diets, 2) small animal hunting is a direct result of increased landscape modification due to agricultural activities, 3) the use of different types of lagomorphs changes across space and through time, 4) taphonomy and recovery methods can greatly affect interpretations of diet, and 5) behavioral processes can affect curation and preservation of certain bone types, especially artiodactyls.

Intended as a pan-southwestern phenomenon, the above trends are especially observable in the Hohokam region, where preservation and large-scale excavation projects by cultural resource management companies have provided a plethora of case studies. Szuter (1989; 1991) and Dean (2003) have provided the most comprehensive and influential overviews of Hohokam subsistence patterns, utilizing both temporal and geographical data. While Szuter's main arguments and conclusions are reflected in the overall trends discussed above, she is primarily concerned with identifying the main subsistence practices of the Hohokam, the taphonomic processes at work on faunal assemblages, and the geographic variables effecting samples. Dean, on the other hand,

while incorporating the conclusions put forth by Szuter, structures her analysis of subsistence by recording changes through time in the context of landscape use, site-use intensity, and optimal-foraging and diet breadth models. Her conclusions suggest that faunal remains reflect social and economic changes throughout the Hohokam cultural sequence, specifically in social organization, labor management, value systems, and residential movement (Dean 2003:334). Both studies have important implications for faunal analyses henceforth, especially as archaeologists seek different forms of data to assess overarching issues, such as sociopolitical organization and ideology.

CHAPTER IV: RESEARCH AT THE MARANA PLATFORM MOUND COMMUNITY

The Marana Community is an early Classic period Hohokam settlement inhabited from A.D. 1150 to 1350 and located between the Tortolita and Tucson Mountains, on both sides of the Santa Cruz River. Although it had long been recognized as culturally important, the 1981 Northern Tucson Basin Survey performed by the Arizona State Museum brought the Marana Community to the forefront of Hohokam archaeology, solidifying its place in a region that was viewed only as the periphery of the much larger, and more studied, Phoenix Basin. At the time, the archaeological sites that would eventually be defined as the Marana Community complex were relatively untouched by development, allowing for a unique, nearly *in situ* examination of the patterns and development of the Hohokam in this region of the Southwest. Additionally full coverage survey allowed researchers Paul and Suzanne Fish and John Madsen to carefully choose the locale of excavation projects that would follow (Fish, et al. 1992).

Archaeological communities in the Southwest have been defined as “multi-site territorial and political entities that have their archaeological expression in symbols, spatial patterns, and the construction of shared public architecture” (Doyel and Fish 2000:18). The Marana Community was defined by those parameters, specifically using a three tiered settlement hierarchy of site size in square meters, the presence of integrative and exclusive architectural features such as walled compound courtyard groups, irrigation canals, and monumental architecture, and shared ceramic horizon (Fish, et al. 1992:38).

The Marana Community is believed to have centered at the Marana Platform Mound, the location of ritual, ceremonial, and community activities. The University of Arizona Field School led by Fish and Fish, and later in conjunction with James Bayman, focused excavation efforts on the platform mound and the residential compounds located in close proximity to the mound, each with associated trash mounds, compound walls, and adobe walled structures (Fish, et al. 1992). Materials recovered from the Marana Platform Mound site indicate a high degree of craft specialization, especially in agave fiber processing, ceramic, and shell craft production.

1. Social Organization at Marana, a Focus on the Classic Period

The transition from the Pre-Classic to the Classic period in the Hohokam world is signaled by fundamental differences in nearly every aspect of daily life. The increased sedentism that defines the transition between the Agricultural and the Pre-Classic Periods is reinforced by an expansion of agricultural systems during the Classic Period.

Architectural changes were also a hallmark of the Pre-Classic to Classic transition. The open ballcourts and clusters of houses arranged around communal courtyards were replaced by enclosed platform mounds while the courtyard groups were enclosed by thick adobe walls. Daily life and ritual was restricted by the construction of these walled compounds, and certainly by the people who occupied the spaces inside (Elson 1998). Craft production also intensified during the Classic Period, especially in shell crafts, ceramics, ground stone, and lithic tools. Locales of production of these specialized crafts

occur at platform mound communities. Instead of being restricted to consumption by the communities nearest the Platform Mounds however, the crafts are more widely distributed throughout the Hohokam world than ever before (Bayman 2002).

The Dual-Processual Theory has been specifically applied to the strategies of social organization in the Hohokam world. Fish and Fish (2000) recently expanded their interpretations of the Marana Mound Community and the Hohokam in the Tucson Basin to encompass a modified dual processual approach. They assert that a dual development of societal power existed in the Hohokam region, in the form of kinship affiliation networks, and civic-territorial organization. These are evidenced by the presence of residential groups and bounded communities in the archaeological record, and are marked by increased exclusivity through time. Harry and Bayman (2000), also suggest that Tucson Basin saw the development of a network-based strategy, which focuses on the maintenance of relationships with neighboring communities through the exchange of goods as a means to solidify position, and the dual development of a corporate-based strategy which focuses on the maintenance of relationships with kinship or descent groups as a means of garnering support to solidify position.

2. Marana Platform Mound Faunal Studies

The Marana Platform Mound site has the unique status in Hohokam archaeology as being one of the most excavated, studied, and published sites in the Tucson Basin. Architectural and special artifact studies have already been completed by previous

researchers as evidence for the type of sociopolitical organization that characterizes the community; however, the tens of thousands of faunal materials recovered from decades of excavations present an opportunity for research that has been largely untapped. In general, the faunal studies of the Marana Platform Mound site have been completed by students focused on one of two topics: general subsistence and taphonomy or the ritual use of faunal remains. Although it has yet to be explored thoroughly, the latter topic has particular utility when viewed in the context of sociopolitical organization at Marana, and even more so when provenience is directly associated with the platform mound.

Attempting a complete analysis and synthesis of the faunal remains recovered between 1989 and 1999 and identified by at least two other zooarchaeologists, Kendall (2002) presented the first major overview of the faunal remains from Marana. In concurrence with the findings noted throughout the Hohokam region (Szuter 1988, 1989), Kendall observed that lagomorphs, specifically jackrabbits, comprised over 25 percent of the total assemblage (n=6,938), while large mammals, including artiodactyls, comprised roughly 10 percent. He also noted that fish, amphibians, reptiles and birds are rare in the assemblage (Kendall 2002:23). The primary focus of Kendall's analysis is the taphonomic processes at various locations across the site, especially between trash mounds, habitation structures, plazas, and other outdoor features. Kendall concluded that trash disposal patterns were such that significant weathering and bioturbation occurred long before trash was removed from habitation areas or covered in middens. No significant patterns of disposal, or taxonomic preference, were observed between the different loci of the site.

Similarly incorporating taphonomic studies, Colwell (1995) provides the first examination of faunal remains as ceremonial paraphernalia with his analysis of the remains from Structure 10 in Compound 1, the residential compound near the Platform Mound. Structure 10 produced an NISP of 3,135 and an MNI of 995, 97 percent of which was made up of deer (*Odocoileus* sp.), all arranged in clusters of cranial, scapular, and pelvic elements. Many of these elements were burned. Because this pattern is rarely observed in Hohokam sites, Colwell proposed four possible explanations: non-cultural formation processes, subsistence related processes, techno-functional non-subsistence processes, and ideo-functional non-subsistence processes (Colwell 1995:4).

Systematically testing each hypothesis, Colwell concludes based on the apparent intentional and undisturbed deposit, the lack of use wear, and the presence of high and low utility elements, that the deer remains likely served a ceremonial function. This is further supported by ethnographic evidence that deer skulls were used as hunting disguises and ritual costumes, scapula were used as instruments, and that rooms and their contents were often ceremonially burned.

Klokler and Thomas (2004) present a second case of ritual deposit of faunal remains from the Marana Platform Mound community, this time from a presumed residential context in Room 2, Compound 3. Unlike most residential structures at the site, Room 2 was unusually constructed—the upper portion of the room was built using an ephemeral mixture of cobbles and adobe, while the lower portion of the room had substantially built adobe walls and well plastered floors, a hearth, post holes, and unidentified pit features. The floor assemblage consisted of a reconstructable vessel, bone

awls, a spindle whorl, a knife, a palette, and turquoise fragments (Klokler and Thomas 2004:3) A total of 511 faunal specimens were recovered from the room, most notably, however, 25 rabbit mandibles, one deer mandible, and one lizard mandible were found on the floor of the structure, all concentrated in the NE and SW quadrants of the room. Using ethnographic evidence from Piman mythology and oral histories, Hopi and Zuni fertility rituals, and Puebloan hunting rituals, as well as the archaeological data, Klokler and Thomas posit that the assemblage represents an intentional ceremonial deposit related to the abandonment of the room.

Bayham and Grimstead (2006) are the first to approach the subject of sociopolitical organization, specifically the interactions between elites and non-elites at Marana by examining evidence for elite feasting on the platform mound. Two localities were analyzed: Room 9, Compound 9 which contained 170 post holes, a datura effigy, a large hearth, and a large deposit of faunal remains and was believed to be intentionally burned and dismantled, and Room 1, Compound 1 which contained the average, non-unique domestic refuse and was contemporaneous with Room 9, Compound 9. Structuring their analysis within the framework of Human Behavioral Ecology, and drawing on ethnographic literature and archaeological examples of feasting, Bayham and Grimstead proposed that feasting events should produce four criteria—a large quantity of bone in a single deposit, taxa with prestige or at least preferentially ranked, low taxonomic diversity, and associated artifacts, architecture, or features that are unique to the site. They conclude that the deposit in Room 9, Compound 9 does indeed represent a feast, but it does not stand out against the results from Room 1, Compound 1. They

suggest the feast may have been communal, non-elite, and intended to promote solidarity within the group, though an elite member of the community may have been responsible for the organization of the event.

CHAPTER V: METHODS

1. *Defining the Assemblage*

The faunal materials discussed in this paper were recovered during four field seasons of excavations at the Marana Platform Mound site. The project was carried out under the direction of Drs. Paul and Suzanne Fish of the University of Arizona, with the aid of graduate students as crew chiefs, and students and volunteers of various skill levels. Standard archaeological excavation techniques were taught as part of the field school program; excavation notes archived in the Borderlands Archaeology Lab at the Arizona State museum provide daily accounts of project activities, problems, and findings.

Archaeological materials were removed from a variety of general localities and specific features, including, but not limited to, house floors and fill, hearths, trash mounds, plazas, and various pits. Test trenches, shovel tests, and stratigraphically controlled units resulting in the complete excavation of rooms and features were completed each field season. In several instances, large rooms and compounds were excavated in part by one field crew and completed in later field seasons by another field crew. Artifacts were recovered from fill dirt by sifting through ¼ inch wire mesh screens. Flotation samples were taken systematically, and provided additional, micro scale faunal remains for analysis.

Provenience information was recorded in the field and based on a carefully calculated and georeferenced grid system. Each stratigraphic level within each feature or general locale was given a unique identifier, called a provenience designation (PD). PD numbers were assigned sequentially from field logs, which were used to store complete provenience records including grid number, feature number, level number and measurement, date of excavation, and the initials of the excavator responsible for assigning the PD number. These logs provide a cross-reference for incomplete information recorded on artifacts once removed from the field.

Post excavation sorting and cataloging of artifacts was conducted by students and graduate students at the Borderlands Archaeology Lab. Artifacts were washed and rebagged by type, with pertinent provenience information recorded on each bag. Rebagged artifacts were further sorted by grid and boxed by type, regardless of excavation date, feature number or PD number. Artifact and excavation data was entered into an Access database administered by the graduate research assistants in the Borderlands Lab. Artifact boxes are stored throughout the Arizona State Museum.

Several problems were identified with the use of the materials from the Marana Platform Mound Site, both in terms of the excavation and post field processing procedures. Some of these problems, called second-order changes, are ubiquitous to all archaeological sites and have been extensively discussed by Reitz and Wing (1999:112-113). These second-order changes as they pertain to the Marana Platform Mound site will be briefly discussed here; though the problems did not prevent further analytical

work on the faunal remains, they must be acknowledged for their potential of limiting the information that can be gleaned regarding the use of fauna at the site.

Reitz and Wing (1999) state that regardless of the amount of care taken during the recovery process of an archaeological site, faunal materials will be compromised. This may result from decisions about when and where to excavate, if the excavation will include all localities and feature types, how much of a site or features will be excavated, and the types of research questions that are being investigated at the time of excavation. The representativeness of the faunal assemblage from a site may be suspect if there is bias in the features excavated, if the sample of the site is too small, or if various sieving strategies were used during excavation. The Marana Platform Mound community was extensively sampled, with several compounds, many rooms, and numerous features fully excavated. Initial research questions focused on the settlement patterns, modes of production, and community organization (Fish, et al. 1992), making it necessary for the archaeologists to recover as much material from as many features as possible. Because many of these questions can be addressed by micro-scale remains, as previously stated, sieve size and techniques were kept standard for all excavations. To particularly address the issue of representativeness for this zooarchaeological analysis, materials from the two most completely excavated compounds were examined; one representing a domestic context and one representing a ritual context.

Perhaps the most problematic issue faced during this analysis has been the number of zooarchaeologists and zooarchaeology students sorting, identifying, and analyzing the faunal materials from the Marana Platform Mound site. As with any

scientific or anthropological study, each researcher brings with them a specific skill set, each in a various stage of practice and expertise. A complete reanalysis of the faunal remains by a single individual would be ideal for achieving continuity in the interpretation of the material. Time constraints, the sheer volume of material, and the fact that nearly all of the work completed thus far has been done so by extremely capable researchers, makes the daunting task of reanalysis impractical and unnecessary.

Though each zooarchaeologist has likely approached the material from the Marana Platform Mound with a slightly different intellectual heritage and training background, a reasonable amount of continuity is assumed. As will be discussed, the majority of materials were analyzed by Chris Szuter, Rick Kendall and Regina Chapin-Pyritz. Szuter and Chapin-Pyritz received instruction and training from Dr. Stanley Olsen and Dr. Mary Stiner while at the University of Arizona. Kendall received his formal training from Dr. Elizabeth Reitz, but continued his training under the direction of Dr. Stiner while at the University of Arizona. The faunal materials analyzed by the author were done so under the direction of Dr. Barnet Pavao-Zuckerman, also a former student of Dr. Elizabeth Reitz. The training lineages suggest continuity, or at least comparability, in the analyses performed on the faunal remains from the Marana Platform Mound Site.

To reinforce this assertion, it was hoped that the author would be able to randomly pull already analyzed specimens from the collections to compare with the analysis notes. This method of checking was found to be inefficient and time consuming, and further complicated by the fact that identification tags had been removed from analyzed bags, and analyzed materials were rebagged and reboxed by provenience.

Because of this, materials from at least one provenience initially analyzed by Szuter and Kendall were unintentionally reanalyzed by the author.

The faunal materials from the Marana Platform Mound site examined for this project were analyzed using standard zooarchaeological techniques based on the methods of Reitz and Wing (1999). Analysis of materials during 2004, 2007 and 2008 were made by the author using the comparative vertebrate collection housed in the Stanley J. Olsen Laboratory of Zooarchaeology at the Arizona State Museum. As previously stated, all work was completed under the supervision of Dr. Barnet Pavao-Zuckerman. The analysis results were recorded using a method of coding developed by Rachel Diaz de Valdes and Barnet Pavao-Zuckerman (Appendix A), based on a system devised by Mary Stiner. Codes were entered into a Microsoft Access Database for sorting, querying, and quantitative analysis.

Initial sorting of materials was required prior to analysis. Because all faunal remains were boxed by compound, regardless of provenience designation or feature number and type, it was necessary to sort by feature within each compound. As the focus of this project is Compound 9, the platform mound compound, the initial sorting step sought to identify features and locales within Compound 9. Compound 9 was intersected by at least three grid numbers, making it necessary to devise a unique system of provenience coding. Since provenience PD numbers were used as unique identifying numbers for the excavation project, they were likewise used to create a provenience code for the faunal analysis. Each artifact bag was assigned a grid number and provenience code (e.g. grid number = 250, PD number = 172, provenience code = 250-172). This code

was assigned a second unique identifying number using the Access Database. Each bag of faunal materials was then sorted by completeness, cortical size, fragment size, and easily identifiable modifications such as burning. Once examined, bones were bagged by species type. Each species bag was assigned a unique number, then bagged once more by provenience designation number.

Identifications were recorded using the coding system found in Appendix A on the tally sheets also found in Appendix A. As Reitz and Wing (1999) state, the identification of faunal remains is a multi-step process, with no single step taking procedural precedence. Typically, however, examination and description of the bone is necessary before taxonomic identification can take place. For this analysis, faunal specimens were first classified based on skeletal element represented. Skeletal landmarks were used to identify elements when only portions of the bone were present. The skeletal landmarks were further used to describe the skeletal portions present; anatomical siding and bone biology terms were incorporated into portion descriptions whenever possible. Highly fragmented elements were described as thoroughly as possible using a system of standard classification to ensure consistency in interpretation. Elements were classified as indeterminate bone, flat bone, long bone, and spongy, or trabecular, bone, while portions were described as nearly complete, complete, half, less than half, unknown/miscellaneous fragments, shaft with foramen, or shaft. Unique skeletal features that could not be accurately described using the coding system were noted in the comments field of the coding sheets.

To facilitate the use of statistical indices such as Minimum Number of Individuals (MNI) for this and future analyses, skeletal side was recorded whenever possible. Additionally, epiphysial fusion was noted when observable for age range analysis. Fusion was generally described as unfused, partly fused, nearly fused or fully fused. In some instances, the location of fusion could be identified, and fusion could be further classified to age class as fetus/neonate or juvenile. The total number of elements was recorded for each observation. Fragmented elements within each bag were counted as individuals, unless fragments obviously mended together. Mending fragments were counted once, but were not permanently rejoined with adhesive. Weights for each species by PD bag were recorded in kilograms to the one-hundredth place. No additional measurements were recorded.

To allow for the interpretation of human behavioral activities and taphonomic processes at work on the Marana Platform Mound site, three basic modification categories were recorded for each specimen: burning, gnawing, and tool marks. Evidence for burning was coded as not present, burned, or calcined. Burned bones exhibited traces of blackening and charring on the surface as a result of exposure to fire either intentionally, such as during cooking, or unintentionally after discard. Calcined bones showed evidence of burning at extreme temperatures and were blue-gray to white in color. Gnawing patterns were classified as not present, rodent gnawing, or carnivore gnawing. Rodent gnawing was noted by the presence of squared-edge, evenly spaced, parallel grooves across the surface or at the edge of the bone. Carnivore gnawing was

noted by the presence of puncture marks, irregular grooves, and shallow pits across the surface and edge of the bone.

Reitz and Wing state that attributing modifications of bone to specific causes is difficult, but is facilitated through the use of scanning electron microscopes (1999:124). The identification of modifications made on the assemblage from the Marana Platform Mound site was limited to those that were macroscopically visible. Evidence for the types of marks observed on the bones are thoroughly described by Reitz and Wing (1999) and Lyman (1994) and were used extensively in this analysis to characterize the modifications present. Though codes for many tool mark types are listed in the coding sheet in Appendix A, only a few were utilized in this analysis and will be presented here. Cut marks were identified by the presence of small, “V” or “U” shaped incisions into the surface of the bone, potentially caused by the use by stone knives or scrapers during skinning or the removing of meat before and after cooking. Hack marks were identified by deep, asymmetrical “V” shaped grooves, likely caused by the use of a chopping tool during the initial dismembering of the animal carcass. Girdled incisions were evidenced by deep grooves around the circumference of the bone—these marks are often made during tool manufacture. Saw marks were identified as either hand-sawn or mechanically sawn, though the latter was not recorded in this context, and are characterized by parallel striations inside a grooved cut on the surface of the bone. Blunt impact fractures result from the use of pointed tools to inflict blows on the bone either to remove the bone from the meat, to extract marrow, or during tool manufacture and are identified by local crushing. Abrasion, grinding, and polishing are indicative of tool manufacture and are

noted by the presence of high sheen along the surface of the bone. Decorated bones were identified by the presence of foreign pigments or coloration on the surface of the bone. Excavation or lab damage was recorded for fresh breaks on bone and poor preservation methods, including glue and varnish. Two additional biotic changes were recorded for the bones in this collection. Digested bone is indicated by a porous bone surface that results from exposure to stomach acid. Eroded bone was evidenced by flaking and cracking of the bone cortex consistent with being exposed to the elements.

Finally, all specimens were identified to the lowest taxonomic level based on standard nomenclature and the comparative collection of the Arizona State Museum. Specimens that could not be identified to the taxonomic level of Class were assigned to Vertebrata. These specimens were weighed and are included in calculations of biomass but not NISP. Vertebrate remains that could only be identified to Class were further separated by size grades depending on the amount of cortex and perceived size of the element.

2. Quantifying the Assemblage

The faunal material from the Marana Community will be quantified using several methods. These include the Number of Identified Specimens (NISP), the Minimum Number of Individuals (MNI), and biomass. Each of these have been discussed at length, most notably by Grayson (1984), Lyman (1994), and Reitz and Wing (1999). Problems are recognized with each of these methods, and the use of these calculations is not always

standard from one analysis to the next. This may sometimes hinder an accurate comparison between analyses, as well as the ability to reconstruct or reassess previous work by other zooarchaeologists.

The Number of Identified Specimens is most simply the basic counting unit applied to an assemblage. Each specimen is identified to the lowest taxonomic level, and each element is considered part of the total bone count. The resulting numbers should, theoretically, provide a quantification of the relative abundance for each taxa within a given assemblage. As Grayson (1984) has recognized, faunal analysis using NISP assumes independence of each element, a problem further elaborated by Reitz and Wing (1999:192) who state that in order to apply NISP to an assemblage, an analyst must also assume “equal opportunity” for each specimen in terms of element identifiability, element survivability, and taphonomic and human behavioral processes, in both the past and present. Butchering patterns, methods of procurement, biotic and abiotic processes, such as weathering, trampling and scavenging, and curate behavior may result in inflated or underrepresented element counts.

MNI, or the Minimum Number of Individuals, was derived as a measure of taxonomic abundance that accounts for some of the biases that are inherent in NISP, though MNI is based on NISP. Citing Shotwell, Reitz and Wing define MNI as the “smallest number of individuals which is necessary to account for all of the skeletal elements (specimens) of a particular species found in the site” (1999:194). MNI is calculated by a careful examination of the skeletal elements present, the symmetry of the elements present (lefts versus rights), and the fusion status of each element (age at death).

Additionally, MNI is calculated for the lowest (most specific) taxonomic level observed. As Grayson (1984) points out, the MNI of a site is greatly effected by the aggregation of the faunal assemblage; as smaller scales of analysis, such as by stratigraphic levels or features, are approached, a larger minimum number of individuals will be arrived at than if the assemblage is examined as single unit. Aggregation for the Marana assemblage was based on archaeologically defined structures and features. Within each feature, faunal material is further analyzed by stratigraphic level if and only if appropriate justification for doing so is apparent.

Weights were recorded for all specimens by taxa for the derivation of estimates of dietary contribution through the calculation of sample biomass. Sample biomass is defined in this project according to Reitz and Wing (1999:227) as the “allometrically estimated total weight” the archaeological specimen represents, and is calculated using the actual weight of the materials and a biologically derived measure of living specimen weight. For archaeological specimens, the allometric formula used to calculate the sample biomass is:

$$Y = aX^b$$

where

“Y = the estimated sample biomass (kg) contributed by the archaeological specimens for

a taxon

X = specimen weight of the archaeological specimens for a taxon

a = the Y-intercept of the linear regression line

b = slope of the regression line”

(Reitz and Wing 1999:224)

Reitz and Wing (1999:227) suggest that using the allometric formula takes away the bias that is imposed on the sample when attempts are made to estimate the numbers of individuals present and the amount of edible tissue that might have been available, a criticism they level at the other methods of biomass calculation. Likewise, because the allometric formula is constant for all living organisms, temporal comparisons of specimens are reasonably accurate between modern populations and archaeological populations. The sample biomass provides, in essence, a general look at the predicted dietary contribution of the specimens recorded from the site.

3. Diversity Calculations

Diversity calculations are key to understanding the differences between assemblages in different locations, and as Reitz and Wing (1999:234) suggest, can be used to distinguish ethnicity, social status, level of urbanization, niche breadth, and dietary contributions. Diversity measures are derived from ecology and speak to the observable taxonomic construction of both an ecosystem and an archaeological assemblage, specifically in terms of richness, evenness, and relative importance of each taxa (Schmitt and Lupo 1995). Richness is defined as the total number of taxa represented in an assemblage relative to the sample size (Grayson 1984:132; Reitz and

Wing 1999:102), and can be represented by the equation $\sum \text{TAXA}$ (Lupo and Schmitt 2005:342), or \sum_i , where i represents each taxonomic group (Schmitt and Lupo 1995:508). Evenness, sometimes called equitability, is the “degree to which species are equally abundant” (Reitz and Wing 1999:105) in an assemblage. Though the ecological approach to diversity is intended to examine regional diversity in taxonomic distribution, the application in zooarchaeology is, by nature, a sample of regional diversity and can only be used as a measure of the importance of the animals used by the inhabitants of a site. Diversity can, of course, only be measured on the faunal remains that have been recovered and identified at a site (Reitz and Wing 1999:234) and are constrained by sample size (Grayson 1984:158).

In this analysis, diversity was calculated by the Shannon-Weaver function as described in Reitz and Wing using the formula:

$$H' = \frac{-\sum_{i=1}^s p_i \log_e p_i}{s}$$

where :

H' = information content of the sample

p_i = the relative abundance of the i^{th} taxon within the sample

$\log_e p_i$ = the natural logarithm of p_i .

s = the number of taxonomic categories

(Reitz and Wing 1999:105, 235).

According to Reitz and Wing, this calculation looks at the combination of relative abundance and taxonomic categories to determine the heterogeneity of a sample, on a

scale of one to five. In other words, an even distribution of specimens between taxa suggests a more diverse sample than a disproportionate distribution of specimens between the same numbers of taxa. More taxonomic categories lead to greater diversity, only if there is evenness in the distribution of specimens between the taxa present (Reitz and Wing 1999:105).

Reitz and Wing further suggest that independent calculations of equitability are useful for understanding the actual evenness of distribution between taxa. This can be calculated with the Sheldon formula

$$V' = H' / \log_e S$$

Where:

H' = the Shannon-Weaver function

S = the number of species in the community (Reitz and Wing 1999:105)

As V' approaches 1.0, more even distribution between taxa is observed. Lower values indicate that one or more taxa are dominant in the assemblage. Sample size does have an effect on diversity calculations; as sample size increases, diversity will likewise increase until

To arrive at diversity calculations using the Shannon-Weaver function the NISP is used for the lowest (most specific) taxonomic level observed. Grayson similarly utilizes NISP in his calculations (Grayson 1984:160). Reitz and Wing prefer MNI in their calculations, but suggest that MNI, NISP, specimen weight and sample biomass could also be utilized (Reitz and Wing 1999:234). NISP is used because the faunal reports for both Los Morteros and Muchas Casas did not include MNI, biomass, or specimen

weights in their published results—it is the only quantitative measure available for all three assemblages. Returning to the hypothesis and research questions stated earlier, taxonomic diversity between the Marana Platform Mound compound, residential compound, and sites further away but still within the Marana Community should be similarly diverse if the Marana Platform Mound served an integrative function. Disparities in diversity will be examined in detail in the results portion below.

4. Lagomorph and Artiodactyl Indices

Prehistoric southwestern faunal assemblages are primarily made up of artiodactyls and lagomorphs, especially in the arid regions of the desert Southwest that were once occupied by the Hohokam (Dean 2003; Szuter 1991). The representation of artiodactyls and lagomorphs in archaeological contexts is important to the understanding of how the landscape was utilized prehistorically, what decisions people made with regard to hunting strategies and prey choice, and how the intensification of hunting or other food procurement practices, such as agriculture, may have changed the landscape and lead to resource depletion (Dean 2005b, 2007; James 2003). Bayham (1982) and Szuter (1989; 1991) developed indices, referred to as the Artiodactyl and the Lagomorph Indices, to measure the relative importance of lagomorphs and artiodactyls in archaeological assemblages. The Artiodactyl Index is calculated by dividing the total NISP of artiodactyls by the NISP of all lagomorphs. High artiodactyl values may indicate an intensification of hunting strategies focused on large game. The Lagomorph Index is

calculated by dividing the total NISP of cottontails (*Sylvilagus* spp.) by the total NISP of all lagomorph specimens (*Sylvilagus* spp. and *Lepus* spp.)(Gillespie 1995:686). Low lagomorph values suggest a predominance of jackrabbits in the assemblage, while a higher value suggests a predominance of cottontails. This has been linked to a change in environment and communally based hunting practices. For the purposes of this project the Lagomorph and Artiodactyl Indices were calculated to examine the heterogeneity of the samples from each part of the Marana Community. Similar indices should indicate similar access to resources.

5. Sampling the Assemblage

The sheer volume of faunal materials available for analysis from the Marana Community required that a sampling strategy be devised to ensure that a meaningful analysis was conducted. As the focus of the current research rests on the strategies of social integration as evidenced in the faunal assemblage, the obvious approach would be a comparison of the Marana Platform Mound Compound to a residential compound within proximity to the mound. Compound 1, located to the east of the platform mound, is the most completely excavated compound at the site, and in terms of faunal materials, the most completely analyzed. Appendix B provides a table of all proveniences analyzed in this work, including the names of the faunal analyst responsible for completing the initial analysis.

i. Compound 9 Proveniences

Compound 9, as previously stated, is the location of the Classic Period Platform Mound. The Compound itself encompasses approximately 2700 square meters and includes several rooms, large roasting features and hearths, puddling pits, storage features and plazas all surrounded by several meter thick adobe walls. The Platform Mound is found within the compound, and has at least four rooms on top, all with postholes and hearths suggestive of residential spaces. Trash mounds and a reservoir are located outside the compound walls, but the proximity of these features suggests they were likely associated. The proveniences examined below represent a variety of features from Compound 9, though the faunal materials from many rooms and features remain to be analyzed.

1. Compound 9, Exploratory Trench 1, 1989

Grid 250, Compound 9 Exploratory Trench 1, 1989 was also chosen for analysis based on its intended function as a cross section of the Platform Mound Compound. Beginning outside the walls of Compound 9, the trench was excavated along a southwest-northeast axis into the compound, a total length of approximately 54 meters. The original intention of the trench was to identify features within the mound complex for further excavation. The trench was excavated by both hand and backhoe; back dirt was screened using ¼ inch wire mesh. Flotation samples were removed from most levels of the trench,

particularly from potential features. The 1989 trench extended to the base of the inner platform mound, bisecting the space between Room 3 and Extramural Area West. Stratigraphic control, as with the early excavations in Room 3, was based on the placement of a temporary site datum outside the trench walls. Each level was excavated using arbitrary 20 cm intervals. The extent of intrusive, post-abandonment features and deposition is not clear, but can potentially be controlled for by excluding the first level of excavation from each trench unit. Though the entire 1989 trench has been completely analyzed, because this includes a small portion of the compound, only the materials in direct association with the platform mound compound are included in this discussion.

Presumably, the faunal remains recovered from this trench represent a sampling of the open contexts within the mound compound and immediately outside the walls of Compound 9. The open plaza areas between the structures within the mound compound were likely utilized as public spaces, as evidenced by the presence of hearths, puddling pits, and various features of cultural origin in this and other residential compounds throughout the Marana community (Doyel and Fish 2000). Because the trench passes through a portion of Extramural Area West, it is assumed that some of the faunal remains analyzed from this area of the compound are likely associated with the activities that would have taken place in the Extramural Area West. Though the 1989 trench was continued in 2004 from its ending point to extend to the furthest northeastern extent of the mound, the faunal remains recovered during the later excavation have yet to be fully analyzed.

2. Compound 9, Mound Borrow Pit

The Mound Borrow Pit located northwest of Compound 9, approximately ten meters from Room 3 and 50 meters from the Platform Mound, was chosen for analysis because of its proximity to Compound 9 and its uniqueness as both a material source for the construction of the mound and a water source for the otherwise water-sparse community. In addition, the tight stratigraphic control established for the Borrow Pit allows for an examination of the levels associated with the periods of occupation and use of the mound.

The Mound Borrow Pit was first recognized by researchers at the platform mound as depressed topography that was likely associated with the building of the platform mound. Excavation of the Mound Borrow Pit was led by Ryan Howell during the 2004 field season (Howell 2004). A backhoe trench was excavated through the center of the pit in an effort to determine the extent of the pit, as well as to identify any artifact concentrations. Approximately one meter of overburden was removed in the lowest area west of the trench, and two 2 by 2 m excavation units were placed in the area.

Excavation began in Unit 2, where the highest concentration of artifacts was observed in the trench profile. Excavation levels generally followed the stratigraphy defined by the trench. Artifacts were found in both units, but the major part of the excavation was concentrated on Unit 2, where artifacts were found in levels three, four, five, seven, and eight. Because of the stratigraphic control for this feature, a selection of PDs directly associated with the probable occupation of the nearby Mound was retained

for closer analysis, the results of which are presented below. Table 1 briefly describes the levels, associated units, and PD numbers of the levels focused on during this analysis. A brief characterization of the layer is also provided.

The excavators conclude that the paucity of artifacts recovered from the Mound Borrow Pit is a reflection of its use as a water source; the artifacts recovered appear to have been deposited only on occasion. A high number of Tanque-Verde sherds in a single layer may represent a single reconstructable vessel or a ritual deposit of many pots after a feasting event. The stratigraphy itself suggests that there were many periods in which the pit was a reservoir filled with water, and other periods in which it was a dry depression west of the mound.

3. Compound 9, Feature 1, Extramural Area East

Feature 1, Extramural Area East is a large pit located on the east site of the Marana Platform Mound in an open extramural area. Feature 1, measuring approximately 145 cm by 125 cm, was initially encountered during trench excavations of the mound in 1989. Half of the feature was fully excavated at that time. Crews during the 2004 field season reidentified and completed the excavation of the pit, observing that the pit was oval in shape, had at least two floors, and was capped with adobe. The materials in the pit were burned prior to deposit, and along with a large quantity of bone, included obsidian, projectile points, various ceramics sherds, shells, and at least one ceramic bowl. The pit is interpreted as a ceremonial deposit, based on the identification of red ochre or a similar

red powdered mineral on some of the artifacts, the presence of an intentional adobe cap over all the materials, and its proximity to the Platform Mound.

The faunal materials recovered during the 1989 excavations were previously analyzed by Michael Boley, but have not been incorporated in this analysis. The data presented for Feature 1 in this work are derived from the material recovered in 2004. While the exact function of the extramural area and the pit itself are still a topic of interpretation and debate, the materials recovered are likely the result of a single deposition event.

4. Compound 9, Room 3

Compound 9, Room 3 of the Marana Platform Mound Site was chosen for this analysis for its distinction as the largest structure identified at the Marana site, as well as in the Tucson Basin, and its unique location within the compound walls surrounding the platform mound. The dimensions of Room 3 are 10 meters north to south by 11 meters east to west. The walls were constructed of compact adobe, ranging in thickness from 60 to 75 cm, with an average thickness of 69 cm. The room is located in the southwest corner of the mound compound, bordered on the southeast by a large, open plaza area defined during excavation as Extramural Area West, and by a large borrow pit to the northwest and immediately outside the compound wall. An area of higher elevation northeast of the structure is defined as the inner mound; this area is topped by an additional compound wall with small rooms fully enclosed inside.

Room 3 was excavated during two field seasons, though the results of both seasons were not fully reported until the 2004 field season by Hill, Fong, and Jamieson (2004). The excavations during both seasons were driven by three overarching research questions:

“to (1) understand the function and use of the structure, (2) gain information about the social and/or ritual activities associated with this area in the mound compound, and (3) reconstruct the formational history of the structure” (M. C. Hill, et al. 2004:1).

The first season resulted in full excavation of half of the room, specifically the southwestern and southeastern quadrants of the structure. Room 3 was excavated at arbitrary intervals between 10 and 30 cm, controlled by temporary site data located on two edges of the excavation area (M. C. Hill, et al. 2004:1). A total of six levels were excavated during the 1991 season; levels one through four were situated above the feature floor, while levels five and six represent the floor and subfloor, respectively. Nearly one meter of fill and material was removed from the structure in 1991, the majority of which was screened through ¼ inch mesh. According to Hill, et al. (2004:3), the 1991 excavations resulted in the identification of seven postholes, four hearths, four puddling pits, one unknown pit, one ash pit, and one adobe feature. Only five features – a hearth, a posthole, a pit, an ash pit, and an adobe feature were fully investigated in 1991, the remaining features were not excavated until the 2004 field season. Additionally, a single floor, measuring two to three cm in thickness was identified during the 1991 season, marked by presumably *in situ* artifacts, including flat lying ceramic sherds, adobe

chunks, ground stone, “exotics,” and lithic artifacts, some of which were “pushed” into the plaster on the floor surface.

The 2004 season excavations followed similar strategies to the 1991 season, although efforts in the later season concentrated on the full excavation of the north half of the room (the northeast and northwest quadrants). The vertical control for the excavations was based on the overall site datum, rather than the temporary datum set in 1991. Consequently, as Hill et al. state (2004:6), all levels were approximately 1.05 meters higher than the 1991 elevations. Unique artifacts and large sherds encountered *in situ* during excavation were individually mapped, while all other artifacts were recovered by screening through ¼ inch mesh. Sediment samples were taken from floor localities. Excavation levels were arbitrary 10 to 20 cm in depth throughout the structure, though features were excavated in single levels. As with the 1991 season, levels one through four were identified as above the floor surface, while levels five and six represented the floor. Unlike the 1991 season, however, at least two floor surfaces were identified. A total of 29 features were identified in Room 3: ten non-structural postholes, seven puddling pits, six hearths, two ash pits, two structural postholes, and two unknown pits (M. C. Hill, et al. 2004:10).

The conclusions drawn and interpretations made by the field investigators are important to the interpretations of the faunal materials analyzed from the structure. The exact age of the structure is not yet known, but a large number of Tanque-Verde Red-on-brown ceramics recovered from the room fill are used by Hill, et al. (2004:16) to suggest an early 1300s A.D. date for the construction and occupation of the room. They further

suggest that the room was likely a communal structure, perhaps a location for community ceremonies or meetings. This is evidenced not only by the structure's proximity to the platform mound, but also based on the presence of six hearth features and lack of artifacts indicative of a residential or industrial locale – or many artifacts at all. The structure appears to have been burned, possibly ritually, and filled, either by the use of the room as a midden after the collapse of the roof, or through the filling of the room by erosion and slope wash. Erosion and weathering patterns on the architectural features and artifacts recovered from the structure further indicate that the room was open to the elements for some time following abandonment.

6. Compounds 1 and 9 Proveniences: Methods for Choosing Previously Analyzed Samples

Christine Szuter began analyzing the faunal remains produced during excavations from the Marana Community in the early 1990s. Analysis of materials from the site was also undertaken by Regina Chapin-Pyritz, and later completed by Rick Kendall. The original analysis involved a method of coding similar to the one utilized in the current research; all observations were recorded on 11 x 17 sheets. In the later part of the 1990s and early 2000s, Kendall digitized the coding sheets into Excel spreadsheets. This allowed for easier sorting, storing, and, much to the benefit of this analysis, access to the data. With the exception of a few feature-specific studies, discussed above, the results of the zooarchaeological research from the last decade have been relatively unexamined.

Kendall is thus far the only zooarchaeologist to produce a study using all of the data available across the site.

The Excel spreadsheets provided by Kendall were sorted by grid number. The grids known to be associated with Compound 1 and Compound 9 were separated into individual Excel worksheets. Specifically sought for Compound 1 were grids 329, 330, 349, 350, 351, and 370. For Compound 9, grids 250, 270, and 271 were identified. Next, the “Coding Format for Marana Platform Mound Site Guide” developed by Chris Szuter and utilized by Kendall was compared to the “Faunal Coding Guide” used in this analysis. The taxonomic identification codes for each analysis were cross referenced; the code values from the current analysis were entered into the spreadsheets to allow for faster searching and calculation based on familiar criteria. The grids were then separated by identified structures and features. Tables 2a and 2b shows the features previously analyzed by grid.

Many entries were missing specific provenience data. To remedy this, the PD and grid numbers recorded in Kendall’s tables were cross-referenced to a query of PD and grid numbers produced from the Marana Access Database administered by the Borderlands Archaeology Lab. If more detailed provenience information could not be determined, entries were excluded for further consideration in this project. Because the temporal relationships between Compound 1 and Compound 9 are not yet established with certainty, all proveniences were treated for this analysis as roughly contemporaneous to the Tanque Verde Period based on identified ceramics.

Using Kendall's data, the number of identifiable species, minimum number of individuals and biomass were then calculated for a select number of proveniences listed above. To facilitate comparison, one additional structure, two compound-associated trash mounds, one exploratory trench, and one plaza or courtyard feature were examined using both Kendall's data and the current analysis data. Table 3 briefly outlines the proveniences examined, while Appendix B provides a detailed list of those proveniences.

i. Compound 9, Trash Mound 1

Compound 9, Trash Mound 1 is located north and west of the Marana Platform Mound and was chosen for further investigation in this analysis for its potential as the locale of refuse deposition for those inhabiting or using the platform mound. Several testing methods were used for the Trash Mound, including a backhoe trench and hand excavated test units. The backhoe trench was used to identify the trash mound during the 1989 field season and resulted in the excavation of adjacent one by two meter hand trenches. The 1989 testing efforts reached a depth of approximately 128 cm below ground surface. A cremation was encountered during the trenching; back dirt from the backhoe trench was screened to ensure that all burial related materials were recovered. Three additional 1 x 2 meter units were excavated in 1991 as part of the craft economy study of the Marana Community by Bayman (1994). These units reached a maximum depth of 96 cm below ground surface before encountering sterile soil.

Each excavation event resulted in the recovery of a large number and variety of materials within a matrix of gray ashy soil and silt. Artifacts included shell, local and exotic ceramics, lithics, complete and partial projectile points, charcoal, groundstone, tabular knives, and faunal material. The faunal materials included in this analysis were identified by Kendall, and are primarily from the 1989 trench excavations. Though some of the material from the trash mound was recovered from the back dirt of the backhoe trench, the materials are still representative of the artifact suite available within this Platform Mound associated feature.

ii. Compound 1

Compound 1 is situated approximately 100 meters east of Compound 9. It is one of the largest compounds identified in the Marana Community, and one of the most fully tested and excavated compounds to date. The walls surrounding the compound enclose an area of approximately 5500 square meters. At least 11 rooms have been identified within the compound walls, including one pithouse, and several trash mounds surround the entire compound. Compound 1 was the focus of multiple seasons of research, however the information for each of the proveniences described below was gleaned from the extremely detailed field notes of Curtiss Brennan recorded in 1989. As previously mentioned, the faunal material discussed from Compound 1 was exclusively analyzed by Szuter, Kendall, and Chapin-Pyritz.

1. Compound 1, Trash Mound 1

Trash Mound 1, Compound 1 is located east of Compound 1, at the northeast corner of the compound wall. The trash mound was chosen for this comparative analysis for its location near the compound and its potential for containing the refuse materials generated by those inhabiting the compound. The trash mound was partially excavated in 1989 using a 1 x 2 meter test unit. The excavators noted that the locus was chosen for further investigation based on its proximity to the platform mound, heavy scatter of surface artifacts, and mounded configuration. A total of ten levels were excavated in soft alluvial soil mixed with ash and charcoal. Artifacts removed from the trash mound were primarily Tanque Verde phase ceramics, lithics, shell, and worked sherds. The majority of charcoal was encountered one meter below the datum, and very few bones were recovered. Rodent burrowing was observed throughout.

2. Compound 1, Trash Mound 2

Trash Mound 2, Compound 1 is located along the southeast side of Compound 1 and was likewise chosen for this analysis for its proximity to Compound 1 and likely association with the occupation there. The trash mound was tested during the 1989 field season using two 1 x 2 meter test units in the center of the mound based on surface artifact distribution. The trash mound produced a high volume of artifacts, all of which were situated in a matrix of gray ashy soil and reddish-orange soil. Bioturbation from

roots and rodent burrowing was observed throughout the units, which reach a maximum of 93 cm below datum. Artifacts recovered were very diverse, and included lithics, shell, local and exotic ceramics, charcoal, grounds stone, complete and partial lithic tools, and faunal remains.

3. Compound 1, Exploratory Trench, Grid 370

The Exploratory Trench in Grid 370, Compound 1 was a cross-trench excavated on the north side of the compound in an effort to expose the northern compound wall. The trench was approximately five meters long, and encountered the compound wall between meters two and three. Two separate units were excavated; Unit 1 was outside of the compound and Unit 2 was inside of the compound. Features were encountered during the excavation of Unit 2 inside of the compound wall. The trench was terminated to allow for more controlled excavation. Artifacts were encountered throughout the test units, however, the materials recovered were very limited. This trench was chosen for this analysis for its potential comparability to the exploratory trench in Compound 9.

4. Compound 1, Plaza, Grid 329

Compound 1, Plaza excavations were focused on the space outside of Compound 1, Structure 10 located on the northwest side of the compound, adjacent to the east compound wall. A total of eleven units 2 ½ by 2 ½ meter units were excavated in an

effort to describe the public spaces surrounding the residential room. The plaza surface was encountered approximately 30 to 40 cm below the datum and was characterized by a hard, compact surface, reconstructable vessels, and horizontal-lying sherds. Artifacts recovered from the plaza test units included lithics, spindle whorls, polishing stones, ground stone, local and non-local ceramics, and faunal remains.

5. Compound 1, Structure 8

Structure 8, Compound 1 was encountered during test excavations in 1989 of the inside of Compound 1. The walls of the room were completely revealed, allowing the field crew to determine that the room was rectangular in shape, measuring approximately six by three and one-half meters with a wide door on the northwest side of the room. The room walls were approximately 40 cm wide with at least 10 cm of plaster on the inside. The interior of the room was not fully excavated; instead, test units were excavated to identify the floor surface and typical artifact assemblage. The floor was encountered in the room 80 cm below ground surface. The floor was well preserved and plastered, with a five centimeter thick ash deposit immediately above the floor. Flat-lying sherds were observed 25 cm above the floor as well; no adobe or roof fall was encountered.

CHAPTER VI: RESULTS

1. *Compound 9*

The Compound 9 proveniences studied in this zooarchaeological analysis produced 1,660 specimens, 1,322 (80%) of which were identifiable to the level of Class or below. Four localities were studied: Exploratory Trench 1, 1989 that bisects Compound 9, Extramural Area East Feature 1, the Mound Borrow Pit, and Room 3. Included in this analysis of Compound 9 is the material analyzed previously analyzed by Kendall for Trash Mound 1. The notably small sample size for this analysis is a product of sampling strategy and, as will be discussed, the nature of the proveniences analyzed. The results of all proveniences will first be presented as a single unit of inquiry, combing the results of the single provenience from Compound 9 analyzed by Szuter, Kendall, and Chapin-Pyritz in Appendix C, followed by a closer examination of the results from each feature. This will facilitate comparison between this analysis and the analysis previously conducted by Szuter, Kendall, and Chapin-Pyritz.

Forty-eight taxa are represented in the assemblage (Appendix D). Faunal remains are primarily mammalian ($n = 1296$), but include Amphibia, Reptilia, and Aves specimens as well. Forty-two of the represented taxa have been identified to the taxonomic level of Order or lower, roughly 28 percent ($n = 457$) of the actual specimens. At least 30 of those taxa are identified to the Genus level or lower. Faunal remains that could not be identified to as specific Class were assigned to the category of

Mammalia/Aves or simply to Vertebrata. Though counts have been given for these categories (n = 150, n = 188, respectively), the weights provided may represent additional bone fragments too small for accurate counting.

Non-mammalian specimens identified contribute less than two percent of the faunal remains from all analyzed proveniences in Compound 9. The single amphibian in the assemblage was identified as a true toad (*Bufo* sp.). Reptiles identified include one unidentifiable remain, classified as Reptilia, one lizard element classified as Squamata, Suborder Sauria, and nine elements identified as a single individual of the spiny lizard genus, *Sceloporus* sp. Turtles and tortoises are also present in the assemblage including a single element belonging to the Family Kinosternidae, mud or musk turtle, and 1 fragment of Desert Tortoise (*Gopherus agassizii*) shell. As will be discussed below, these faunal remains are likely intrusive or incidental deposits in the proveniences where they were found.

Avian remains contribute less than one percent of the total assemblage (n = 12). One element could not be identified below Class Aves, but were categorized according to sizes small (n = 2) and medium (n = 2) when possible. Three individuals were identified to at least Family. These include Phasianidae (quails), Tytonidae (barn owls), and Corvidae (ravens, crows, magpies, and jays). Species Gambel's Quail (*Callipepla gambelii*), bobwhite (*Colinus virginianus*), and Ferruginous hawk (*Buteo regalis*) were also observed. The paucity of bird remains from the assemblage is likely due to taphonomic processes, including differential preservation of avian bones (Lyman

1994:442) and excavation techniques though ¼ inch mesh screens were utilized. This observation is not unique to Compound 9 and will be further explored.

Mammals constitute the bulk of the assemblage in Compound 9, comprising not only the largest number of identified specimens, but the majority of total biomass to the sample. Approximately 853 elements could not be classified to the taxonomic level of Order or lower and were sorted by estimated body size categories that included small, medium, large, and combinations thereof. The mammal remains are primarily lagomorphs, including one species of cottontail (*Sylvilagus audubonii*), and two species of jackrabbit (*Lepus alleni* and *L. californicus*). Artiodactyls, even toed ungulates, are the next most abundant species in the assemblage, contributing approximately 26% of the total NISP of the assemblage (n = 117). Elements identified as Order Artiodactyla comprised nearly 79% (n = 92) of all ungulate remains. Family Cervidae (deer) account for 13% of the total, and include elements identified as Cervidae, *Odocoileus* sp. (mule deer/white-tailed deer), mule deer (*Odocoileus hemionus*), and white-tailed deer (*Odocoileus virginianus*). Bighorn sheep (*Ovis canadensis*) are also present in the assemblage (n = 5), as are pronghorn antelope (*Antilocapra americana*, n = 5). Carnivorous mammals and commensal mammals are also present in all proveniences. Carnivores make up three percent of the total mammal remains and includes specimens identified as “generic fox” (*Urocyon/Vulpes* sp.), true fox (*Vulpes* sp.), Kit fox (*Vulpes macrotis*), bobcat (*Felis rufus*), badger (*Taxidea taxus*) and coyote/domestic dog (*Canis latrans/Canis familiaris*). Commensal mammals are typically identified as tolerated pests though they may also be consumed (Dean 2003, 2005b). Rodent elements representing a

variety of small rodent species make up approximately two percent of the total assemblage analyzed, and nearly eight percent of all mammals identified. In addition to the rodents interpreted as commensal, a single element representing a single individual of the Order Chiroptera, bat, was identified and incorporated into calculations where commensals are treated as single unit of analysis.

Table 4 displays the total MNI and the associated biomass for the Compound 9 assemblage, summarized by vertebrate category. The categories chosen for this table are all artiodactyls, all carnivores, all lagomorphs, all birds, and all tortoises. Commensals include all rodents, reptiles, and the single bat. Not included on this table are specimens identified only to Class Mammalia or Aves nor any specimens that could only be identified as Vertebrata. Though these vertebrate categories are used throughout this research, it should be noted that in some instances, more specific taxonomic categories will be represented individually rather than cumulatively to highlight the importance of the resource. Lagomorphs contribute the highest percent of MNI to the total assemblage, approximately 35% ($n = 19$). Despite this, only 26% of the biomass can be attributed to these individuals. Commensals contribute 24% ($n = 13$) of the total MNI, though they contribute a nearly negligible percentage to the overall biomass. Artiodactyls contribute the third lowest percent MNI (20.4%, $n = 11$), but are responsible for nearly 69% of the overall biomass. Carnivores and tortoises/turtles each contribute roughly seven percent and three percent of the MNI, respectively ($n = 4$, $n = 2$); carnivores also add two percent while tortoises/turtles add nearly one percent of the biomass. Birds, like commensals, are

nearly negligible contributors to the biomass, but do account for nine percent of the total MNI.

Skeletal elements were recorded for all specimens identified. Table 5 shows the element distribution for all bighorn sheep, antelope, deer, rabbits, and jackrabbits from all proveniences analyzed in Compound 9. Artiodactyls element distribution was included in this table, though counts of unidentifiable long bone fragments are not represented.

Rabbit elements are most abundant from the hindquarter, head, and hindfoot. Jackrabbit forequarter and hindquarter elements are nearly equally represented and also appear to be equally represented from the head, vertebral column, and hindfoot. Though standard $\frac{1}{4}$ " mesh screen size was used, smaller $\frac{1}{8}$ " mesh has been found to increase the recovery of small animal remains (Shaffer and Sanchez 1994). Large mammal elements are heavily biased toward the hindquarter, though bighorn sheep have three elements represented from the head. These distributions may be more meaningful when interpreted by provenience, and will be analyzed more fully below.

The faunal materials from all proveniences in Compound 9 exhibit evidence of many of the modifications described above, including gnawing, weathering, burning, digesting, and cultural processing. A total of 477 bones, approximately 36% of all identifiable remains, showed at least one type of modification. Table 6 shows the gamut of modifications observed on the faunal materials from Compound 9.

Burning and calcining was the most common modification observed, accounting collectively for 21% of all identifiable remains in the assemblage. Most burned specimens were recorded as indeterminate mammal ($n = 134$), though artiodactyl ($n = 29$)

and lagomorph ($n = 33$) elements are also well represented by this table. Calcination was observed on 101 elements, 78 of which were identified as indeterminate mammal. Table 7 shows a closer examination of burning and calcining, specifically focusing on the percent of the total NISP of each taxa that has been burned or calcined. All antelope elements in the assemblage have been burned, while half of the deer elements have been either burned or calcined. Approximately 60% of the bighorn sheep also have been either burned or calcined. As with the element distributions examined above, taking an even closer examination of the burning and calcining of elements at Compound 9 on a feature-to-feature basis may reveal interesting patterns of deposition.

Referring back to Table 6, rodent and carnivore gnawing is apparent on many of the elements from the assemblage in Compound 9. Lagomorphs and indeterminate mammal remains were the most often rodent gnawed specimens, as well as the only taxa with elements that showed signs of carnivore gnawing.

Cultural modifications observed on the materials from Compound 9 included abrasion/grinding/polishing and girdled incisions, as during the manufacture of bone crafts, cut marks, hack marks, saw marks, and decoration. Digestion, erosion, and blunt impact fracturing may be a result of human activities, but are more likely associated with post-depositional first order changes (Reitz and Wing 1999:114-118). Of the cultural modifications observed, excavation/lab damage accounted for nine percent of the total elements modified. Nearly every taxon has at least one element with damage from modern handling. Cut, hack, and saw marks were present and are likely the result of prehistoric subsistence practices. Evidence of bone craft manufacture was observed on

just eight elements, though no formal bone tools or jewelry were analyzed during this project. The single element that was identified as decorated was covered in a fine red powder. This element will be discussed in more detail below.

2. Results by Provenience

It became evident during the identification of the elements from Compound 9 that the most significant observations would not come from the compound assemblage as a whole, but rather from the individual proveniences that make up the assemblage. The combined observations outlined above are still valid, especially when overarching intra- and inter- site observations are made later on in this thesis.

i. Compound 9, Exploratory Trench 1, 1989

The analysis of remains from Exploratory Trench 1, 1989 (ET1) was completed by the author in 2004. This provenience was initially excavated to provide a cross-compound view of the Marana Platform Mound Compound. The nature of the trench as a sample implies that the faunal remains examined and presented here are also a sample of the platform mound compound. The small number of remains analyzed from this provenience attests to the nature of the feature as a small sample; because of this, relative frequency and element distributions were calculated for all of ET1 rather than individual units and levels.

A total of 227 specimens were identified in ET1, constituting approximately 14% of all identifiable faunal remains from Compound 9 (Table 8). Sixteen taxa were represented in this sample, including reptiles, birds, and mammals. The biomass contributed to the total site assemblage by ET1 is six percent. A total MNI for all taxa represented in this provenience is 9, roughly 16 % of the total MNI identified in the current analysis.

The avian remains identified include two specimens identified to Class Aves, two identified to family Phasianidae (quail) and Tytonidae (barn owls), and one identified to the Gambel's quail species (*Callipepla gambelii*). One reptile was found in the assemblage, Desert Tortoise (*Gopherus agassizii*). The non-mammalian specimens contribute a minimum of four individuals.

The majority of mammal bones were assigned to Class Mammalia, making up over 97% of the assemblage (n = 221). Lagomorphs were the next most commonly identified taxonomic group in ET1, accounting for approximately 28% (n = 64) of the total. Of those, jackrabbits (*Lepus* sp.), black-tailed jackrabbits (*L. californicus*), and antelope jackrabbit (*L. alleni*) are the most abundant. Cottontail rabbits (*S. spp.*, *S. audubonii*) were less frequent than jackrabbits, providing five total specimens and a minimum of one individual. Rodents and artiodactyls, though present, are represented by less than three elements for each of the taxa identified. As mentioned above, though rodents may have been a part of prehistoric diet, it is likely that these specimens were commensal. Artiodactyl elements, including deer (*Odocoileus* sp.), account for less than one percent of the faunal remains in the feature (n =2). Despite the paucity of large

mammal remains, the two artiodactyl elements present contribute nearly 19% of the total biomass for the provenience.

Table 9 presents the total MNI and contributing biomass for the taxonomic categories most specifically identified in ET1. The five individual lagomorphs contribute the highest percentage of MNI (44.4%) and the highest percent biomass (72.0%). The single tortoise contributes 1.8% of the biomass noted on Table 9. Despite the under representation of artiodactyls in the provenience, the single individual identified accounts for nearly 22% of the total biomass.

The distribution of skeletal elements for deer, jackrabbit, and rabbit are presented in Table 10. The jackrabbit skeletal elements are nearly evenly distributed for the head, vertebral column, forequarter and hindquarter, suggesting the deposition of jackrabbit remains, whether by human behavior or natural processes, occurred as whole animals rather than carcass portions. The fewer number of forefoot, hindfoot, and foot elements is not unexpected even if whole animals were deposited, given the differential preservation of smaller bones and the excavation strategies at the site using ¼ inch mesh. The deer elements are from the hindquarter and foot. The limited number of elements present suggests either the purposeful retention of select elements, in this case a tibia and front phalanx, for consumption or other cultural use, or differential preservation of large elements such that complete elements are fragmented post deposition.

Nearly 40% of all materials recovered from ET1 exhibited some evidence of modification (Table 11). Burning was recorded the most often for the remains in ET1, specifically of the indeterminate mammal remains. The burning and calcining observed

on these materials may account for the lack of identifiability to a taxonomic order below Class. Lagomorphs were also burned or calcined more often compared to other taxa recorded in the provenience. The artiodactyl elements reported are only for the *Odocoileus* sp. specimen. The digested lagomorph element is likely the result of consumption by another animal. The eroded lagomorph element was identified by a flaky surface indicative of exposure to water and other natural elements. Rodent and carnivore gnawing is limited in this sample.

ii. Compound 9, Mound Borrow Pit

The use life and abandonment of the Mound Borrow Pit is reflected in the stratigraphy that has been established by excavations. This established stratigraphy, especially of the occupation surfaces of the pit, allows for an analysis of the faunal material most likely associated with the prehistoric use of Compound 9. Though all faunal material from the Mound Borrow Pit sample was analyzed and has been retained for future analysis, special attention will be given to the remains recovered from the surfaces with artifact concentrations (Table 1)

The species list (Table 12) highlights the recovered fauna from the surfaces with concentrations of artifacts and the fill material immediately above the concentrated surfaces in the Mound Borrow Pit (MBP). A total of 177 of the 271 faunal remains analyzed occurred in fill and surface associated with the use and occupation of the Platform Mound and Room 3 inside Compound 9. All taxa present in the MBP were

mammalian. Despite the number of taxa present, the majority of individual elements (n = 110) could only be identified as Mammalia and were sorted by estimated body size. Lagomorph elements were classified to the genus level for cottontails (*Sylvilagus* sp.) and jackrabbits (*Lepus* sp.) and to the species level for antelope jackrabbit (*Lepus alleni*). Two rodent elements were identified and classified as Order Rodentia and Harris' antelope squirrel (*Ammospermophilus harrisi*). A single element of fox was identified (*Urocyon/Vulpes* sp.). Artiodactyls were the most abundant taxa identified beyond Mammalia. The elements were classified as Order Artiodactyla, Cervidae, mule deer (*Odocoileus hemionus*), and bighorn sheep (*Ovis canadensis*). The artiodactyls contribute approximately 90% of the total biomass of the analyzed assemblage. A summary of the minimum number of individuals located in MBP is provided in Table 13, along with contributing biomass of each taxonomic grouping.

The skeletal distributions of the taxa recorded in the MBP are displayed in Table 14. The jackrabbit elements are evenly distributed between the skeletal portions, indicating deposition of a complete animal. The rabbit elements are primarily from the hindquarter. The deer elements are from the hindquarter and foot, while the bighorn sheep elements are from the head and hindquarter. Though included on the table, the Artiodactyla elements do not include unidentifiable long bone fragments. The relatively low number of identifiable specimens and their elements makes the interpretation of this table difficult; however, a closer examination of the small or medium mammal category has been included to reflect an observed pattern during analysis of a high number of femoral elements. A total of nine femurs were recorded as small mammal from the

artifact concentration surfaces of MBP; combined with the number of hindquarter elements recorded for jackrabbit and rabbit, this may suggest a pattern of processing small animals so that only the meatiest portions from the hindquarter make it back to the place of consumption after the animals are killed.

Modifications were minor on the elements from MBP (Table 15). Burning and excavation damage were the most often identified modifications. With the exception of the commensal animals which had no modifications, all taxa represented in the assemblage showed signs of burning. Only two instances of calcining were observed, on an indeterminate mammal and the horn core of a bighorn sheep. Rodent gnawing was limited to two elements. Excavation and lab damage was observed on at least one element in each taxonomic grouping.

iii. Compound 9, Feature 1, Extramural Area East

The faunal materials from Feature 1, Extramural Area East, Compound 9 (Feature 1) were chosen at random from the boxes of faunal materials available for Compound 9. The feature was assigned a single provenience designation number at the time of excavation and was treated as single level from the top of the feature to the bottom. All artifacts were assumed to be deposited at the same time, including the faunal remains discussed below.

Eleven taxa were represented in the feature (Table 16). Lagomorphs account for 30% of the remains recovered from Feature 1 and include Family Leporidae (n = 9),

desert cottontail (n = 4), jackrabbits (n = 27), black-tailed jackrabbit (n = 62), and antelope jackrabbit (n = 11).. Artiodactyls were the next most abundant group present in Feature 1. Elements were identified as Order Artiodactyla and as white-tailed deer (*Odocoileus virginianus*) . The two deer elements were from two different individuals, as evidenced by a full fused proximal femur and an unfused, possibly juvenile, innominate. Rodents were also present in the feature and were identified to three taxa: New World rats and mice of the Family Muridae, Subfamily Sigmodontinae , Voles (*Microtus* sp.) and Merriam kangaroo rat (*Dipodomys merriami*) The rodents from this provenience are likely intrusive, but level information for the excavation unit are not available in order to verify this assessment.

The total MNI and contributing biomass by MNI for Feature 1 is presented on Table 17. Because of the limited number of taxonomic groups in this feature, only data for artiodactyl, lagomorph, and commensal mammals are presented. Unlike the MNI summary tables presented so far, lagomorphs make up not only the highest percent MNI (68.8%), they also contribute the highest percentage of biomass (60.4%). The skeletal element distribution (Table 18) reiterates the abundance of lagomorphs in this feature. The majority of jackrabbit elements are from the head. The hindquarter, forequarter and vertebral column are also well represented. Foot elements are present, but as with other features, are less evenly distributed. The high number of head elements and the somewhat even distribution of the axial skeleton of the jackrabbit specimens suggest that jackrabbits were likely deposited as whole animals in this feature. The same cannot be suggested of the rabbit elements; the elements are from the hind- and forequarter as well as the feet.

Artiodactyl elements for both Artiodactyla and white-tailed deer are from the hindquarter, though two elements from Artiodactyla are from the vertebral column.

Burning and calcining account for 91% of the observed modifications for Feature 1 (Table 19). As with other features from Compound 9, indeterminate mammal elements were the most often burned and calcined. The high number of calcined elements from this feature suggests a high temperature, or long burning fire may have been associated with the deposition of these remains. The remaining cultural modifications to the specimens from Feature 1 were excavation/lab damage, cut marks, hack marks, girdling, and decoration. Cut marks and hack marks were observed likely represent processing of carcasses for consumption. The girdled incision observed on the single deer element, a femur, is associated with the groove and snap technique of bone ornament and tool manufacture, though no bone tools were identified in this assemblage.

The single occurrence of decoration was identified by the presence of faint red powder on the surface of the bone. The element was in several mending fragments, but could only be identified as a long bone of an indeterminate, small sized mammal. No other elements in the assemblage from Feature 1 showed evidence of coloration. It is not known the exact source of the powder, and further examination will need to be conducted to determine if the powder is intentional decoration, such as from red ochre, or from an unknown, naturally occurring, oxidized mineral.

Gnawing was the only modification identified that is not a direct result of human behavior. Rodent gnawing accounts for 17% of the identified modifications, and was observed on every taxa represented in the feature but commensals. Rodent gnawing was

most frequently observed on leporid remains. The only occurrence of carnivore gnawing was also observed on the leporid remains.

iv. Compound 9, Room 3

The faunal materials from Room 3, Compound 9 (C9R3) were recovered during the course of two excavation seasons separated by a thirteen-year time interval. The remains from the first half of the excavation were identified by Rick Kendall and others during the course of the thirteen years. As has been previously mentioned, the data from Kendall's analysis is available, however it was impossible to discern which proveniences had already been analyzed when this project began. All materials from both excavation seasons at C9R3 have been analyzed, including elements that have likely already been identified and reported by Kendall.

A total of 586 specimens were recovered from a total of 80 uniquely designated proveniences, levels, and features in C9R3. Identifications could be made on 533 of the vertebrate remains to at least 35 taxonomic groups below Vertebrata. A variety of taxa were identified, including members of Class Amphibia, Class Reptilia, Class Aves, and most frequently, Class Mammalia. Indeed, the majority of the diversity for all proveniences in Compound 9 is derived for the deposited remains in C9R3 (Table 20a) A minimum of 24 individuals are present in the assemblage from C9R3 (Table 20b).

Detailed level and provenience information is available for C9R3. Based on the descriptions provided by Hill, et al. (2004), the species identified in C9R3 are presented

by level and feature. Because the top layers of any excavation unit include artifacts that were deposited after the life of the structure or feature is exhausted, it is reasonable to assume that the specimens recovered from the top levels of C9R3 are intrusive and likely not related to the original, intended use of C9R3. The information will be analyzed regardless however, given that the upper most modern ground surface of C9R3 was mechanically stripped to expose the outer walls of the room. The fill between the exposed surface and the floor surface of the structure represents the accumulation of trash, presumably while the Platform Mound and Compound 9 were still utilized, whether by the original occupants or by their descendants who continued to use the mound well after the Marana Community was abandoned.

Appendix E shows the results of MNI and NISP with the aggregation of the faunal remains by stratigraphic level in Room 3. The 1991 test pit units, Levels 1-3 in the SW and SE quad in 1991, and Levels 1-3 NW-NE were combined into single analytical units. Because several levels are included, MNI was not calculated. Level 4 for both excavation years were combined as they each represent the fill above the occupation surface. Level 5 was defined as the floor by both excavation crews, though the 2004 crew suggests there is a sub-floor below the first. Level 6 2004 is the subfloor defined in 2004, and Level 6 1991 is the sterile fill below the subfloor surface encountered by the 1991 crew.

The majority of elements are encountered in Levels 1-3 2004, Level 4, and Level 5. A closer examination of the break down of Levels 1 – 3 2004 reveals that the majority of the elements identified to this category fall into Level 3, suggesting there may be some

association with this level and the initial filling of the structure with debris post abandonment. Notable taxa from Levels 1-3 2004 (most specifically Level 3) are bobcat (*Felis rufus*), pronghorn antelope (*Antilocapra americana*), and deer (*Odocoileus* sp.), as well as the deposit of 35 lagomorph elements. Level 4 is also associated with the initial filling of the room after abandonment and includes a deposit of kit fox (*Vulpes macrotis*), lagomorphs, small bird, deer, and bighorn sheep (*Ovis canadensis*) elements. Level 5 is the floor assemblage and includes several birds, bat (Chiroptera), kit fox, and deer. Interpretations of this assemblage will be presented below.

3. Kendall's Compound 1 and 9

An integral part of this analysis is the comparison between structures and features in Compound 9, the Platform Mound, and Compound 1, a residential compound. In order to do such a comparison, it was necessary to do some reconstructive analysis from the observations made and recorded by Kendall, Szuter, Chapin-Pyritz, and other student analysts. Rooms and features within the compounds were chosen randomly for comparison. Table 21 again shows all proveniences that will be compared.

As part of the broader focus of this paper, the taxonomic diversity and types of bone modifications observed were recorded for each provenience. However, because modifications were recorded differently by Kendall and others, the only comparable modifications were assessed: burning, gnawing, and evidence of working. Number of identifiable specimens, MNI and biomass were calculated and are presented in the

species lists for each provenience. Fusion and element distribution have not been assessed for Kendall's data, though the information is available for future analysts for further reconstruction. The results of the reconstructive analysis of Kendall's data are reported below.

i. Compound 9, Trash Mound 1

In addition to the four major proveniences examined in the current analysis, one additional feature, Trash Mound 1, was included from Kendall's previously analyzed material. The trash mound is near Compound 9; the deposits in this mound are likely associated with the activities taking place inside the compound, as well as on the Platform Mound. For the sake of continuity in data from Compound 9, the taxonomic data for each of the proveniences studied will be presented in same method as above.

Trash Mound 1 is located north and west of Compound 9 and was initially encountered in the 1989 Mound Exploratory Trench. Excavation at Trash Mound 1 included a backhoe trench and several hand excavated test units to sample the contents of the mound. The limited excavation procedures are reflected in the number of specimens identified. Table 22 displays the taxonomic listing of all 140 specimens that were recovered from Trash Mound 1 (TM 1).

A total of 19 taxa were identified by Kendall, 18 of which were classified to Class or lower. The majority of specimens were mammalian, though three birds were present. Two avian specimens were identified to species level and included Ferruginous Hawk

(*Buteo regalis*) Bobwhite (*Colinus virginianus*). A third specimen was identified as a single individual of Family Columbidae, pigeons and doves. Mammalian specimens that could not be identified below Class were ordered by body size similar to the current analysis.

Lagomorphs constitute the bulk of the identifiable remains recovered from TM 1, approximately 36% (n = 50). In addition to elements identified to Order Leporidae, the genus of cottontail (*Sylvilagus* spp.) and the genus of jackrabbit (*Lepus* spp.) were observed. Two jackrabbit species (*Lepus alleni* and *Lepus californicus*) were also noted. A variety of rodents and several carnivores were also present in the deposit from TM 1. Rodents were classified as Rodentia, Harris' antelope squirrel (*Ammospermophilus harrisi*), kangaroo rats (*Dipodomys* sp.), and desert kangaroo rat (*Dipodomys desertii*). Carnivores included one specimen of a domestic dog or coyote (*Canis latrans/Canis familiaris*) and one specimen of badger (*Taxidea taxus*). Only two specimens of Artiodactyla were observed in the TM 1: a single specimen of the Order Artiodactyla and a single specimen of mule deer (*Odocoileus hemionus*).

The modifications to the faunal material were very minimal, and included only burning, calcining and rodent gnawing (Table 23). Indeterminate mammal elements were the most often observed with modifications, specifically calcining. Lagomorphs were most often gnawed. Two of the three bird elements were burned, specifically the Columbidae and Ferruginous Hawk elements. Modifications were not observed on any of the artiodactyls, commensals (rodents), or carnivores. Additionally, no faunal materials appeared to be worked.

ii. Compound 1

Compound 1 is a residential compound located east of Compound 9. At least 11 rooms have been identified inside the compound walls, which surround an area measuring 5500 square meters (Fish, et al. 1992:28). The faunal remains discussed below were exclusively identified by Kendall, Chapin-Pyritz, and Szuter. The sampled features in Compound 1 are Structure 8, Trash Mounds 1 and 2, Exploratory Trench 1, and Plaza, Grid 329. The taxonomic data for Compound 1 is presented collectively in Appendix E and discussed briefly below. Summary tables of MNI and biomass will be presented for each of the proveniences to highlight the diversity of taxa, as well as frequency of commonly used taxa. Additional focus for this section will be the modifications recorded on the elements from each provenience.

A total of 33 taxa were recorded for the faunal remains for the five proveniences studied in Compound 1, 776 specimens make up the assemblage. Of those, 42% are identified as lagomorph. The remaining taxa are identified as Mammalia, small body size, and at least eleven varieties of commensal rodents. Snakes and reptiles were also present in the assemblage, as well as one fish. Birds are relatively abundant in the assemblage as well, while artiodactyls are notably underrepresented.

1. Trash Mound 1, Compound 1

Trash Mound 1 is located northwest of Compound 1, several meters outside the compound wall. The feature was tested using 1 x 2 meter excavation units. PD descriptions for Trash Mound 1 (C1TM1) retrieved from a query of the Marana database and cross referenced to Kendall's data suggest that the faunal remains analyzed for the feature included Units 1, 2, 3, 4, and 5, and Levels 1-6, 8 and 10.

A total of 189 specimens were recovered from C1TM1, 177 of which were classified below Vertebrata. Twenty-three taxa are represented in the remains, including Reptilian members of Order Testudines (turtles and tortoises, n = 7), Family Colubridae (colubrid snakes, n = 2), and *Crotalus* sp. (rattlesnake, n = 2). Avian specimens included hawk (*Buteo* sp., n = 1) and a pigeon or dove (Columbidae N = 1). Mammalian taxa make up the rest of the assemblage, and include lagomorphs, rodents, artiodactyls, and carnivores.

Table 28 reaffirms the relatively high diversity of taxa observed in C1TM1. Commensal mammals and leporids each contribute a minimum of five individuals to the assemblage. Leporids constitute the bulk of the biomass, nearly 72%. Gray fox (*Urocyon cinereoargenteus*) and domestic dog or coyote (*Canis latrans/Canis familiaris*) each contribute a single individual to the total MNI for carnivores, as did the two snakes specimens.

The modifications observed on elements from C1TM1 show that the majority of elements were rodent gnawed, an expectation given that excavators observed rodent

disturbance throughout the test units (Table 29). Burning and calcining was most often observed on indeterminate mammals, but was also noted on lagomorphs. One of the burned artiodactyl elements was an antler, though it showed no other signs of modification. A second antler in the assemblage was likewise not modified, nor was it burned. The single worked element is the radius of a Gray Fox. Kendall made no other notes regarding the method of working, but the coding formulas for Kendall's spreadsheets lists "polish, striations, awl, hairpin, bone tubes." This indicates that "worked" could be a completed tool or ornament, or the scraps from manufacture.

2.Trash Mound 2, Compound 1

Trash Mound 2, Compound 1 is similarly located outside the walls, to the south and east of the compound. Like C1TM1, Trash Mound 2 was excavated in 2 x 1 meter units. The materials analyzed come from test Unit 1, Levels 1-4 and 6, and Unit 2, Levels 1-3.

A total of 231 specimens were analyzed from Trash Mound 2 (C1TM2), 220 of which were identifiable below Class (Appendix F). A total of 18 distinct taxa were identified, including reptiles, birds, and mammals. Tortoise or turtle (N = 1), unidentified snakes (n = 2), rattlesnake (N = 1), and unidentified small bird (N = 1) make up 2% of the assemblage. One-hundred and four elements were identified to Mammalia and various size grades accordingly, while 89 elements were identified as lagomorph to either Family Leporidae, genus *Sylvilagus* or *Lepus*, or to species *Lepus californicus* and *Lepus alleni*.

Carnivores observed include badger (*Taxidea taxus*) and coyote or domestic dog (*Canis latrans/Canis familiaris*). Notably missing from this assemblage are elements identified as Artiodactyla.

Table 30 displays the total MNI for C1TM2. As observed in the NISP counts of the identifiable remains, leporids make up the bulk of the assemblage. Additionally, the lagomorphs contribute the highest biomass. Commensal mammals are the next most represented with a minimum of five individuals, while carnivores account for two.

Though not minimal in comparison to observations elsewhere in Compound 1, the modifications observed on the elements in the assemblage are restricted to indeterminate mammals and lagomorphs (Table 31). Burning and calcining is evident on both taxa, though with greater frequency on lagomorphs. Rodent gnawing is likewise observed on elements of both groups. The elements that were worked showed signs of both tool manufacture and processing. Of the worked indeterminate mammal remains, one, a large mammal, was identified as a possible awl missing the tip. The second, also a large mammal, was identified by smoothed edges and butchering marks. The third was a small or medium sized mammal and was both calcined and smoothed at the edge. The smoothed edges may be indicative of girdled incision for the manufacture of tools and ornaments. The two lagomorph elements were noted as having cut and butchering marks.

3. Compound 1, Exploratory Trench 1

Like the trench studied in compound 9, it was anticipated that the exploratory trench in Compound 1 would serve a similar function of providing a cross-compound sample. This assumption is complicated by the lack of information regarding the findings of the trench.

Very few faunal remains were recovered from this provenience; the 25 specimens identified provide too small of a sample to make any generalizations or say anything conclusive about the assemblage recovered. A total of six taxa were identified, and with the exception of a single bird, were small mammals. The majority of elements were classified as black-tailed jackrabbit (*Lepus californicus*, n = 11) or Class Mammalia, body size small (n = 7). Four individuals were present in the assemblage (Table 26). Two individuals of leporid were identified from the back-tailed jackrabbit and an antelope jackrabbit (*Lepus alleni*, n = 3).

Modifications observed are reported in Table 27. Few elements were burned or calcined, suggesting accidental deposition of remains in the plaza rather than intentional. This, of course, could only be determined with greater stratigraphic control. The high instance of rodent gnawing observed is likely a result of the elements being exposed on the ground surface, a pattern observed during the initial analysis of this data by Kendall (2002).

4. Compound 1, Plaza, Grid 329

The plaza of Compound 1 was chosen for its presumed location in an open-air context within the compound. The Plaza was tested using 2 ½ by 2 ½ meter excavation units. Provenience notes in Kendall's data suggest that at least eleven test units were placed throughout the Plaza. This resulted in, among others presumably, a total of 87 specimens identified to six taxa. One element has been identified as Class Aves, while the rest of the sample is classified as mammalian. The Class Mammalia, categorized by body size, makes up nearly 86% of the entire assemblage. Only four elements of deer (*Odocoileus* sp.) were identified; lagomorphs were represented by only five elements of black-tailed jackrabbit (*Lepus californicus*).

Table 24 displays the relatively low number of elements recovered from the plaza. One individual could be assigned to each of the specimen categories observed. Interestingly, the leporid elements contribute roughly four times the biomass as the deer individual. A closer review of Kendall's data reveals that the elements recovered from the deer are exclusively cranial fragments.

Evidence for modification (Table 25) on the elements for the Plaza is limited to burning and some calcining. Indeterminate mammal elements were most often modified, but as they constitute 86% of the assemblage, this is not surprising. Four of the five jackrabbit elements were burned or calcined. The single bird, as noted by Kendall, was scorched at the tip. All four of the observed deer elements were burned.

5. Structure 8, Compound 1

Structure 8 is located within the walled courtyard of Compound 1. The feature was excavated by a series of test trenches and test pits. It is unclear if the entire room has been excavated, but notes from Kendall's spreadsheets suggest that all materials that were analyzed from Structure 8 derived from those test pits and trenches.

A total of 232 elements were recorded for Structure 8 (C1S8), 231 of which could be identified to Class or better. A diversity of taxa are present in this assemblage, including fish, tortoises, snakes, birds, and mammals – a total of 18 unique taxonomic groupings. Mammals account for 12 of the taxa, and include rodents, lagomorphs, carnivores, and artiodactyls. Lagomorph elements constitute nearly 65% of all remains in the structure and are collectively the highest contributor of overall biomass for the assemblage.

Table 32 reiterates the taxonomic variety observed in C1S8. A minimum of 19 individuals account of the faunal remains in the structure. Lagomorphs are again the highest contributor of MNI and biomass. Commensal mammals and birds add four individuals and two individual, respectively. All other taxonomic categories contribute single individuals, and with the exception of the artiodactyl, add less than one percent to the total biomass of the site.

Observed modifications to the elements from C1S8 are almost exclusively on lagomorphs (Table 33). Burning was observed on all specimens except fish, reptile, and bird. Calcining was observed on indeterminate mammal and lagomorph elements.

Gnawing by rodents was observed on indeterminate and lagomorph elements, while gnawing by carnivores restricted to lagomorph elements. The high number of rodent gnawing on the lagomorph elements is particularly notable, and will be discussed below.

CHAPTER VII: DISCUSSION

I suggest that the faunal remains from archaeological contexts in the Marana Community can be used to assess the mechanisms of social integration practiced by the inhabitants of the platform mound compound and the surrounding compounds. If the Marana Platform Mound indeed served as a point of social integration rather than social differentiation, then faunal assemblages from the platform mound compound should be similar in quality and taxonomic diversity to the residential compounds surrounding the platform mound compound. Larger quantities of faunal materials indicative of isolated and large-scale consumption events should be found in the Platform Mound Compound and notably absent from surrounding compounds. Likewise, if the Platform Mound community served as an integrative site for the entire Marana Community in the Northern Tucson Basin, a similar pattern of consumption and faunal distribution will be found in communities located further away from the Platform Mound. I begin my discussion of these intra-site and inter-site comparisons with general observations of each context, followed by an assessment of the research questions posed above, focusing on the observations of quantity, quality, and diversity of fauna throughout the Marana Community.

1. General Observations

i. Compound 9

Several proveniences were examined from Compound 9, including an exploratory test trench, a plaza feature, a reservoir/borrow pit that served at times as a trash mound, and a large room at the base of the Platform Mound. The zooarchaeological research completed for this project resulted in the analysis of 1660 faunal remains from forty-eight unique taxa. Summary overviews of all Compound 9 proveniences analyzed suggest that the most dominant taxa at the Platform Mound were lagomorphs (19%, NISP = 317). Artiodactyls were present in most proveniences, and made up approximately 1% of the entire assemblage. Rodents made up approximately 2% of the assemblage, and though present, birds and carnivores contribute less than 1% each to the entire assemblage. Element distributions show that lagomorphs were likely brought to the Compound as whole carcasses. Artiodactyl elements, on the other hand, are heavily biased to the head and hindquarters. While interesting, using multiple scales of spatial analysis for Compound 9 makes the interpretation of the remains more meaningful.

1. Compound 9, Exploratory Trench 1, 1989

As previously stated, ET1 was chosen because of its potential to provide a cross – section of the open contexts within the mound. Stratigraphic control could not be applied

to the analysis of the remains, and each PD was analyzed a single unit. A total of 318 specimens were identified, to at least eighteen taxa. Burning and butchering marks suggest that the trench encountered a roasting feature, hearth, or post abandonment intrusive pit.

2. Compound 9, Mound Borrow Pit

The Mound Borrow Pit provided a unique opportunity for aggregating the faunal assemblage by stratigraphy. The majority of the 177 elements recovered could not be classified beyond Mammalia, supporting the nature of the provenience as a water reservoir. The artiodactyl elements in the assemblage were from the head and hindquarter. The bighorn sheep head element was a calcined horn core. Though the function of this particular horn core is not known, Mills et al. (2006) recently presented evidence for the ritual deposit of burned horn core, citing evidence for the association of horn core with watering holes.

3. Compound 9, Extramural Area East, Feature 1

Feature 1 produced a total of 548 specimens, 376 of which were identifiable. The field notes for the feature indicate that excavators suspected that the deposit was ceremonial in nature. Indeed, a minimum of eleven individuals was identified from lagomorph elements. The even distribution of lagomorph elements suggests that the

animals were deposited or used as whole carcasses. Forty-nine of the elements recovered were calcined, suggesting a sustained exposure to a heat source. One deer element showed signs of girdled incision generally related to tool manufacture (Griffitts and Waters 2005). Most interestingly, one element was covered in a fine red powder—suggesting that this provenience was ritually deposited. The quantity of elements from this single location also suggests an isolated, large-scale consumption event. Examination of other artifacts associated with this feature would allow for a more accurate interpretation of this feature as a ritual deposit or a feasting event, though these interpretations are not necessarily exclusive of each other (Dietler and Hayden 2001a).

4. Compound 9, Room 3

Room 3 provided another opportunity in which the faunal remains could be divided into stratigraphic units of analysis. The most unique levels were the floor (level 5) and the fill immediately above the floor (level 4). Room 3 is an unusually large room for Hohokam communities, and is roughly the size of a great kiva (M. C. Hill, et al. 2004). The room was chosen for this analysis because of its unique location near the mound; the excavation report indicates that it was most likely used for ritual or community events. There is little evidence to suggest that feasting was part of the closing and abandonment of the room, such as is observed in the room next to the mound (Bayham and Grimstead 2006). However, this does not preclude ritual activity associated

with the room; indeed, the high taxonomic diversity from the floor level alone suggests that some amount of ritual was involved.

LaMotta and Schiffer (1999) have suggested that structure floor assemblages are subject to the processes of accretion and depletion throughout the life history of the structure. During the abandonment phase, accretion processes include the *de facto* deposit of still usable objects within the structure, while depletion processes include curation behaviors that result in the removal of objects from an abandoned structure to a new activity location. LaMotta and Schiffer further suggest that the category of “ritual formation processes” need to be considered when examining floor assemblages; ethnographic and cross-cultural archaeological evidence indicate that many actions can create a floor assemblage, including burning of the structure and materials inside and introducing “foreign” objects to floor assemblages. Post-abandonment processes can also result in the addition of materials to floor assemblages, such as would result from using the structure as a midden, and the removal of materials from floor assemblages, as would result from non-cultural and cultural disturbance processes. They also suggest that the deposition of artifacts post-abandonment may have significance to the use of the structure. This observation is similar to Walker (2002), who suggests that some structures may have purposefully created ritual strata that can only be accurately defined by the examination of each stratigraphic layer.

The majority of elements in Room 3 were recovered from levels four and five. The floor surface, level five, faunal remains were extremely diverse, and included birds, lagomorphs, artiodactyls, fox, bobcat, lizard, frog, and bat. The fill above the floor, level

four, had the remains of several deer, bighorn sheep, many lagomorphs, and fox. The portions of the lagomorphs suggest deposition of whole animals, while the artiodactyl remains were horn cores, antlers, innominates, and femurs. The artiodactyl elements and taxa observed are similar to those identified in Compound 1 Room 10 by Colwell (1995), and the lagomorph distribution observed by Klokler and Thomas (2004) in Compound 3 Room 2. Point plotting and mapping of faunal elements was not done during the excavation of Room 3, making clear evidence of intentionally deposited faunal material difficult to discern. The attribution of elements to general stratigraphic level does mitigate this problem somewhat. It is also noted that very few faunal remains were found in the levels of fill. Following LaMotta and Schiffer (1999), this may be the result of post-abandonment ritual processes that resulted in the deposition of objects directly related to the function of the structure. This interpretation of the room, while convincing, is limited by its use of a single artifact class. Additional analysis of the materials recovered from each level would provide a more solid case for the ritual processes that resulted in this particular faunal assemblage.

5. Compound 9, Trash Mound 1, Kendall

The only feature not analyzed by the author in Compound 9 was Trash Mound 1. The mound is located northwest and adjacent to Compound 9. It is assumed to be associated with the activities on the Platform Mound. As such, it was originally suspected that evidence for isolated or large-scale communal consumption events may be identified.

Unfortunately, this was not the case. The trash mound was only tested, resulting in the identification of 140 elements. The majority of remains recovered were lagomorph. A variety of rodents was also recovered.

ii. Compound 1

The Compound 1 proveniences discussed below were identified exclusively by Kendall, Szuter, and Chapin-Pyritz. Compound 1 is relatively large in comparison to other compounds (Fish, et al. 1992:28), and it is one of the more fully documented compounds near the Platform Mound compound. The proveniences reconstructively analyzed were Structure 8, Trash Mound 1, Trash Mound 2, Plaza Grid 329, and Exploratory Trench 1. Thirty-three taxa are represented in the sample study, including fish, turtle, reptile, bird, and mammal. Lagomorphs make up approximately 42% of the assemblage from Compound 1, while artiodactyls make up just over 1% of the total. Rodents make up 8% of the total assemblage. Approximately 40% of elements were heavily fragmented, weathered, and/or gnawed and could only be identified by Kendall and others as Mammalia and various size grade categories therein. All of the features examined below were tested, thus some comparability is lost between Compound 1 assemblages and Compound 9 assemblages, where at least two of features analyzed were fully excavated.

1. Compound 1, Trash Mound 1

Trash Mound 1 produced a total of 189 specimens. Lagomorphs and rodents make up the bulk of the assemblage. Six of the seven artiodactyl elements recovered from Compound 1 were located in this trash mound. A single hawk (*Buteo* sp.) was identified. At least 27 of the elements recovered were rodent gnawed, leading Kendall (2002:33) to suggest there may have been a pest problem in this portion of the site.

2. Compound 1, Trash Mound 2

Trash Mound 2 produced 231 faunal elements, the majority of which were also lagomorphs and rodents. No artiodactyl elements are associated with this trash mound. The only evidence of bone tool manufacture was found in this trash mound, specifically a possible awl and bones with smoothed edges indicative of girdled incision. Additional bone tools are available from the Marana Platform Mound site, however, these materials were not analyzed in this project.

3. Compound 1, Exploratory Trench 1

A total of 25 specimens were recovered from the Compound 1 Exploratory Trench. The small sample size makes it difficult to extend conclusions or generalizations about this feature beyond including the counts as part of the overall Compound 1

assemblage. It was noted, however, that five of the twenty-five elements were rodent gnawed. Kendall's (2002) research was primarily focused on taphonomy at the site, and observed a pattern of rodent gnawing in Locus 2, where Compound 1 is located, that was much higher than Locus 1, where the Platform Mound is located.

4. Compound 1, Plaza, Grid 329

Eighty-seven specimens were recovered from the open plaza contexts in Compound 1. Of these, 50 were burned. The majority of elements were only identifiable by size class within Mammalia. The remains from this feature are likely incidental or intrusive deposits, unless excavation reports denote the presence of a feature where the majority of burned bones were found. Like the Exploratory Trench 1, the sample is generally too small to offer generalizations or interpretations of the feature.

5. Compound 1, Structure 8

Analysis of materials from Structure 8 could not be done by stratigraphic aggregation. This is unfortunate, given the uniqueness of the floor assemblage in Compound 9, Room 3 and the goal of this research for comparative analysis. Regardless, the faunal materials from Structure 8 are very diverse, including the only occurrence of fish, snake, rodents, lagomorphs, carnivores, and one artiodactyl. The rodent gnawing on many of the elements from this Room suggests, according to Kendall, that the room was

left open for a while before it was covered with trash, allowing rodents and other animals access to the remains deposited there.

The evidence for rodent gnawing on many specimen elements, the number of recovered rodent specimens ($n = 64$), and the identification of at least 11 rodent taxa suggests, as Kendall (2002) contends, that there may have been a rodent problem at this portion of the Marana Mound Community. According to Szuter (1989), the interpretation of rodents from archaeological sites is difficult, given their habit of burrowing and therefore becoming intrusive to a site, and their easy acquisition as a food source from around structures and gardens that may or may not show evidence of cooking or processing. Taphonomic studies are the most efficient means of determining which of the interpretations best fit the rodent assemblage from the site. Further study would need to be completed for the Structure 8 fauna to determine if the rodents observed were consumed or intrusive. However, two interpretations may reasonably be drawn from this observation. First, as Szuter (1989) suggests, while larger game was the “binge food” for the Hohokam, rodents might have been more commonly consumed on a daily basis. This pattern was likely tied to a garden hunting strategy (Linares 1976; Szuter 1989) of taking small game and rodents opportunistically as a means of supplementing diet and protecting agricultural resources. In terms of the hypothesis put forth for this analysis, the presence of rodents may be interpreted as *habitus* diet.

Second, Dean’s (2005b) rodent ubiquity analysis suggests that the increase in rodents in archaeological features is directly related to the disturbance of the landscape and the intensity of use at the site. Knowing the diet of choice for some rodents is useful

in interpreting why rodents appear in the archaeological record. For example, kangaroo rats' primary food resource is seeds; ground squirrels are omnivores that eat seeds, fruit and suet; pocket gophers eat tubers and roots; wood rats eat cacti (Dean 2005b:411). Indeed, all of the rodents mentioned occur in Compound 1. Ground squirrels are the most abundant (n = 28), followed by pocket gophers (n = 9), kangaroo rats (n = 8), and wood rats (n = 5). An increase in rodents in and around Compound 1 may indicate several things about the function of the compound and the site inhabitants. The presence of seed-eating kangaroo rats may indicate the presence of stored seeds at the compound. The presence of omnivorous ground squirrels may indicate that a wide variety of plant material was available in the trash mounds and features of the compound. The presence of wood rats and pocket gophers may be indicative of opportunistic hunting during plant foraging, especially of cacti, and during cultivation and maintenance of the nearby agave fields. These observations, though dependent on taphonomic studies of the rodent remains, suggest that the inhabitants of Compound 1 were involved in plant-related production and possibly seed storage.

2. Inter-Site Comparison with Muchas Casas and Los Morteros

Two additional Early Classic Period Hohokam sites in the Tucson Basin and within the Marana Community (Fish, et al. 1992) were chosen as comparative sites for the faunal assemblage identified from the platform mound and nearby residential compound at the Marana Mound Site. The first site, Muchas Casas (AZ

AA:12:2(ASU)AZ V:9:56[ASM]) is located roughly two miles southeast of the Marana Mound site. The second site, Los Morteros is located approximately seven miles from the Marana Mound site (see Figure 3.2 Fish, et al. 1992:23; Harry and Bayman 2000). To restate my previous hypothesis, if the Marana Mound Site was a location of social integration rather than differentiation, similar patterns of food distribution should be observed throughout the community. This will be specifically measured by comparing the diversity of taxa present at all three sites. An even distribution of taxa would indicate even access to resources, while a disparity in diversity may indicate the presence of restricted access to resources.

Muchas Casas and Los Morteros were chosen for comparison for several reasons. First and foremost, both sites have published faunal studies that were reproducible in terms of diversity calculations. The methods used by the researchers were comparable to those used in this analysis (Gillespie 1995; James 1987). Second, Los Morteros and Muchas Casas were both examined as part of a case study of leadership strategies in the Marana Community based on ceramic and prestige good distribution, thus providing an additional source of data regarding the social organization of the site (Harry and Bayman 2000). Third, each site has a unique spatial location and occupational sequence. Muchas Casas is situated at the northeastern edge of the canal that connects the community. The site was established at the end of the Preclassic or beginning of the Early Classic – contemporaneous with the settlement and occupation of the platform mound. Muchas Casas, like Marana Mound, is located within the environmental Zone 1, suggesting equal access to similar food resources likely resulting from floodwater agriculture (Fish and

Nabhan 1991). Los Morteros is located at the head of the canal, the terminus of which is the Marana Mound site. Harry and Bayman, among others (Haury 1976; Hunt, et al. 2005), have indicated the importance of maintaining the head gates of canals to ensure that water is received to all fields and parts of the community. Significantly, Los Morteros has a long occupational sequence, beginning as early as the Late Archaic period, and was the location of a Preclassic ballcourt community that was abandoned during the Early Classic Period with the inception of the Marana Platform Mound. Los Morteros occupies portions of Zone 5 and Zone 6, allowing greater access to food resources, including those derived from irrigation and floodwater agriculture, the riparian environment, terraced agriculture, and the upper bajadas. The details of the faunal analyses from both sites are presented below.

i. The Fauna from Muchas Casas

The site of Muchas Casas was excavated in 1985 by the Office of Cultural Resource Management at Arizona State University. The site is in prime desert habitat; it is situated on an alluvial slope of the Tortolita Mountains and approximately four kilometers northwest of the Santa Cruz River, allowing, as stated, access to resources from floodwater agriculture (Fish and Nabhan 1991; James 1987). Its location near the agave rock pile fields in Zone 2 may suggest access to agave resources as well (Fish, et al. 1992). Chronometric dates from the site indicate it was occupied between A.D. 1070 and A.D. 1160, the dates identified within the late Sedentary-early Classic Period. Faunal

materials recovered from the site were selectively analyzed by Steven R. James, totaling approximately 1,688 elements. James' primary research goals were to identify the patterns of faunal exploitation and subsistence, as well as general patterns of distribution and bone modification across the site. Three loci were examined: Locus A and twelve features and rooms therein, Locus E and four features and rooms therein, and Locus H and four therein.

The analysis resulted in the observation that 95% of the faunal remains from Muchas Casas were either lagomorph or artiodactyls (James 1987). In Locus A, 87% of the remains were attributed to lagomorphs, while 93% were identified as such in Locus E. In stark contrast, Locus H was made up of nearly 99% artiodactyl remains, the majority of which were identified from Pithouse 486. Modification analysis was also very informative, especially from Pithouse 486, where all 555 artiodactyl elements recovered were burned. This, he suggests, could be attributed to different patterns of burning within the structure itself.

Additionally, James observed that the majority of element portions from Pithouse 486 were from bighorn sheep horn core, skull, and pelvis and deer skull and pelvis (James 1987). Using ethnohistoric and ethnographic accounts from the Southwest, James suggests that the high number of pelvises indicated the consumption of "rump roast" (James 1987:187), and the high number of skull elements may have indicated the use of brains for hide tanning or skulls as hunting disguises. For the rest of the site, the lagomorph body parts are almost exclusively post-cranial. He suggests that this was likely the product of the Hohokam removing the head of the rabbit away from the

structure and discarding it elsewhere in the site. Interestingly, James observed that half of the artiodactyl elements recovered from Locus A and E were made into bone awls. James concludes that specialized hunters may have supplied the village with meat, and that meat was primarily lagomorph or artiodactyl.

ii. The Fauna from Los Morteros

The site of Los Morteros (AZ AA:12:57[ASM]) was excavated in the early 1990s by the Center for Desert Archaeology, though it was previously tested by the Arizona State Museum between 1979 and 1893 (Gillespie 1995). Los Morteros, as stated, occupies two environmental zones, one in which access to riparian resources and several forms of agriculture were available, and one in which trincheras agriculture and upper bajadas resources were available. The site dates between the Rillito Phase and the Tanque Verde Phases, or the Late Archaic to the Classic Periods, and a total of 55 features were analyzed from all periods. The majority of remains were identified in the Middle Rincon and Tanque Verde phases. The faunal analysis conducted by Gillespie (1995) was divided into three chronological parts to allow for observations of changes through time at the site. Approximately 5,135 elements were identified from 29 vertebrate taxa.

The results from all periods revealed at least 95% of the assemblage were lagomorphs (Gillespie 1995). He notes a scarcity of artiodactyl remains associated with food, the artiodactyl elements instead were modified into bone tools or ornaments. He observes a wide variety of carnivore taxa and at least two elements identified as macaw

(*Ara cf. A. macao*). An overall higher diversity of taxa is observed in the later period of occupation. Lagomorph indices calculated for all periods suggest a greater reliance on lagomorph resources; compared to the nearby Lonetree Site and Redtail Site, the Tanque Verde phases has the highest lagomorph index.

Gillespie (1995) concludes that the lack of faunal representation in the earlier phases of occupation is likely the result of excavation sampling strategies. He notes that the increase in cottontail frequencies is the opposite of what had been previously observed from sites in the vicinity (Gillespie 1995), an observation that has been recently revisited by Dean (2003; 2005b). Rodents, carnivores, and birds are also most abundant in the later occupations.

3. Compound 1 versus Compound 9: The Intra-Site Comparison

Once again returning to the research questions driving the hypothesis that social organization at the Marana Community may be reflected in foodways, I suggested that the intra-site and inter-site comparison of quality, quantity, and diversity of faunal should reveal meaningful patterns of distribution.

The first assessment of faunal remains as indicative of social organization is made possible by the examination of taxonomic diversity. For Compound 1 and Compound 9, diversity was calculated for total species NISP using the Shannon-Weaver function. Equitability or evenness of the distribution was calculated by the Sheldon formula. All diversity measures were calculated for the lowest taxonomic category observed. In

addition to the diversity index, the Artiodactyl Index was calculated by dividing total NISP artiodactyl by total NISP lagomorph, and Lagomorph Index was calculated by the total NISP cottontail by total NISP *Sylvilagus* and *Lepus*. All detailed diversity, Artiodactyl and Lagomorph Index tables are given in Appendix F.

The results in Table 34 show that there is generally low diversity in both Compound 1 and Compound 9. Comparatively, Compound 9 shows a slightly higher diversity ($H' = 1.773$) than Compound 1 ($H' = 1.729$). Higher equitability ($V' = .568$) is observed in Compound 1 when compared to Compound 9 ($V' = .544$). Richness is similar for both, differing by five taxa.

Regardless of the observed pattern, the differences in diversity and equitability are very minimal between Compound 1 and Compound 9, given that the scale of diversity is 1 through 5. This may be a reflection of several factors. First, the sample size of both compounds is small; the less diverse assemblage is derived from the larger of the two. The problem between sample size and diversity has been extensively discussed by Grayson (1984:160), who warns that as sample size increases, diversity will begin to decrease creating the possibility of misinterpretation of diversity measures. Reitz (1987:116) also acknowledges that smaller samples have an effect on diversity; she argues that small collections are less diverse than larger ones. A more in-depth discussion of the issues with sample size and diversity are covered by Grayson (1984).

Second, the observed diversity may be a reflection of ritual formation processes at work on Compound 9 that are dissimilar to the formation processes in Compound 1. The Platform Mound in Compound 9 is believed to have served as the locus for social,

political, and ritual action. Many material culture studies affirm this hypothesis; however, the faunal remains from Marana have only been studied in select contexts where there is strong evidence for ritual deposition of faunal materials (Colwell 1995; Klokler and Thomas 2004) or a feasting event (Bayham and Grimstead 2006). These studies provide valuable evidence in support of the working hypothesis.

Based on the results of this research and previous analyses by Bayham and Grimstead (2006), Compound 9 has evidence of at least two ritually associated faunal deposits found specifically in Extramural Area East Feature 1 and Room 9 on beside the mound. The sparse and equally diverse assemblage of materials associated with the floor level of Room 3 suggest the possibility of ritual deposits by way of accretion and depletion processes associated with the closing of the room (LaMotta and Schiffer 1999). Compound 1 has only one specialized deposit of faunal material, in Room 10 (Colwell 1995), though based on the findings of Kendall (2002) and the observations of Compound 1 Room 1 by Bayham and Grimstead (2006) no other specialized deposits are observed. This does not mean additional ritual deposits do not exist in Compound 1, indeed a closer examination of Structure 8 may reveal a similar deposit of floor level remains as was identified in Compound 9, Room 3. Additionally, a Compound 9, Room 3-specific artifact analysis may reveal firmer lines of evidence in support of the formation processes at work on the floor assemblage.

As previously discussed, the proportion of total NISP of rodents in the Compound 1 assemblage is roughly eight percent. While the rodent remains could represent a higher than expected ratio of disturbance fauna in Compound 1, it may also reflect a reliance on

rodents as a daily food source, rather than the higher meat yielding artiodactyls or lagomorphs. If rodents indeed represent food *habitus*, then according to the hypothesis that the platform mound was a place of social integration, a similar pattern of rodents should be present in Compound 9. Interestingly, only two percent of the total NISP from Compound 9 were rodents. The excavation strategies between Compound 1 and Compound 9 are identical, both using ¼ inch mesh screening materials, thus dismissing the potential bias introduced by different recovery techniques. The presence of more rodents in Compound 1 may also be a reflection of the subsistence strategies for the inhabitants of the compound. Certain rodents could be easily taken from residential areas while others would be targeted during agricultural activities (Dean 2005b; Szuter 1989), suggesting that the inhabitants of Compound 1 were active in the agricultural economy, especially in comparison to inhabitants of Compound 9. The high instance of rodent gnawing on elements from Compound 1 has led Kendall (2002) to suggest that there may have been a rodent problem there; the rodent problem may have to do with the storage of plant materials including seeds, or the processing and disposal of plant materials, an activity that may not have been happening at Compound 9. This interpretation hinges on a closer examination of the taphonomy of recovered rodent specimens, including evidence for burning or butchering, though as Szuter (1989) suggests only certain rodent elements would burn during cooking, specifically phalanges; the small size of rodent phalanges makes their recovery extremely unlikely. Additionally, taphonomic studies of the features where rodent elements were recovered would help distinguish intrusive burrowing from cultural deposition. Regardless of the interpretation of food uses of

rodents, Dean (2005b) contends that rodents are attracted to highly disturbed areas, such as domestic spaces, where food and water resources are readily available. The difference in the representation of rodents between Compound 1 and Compound 9 may simply be a reflection of the intensity of use at each compound, or as Kendall (2002) has argued, differences in the method of deposition of domestic refuse that would have attracted rodents in the first place.

The Artiodactyl Index (AI) and Lagomorph Index provide the most useful comparison between Compound 1 and Compound 9, highlighting the differences in quality of food resources. For Compound 9, the Artiodactyl Index (AI = 0.4366) suggests that artiodactyls were more often utilized over lagomorphs at Compound 9 than at Compound 1 (AI = 0.0340). Indeed, the most striking difference between Compound 1 and Compound 9 is in the assemblage of artiodactyls. Only seven specimens are observed for the Compound 1 assemblages, while at least 117 specimens were recovered in the various proveniences in Compound 9. The 117 specimens identified in Compound 9 do not include those recovered and identified by the previous analyses mentioned, and would indeed increase if those specimens were included in this analysis. The Artiodactyl Index for both compounds would likely also increase if the formal bone tools were included in this analysis. The portions of artiodactyls present in Compound 9 (see Table 5) represent both high meat yielding portions such as femurs and portions that may have been associated with ritual use according to Szuter (1989:273, 281), including pelvis and antler. Curation behavior of ritually-associated materials may skew interpretation of

artiodactyl remains (Dean 2005a), but the presence of burned and butchered elements in Compound 9 suggests that artiodactyls were likely consumed there.

The Lagomorph Index for Compound 1 shows a greater reliance on jackrabbits than cottontails ($L = 0.0525$), while the Compound 9 lagomorph assemblage shows a greater reliance on cottontails ($L = 0.1781$). Gillespie (1995:686) contends that the change in lagomorph frequency is a direct result of modified environment (see also Szuter 1989:41). Jackrabbits prefer high visibility and low brush cover and rely on speed to elude predators, while cottontails prefer hiding from predators in dense brush cover. Szuter's (1989:46) analysis of social hunting practices associated with lagomorph exploitation shows that jackrabbits were more often hunted as part of a communal event, while cottontails are more likely to be hunted by individuals. The interpretation of the differences in the lagomorph indexes suggests 1) there may have been differential vegetation cover at Compound 1 than at Compound 9, or 2) communal hunts for jackrabbits may have been coordinated between the inhabitants of Compound 1, but not as frequent at Compound 9. The first interpretation is in line with Szuter's assessment of sites throughout the Hohokam region; farmsteads had higher lagomorph indices than villages and large settlements, which she suggests is the direct result of brush clearing, construction, and larger populations (Szuter 1989:239). Compound 1 was more intensively used as a residential area, thus the vegetation cover may not have supported cottontail populations. A larger population base at Compound 1 would have allowed for the organization of communal hunting drives for jackrabbits.

Quantitative differences between Compound 9 and Compound 1 were expected in the form of single deposits of many elements, such as might be indicative of a large scale, communal consumption event. Only one analyzed feature produced an abnormal, single deposit of a large quantity of remains: Feature 1, Extra Mural Area East in Compound 9. This feature has already been discussed for its potential as a ritual deposit, and produced 113 specimens that could be identified as lagomorph. A comparable feature in Compound 1 was not found in this analysis, nor in the analysis conducted by Bayham and Grimstead (2006) who looked at a second instance of a large deposit of faunal remains in Compound 9 Room 9 next to the platform mound.

Based solely on the comparisons between Compound 9, the Marana Platform Mound, and Compound 1, a nearby residential compound, it appears that differential access to some resources may have occurred between the two locales. Diversity is higher at Compound 9, instances of deposition of large quantities of animal bone occur at Compound 9, and the greater abundance of Artiodactyla remains and lower frequency of rodents suggests that higher quality, or at least high utility, faunas were deposited at the platform mound .

4. Los Morteros, Muchas Casas, and the Marana Platform Mound

As has been previously stated, the diversity of the faunal assemblages from the Marana Community was calculated using the Shannon-Weaver Index as described by Reitz and Wing (1999:105) using the NISP of all taxa as published in Grayson

(1984:159). Because the primary concern of this analysis is the mechanisms of social organization in the Classic period Hohokam world associated with the occupation of the Marana Platform Mound, the diversity calculations for Los Morteros are based on the faunal remains recovered from the Period Three contexts which Gillespie identifies to the Late Rincon to Tanque Verde Phases (Gillespie 1995).

To facilitate comparison, the results for Compound 9 are presented in two ways (Table 35). The category “All MPM” represents the aggregate diversity of the platform mound community, allowing for a comparison of all compounds directly associated with the mound against the assemblages from Muchas Casas and Los Morteros. I have also included the diversity of Compounds 9 and 1 to highlight the differences between the rest of the Marana Community and the Marana Platform Mound in Compound 9. The column “Rank A” represents the ranking of the diversity based on aggregation of the compounds under “All MPM” while “Rank B” represents the ranking of diversity based on the division of compounds from the mound vicinity.

Low taxonomic diversity is observed in all three sites. Using Rank A, All MPM has the highest diversity ($H' = 1.782$), Muchas Casas ($H' = 1.368$) is the next highest, followed by the Los Morteros Period 3 deposits ($H' = 1.273$). Equitability is highest at MPM ($V' = 0.4936$), followed by Muchas Casas remains ($V' = 0.4935$) and Los Morteros ($V' = 0.418$). Rank B suggests that Compound 9 has the highest diversity ($H' = 1.773$) compared to all other proveniences. Taxonomic richness is highest at Compound 9 individually ($n = 26$), and All MPM ($n = 37$) when the compounds are aggregated. The

low taxonomic richness observed at Muchas Casas and the mid-range ranking of the diversity may be a product of the inclusion of Pithouse 496 artiodactyl remains.

The Artiodactyl and Lagomorph Indices were both very informative to this analysis (Table 36), highlighting both the dependence on regularly consumed taxa and taxa of high meat yield and ritual importance (Szuter 1989). The Artiodactyl Index (AI), like diversity, was calculated for the aggregated assemblages of Compound 9 and Compound 1 at the Marana Platform Mound site, as well as for each individual compound. Because a very unique deposit of artiodactyls was identified from Muchas Casas, the AI is presented with the assemblage from Pithouse 496 and without the assemblage from Pithouse 496. The AI was calculated this way also because a similar concentration of artiodactyl elements from Room 10 in Compound 1 (Colwell 1995) is not included in this analysis, and would likely show a similar skew in the representation of artiodactyl elements.

Without the inclusion of special artiodactyl deposits from individual features, the Marana Platform Mound Compound 9 shows the highest AI (AI = 0.4366) when compared to Compound 1 (AI = 0.0340), Muchas Casas without Pithouse 496 (AI = 0.0074), and Los Morteros Period 3 (AI = 0.0201). The cumulative AI for both Compound 9 and Compound 1 at MPM (AI = 0.2314) is still high compared to Los Morteros and Muchas Casas.

The high artiodactyl index at Muchas Casas led to the interpretation by James (1987) that specialized hunters were inhabiting the site and providing meat to the entire village. He further contends that the presence of bighorn and deer pelves was likely the

result of selective butchering, or a gourmet strategy of meat procurement (James 1987:195). Interestingly, all of the artiodactyl elements from Pithouse 496 were burned. Unfortunately, the recovery technique used for this feature was less than ideal – elements were recovered by hand rather than by screen, thus biasing the sample from this deposit toward large mammals (James 1987:173), and making the interpretation of this potentially ritual deposit somewhat suspect. Colwell's (1995) deposit of artiodactyl remains in Compound 1, Room 10 of the Marana Platform Mound showed a similar pattern of burning and disposal of artiodactyl pelvises, which he interpreted as a deposit of ritual paraphernalia, specifically for hunting disguises and hunting-related ceremony. The similarity in potentially ritual-related deposits in both sites suggests continuity in ideology throughout the Marana Community. A similar deposit was not identified at Los Morteros for the Period 3 occupation, though several ritually associated features were identified in earlier occupations. Instead, at least 14 artiodactyl elements were observed that had been modified into ornaments or tools. Muchas Casas had some bone tools, while very few were identified in any of the MPM contexts.

The Lagomorph Index shows that the inhabitants of the Marana Platform Mound Community more often utilized cottontail remains compared to Muchas Casas and Los Morteros. Like the interpretations presented above, this may be an indication of the site use intensity between these three locales. The added consideration of environments sheds light on the pattern observed. Los Morteros has the longest occupation, and presumably the most intensive modification of the environment around the site, but has the second highest Lagomorph Index ($L=0.1915$). Gillespie (1995:686) suggests that this may be the

result of revegetation of previously cleared areas as a result of a reduction in human population at the site. This is in keeping with the current interpretations of the Classic Period Hohokam, which saw a shift from large ballcourt sites like Los Morteros to more centralized locations near platform mounds. Los Morteros inhabitants also had the largest range of exploitable environmental zones, including the riparian zone of the Santa Cruz River that undoubtedly fostered brush growth. Some proveniences from Muchas Casas were not screened, specifically Pithouse 496, making it difficult to determine if the lagomorph elements from the site are accurately represented.

Only general comparisons between the Marana Platform Mound Community, Los Morteros, and Muchas Casas can be made given the available published data. Diversity and equitability are highest at the aggregated Marana Compounds, suggesting again a differential pattern of distribution associated with platform mound contexts. Aside from Pithouse 496 and its unfortunately biased sample of artiodactyls, large, single deposits of faunal remains potentially associated with communal consumption events are not present in any of the studied locales at the Marana Community, except those directly associated with the Marana Platform Mound in Compounds 1 and 9. If Artiodactyl Index results can be taken to represent quality foods compared to the normal day to day consumption of lagomorphs and small game, then the high Artiodactyl Index observed at the platform mound contexts suggests that there may have been differential access to those foods. The identification of ritual paraphernalia and deposits in contexts at the Marana Platform Mound, Compound 1, and possibly Muchas Casas suggest that non-consumption related ritual may occur throughout the Marana Community.

CHAPTER VIII: CONCLUSION

The importance of monumental architecture to ethnographic, ethnohistoric, and prehistoric cultures is well documented in the Southwest and throughout the world. This is no less the case for the Classic Period Marana Platform Mound in the Tucson Basin, where Fish and Fish (Fish, et al. 1992) have long held that this particular monument served to integrate a community that was experiencing, as Bayman suggests, “unprecedented changes in patterns of settlement, technology, material culture, and ideology...” (2001:281). The goal of this study was to examine the faunal remains from the Marana Platform Mound Community as they may or may not aid in furthering our understanding of the mechanisms for social integration centered at the platform mound itself. I specifically asked how differences in taxonomic diversity, quantities of deposited faunal remains, and quality of food resources available may reflect both social status and identity on the intra-site and inter-site level. Ethnographic, ethnoarchaeological, and archaeological studies in other areas have similarly approached this topic with faunal remains, and I have relied heavily on those methods and interpretations to structure my analysis.

The theoretical perspective framing this thesis is based in dual-processualism, which suggests that some communities operate at multiple scales of organization: network modes which allow individuals to utilize their relationships with other, more distant communities to control trade, resources, and ultimately power, and corporate modes which promote communal decision making, shared understanding of social rules,

roles, and resources, and distributes power more or less evenly between members. Harry and Bayman (2000:147) present a solid case study in support of this organizational strategy at the Marana Community, suggesting that clear leaders were installed at the platform mound with exclusive control over ritual knowledge and practice, utilizing high value goods to increase their social power, though wealth related items were not necessarily controlled by these individuals. They suggest based on ceramic data that the settlers of the Marana Platform Mound may have come from the site of Los Morteros, thus the canal, in addition to the platform mound, served an integrative function. According to Harry and Bayman's model, elites likely lived at the base of the platform mound, and were likely previously established elites who maintained ties to their kinship groups at Los Morteros. Fish and Fish (2000) present a similar perspective that focuses on the maintenance of social ties through kinship networks, and civic territorial affiliation. Those associated with the platform mound performed rituals and organized civic actions on behalf of the community. In these interpretations, the heads of kin groups were they hypothesized leaders.

The findings from the research presented here lend further support to Harry and Bayman's (2000) and Fish and Fish's (2000) interpretations of the Marana Platform Mound as the locus of ritual action. Several observations above were made regarding the role of faunal remains in the Platform Mound. In particular, a differential treatment of the rooms next to the mound and below the mound within Compound 9 is observed. Bayham and Grimstead found clear evidence of a communal consumption event related to the closing of the Room 9. Though no clear evidence of such treatment was given to Room 3,

a diversity of taxa is recorded from the floor surface and the fill immediately above, although not at the densities expected for a communal consumption event. On the other hand, the floor assemblage may be indicative of ritual formation processes.

The analysis of Compound 1 Room 10 identified a deposit of artiodactyl remains that was interpreted as a cache of ritual paraphernalia. Similar patterns of ritual deposition are not observed in the contemporaneous assemblages from Los Morteros. Pithouse 496 at Muchas Casas has a single deposit of 369 burned bighorn sheep elements, but the methods used to excavate the room and recover the bones were not standardized, possibly introducing biases in the recovery of materials from this feature. Detailed analysis of floor assemblages from all comparative sites may reveal similar patterns of room abandonment rituals as seen in Room 3.

The interpretation of special food assemblages begins with the identification of the “normal” foods of everyday subsistence patterns. Food *habitus* for Hohokam sites is primarily lagomorph and small game, including rodents, as evidenced by the high numbers of these fauna included in all studied assemblages, and the research presented by Szuter (1989). A difference in access to resources beyond the daily needs of the individual should be manifested as a difference in diversity, quality, and quantity of taxa compared to expectations of daily food consumption. As I have shown, high taxonomic diversity, higher quality foods, and deposits of large quantities of food resources are observed at the Marana Platform Mound, both as an aggregated site that includes Compound 1 and Compound 9, and as individually considered proveniences. Though the high diversity in Compound 9 may be a product of ritual deposition of selected items,

such as carnivore and bird remains, it can still be reasonably assumed that the inhabitants of the Marana Platform Mound had access to some resources that inhabitants of other sites did not.

The Artiodactyl Index was used as a measure of access to food resources that may be considered luxury, given the cost of procurement of large game. Szuter (1989) has referred to artiodactyl meat as “binge food,” further supporting the notion that the consumption of artiodactyl meat was not an everyday occurrence. The Artiodactyl Index shows that artiodactyls occurred at greater frequencies at the Marana Platform Mound than at other sites, with the exception of the ritual deposit at Muchas Casas. While again this may be due to the ritual deposit of these remains, evidence of burning and butchering suggests that the animals were likely consumed within Compound 9. Whether the consumption of high meat yielding foods was restricted to only those living in the compound is unclear, however it appears that this access was more frequent at the platform mound than in the nearby residential compound or at the sites further away from the platform mound.

At least two deposits of large quantities of food remains were identified within Compound 9 Room 9 and Feature 1, Extramural Area East. As I have mentioned, these may be ritually related consumption events involving the preparation of large quantities of food that served to socially integrate the participants and foster group cohesion. The consumption of large quantities of *habitus* foods, as is noted in both of these assemblages, led Bayham and Grimstead (2006) to suggest that the large-scale consumption events were not about aggrandizing behaviors, but community participation.

Differential access to food resources reinforces social status. When consumption of restricted resources is done so in ritual contexts or in public events, social identity is likewise created. The context of consumption emphasizes one's social role and membership in a group. While the faunal analysis reported here suggests that the inhabitants of the Marana Platform Mound had special access to food resources that do not appear as frequently as elsewhere in the Marana Community, the observed patterns of distribution do not suggest they had complete control of the resources, as would be expected if aggrandizing leaders were directing the community. As Schmitt and Lupo (2008) contend, bone alone cannot be used as a measure of social organization. I use also the context of food resources within the monumental architecture of the site, and the previously presented hypotheses put forth by Harry and Bayman (2000), Fish and Fish (2000) to suggest that social organization can be addressed through the faunal assemblage. The faunal remains from the Hohokam site of the Marana Platform Mound should be added to the suite of artifacts currently used to hypothesize social organization, as it is in the daily needs of individuals that perceptions of identity and status are reflected.

TABLES:

Grid	Retained?	Layer Description	Level	Unit
250-289		Clay layer and loose depositional fill	1	2
250-299	X	Fill immediately above artifact concentration surface	1	1
250-308	X	Fill immediately above artifact concentration surface	3	2
250-323	X	Artifact concentration surface with flat-lying sherds and other artifacts	4	2
250-329	X	Artifact concentration surface with flat-lying sherds and other artifacts	5	2
250-368	X	Artifact concentration surface with flat-lying sherds and other artifacts	7	2
250-369	X	Artifact concentration surface with flat-lying sherds and other artifacts	8	2
250-378		Hard packed depositional fill	11	
250-398		Loose depositional fill	12	
250-400		Backhoe trench to define depth of Borrow Pit. Artifacts collected from the back dirt.		
250-429	X	Profile artifacts		

Grid 329	Grid 330	Grid 349	Grid 350	Grid 351	Grid 370
Plaza	Structure 8	Trash Mound 2	Structure 2	Trash Mound 3	Trash Mound 1
	Trash Mound 6	Unit 2	Structure 3		Compound Trench
			Structure 4		
			Room A		
			Room C		
			Room E		
			Room 4		
			Feature 3		
			Feature 10		
			Hearth		
			Unit 3		

Grid 249	Grid 250	Grid 270	Grid 271
Structure 1	Structure 1	Trench 1	Trash Mound 1
Trash Mound 3	Room 3/Strucutre 3	Trench 2	Trash Mound 2
Trash Mound 4	Exploratory Trench 1	Top of Mound	Trench
Exploratory Trench 1	Plaza Features	Pithouse	Trench North of Compound
Feature A	Pit	Room 5	
	Hearth	Structure 4	
	Courtyard Mound Hearth	Structure 5/Mound	
	Courtyard Mound		

Compound 1	Compound 9
Structure 8	Room 3*
Trash Mound 1	Trash Mound 1
Trash Mound 2	Mound Borrow Pit*
Exploratory Trench	Exploratory Trench I*
Plaza (Grid 329)	Extramural Area East, Feature 1*

*Zooarchaeological analysis completed during this project

	MNI			Biomass	
	#	%		kg	%
Artiodactyls	11	20.4		7.220	68.5
Carnivores	4	7.4		0.226	2.1
Lagomorphs	19	35.2		2.787	26.5
Commensals	13	24.1		0.115	1.1
Wild birds	5	9.3		0.039	0.4
Tortoises/Turtles	2	3.7		0.149	1.4
Total	54	100.0		10.536	100.0

Note: Anurans are included in the MNI calculation, but are not included in the biomass calculation because allometric values are not currently available for the Anurans.

Table 5. AZ AA:12:251(ASM) All Proveniences Compound 9: Element Distribution by NISP						
	Artiodactyla*	Antelope	Bighorn Sheep	Deer	Jackrabbit	Rabbit
Head	41		3	2	51	8
Vertebra/Rib	8				61	8
Forequarter	2				73	4
Hindquarter	12	5	2	11	67	16
Forefoot					33	1
Hindfoot					35	5
Foot	1			3	24	1
Total	64	5	5	16	344	43
*Total does not include long bone fragments						

Table 6. AZ AA:12:251(ASM) Compound 9 All Proveniences:
Modifications (NISP)

Taxon	Burned	Calcined	Rodent Gnawed	Carnivore Gnawed	Abrasion/ Grinding/ Polishing	Impact	Cut Mark	Decorated	Digested	Eroded	Excavation /Lab Damage	Girdled Incision	Hack Mark	Saw Mark	Totals
Indeterminate mammal	135	78	34	5	5	1	4	1			15		3		281
Artiodactyls	29	3	3		1						6				42
Deer	6	1	2				1				1	2		1	14
Antelope	5												4		9
Big Horn Sheep	1	2									1				4
Carnivores	2	2	2												6
Lagomorphs	33	15	36	10			2		1	1	17		2		117
Wild birds															0
Tortoises															0
Commensals	1		2								1				4
Totals	212	101	79	15	6	1	7	1	1	1	41	2	9	1	477

Table 7. AZ AA:12:251(ASM) Compound 9 All Proveniences: Percent Burned and Calcined by Taxon Total					
Taxon	Total NISP	Burned	% Burned	Calcined	% Calcined
Indeterminate mammal	853	135	15.8%	78	9.1%
Artiodactyls	92	29	31.5%	3	3.3%
Deer	15	6	40.0%	1	6.7%
Antelope	5	5	100.0%		
Big Horn Sheep	5	1	20.0%	2	40.0%
Carnivores	15	2	13.3%	2	13.3%
Lagomorphs	268	33	12.3%	15	5.6%
Wild birds	12				
Tortoises	2				
Commensals	54	1	1.9%		
Totals	1321	212		101	

Table 8. AZ AA:12:251(ASM) Compound 9 Exploratory Trench 1-1989: Species List						
Taxa	NISP	#	MNI		Biomass	
			%	Weight, g	kg	%
<i>Gopherus agassizii</i>	1	1	11.1	0.18	0.010	0.7
Desert Tortoise						
Aves	1			0.05	0.001	0.1
Indeterminate bird						
Phasianidae	1			0.22	0.005	0.3
Fowl-like birds						
<i>Callipepla gambelii</i>	2	1	11.1	0.22	0.005	0.3
Gambel's quail						
Tytonidae	1	1	11.1	0.78	0.016	1.1
Owls						
Mammalia	150			21.07	0.409	27.5
Order Unknown, Body Size Unknown*						
Leporidae	4			2.67	0.064	4.3
Rabbits						
<i>Sylvilagus</i> sp.	5	1	11.1	0.90	0.024	1.6
Cottontail rabbit						
<i>Lepus</i> spp.	31			12.63	0.258	17.4
Jackrabbits						
<i>Lepus californicus</i>	21	2	22.2	14.45	0.291	19.6
Black-tailed jackrabbit						
<i>Lepus alleni</i>	3	1	11.1	4.13	0.094	6.4
Antelope jackrabbit						
Rodentia	3			0.01	0.000	0.0
Indeterminate rodents						
<i>Ammospermophilus harrisii</i>	2	1	11.1	0.11	0.004	0.2
Harris' Antelope Squirrel						
Artiodactyla	1			7.14	0.154	10.4
Even-toed ungulate						
<i>Odocoileus</i> sp.	1	1	11.1	5.60	0.124	8.4
Deer						
Vertebrata				0.92	0.024	1.6
Indeterminate vertebrate						
Total	227	9	100.0	71.08	1.484	100.0
* Identifications were made prior to the use of body size categories.						

Table 9. AZ AA:12:251(ASM) Compound 9 Exploratory Trench 1-1989: Summary Table					
	#	MNI		Biomass	
			%	kg	%
Artiodactyls	1		11.1	0.124	21.8
Lagomorphs	4		44.4	0.409	72.0
Commensal Mammals	1		11.1	0.004	0.7
Wild birds	2		22.2	0.021	3.7
Tortoises/Turtles	1		11.1	0.010	1.8
Total	9		100.0	0.568	100.0

Table 10. AZ AA:12:251(ASM) Compound 9 Exploratory Trench 1-1989: Element Distribution (NISP)			
	Deer	Jackrabbit	Rabbit
Head		9	1
Vertebra/Rib		10	1
Forequarter		9	1
Hindquarter		8	1
Forefoot		6	
Hindfoot		1	1
Foot	1	8	
Total	1	51	5

Table 11. AZ AA:12:251(ASM) Exploratory Trench 1, 1989, Compound 9: Modifications (NISP)									
Taxon	Burned	Calcined	Rodent Gnawed	Carnivore Gnawed	Cut Mark	Digested	Eroded	Excavation /Lab Damage	Totals
Indeterminate mammal	55	10	1					1	67
Artiodactyls	1				1				2
Lagomorphs	6	2		5		1	1	5	20
Tortoise									0
Wild Bird									0
Commensals								1	1
Total	62	12	1	5	1	1	1	7	90

Table 12. AZ AA:12:251(ASM) Compound 9, Artifact Levels, Mound Borrow Pit: Species List						
Taxa	NISP	MNI		Weight, g	Biomass	
		#	%		kg	%
Mammalia	4			0.17	0.005	0.1
Order Unknown, Body Size Unknown						
Mammalia	54			9.86	0.206	2.4
Order Unknown, Body Size Small (e.g. Rodent and Rabbit)						
Mammalia	3			2.20	0.053	0.6
Order Unknown, Body Size Medium (e.g. Coyote)						
Mammalia	16			6.01	0.132	1.6
Order Unknown, Small or Medium Mammal						
Mammalia	33			12.61	0.257	3.0
Ungulate (Large Mammal), Body Size Unknown						
<i>Sylvilagus</i> sp. Cottontail rabbit	4	1	16.7	1.06	0.028	0.3
<i>Lepus</i> spp. Jackrabbits	6			4.71	0.106	1.3
<i>Lepus alleni</i> Antelope jackrabbit	1	1	16.7	0.11	0.004	0.0
Rodentia Indeterminate rodents	1			0.02	0.001	0.0
<i>Ammospermophilus harrisi</i> Harris' Antelope Squirrel	1	1	16.7	0.10	0.003	0.0
<i>Urocyon/Vulpes</i> sp. Generic Fox	1	1	16.7	1.88	0.046	0.5
Artiodactyla Even-toed ungulate	9			99.86	1.658	19.6
Cervidae Deer	1			124.03	2.015	23.8
<i>Odocoileus hemionus</i> Mule Deer	2	1	16.7	145.37	2.324	27.5
<i>Ovis canadensis</i> Bighorn sheep	2	1	16.7	95.73	1.596	18.9
Class Mammalia/Class Aves Unknown Mammal or Bird	39			0.503	0.014	0.2
Total	177	6	100.0	504.22	8.449	100.0

Table 13. AZ AA:12:251(ASM) Compound 9, Artifact Levels, Mound Borrow Pit				
Summary Table				
	MNI		Biomass	
	#	%	kg	%
Artiodactyls	2	33.3	3.920	96.8
Leporids	2	33.3	0.032	0.8
Commensal Mammals	1	16.7	0.050	1.2
Carnivores	1	16.7	0.046	1.1
Total	6	100.0	4.048	100.0

Table 14. AZ AA:12:251(ASM) Compound 9, Artifact Levels, Mound Borrow Pit:						
Element Distribution (NISP)						
	Artiodactyla*	Bighorn Sheep	Deer	Hare	Rabbit	Small Mammal
Head	1	1		1		2
Vertebra/Rib	4			1	1	
Forequarter				1		6
Hindquarter	3	1	1	2	3	12
Forefoot				1		
Hindfoot						1
Foot			1	1		
Total	8	2	2	7	4	21

*Does not include unidentified long bone fragments

Table 15. AZ AA:12:251(ASM) Compound 9, Artifact Levels, Mound Borrow Pit:					
Modifications (NISP)					
Taxon	Burned	Calcined	Rodent Gnawed	Excavation/Lab Damage	Totals
Indeterminate mammal	7	1	1		20
Artiodactyls	3	1			5
Lagomorphs	3		1		5
Carnivores	1				2
Total	14	2	2	14	32

Taxa	MNI			Biomass		
	NISP	#	%	Weight, g	kg	%
Mammalia	234			46.19	0.828	14.8
Order Unknown, Body Size Small (e.g. Rodent and Rabbit)						
Mammalia	15			12.95	0.264	4.7
Ungulate (Large Mammal), Body Size Unknown						
Leporidae	9			2.02	0.050	0.9
Rabbits						
<i>Sylvilagus audubonii</i>	4	1	6.3	1.83	0.045	0.8
Desert Cottontail rabbit						
<i>Lepus</i> spp.	27			16.78	0.333	5.9
Jackrabbits						
<i>Lepus californicus</i>	62	8	50.0	69.29	1.193	21.3
Black-tailed jackrabbit						
<i>Lepus alleni</i>	11	2	12.5	17.03	0.337	6.0
Antelope jackrabbit						
<i>Dipodomys merriami</i>	1	1	6.3	0.02	0.001	0.0
Merriam Kangaroo Rat						
Muridae, Subfamily Sigmodontinae	2	1	6.3	0.04	0.001	0.0
New World Rats and Mice						
<i>Microtus</i> sp.	2	1	6.3	0.05	0.002	0.0
Vole						
Artiodactyla	7			69.7	1.199	21.4
Even-toed ungulate						
<i>Odocoileus virginianus</i>	2	2	12.5	70.89	1.218	21.7
White-tailed Deer						
Class Unknown	172			6.04	0.133	2.4
Indeterminate vertebrate						
Total	548	16	100.0	312.83	5.604	100.0

	MNI		Biomass	
	#	%	kg	%
Artiodactyls	2	12.5	1.218	39.5
Lagomorphs	11	68.8	1.864	60.4
Commensal Mammals	3	18.8	0.004	0.1
Total	16	100.0	3.086	100.0

Table 18. AZ AA:12:251(ASM) Compound 9, Extramural Area East, Feature 1: Element Distribution (NISP)				
	Artiodactyla*	Deer	Hare	Rabbit
Head				24
Vertebra/Rib	2			15
Forequarter				18
Hindquarter	4	2		20
Forefoot				4
Hindfoot				11
Foot				8
Total	6	2	100	4
* Total does not include long bone fragments				

Table 19. AZ AA:12:251(ASM) Compound 9, Extramural Area East, Feature 1: Modifications (NISP)										
Taxon	Burned	Calcined	Rodent Gnawed	Carnivore Gnawed	Cut Mark	Decorated	Excavation /Lab Damage	Girdled Incision	Hack Mark	Totals
Indeterminate mammal	19	40	3		1	1	1			65
Artiodactyls	1	1	2							4
Deer	1		1					1		3
Leporids	4	8	12	2			8		1	35
Totals	25	49	18	2	1	1	9	1	1	107

Table 20A. AZ AA:12:251(ASM) All Levels Room 3, Compound 9: Species List						
Taxa	NISP	MNI		Weight, g	Biomass	
		#	%		kg	%
<i>Bufo</i> sp. True Toad	1	1	4.2	0.46	0.019	0.3
Reptilia Indeterminate Reptile	1			0.09	0.006	0.1
Kinosternidae Musk and Mud Turtles	1	1	4.2	0.28	0.013	0.2
Squamata, Suborder Sauria Lizards	1			0.03	0.003	0.0
<i>Sceloporus</i> sp. Spiny Lizards	9	1	4.2	0.19	0.010	0.1
Aves Bird, Body Size Unknown	1			0.10	0.003	0.0
Aves Bird, Body Size Small	1			0.02	0.001	0.0
Aves Bird, Body Size Medium	2			0.22	0.005	0.1
Corvidae Ravens, Crows, Magpies, Jays	1	1	4.2	0.25	0.006	0.1
Mammalia Order Unknown, Body Size Unknown	6			0.94	0.025	0.3
Mammalia Order Unknown, Body Size Small (e.g. Rodent and Rabbit)	136			20.46	0.398	5.5
Mammalia Order Unknown, Body Size Medium (e.g. Coyote)	12			8.85	0.187	2.6
Mammalia Order Unknown, Body Size Large Mammal (e.g., "artiodactyl")	1			1.17	0.030	0.4
Mammalia Order Unknown, Small or Medium Mammal	81			16.70	0.331	4.6
Mammalia Ungulate (Large Mammal), Body Size Unknown	37			21.50	0.416	5.8
Mammalia Small Ungulate (e.g., deer/sheep/pig)	8			12.31	0.252	3.5
Chiroptera Bats	1	1	4.2	0.05	0.002	0.0

Table 20A. AZ AA:12:251(ASM) All Levels Room 3, Compound 9: Species List, Cont'd

Taxa	MNI			Biomass		
	NISP	#	%	Weight, g	kg	%
Leporidae	5			1.03	0.027	0.4
Rabbits						
<i>Sylvilagus</i> sp.	19			8.03	0.171	2.4
Cottontail rabbit						
<i>Sylvilagus audubonii</i>	4	1	4.2	1.46	0.037	0.5
Desert Cottontail rabbit						
<i>Lepus</i> spp.	72			31.36	0.584	8.1
Jackrabbits						
<i>Lepus californicus</i>	41	2	8.3	38.41	0.701	9.7
Black-tailed jackrabbit						
<i>Lepus alleni</i>	6	1	4.2	9.22	0.194	2.7
Antelope jackrabbit						
Rodentia	1			0.06	0.002	0.0
Indeterminate rodents						
Sciuridae	1			0.09	0.003	0.0
Squirrels						
<i>Ammospermophilus harrisi</i>	12	2	8.3	1.06	0.028	0.4
Harris' Antelope Squirrel						
<i>Spermophilus</i> sp.	1	1	4.2	0.22	0.007	0.1
Ground Squirrels						
<i>Dipodomys</i> sp.	1			0.21	0.006	0.1
Kangaroo Rats						
<i>Dipodomys merriami</i>	4	1	4.2	0.31	0.009	0.1
Merriam Kangaroo Rat						
<i>Dipodomys desertii</i>	1	1	4.2	0.30	0.009	0.1
Desert Kangaroo Rat						
<i>Neotoma</i> sp.	3			0.23	0.007	0.1
Packrat						
<i>Neotoma albigula</i>	1	1	4.2	0.10	0.003	0.0
White-throated Woodrat						
<i>Microtus</i> sp.	1	1	4.2	0.02	0.001	0.0
Voles						
Canidae	1			0.38	0.011	0.2
Coyotes, Dogs, Wolves, Foxes						
<i>Urocyon/ Vulpes</i> sp.	2			0.83	0.022	0.3
Generic Fox						
<i>Vulpes</i> sp.	3			0.78	0.021	0.3
Fox						
<i>Vulpes macrotis</i>	4	1	4.2	3.18	0.074	1.0
Kit Fox						

Taxa	MNI			Biomass		
	NISP	#	%	Weight, g	kg	%
<i>Felis rufus</i> Bobcat	2	1	4.2	5.07	0.113	1.6
Artiodactyla Even-toed ungulate	32			58.2	1.020	14.2
<i>Odocoileus</i> sp. Mule Deer/White-tailed Deer	6		0.0	69.86	1.202	16.7
<i>Odocoileus hemionus</i> Mule Deer	2	1	4.2	24.31	0.465	6.5
<i>Ovis canadensis</i> Bighorn sheep	3	1	4.2	15.96	0.318	4.4
<i>Antilocapra americana</i> Antelope	5	4	16.7	22.74	0.438	6.1
Class Unknown Indeterminate vertebrate	11			0.128	0.004	0.1
Class Mammalia/Class Aves Unknown Mammal or Bird	42			0.67	0.018	0.3
Total	586	24	100	377.83	7.205	100.0

Taxon	MNI		Biomass	
	#	%	kg	%
Artiodactyls	6	25.0	1.221	50.3
Carnivores	2	8.3	0.188	7.7
Leporids	4	16.7	0.933	38.4
Commensal Mammals	8	33.3	0.058	2.4
Wild birds	1	4.2	0.006	0.2
Tortoises/Turtles	1	4.2	0.013	0.5
Reptiles/Amphibians	2	8.3	0.010	0.4
Total	24	100.0	2.429	100.0

Note: Anurans are included in the MNI calculation, but are not included in the biomass calculation because allometric values are not currently available for the Anurans.

Table 21: AZ AA:12:251(ASM) Proveniencies with Faunal Data Available for Comparison	
Compound 1	Compound 9
Structure 8	Room 3*
Trash Mound 1	Trash Mound 1
Trash Mound 2	Mound Borrow Pit*
Exploratory Trench	Exploratory Trench I*
Plaza (Grid 329)	Extramural Area East, Feature 1*

*Zooarchaeological analysis completed during this project

Table 22. AZ AA:12:251(ASM) Compound 9, Trash Mound 1: Species List						
Taxa	NISP	MNI		Weight, g	Biomass	
		#	%		kg	%
<i>Buteo regalis</i> Ferruginous hawk	1	1	7.1	0.40	0.009	0.3
<i>Colinus virginianus</i> Bobwhite	1	1	7.1	0.10	0.003	0.1
Mammalia Order Unknown, Body Size Small (e.g. Rodent and Rabbit)	31			9.60	0.201	7.5
Mammalia Order Unknown, Body Size Large Mammal (e.g., "artiodactyl")	14			5.60	0.124	4.6
Mammalia Order Unknown, Small or Medium Mammal	2			1.10	0.029	1.1
Mammalia Ungulate (Large Mammal), Body Size Unknown	4			15.80	0.315	11.7
Leporidae Hares and Rabbits	3			0.50	0.014	0.5
<i>Sylvilagus</i> sp. Cottontail rabbit	7	2	14.3	1.50	0.038	1.4
<i>Lepus</i> spp. Jackrabbits	22			7.30	0.157	5.9
<i>Lepus alleni</i> Antelope jackrabbit	18	3	21.4	14.60	0.294	10.9
Rodentia Indeterminate rodents	1			0.00	0.000	0.0
<i>Ammospermophilus harrisi</i> Harris' Antelope Squirrel	1	1	7.1	0.20	0.006	0.2
<i>Dipodomys</i> sp. Kangaroo Rats	1	1	7.1	0.00	0.000	0.0
<i>Dipodomys desertii</i> Desert Kangaroo Rat	11	1	7.1	2.90	0.069	2.6
<i>Canis latrans/Canis familiaris</i> Coyote/Domestic dog	1	1	7.1	1.00	0.026	1.0
<i>Taxidea taxus</i> Badger	1	1	7.1	0.40	0.012	0.4
Artiodactyla Even-toed ungulate	1	1	7.1	0.6	0.017	0.6
<i>Odocoileus hemionus</i> Even-toed ungulate	1	1	7.1	76.3	1.301	48.5

Taxa	NISP	MNI		Biomass		
		#	%	Weight, g	kg	%
Class Mammalia/Class Aves Unknown Mammal or Bird	19			3	0.071	2.6
Total	140	14	100.0	140.90	2.685	100.0

Taxon	Burned	Calcined	Rodent Gnawed	Carnivore Gnawed	Worked	Totals
Indeterminate mammal	5	14	8			27
Artiodactyls						0
Lagomorphs	4	3	8			15
Wild Bird	2					2
Commensals						0
Carnivores						0
Total	11	17	16	0	0	44

Taxon	Burned	Calcined	Rodent Gnawed	Carnivore Gnawed	Worked	Totals
Indeterminate mammal	40	2				42
Artiodactyls	4					4
Lagomorphs	3	1				4
Commensals	2					2
Bird	1					1
Carnivores						0
Total	50	3	0	0	0	53

Table 25. AZ AA:12:251(ASM) Compound 1, Plaza: Summary Table				
	MNI		Biomass	
	#	%	kg	%
Artiodactyls	1	25.0	0.012	13.3
Leporids	1	25.0	0.056	62.2
Commensal Mammals	1	25.0	0.019	21.1
Wild birds	1	25.0	0.003	3.3
Total	4	100.0	0.090	100.0

Table 26. AZ AA:12:251(ASM) Compound 1, Exploratory Trench, Grid 329: Summary Table				
	MNI		Biomass	
	#	%	kg	%
Lagomorphs	2	50.0	0.154	92.8
Commensal Mammals	1	25.0	0.003	1.8
Wild birds	1	25.0	0.009	5.4
Total	4	100.0	0.166	100.0

Table 27. AZ AA:12:251(ASM) Compound 1, Exploratory Trench, Grid 329: Modifications (NISP)						
Taxon	Burned	Calcined	Rodent	Carnivore	Worked	Totals
			Gnawed	Gnawed		
Indeterminate mammal		1	1			2
Lagomorphs	2	1	3			6
Commensals			1			1
Total	2	2	5	0	0	9

Table 28. AZ AA:12:251(ASM) Compound 1, Trash Mound 1: Summary Table				
	MNI		Biomass	
	#	%	kg	%
Artiodactyls	1	5.6	0.024	3.6
Lagomorphs	5	27.8	0.479	71.8
Carnivores	2	11.1	0.059	8.8
Commensal Mammals	5	27.8	0.024	3.6
Wild birds	2	11.1	0.011	1.6
Tortoises	1	5.6	0.060	9.0
Reptiles	2	11.1	0.010	1.5
Total	18	100.0	0.667	100.0

Table 29. AZ AA:12:251(ASM) Compound 1, Trash Mound 1: Modifications (NISP)						
Taxon	Burned	Calcined	Rodent	Carnivore	Worked	Totals
			Gnawed	Gnawed		
Indeterminate mammal	8	6	6			20
Artiodactyls	2		2			4
Lagomorphs	7	3	16			26
Commensals			2			2
Carnivores			1		1	2
Total	17	9	27	0	1	54

Table 30. AZ AA:12:251(ASM) Compound 1, Trash Mound 2: Summary Table				
	MNI		Biomass	
	#	%	kg	%
Lagomorphs	7	41.2	0.305	55.4
Carnivores	2	11.8	0.156	28.3
Commensal Mammals	5	29.4	0.037	6.7
Wild birds	1	5.9	0.005	0.9
Reptiles	1	5.9	0.010	1.8
Tortoises	1	5.9	0.038	6.9
Total	17	100.0	0.551	100.0

Table 31. AZ AA:12:251(ASM) Compound 1, Trash Mound 2: Modifications (NISP)						
Taxon	Burned	Calcined	Rodent	Carnivore	Worked	Totals
			Gnawed	Gnawed		
Indeterminate mammal	3	7	4		3	17
Lagomorphs	15	8	4		2	29
Total	18	15	8	0	5	46

Table 32. AZ AA:12:251(ASM) Compound 1, Structure 8: Summary Table				
Taxon	MNI		Biomass	
	#	%	kg	%
Artiodactyls	1	5.3	0.024	4.2
Lagomorphs	8	42.1	0.449	78.4
Carnivores	1	5.3	0.022	3.8
Commensal Mammals	4	21.1	0.033	5.8
Wild birds	2	10.5	0.043	7.5
Tortoises	1	5.3	0.001	0.2
Reptiles	1	5.3	0.000	0.0
Fish	1	5.3	0.001	0.2
Total	19	100.0	0.573	100.0

Taxon	Rodent		Carnivore		Worked	Totals
	Burned	Calcined	Gnawed	Gnawed		
Indeterminate mammal	4	2	3			9
Artiodactyls	1					1
Lagomorphs	10	3	24	3		40
Commensals	1					1
Carnivores	1					1
Tortoise	1					1
Total	18	5	27	3	0	53

	NISP	Richness (nTaxa)	*Diversity (H')	Rank	**Equitability (V')	†Artiodactyl	‡Lagomorph
Compound 1	291	21	1.729	2	0.568	0.0340	0.0525
Compound 9	241	26	1.773	1	0.544	0.4366	0.1781
* Shannon-Weaver function calculated as $H' = -\sum_{i=1}^n (p_i)(\log_e p_i)$ Reitz and Wing 1999:235)							
**Sheldon formula: $V' = H'/\log S$ (Reitz and Wing 1999:235)							
† Artiodactyl Index calculated as ?NISP artiodactyl divided by ?NISP lagomorphs (Bayham 1982, Szuter 1989, 1991)							
‡ Lagomorph Index calculated as ?NISP cottontail divided by ?NISP <i>Sylvilagus</i> and <i>Lepus</i> (Gillespie 1995, Szuter 1989, 1991)							

	NISP	Richness (nTaxa)	*Diversity (H')	Rank A	Rank B	**Equitability (V')	†Artiodactyl	‡Lagomorph
All MPM	562	37	1.782	1	--	0.4936	0.2314	0.3135
Compound 9	271	26	1.773	2		0.544	0.4366	0.1781
Compound 1	291	21	1.729	3		0.568	0.0340	0.0525
Muchas Casas	806	16	1.368	4		0.4935	1.1000	0.1187
MC w/o PH 496 [€]	435	15	1.009	----	----	0.372	0.0074	0.1715
Los Morteros	1040	21	1.273	5		0.418	0.0201	0.1915
* Shannon-Weaver function calculated as $H' = -\sum_{i=1}^n (p_i)(\log_e p_i)$ Reitz and Wing 1999:235)								
**Sheldon formula: $V' = H'/\log S$ (Reitz and Wing 1999:235)								
† Artiodactyl Index calculated as ?NISP artiodactyl divided by ?NISP lagomorphs (Bayham 1982, Szuter 1989, 1991)								
‡ Lagomorph Index calculated as ?NISP cottontail divided by ?NISP <i>Sylvilagus</i> and <i>Lepus</i> (Gillespie 1995, Szuter 1989, 1991)								
€ Muchas Casas faunal assemblage with the remains from Pithouse 496 removed								

	Artiodactyl Index*	Lagomorph Index**
MPM Combined	0.2314	0.3135
Compound 9	0.4366	0.1781
Compound 1	0.0340	0.0525
Muchas Casas	1.1000	0.1187
MC w/o PH 496 [€]	0.0074	0.1715
Los Morteros P3	0.0201	0.1915
* NISP of all artiodactyl divided by the total NISP of lagomorphs		
**NISP of cottontails divided by total NISP of rabbits		
€ Muchas Casas faunal assemblage with the remains from Pithouse 496 removed		

APPENDIX A:
ZOOARCHAEOLOGICAL ANALYSIS CODING SHEETS

**Arizona State Museum, Marana Platform Mound Community
Faunal Analysis Codes**
Revised by AAB 11/2007

Coding advice for taxonomic numbering:

We are recommending a three digit codes to reduce entry error.

The 100 place value is being used here as Class designation but would be used by other analyst as the most useful generic taxonomic level.

The 10 place value is being used as Order level

The 1 place value is used as a consecutive code for Family, Genus, Species. This should be assigned by the analyst based on how finely you can make your identification.

Class Osteichthyes (Bony Fishes)

Class Osteichthyes, Order Unknown [100]

Order Cypriniformes (Minnow-like Fishes) [110]

Family Cyprinidae (Minnows) [120]

Gila elegans (Bonytail Chub) [121]

Gila cypha (Humpback Chub) [122]

Gila elegans/Gila cypha (Bonytail/Humpback Chub) [123]

Ptychocheilus lucius (Colorado Salmon) [124]

Family Catostomidae (Suckers) [130]

Xyrauchen texanus (Razorback Sucker) [131]

Class Amphibia (Amphibians)

Class Amphibia, Order Unknown [200]

Order Salientia (Frogs and Toads) [210]

Family Pelobatidae (Spadefoot Toads)

Scaphiopus sp. (Spadefoot Toad) [211]

Family Bufonidae (True Toads)

Bufo sp. (True Toad) [212]

Family Ranidae (True Frogs)

Rana sp. (True Frog) [213]

Class Reptilia (Reptiles)

Class Reptilia, Order Unknown [300]

Order Testudines (Tortoises and Turtles) [310]

Family Chelydridae (Snapping Turtles, and Allies) [311]

Family Kinosternidae (Musk and Mud Turtles) [312]

Kinosternon sp. [313]

Family Testudinidae (Land Tortoises) [314]

Gopherus agassizii (Desert Tortoise) [315]

Family Emydidae (Box and Water Turtles) [316]

Terrapene ornata (Western Box Turtle) [317]

Chrysemys picta (Painted Turtle) [318]

Order Squamata, Suborder Serpentes (Snakes) [320]

Family Colubridae (Colubrid Snakes) [321]

Family Elapidae (Coral Snakes) [322]

Micruroides euryxanthus (Coral Snake) [323]

Family Viperidae, Subfamily Crotalinae (Pit Vipers) [324]

Crotalus sp. (Rattlesnake) [325]

Order Squamata, Suborder Sauria (Lizards) [330]

Family Gekkonidae (Geckos) [331]

Family Iguanidae (Iguanas) [332]

Family Teiidae (Whiptails and Allies) [333]

Cnemidophorus sp. (Whiptails) [334]

Sceloporus sp. (Spiny Lizards) [336]

Family Anguidae (Alligator Lizards) [335]

Gerrhonotus kingii (Madrean Alligator Lizard) [337]

Family Helodermatidae (Venomous Lizards) [338]

Heloderma suspectum (Gila Monster) [339]

Class Aves (Birds)

Class Aves, Order Unknown, Body Size Unknown [400]

Class Aves, Order Unknown, Small Bird [401]

Class Aves, Order Unknown, Medium Bird [402]

Class Aves, Order Unknown, Large Bird [403]

Order Podicipediformes (Grebes) [410]

Family Podicipedidae (Grebes) [411]

Podiceps caspicus (Eared Grebe) [412]

Podilymbus podiceps (Pied-billed Grebe) [413]

Order Ciconiiformes (Storks and relatives) [420]

Family Ardeidae (Hérons, Bitterns, and Egrets) [421]*Ardea herodias* (Great Blue Heron) [422]*Casmerodius albus* (Great Egret) [423]*Butorides striatus* (Green-backed Heron) [424]*Botaurus lentiginosus* (American Bittern) [425]*Bubulcus ibis* (Cattle Egret) [426]*Nycticorax nycticorax* (Black-Crowned Night-Heron) [427]Family Cathartidae [428]*Cathartes aura* (Turkey Vulture) [429]

Order Falconiformes (Birds of Prey) [430]

Family Accipitridae (Kites, Hawks, Eagles, and Harrier) [431]*Accipiter striatus* (Sharp-shinned Hawk) [432]*Buteo* sp. (Buteonine Hawks) [433]*Buteo jamaicensis* (Red-tailed Hawk) [434]*Aquila chrysaetos* (Golden Eagle) [435]*Circus cyaneus* (Marsh Hawk) [436]Family Falconidae (Caracas and Falcons) [437]*Falco* sp. (Falcons/Kestrel/Merlin) [438]*Falco mexicanus* (Prairie Falcon) [439]*Falco sparverius* (Sparrow Hawk/Kestrel) [440]

Order Anseriformes (Ducks, Geese and Swans) [441]

Family Anatidae (Ducks, Geese, and Swans) [442]

Subfamily Anatinae (Ducks) [443]

Anas platyrhynchos (Mallard) [444]*Anas strepera* (Gadwall) [445]*Anas cyanoptera* (Cinnamon Teal) [446]*Anas* sp., duck-sized [447]*Anas* sp., teal-sized [448]*Anas acuta* (Pintail) [449]*Anas americana* (American Wigeon) [450]*Aythya valisineria* (Canvasback) [451]*Oxyura jamaicensis* (Ruddy Duck) [452]

Subfamily Anserinae (Geese and Swans) [453]

Branta canadensis (Canada Goose) [454]*Anser albifrons* (White-fronted goose) [455]*Bucephala* sp. (Goldeneyes/Bufflehead) [456]*Cygnus buccinator* (Trumpeter Swan) [457]*Spatula clypeata* (Northern Shoveler) [458]

Order Galliformes (Fowl-like Birds) [460]

Family Phasianidae (Quails) [461]*Callipepla* sp. (Scaled/Gambel's/Elegant Quail) [462]*Callipepla gambelli* (Gambel's Quail) [463]*Colinus virginianus* (Bobwhite) [464]*Cyrtonyx montezumae* (Montezuma Quail) [465]*Gallus gallus* (Domestic Chicken) [466]Family Meleagrididae (Turkeys) [467]*Meleagris gallopavo* (Turkey) [468]

Order Gruiformes (Cranes and Rails) [470]

Family Gruidae (Cranes) [471]*Grus canadensis* (Sandhill Crane) [472]Family Rallidae (Rails, Gallinules, and Coots) [473]*Fulica americana* (American Coot) [474]*Gallinula chloropus* (Common Moorhen) [475]*Porzana carolina* (Sora) [476]*Rallus limicola* (Virginia Rail) [477]

Order Charadriiformes (Shorebirds, Gulls, and Allies) [480]

Family Recurvirostridae (Avocets and Stilts) [481]Family Laridae (Gulls and Terns) [482]*Larus delawarensis* (Ring-Billed Gull) [483]Family Scolopacidae / Charadriidae (Sandpipers / Plovers) [484]*Actitis macularia* (Spotted Sandpiper) [485]*Calidris minutilla* (Least Sandpiper) [486]*Charadrius vociferus* (Killdeer) [487]*Gallinago gallinago* (Common Snipe) [488]*Limnodromus scolopaceus* (Long-Billed Dowitcher) [489]*Tringa melanoleuca* (Greater Yellowlegs) [490]

Order Columbiformes (Pigeons and Doves) [500]

Family Columbidae (Pigeons and Doves) [501]*Columba* sp. (Dove/Pigeon) [502]*Columba fasciata* (Band-Tailed Pigeon) [503]*Columbina* sp. (Dove) [504]*Columbina inca* (Inca Dove) [505]*Columbina passerina* (Common Ground-Dove) [506]*Zenaidura* sp. (Dove) [507]*Zenaida asiatica* (White-Winged Dove) [508]*Zenaida macroura* (Mourning Dove) [509]

Order Cuculiformes

Family Cuculidae*Geococcyx californianus* (Greater Roadrunner) [510]

Order Strigiformes (Owls) [520]

Family Strigidae (Typical Owls) [521]*Asio flammeus* (Short-eared Owl) [522]*Glaucidium gnoma* (Northern Pygmy Owl) [523]*Micrathene whitneyi* (Elf Owl) [524]*Otus* sp. (Screech Owl) [525]*Bubo* sp. (Typical Owl) [526]*Bubo virginianus* (Great Horned Owl) [527]*Speotyto cunicularia* (Burrowing Owl) [528]*Tyto alba* (Barn Owl) [529]Family Caprimulgidae (Nighthawks and Whip-poor-wills) [530]*Chordeiles* sp. (Nighthawk) [531]*Phalaenoptilus nuttallii* (Common Poorwill) [532]*Chordeiles acutipennis* (Lesser Nighthawk) [533]

Order Piciformes (Woodpeckers and Allies) [540]

Family Picidae (Woodpeckers and Flickers) [541]*Colaptes auratus* (Northern Flicker) [542]*Melanerpes* sp. (Woodpecker) [543]*Melanerpes formicivorus* (Acorn Woodpecker) [544]*Melanerpes uropygialis* (Gila Woodpecker) [545]*Sphyrapicus nuchalis* (Red-Naped Sapsucker) [546]*Picoides scalaris* (Ladder-Backed Woodpecker) [547]

Order Passeriformes (Perching Birds) [550]

Family Tyrannidae (Tyrant Flycatchers) [551]*Sayornis* sp. (Phoebes) [552]Family Corvidae (Ravens, Crows, Magpies, and Jays) [553]*Cyanocitta stelleri* (Steller's Jay) [554]*Aphelocoma coerulescens* (Scrub) [555]*Pica pica* (Common Magpie) [556]*Corvus corax* (Common Raven) [557]Family Mimidae (Mockingbirds and Thrashers) [558]Family Turdidae (Thrushes, Solitaires, and Bluebirds) [559]*Turdus migratorius* (American Robin) [560]*Catharus* sp. (Thrush) [561]

- Sialia* sp. (Bluebirds) [562]
Family Laniidae (Shrikes) [563]
Lanius ludovicianus (Loggerhead Shrike) [564]
Family Icteridae (Blackbirds, Meadowlarks, and Orioles) [565]
Xanthocephalus xanthocephalus (Yellow-headed Blackbird) [566]
Family Thraupidae (Tanagers) [567]
Piranga sp. (Tanagers) [568]
Family Fringillidae (Finches, Grosbeaks, Buntings, and Sparrows) [569]
Passerina amoena (Lazuli Bunting) [570]

Class Mammalia (Mammals)

- Class Mammalia, Order Unknown, Body Size Unknown [600] **REVISIT in sample**
 Class Mammalia, Order Unknown, Small Mammal (e.g., “rodent and rabbit”) [601]
 Class Mammalia, Order Unknown, Medium Mammal (e.g., “coyote”) [602]
 Class Mammalia, Order Unknown, Large Mammal (e.g., “artiodactyl”) [603]
OLD (REVISIT)
 Class Mammalia, Small or Medium Mammal [604]
 Class Mammalia, Ungulate (Large Mammal), Body Size Unknown [605]
 Class Mammalia, Small Ungulate (e.g., deer/sheep/pig) [606]
 Class Mammalia, Large Ungulate (e.g., cow/horse) [607]
- Order Chiroptera (Bats) [610]
Family Phyllostomatidae (Leaf-nosed Bats) [611]
Family Vespertilionidae (Plain-nosed Bats) [612]
Family Molossidae (Free-tailed Bats) [613]
- Order Lagomorpha (Hares and Rabbits)
Family Leporidae (Hares and Rabbits) [620]
Sylvilagus sp. (Cottontails) [621]
Sylvilagus floridanus (Eastern Cottontail) [622]
Sylvilagus audubonii (Desert Cottontail) [623]
Lepus sp. (Hares and Jackrabbits) [624]
Lepus californicus (Black-tailed Jackrabbit) [625]
Lepus alleni (Antelope Jackrabbit) [626]
- Order Rodentia (Rodents) [630]
Family Sciuridae (Squirrels) [631]
Sciurus arizonensis (Arizona Gray Squirrel) [632]
Ammospermophilus harrisi (Yuma Antelope Squirrel) [633]
Spermophilus sp. (Ground Squirrels) [634]

Spermophilus variegatus (Rock Squirrel) [635]

Spermophilus spilosoma (Spotted Ground Squirrel) [636]

Spermophilus tereticaudus (Roundtail Ground Squirrel) [637]

Family Geomyidae (Pocket Gophers) [640]

Thomomys sp. (Pocket Gophers) [641]

Thomomys bottae (Valley Pocket Gopher) [642]

Thomomys umbrinus (Pygmy Pocket Gopher) [643]

Family Heteromyidae (Pocket mice, Kangaroo Mice, and Kangaroo Rats) [650]

Dipodomys sp. (Kangaroo Rats) [651]

Dipodomys ordii (Ord's Kangaroo Rat) [652]

Dipodomys merriami (Merriam Kangaroo Rat) [653]

Dipodomys spectabilis (Bannertail Kangaroo Rat) [654]

Perognathus sp. (Pocket Mice) [655]

Family Muridae, Subfamily Sigmodontinae (New World Rats and Mice) [660]

Neotoma albigula (White-throated Woodrat) [661]

Onychomys torridus. (Southern Grasshopper Mouse) [662]

Peromyscus sp. (White-footed Mice) [663]

Reithrodontomys sp. (Harvest Mouse) [664]

Sigmodon sp. (Cotton Rats) [665]

Subfamily Microtinae (Lemmings, Voles, and Muskrats) [670]

Ondatra zibethicus (Muskrat) [671]

Family Erethizontidae (New World Porcupine)

Erethizon dorsatum (Porcupine) [672]

Family Castoridae (Beaver) [673]

Castor canadensis (Beaver) [674]

Order Carnivora (Carnivores) [680]

Family Canidae (Coyotes, Dogs, Wolves, and Foxes) [681]

Canis sp. (Coyote/Domestic Dog/Wolf) [682]

Canis latrans/Canis familiaris (Coyote/Domestic Dog) [683]

Canis familiaris (Domestic Dog) [684]

Canis latrans (Coyote) [685]

Urocyon/Vulpes (Generic "Fox") [686]

Urocyon cinereoargenteus (Gray Fox) [687]

Vulpes macrotis (Kit Fox) [688]

Family Procyonidae (Raccoons and Allies) [690]

Bassariscus astutus (Ringtail) [691]

Nasua narica (Coati) [692]

Procyon lotor (Raccoon) [693]

Family Mustelidae (Weasels, Skunks, and Allies) [700]

Mustela frenata (Longtail Weasel) [701]

Taxidea taxus (Badger) [702]

Conepatus leuconotus (Hognose Skunk) [703]

Mephitis macroura (Hooded Skunk) [704]

Mephitis mephitis (Striped Skunk) [705]

Spilogale gracilis (Western Spotted Skunk) [706]

Family Felidae (Cats) [710]

Felis catus (Domestic Cat) [711]

Felis concolor (Mountain Lion) [712]

Felis rufus (Bobcat) [713]

Order Artiodactyla (Even-toed Ungulates) [720]

Family Suidae

Sus scrofa (Domestic Pig) [721]

Family Tayassuidae

Pecari tajacu (Collared Peccary) [722]

Family Cervidae (Deer)

Odocoileus sp. (Mule Deer/White-tailed Deer) [730]

Odocoileus hemionus (Mule Deer) [731]

Odocoileus virginianus (White-tailed Deer) [732]

Family Bovidae (Wild Cattle)

Bos taurus (Domestic Cattle) [740]

Caprinae (Sheep/Goat) [750]

Ovis canadensis (Bighorn Sheep) [751]

Ovis aries (Domestic Sheep) [752]

Capra hircus (Domestic Goat) [753]

Family Antilocapridae (Antelopes) [760]

Antilocapra americana [761]

Class Unknown [900]

Class Mammalia/Class Aves [901]

Marana Platform Mound
Faunal Coding Key

ELEMENT [ELEM]

General elements:

- 1= indeterminate bone
- 2= flat bone
- 3= long bone
- 4= spongy bone
- 5= misc. fish frag.
- 6= eggshell

Skull:

- 10= cranium
- 11= antler
- 12= horn core
- 15= mandible
- 113= quadrate (also in fish)

Neck:

- 20= atlas
- 21= axis
- 22= cervical vertebra

Axial Column:

- 23= vertebra, type unknown
- 24= thoracic
- 25= lumbar
- 26= sacrum/ synsacrum (birds)
- 27= caudal
- 28= urostyle (Anura)/ pygostyle

(birds)

- 29= rib
- 30= costal cartilage
- 31= sternum/ keel (birds)
- 32= manubrium
- 33= innominate
- 34= branchiostegels
- 35= pterygiophores

Front limb:

- 40= scapula
- 41= coracoid
- 42= clavicle/ furculum (birds)
- 43= humerus
- 44= radius/ radioulna
- 45= ulna
- 46= carpal (type unknown)
- 47= radial (scaphoid)

- 48= accessory (pisiform)
- 49= intermediate (lunate)
- 50= ulnar (cuneiform)
- 51= 1st carpal
- 52= 2nd carpal/ 2nd and 3rd carpal

(magnum)

- 53= 3rd carpal
- 54= 4th carpal (unciform or hamate)
- 55= metacarpal/ carpometacarpus

(birds)

- 56= phalanx- front
- 57= digit (bird-record specific digit

in Comments)

Hind limb:

- 60= femur
- 61= patella
- 62= tibia/ tibiofibula/ tibiotarsus

(birds)

- 63= fibula (os malleolaire)
- 66= tarsal (unknown type)
- 67= calcaneum
- 68= astragalus
- 69= 1st tarsal (cuneiform)
- 70= 2nd tarsal/ tarsal 2 and 3
- 71= 3rd tarsal
- 72= cuboid (4th tarsal)/

cubonavicular

- 73= navicular
- 74= metatarsal/ tarsometatarsus

(birds)

- 75= phalanx- rear

Teeth

- 7_ _ _deciduous tooth
- 100 from upper jaw
- 200 from lower jaw
- 300 dental position unknown

(misc. tooth)

- _10 incisor (type unknown)
- _11 first incisor
- _12 second incisor
- _13 third incisor
- _20 canine
- _30 premolar (type unknown)
- _31 first premolar
- _32 second premolar
- _33 third premolar

_34 fourth premolar
 _40 molar (type unknown)
 _41 first molar
 _42 second molar
 _43 third molar
 _50 molar/premolar (cheek
 tooth)
 Tortoise shell:
 80= carapace/plastron
 81= carapace
 82= plastron
 Feet:
 90= sesamoid
 91= metapodial
 92= podial
 93= first phalanx
 94= second phalanx
 95= third phalanx
 96= vestigial phalanx
 97= phalanx (type unknown)
 Fish:
 111= premaxilla
 112= maxilla
 113= quadrate (also in birds)
 114= basioccipital
 119= endocranium
 (neurocranium)
 120= endopterygoid
 121= angular
 122= articular
 123= dentary
 124= ectopterygoid
 126= metapterygoid
 127= vomer
 128= cleithrum
 129= posttemporal
 131= basihyal
 133= ceratohyal
 134= epihyal
 135= hyomandibular
 138= interoperculum
 139= operculum
 140= suboperculum
 141= preoperculum
 144= urohyal
 145= lacrymal

146= parasphenoid
 147= pterotic
 148= otolith

SIDE [SIDE]

0= unknown/not applicable
 1= left
 2= right

PORTION [PRTN]

Horn/antler:

1=rosette (base)
 2=pedicel-braincase
 3=shaft-rosette-pedicel-
 braincase
 4=tip/tine
 5=antler shed

Cranium:

10= frontal
 11= parietal
 12= squamosal
 13= auditory bulla
 14= petrous
 15= occipital (no condyle)
 16= occipital condyle
 17= nasal
 18= maxilla
 19= zygomatic (jugul-squamosal)
 20= palatine
 21= premaxilla
 22= basioccipital
 23= hyoid
 24= skull-medial
 25= skull w/o occipital
 26= skull-partial
 27= other cranial frag (note in
 comments)
 28= sphenoid
 29= tooth root

Mandible:

30= horizontal ramus
 31= ascending ramus
 32= condyloid process
 33= coronoid process
 34= "dip" b/w condyloid-
 coronoid

- 35= diastema
- Vertebra:
- 40= epiphysis
 - 41= centrum
 - 42= neural arch
 - 43= transverse process
 - 44= dorsal spine
 - 45= half
 - 46= anterior-ventral articulation
 - 47= zygopophysis
 - 48= pre-zygopophysis (4848 both intact)
 - 49= post-zygopophysis (4949 both intact)
- Rib:
- 280= Head
 - 281= Neck
 - 282= Articular Tubercle
 - 283= Costal Groove
 - 284= Sternal End
 - 285= Vertebral End
 - 286= Shaft
- Innominate:
- 50= ilium
 - 51= ischium
 - 52= acetabulum
 - 53= pubis
 - 54 = ischiatic spine
- Limb bones:
- 60= unknown
 - 61= proximal (ant) end
 - 62= distal end
 - 63= proximal < 1/2
 - 64= distal < 1/2
 - 65= proximal 1/2
 - 66= distal 1/2
 - 67= proximal > 1/2
 - 68= distal > 1/2
 - 69= diaphysis
 - 70= proximal epiphysis
 - 71= distal epiphysis
 - 72= end
 - 73= shaft/blade (scapula)
- Long bone end portions
- 100= medial distal epiphysis
 - 101= lateral distal epiphysis
 - 102= anterior distal epiphysis
 - 103= posterior distal epiphysis
 - 110= anterior proximal epiphysis
 - 111= posterior proximal epiphysis
- epiphysis
- 112= medial proximal epiphysis
 - 113= lateral proximal epiphysis
- Long bone shaft features
- 900= with foramen
 - 980= medial distal shaft with top condyle
 - 991= with attachment scar (radius)
 - 992= Linea aspera
 - 993= Supercondoloydial crest
 - 994= anterior crest (tibia)
 - 995= muscle insertion scar
 - 996= posterior rugosities (tibia)
 - 997= interior diagonal lattice (humerus)
 - 998= anterior groove (metapodials)
 - 999= posterior groove (metapodials)
- Tortoise shell features:
- 80= peripheral
 - 81= nuchal
 - 82= pygal
 - 83= costal
 - 84= neural
 - 85= suprapygal
 - 86= hyoplastron
 - 87= hypoplastron
 - 88= xiphiplstron
 - 89= entoplastron
 - 90= epiplastron
- General Portions:
- 91=nearly complete
 - 92=complete
 - 93=half
 - 94= less than half
 - 95= unknown/ fragment
 - 96= shaft with foramen
 - 97= misc shaft fragment
 - 98= enamel fragment

TOOL MARK TYPES:

C= cutmark
 H= hack mark
 I= blunt impact with local crushing
 ^= cone fracture
 HS= hand sawing
 MS= mechanized sawing
 Z= scrapes and scratches
 A= abrasion/grinding/polish
 G= girdled incision (groove and snap)
 E= excavation/lab damage
 D= drilled

TOOL MARK ORIENTATION:

T= transverse (perpendicular) to main axis
 L= longitudinal (parallel to main axis)
 D= diagonal (oblique) to main axis

FUSION/ AGE CRITERIA:

0= not applicable/unknown
 1= unfused (epiphysis or diaphysis)
 2= partly fused
 3= nearly fused
 4= fully fused
 10= proximal/anterior fused, distal/posterior unfused
 20= distal/posterior fused, proximal/anterior unfused
 50= woven bone tissue (immature)
 81= probably fetal/neonate
 88= probably juvenile
 90= antler base shed
 91= antler base unshed

BURNING [BURN]

0= none
 1= burned
 2= calcined

TOOL MARKS [MARKS]

0= absent
 1= cut mark

2= hack mark
 3= girdled incision
 4= saw mark
 5= blunt impact
 6= cone fracture
 7= hand sawing
 8= mechanized sawing
 9= scrapes and scratches
 10= abrasion/grinding/polishing
 11= excavation/lab damage
 12= drilled
 13= carved
 14= heat treated
 15= decorated
 16= digested
 17= eroded

GNAWING [GNAW]

0= absent
 1= rodent gnawing
 2= carnivore gnawing

COMMENTS [COMMENTS]

This is where you record any observations about the specimen for which there is no associated code.

APPENDIX B:

AZ AA:12:251(ASM) MARANA PLATFORM MOUND SITE:
ALL PROVENIENCES STUDIED IN COMPOUNDS 1 AND 9**Exploratory Trench 1, Compound 9**

Grid	PD Number	FS Number	Unit	Level	Analyst
250	33		M 30-32	Level 4	AAB
250	74		M 30-32	Level 6	AAB
250	42		M 32-34	Level 3	AAB
250	39		M 34-36	Level 1	AAB
250	41		M 36-38	Level 5	AAB
250	72		M 40-42	Level 4	AAB
250	103		M 50-52	Level 2	AAB
250	112		M 50-52	Level 4	AAB
250	154		M 50-52	Level 5	AAB
250	128		M 52-54	Level 3	AAB
250	133		M 52-54	Level 5	AAB
250	152		M 52-54	Level 5	AAB
250	151		M 54-56	Level 8	AAB
270	29				AAB
270	49		M 0-2	Level 2	AAB
270	3		M 0-2	Level 2	AAB
270	137		M 2-4	Level 2	AAB
270	141		M 2-4	Level 3	AAB
270	26		M 4-6	Level 1	AAB
270	24		M 6-8	Level 1	AAB

Mound Borrow Pit, Compound 9

Grid	PD Number	FS Number	Unit	Level	Analyst
250	289		Trench	Level 1	AAB
250	299		Unit 2	Level 1	AAB
250	308		Unit 2	Level 3	AAB
250	323		Unit 2	Level 5	AAB
250	329		Unit 1	Level 1	AAB
250	368		Unit 2	Level 7	AAB
250	369		Unit 1	Level 4	AAB
250	378		Unit 2	Level 8	AAB
250	398		Unit 2	Level 11	AAB
250	400		Unit 2	Level 12	AAB
250	429		Profile		AAB

Feature 1, Extra Mural Area East, Compound 9

Grid	PD Number	FS Number	Unit	Level	Analyst
271	145		EU 2	1	AAB

Room 3, Compound 9

Grid	PD Number	FS Number	Unit	Level	Analyst
250	164		Test	Level 2	AAB
250	165		Test	Level 3	AAB
250	166		Test	Level 4	AAB
250	169		SE	Level 1	AAB
250	170		SE	Level 2	AAB
250	171		SE	Level 2	AAB
250	173		SE	Level 3	AAB
250	174		SW	Level 4	AAB
250	175		SW	Level 4	AAB
250	176		SW	Level 4	AAB
250	177		SE	Level 4	AAB
250	180		SE	Level 4	AAB
250	181		SW	Level 5	AAB
250	183		SW	Level 5	AAB
250	184		SW	Level 5	AAB
250	186		SE	Level 5	AAB
250	187		SE	Level 5	AAB
250	188		SE	Level 5	AAB
250	189		NW	Level 5	AAB
250	192		SW		AAB
250	194		SE	Level 6	AAB
250	195		SE	Level 6	AAB
250	196		SE	Level 6	AAB
250	197		SE	Level 6	AAB
250	199		SE		AAB
250	200		SW	Level 6	AAB
250	274		SW	Level 2	AAB
250	300		NE	Level 1	AAB
250	309		NE	Level 2	AAB
250	314		SE	Level 3	AAB
250	316		NE	Level 3	AAB
250	320		NE	Level 3	AAB
250	322		NE	Level 3	AAB
250	330		SE	Level 1	AAB
250	332		NE	Level 4	AAB
250	333		NE	Level 4	AAB
250	347		NE	Level 4	AAB
250	350		NE	Level 4	AAB
250	351		SE	Level 2	AAB
250	354		NE	Level 4	AAB
250	364		NE	Level 4	AAB
250	370		SE	Level 4	AAB
250	371		NE	Level 5	AAB

250	374	NE	Level 5	AAB
250	376	NE	Level 5	AAB
250	379	NW	Level 1	AAB
250	380	SW	Level 5	AAB
250	383	NE	Level 5	AAB
250	384	NW	Level 1	AAB
250	389	NW	Level 2	AAB
250	390	NW	Level 3	AAB
250	391	NW	Level 3	AAB
250	393	NW	Level 3	AAB
250	396	NW	Level 3	AAB
250	397	NW	Level 1	AAB
250	402	NW	Level 3	AAB
250	404	NE	Level 5	AAB
250	407	SW	Level 3	AAB
250	410	NW	Level 4	AAB
250	411	NE	Level 5	AAB
250	412	NW	Level 2 & 3	AAB
250	414	NW	Level 4	AAB
250	416	NW	Level 4	AAB
250	419	NW	Level 5	AAB
250	421	NW	Level 5	AAB
250	424	SW	Level 4	AAB
250	425	Doorway	Level 1	AAB
250	428	Doorway	Level 2	AAB
250	435	NE	Level 6	AAB
250	436	NE	Level 6	AAB
250	438	NE	Level 6	AAB
250	439	NE	Level 6	AAB
250	440	Doorway	Level 3	AAB
250	441	Feature 10	Level 1	AAB
250	455	Feature 20	Level 1	AAB
250	459	Feature 8	Level 1	AAB
250	473	Feautre 5	Level 1	AAB
250	476	Feature 34	Level 1	AAB
250	479	NW		AAB

Trash Mound 1, Compound 9

Grid	PD Number	FS Number	Unit	Level	Analyst
271		21	1	Level 1	JRK/RCP/CZ
271		22	10	Level 2	JRK/RCP/CZ
271		36	3	Level 3	JRK/RCP/CZ
271		37	3	Level 4	JRK/RCP/CZ
271		46	2	Level 6	JRK/RCP/CZ
271		47	3	Level 1	JRK/RCP/CZ
271	47b		1	Level 1	JRK/RCP/CZ
271	51b		3	Level 5	JRK/RCP/CZ

Exploratory Trench, Compound 1

Grid	PD Number	FS Number	Unit	Level	Analyst
370	101		3	Level 2	JRK/RCP/CZ
370	102		4	Level 3	JRK/RCP/CZ
370	103		3	Level 4	JRK/RCP/CZ
370	104		3	Level 5	JRK/RCP/CZ
370	106		3	Level 7	JRK/RCP/CZ
370	107		3	Level 4	JRK/RCP/CZ
370	110		3	Level 2	JRK/RCP/CZ
370	113		3	Level 6	JRK/RCP/CZ
370	114		4	Level 7	JRK/RCP/CZ
370	125		3	Level 2	JRK/RCP/CZ
370	127		3	Level 4	JRK/RCP/CZ
370	128		4	Level 5	JRK/RCP/CZ
370	129		3	Level 6	JRK/RCP/CZ
370	130		3	Level 7	JRK/RCP/CZ

Trash Mound 1, Compound 1

Grid	PD Number	FS Number	Unit	Level	Analyst
370	21		5	Level 1	JRK/RCP/CZ
370	22		7	Level 2	JRK/RCP/CZ
370	23		9	Level 3	JRK/RCP/CZ
370	24		7	Level 4	JRK/RCP/CZ
370	26		9	Level 6	JRK/RCP/CZ
370	28		4	Level 8	JRK/RCP/CZ
370	30		7	Level 10	JRK/RCP/CZ
370	35		6	Level 2	JRK/RCP/CZ
370	36		5	Level 2	JRK/RCP/CZ
370	37		4	Level 3	JRK/RCP/CZ
370	38		3	Level 4	JRK/RCP/CZ
370	41		3	Level 5	JRK/RCP/CZ
370	42		3	Level 6	JRK/RCP/CZ
370	43		4	Level 6	JRK/RCP/CZ
370	44		3	Level 1	JRK/RCP/CZ
370	45		4	Level 1	JRK/RCP/CZ
370	46		3	Level 2	JRK/RCP/CZ
370	47		3	Level 2	JRK/RCP/CZ
370	48		3	Level 3	JRK/RCP/CZ

Trash Mound 2, Compound 1

Grid	PD Number	FS Number	Unit	Level	Analyst
349	21		3	Level 1	JRK/RCP/CZ
349	22		4	Level 2	JRK/RCP/CZ
349	23		3	Level 3	JRK/RCP/CZ
349	24		4	Level 4	JRK/RCP/CZ
349	26		4	Level 6	JRK/RCP/CZ
349	28		4	Level 1	JRK/RCP/CZ
349	29		4	Level 2	JRK/RCP/CZ
349	30		3	Level 3	JRK/RCP/CZ

349	31	6	Level 4	JRK/RCP/CZ
349	32	4	Level 5	JRK/RCP/CZ
349	33	3	Profile	JRK/RCP/CZ

Plaza, Compound 1

Grid	PD Number	FS Number	Unit	Level	Analyst
329	47	4		Level 1	JRK/RCP/CZ
329	47	5		Level 1	JRK/RCP/CZ
329	48	4		Level 1	JRK/RCP/CZ
329	49	2		Level 1	JRK/RCP/CZ
329	50	3		Level 1	JRK/RCP/CZ
329	51	3		Level 1	JRK/RCP/CZ
329	53	4		Level 1	JRK/RCP/CZ
329	54	3		Level 2	JRK/RCP/CZ
329	55	2		Level 2	JRK/RCP/CZ
329	56	3		Level 3	JRK/RCP/CZ
329	61	4		Level 2	JRK/RCP/CZ
329	62	4		Level 1	JRK/RCP/CZ
329	63	3		Level 1	JRK/RCP/CZ
329	64	4		Level 2	JRK/RCP/CZ
329	66	3		Level 2	JRK/RCP/CZ
329	67	3		Level 2	JRK/RCP/CZ
329	68	3		Level 1	JRK/RCP/CZ
329	69	4		Level 2	JRK/RCP/CZ

Structure 8, Compound 1

Grid	PD Number	FS Number	Unit	Level	Analyst
330	22	1		Level 2	JRK/RCP/CZ
330	22	7		Level 2	JRK/RCP/CZ
330	23	4		Level 2	JRK/RCP/CZ
330	35	3	Test Pit	Clean up	JRK/RCP/CZ
330	37	3		Level 2	JRK/RCP/CZ
330	38	2		Level 3	JRK/RCP/CZ
330	39	3		Level 4	JRK/RCP/CZ
330	40	3		Level 5	JRK/RCP/CZ
330	43	3		Level 7	JRK/RCP/CZ
330	43	5		Level 8	JRK/RCP/CZ
330	36 0r 30	3			JRK/RCP/CZ

APPENDIX C:
AZ AA:12:251(ASM) MARANA PLATFORM MOUND COMPOUND 9:
ALL ANALYZED PROVENIENCES SPECIES LIST

Appendix C. AZ AA:12:251(ASM) Marana Platform Mound Compound 9: All Analyzed Proveniences Species List						
Taxa	NISP	MNI		Weight, g	Biomass	
		#	%		kg	%
<i>Bufo</i> sp. True Toad	1	1	1.9	0.46	0.019	0.1
Reptilia Indeterminate Reptile	1			0.09	0.006	0.0
Kinosternidae Musk and Mud Turtles	1	1	1.9	0.28	0.013	0.1
<i>Gopherus agassizii</i> Desert Tortoise	1	1	1.9	0.18	0.010	0.0
Squamata, Suborder Sauria Lizards	1			0.03	0.003	0.0
<i>Sceloporus</i> sp. Spiny Lizards	9	1	1.9	0.19	0.010	0.0
Aves Bird, Body Size Unknown	1			0.10	0.003	0.0
Aves Bird, Body Size Small	2			0.07	0.002	0.0
Aves Bird, Body Size Medium	2			0.22	0.005	0.0
<i>Buteo regalis</i> Ferruginous hawk	1	1	1.9	0.40	0.009	0.0
Phasianidae Fowl-like birds	1			0.00	0.000	0.0
<i>Colinus virginianus</i> Bobwhite	1	1	1.9	0.10	0.003	0.0
<i>Callipepla gambelii</i> Gambel's quail	2	1	1.9	0.22	0.005	0.0
Tytonidae Owls	1	1	1.9	0.78	0.016	0.1
Corvidae Ravens, Crows, Magpies, Jays	1	1	1.9	0.25	0.006	0.0
Mammalia Order Unknown, Body Size Unknown	156			20.80	0.404	1.7
Mammalia Order Unknown, Body Size Small (e.g. Rodent and Rabbit)	469			89.95	1.509	6.3
Mammalia Order Unknown, Body Size Medium (e.g. Coyote)	15			11.05	0.229	1.0

Appendix C. AZ AA:12:251(ASM) Marana Platform Mound All Analyzed Proveniences Species List cont'd						
Taxa	NISP	MNI		Weight, g	Biomass	
		#	%		kg	%
Mammalia	16			6.67	0.145	0.6
Order Unknown, Body Size Large Mammal (e.g., "artiodactyl")						
Mammalia	99			23.80	0.456	1.9
Order Unknown, Small or Medium Mammal						
Mammalia	90			64.74	1.122	4.7
Ungulate (Large Mammal), Body Size Unknown						
Mammalia	8			12.31	0.252	1.1
Small Ungulate (e.g., deer/sheep/pig)						
Chiroptera	1	1	1.9	0.05	0.002	0.0
Bats						
Leporidae	21			6.43	0.140	0.6
Rabbits						
<i>Sylvilagus</i> sp.	35			11.49	0.237	1.0
Cottontail rabbit						
<i>Sylvilagus audubonii</i>	9	3	5.6	3.54	0.082	0.3
Desert Cottontail rabbit						
<i>Lepus</i> spp.	40			72.78	1.247	5.2
Jackrabbits						
<i>Lepus californicus</i>	124	9	16.7	122.15	1.987	8.3
Black-tailed jackrabbit						
<i>Lepus alleni</i>	39	7	13.0	39.43	0.718	3.0
Antelope jackrabbit						
Rodentia	6			0.38	0.011	0.0
Indeterminate rodents						
Sciuridae	1			0.09	0.003	0.0
Squirrels						
<i>Ammospermophilus harrisi</i>	16	5	9.3	1.47	0.037	0.2
Harris' Antelope Squirrel						
<i>Spermophilus</i> sp.	1			0.22	0.007	0.0
Ground Squirrels						
<i>Dipodomys</i> sp.	2			0.21	0.006	0.0
Kangaroo Rats						
<i>Dipodomys merriami</i>	5	2	3.7	0.33	0.010	0.0
Merriam Kangaroo Rat						
<i>Dipodomys desertii</i>	1	1	1.9	0.30	0.009	0.0
Desert Kangaroo Rat						
Muridae, Subfamily Sigmodontinae	2			0.04	0.001	0.0
New World Rats and Mice						

**Appendix C. AZ AA:12:251(ASM) Marana Platform Mound All Analyzed Proveniences Species List
cont'd**

Taxa	NISP	MNI		Weight, g	Biomass	
		#	%		kg	%
<i>Neotoma</i> sp. Packrats	4			0.40	0.012	0.0
<i>Neotoma albigula</i> White-throated Woodrat	1	1	1.9	0.10	0.003	0.0
<i>Microtus</i> sp. Voles	3	1	1.9	0.07	0.002	0.0
Canidae Coyotes, Dogs, Wolves, Foxes	1			0.38	0.011	0.0
<i>Canis latrans/Canis familiaris</i> Coyote/Domestic dog	1	1	1.9	1.00	0.026	0.1
<i>Taxidea taxus</i> Badger	1	1	1.9	0.40	0.012	0.0
<i>Urocyon/ Vulpes</i> sp. Generic Fox	3			2.71	0.065	0.3
<i>Vulpes</i> sp. Fox	3			0.78	0.021	0.1
<i>Vulpes macrotis</i> Kit Fox	4	1	1.9	3.18	0.074	0.3
<i>Felis rufus</i> Bobcat	2	1	1.9	5.07	0.113	0.5
Artiodactyla Even-toed ungulate	92			271.92	4.083	17.1
Cervidae Deer	1			124.03	2.015	8.4
<i>Odocoileus</i> sp. Mule Deer/White-tailed Deer	7			75.46	1.288	5.4
<i>Odocoileus hemionus</i> Mule Deer	5	3	5.6	245.98	3.731	15.6
<i>Odocoileus virginianus</i> White-tailed Deer	2	2	3.7	70.89	1.218	5.1
<i>Ovis canadensis</i> Bighorn sheep	5	2	3.7	111.69	1.833	7.7
<i>Antilocapra americana</i> Antelope	5	4	7.4	22.74	0.438	1.8
Class Unknown Indeterminate vertebrate	188			7.048	0.153	0.6
Class Mammalia/Class Aves Unknown Mammal or Bird	150			3.863	0.089	0.4
Total	1660	54	100.0	1439.31	23.910	100.0

APPENDIX D

AZ AA:12:251(ASM) ROOM 3, COMPOUND 9, GRID 250:
MNI AND NISP FOR STRATIGRAPHIC LEVELS

Taxa	Test Pit 1991 All Levels NISP	Fill Levels 1 -3 1991 NISP	Fill Levels 1-3 2004 NISP
<i>Bufo</i> sp. True Toad			
Reptilia			
Indeterminate Reptile			
Kinosternidae		1	
Musk and Mud Turtles			
Squamata, Suborder Sauria			1
Lizards			
<i>Sceloporus</i> sp.			
Spiny Lizards			
Aves			
Bird, Body Size Unknown			
Aves			
Bird, Body Size Small			
Aves			
Bird, Body Size Medium			
Corvidae			
Ravens, Crows, Magpies, Jays			
Mammalia			3
Order Unknown, Body Size Unknown			
Mammalia		10	58
Order Unknown, Body Size Small (e.g. Rodent and Rabbit)			
Mammalia			4
Order Unknown, Body Size Medium (e.g. Coyote)			
Mammalia			1
Order Unknown, Body Size Large Mammal (e.g., "artiodactyl")			
Mammalia	4	4	34
Order Unknown, Small or Medium Mammal			
Mammalia			26
Ungulate (Large Mammal), Body Size Unknown			
Mammalia			5
Small Ungulate (e.g., deer/sheep/pig)			
Chiroptera			
Bats			

	Test Pit 1991 All Levels NISP	Fill Levels 1 -3 1991 NISP	Fill Levels 1-3 2004 NISP
Taxa			
Leporidae			1
Rabbits			
<i>Sylvilagus</i> sp.		4	4
Cottontail rabbit			
<i>Sylvilagus audubonii</i>			
Desert Cottontail rabbit			
<i>Lepus</i> spp.	1	6	27
Jackrabbits			
<i>Lepus californicus</i>		7	12
Black-tailed jackrabbit			
<i>Lepus alleni</i>	1	1	2
Antelope jackrabbit			
Rodentia			
Indeterminate rodents			
Sciuridae			
Squirrels			
<i>Ammospermophilus harrisii</i>		1	6
Harris' Antelope Squirrel			
<i>Spermophilus</i> sp.			
Ground Squirrels			
<i>Dipodomys</i> sp.			
Kangaroo Rats			
<i>Dipodomys merriami</i>			
Merriam Kangaroo Rat			
<i>Dipodomys desertii</i>			
Desert Kangaroo Rat			
<i>Neotoma</i> sp.			
Packrat			
<i>Neotoma albigula</i>			1
White-throated Woodrat			
<i>Microtus</i> sp.			1
Voles			
Canidae			
Coyotes, Dogs, Wolves, Foxes			
<i>Urocyon/ Vulpes</i> sp.			1
Generic Fox			
<i>Vulpes</i> sp.			3
Fox			
<i>Vulpes macrotis</i>			
Kit Fox			
<i>Felis rufus</i>			1
Bobcat			

Taxa	Test Pit 1991 All Levels NISP	Fill Levels 1 -3 1991 NISP	Fill Levels 1-3 2004 NISP
Artiodactyla		3	6
Even-toed ungulate			
<i>Odocoileus</i> sp.			4
Mule Deer/White-tailed Deer			
<i>Odocoileus hemionus</i>			
Mule Deer			
<i>Ovis canadensis</i>			1
Bighorn sheep			
<i>Antilocapra americana</i>			4
Antelope			
Class Unknown			6
Indeterminate vertebrate			
Class Mammalia/Class Aves			5
Unknown Mammal or Bird			
Total	6	37	217

Taxa	Fill Level 4 1991 and 2004			First Floor Level 5			Second Floor Level 6 2004			Second Floor Level 6 1991		
	NISP	MNI	%	NISP	MNI	%	NISP	MNI	%	NISP	MNI	%
<i>Vulpes macrotis</i>	3	1		1	1							
Kit Fox												
<i>Felis rufus</i>				1	1							
Bobcat												
Artiodactyla	3			19								
Even-toed ungulate												
<i>Odocoileus</i> sp.	1			1								
Mule Deer/White-tailed Deer												
<i>Odocoileus hemionus</i>	2	1										
Mule Deer												
<i>Ovis canadensis</i>	2	1										
Bighorn sheep												
<i>Antilocapra americana</i>												
Antelope												
Class Unknown				4							1	
Indeterminate vertebrate												
Class Mammalia/Class Aves	24							2			9	
Unknown Mammal or Bird												
Total	134	12	0.0	132	8	7.7	31	0	0.0	15	0	0.0

APPENDIX E:

AZ AA:12:251(ASM):
ALL PROVENIENCES STUDIED FOR COMPOUND 1

Taxa	Structure 8					
	NISP	#	MNI %	Weight, g	kg	Biomass %
Osteichthyes Bony Fish	1	1	5.3	0.2	0.01	0.3
Testudines Tortoises and Turtles	2	1	5.3	0.3	0.01	0.6
<i>Crotalus</i> sp. Rattlesnakes	1	1	5.3	0.10	0.00	0.1
Aves	1			2.00	0.038	1.6
<i>Buteo regalis</i> Ferruginous hawk	1	1	5.3	1.90	0.037	1.5
Phasianidae Quails	2	1	5.3	0.30	0.007	0.3
Mammalia Order Unknown, Body Size Small (e.g. Rodent and Rabbit)	46			10.00	0.209	8.6
Mammalia Order Unknown, Body Size Large Mammal (e.g., “artiodactyl”)	2			6.50	0.142	5.8
Mammalia Order Unknown, Small or Medium Mammal	15			5.00	0.112	4.6
Mammalia	3			3.70	0.085	3.5
<i>Sylvilagus</i> sp. Cottontail rabbit	8	2	10.5	3.50	0.081	3.3
<i>Lepus</i> spp. Jackrabbits	25			12.10	0.248	10.2
<i>Lepus californicus</i> Black-tailed jackrabbit	95	4	21.1	57.90	1.015	41.7
<i>Lepus alleni</i> Antelope jackrabbit	21	2	10.5	17.90	0.353	14.5
Rodentia Indeterminate rodents	1			0.10	0.003	0.1
<i>Spermophilus variegatus</i> Rock squirrel	1	1	5.3	0.04	0.001	0.1
<i>Dipodomys desertii</i> Desert Kangaroo Rat	1	1	5.3	0.30	0.009	0.4
<i>Peromyscus</i> sp. White-footed mice	3	1	5.3	0.10	0.003	0.1

Structure 8, Cont'd							
Taxa	NISP	#	MNI		Weight, g	Biomass	
			%			kg	%
<i>Neotoma</i> sp. Packrats	3	1	5.3		0.70	0.019	0.8
<i>Canis latrans/Canis familiaris</i> Coyote/Domestic dog	1	1	5.3		0.80	0.022	0.9
Artiodactyla Even-toed ungulate	1	1	5.3		0.9	0.024	1.0
Class Mammalia/Class Aves Unknown Mammal or Bird					0.1	0.003	0.1
Total	234	19	100.00		124.44	2.435	100.0

Trash Mound 1							
Taxa	NISP	#	MNI		Weight, g	Biomass	
			%			kg	%
Testudines Tortoises and Turtles	7	1	5.6		2.6	0.060	4.1
Colubridae Colubrid snakes	2	1	5.6		0.2	0.00	0.2
<i>Crotalus</i> sp. Rattlesnakes	2	1	5.6		0.8	0.01	0.8
<i>Buteo</i> sp. Hawks	1	1	5.6		0.40	0.009	0.6
Columbidae Pigeons and Doves	1	1	5.6		0.10	0.003	0.2
Mammalia Order Unknown, Body Size Small (e.g. Rodent and Rabbit)	38				6.80	0.148	10.1
Mammalia Order Unknown, Body Size Large Mammal (e.g., "artiodactyl")	2				2.00	0.049	3.3
Mammalia Order Unknown, Small or Medium Mammal	11				4.70	0.106	7.2
Mammalia Ungulate (Large Mammal), Body Size Unknown	3				3.70	0.085	5.8

Taxa	Trash Mound 1, Cont'd					
	NISP	#	MNI		Biomass	
			%	Weight, g	kg	%
<i>Sylvilagus sp.</i> Cottontail rabbit	6	2	11.1	1.70	0.042	2.9
<i>Lepus spp.</i> Jackrabbits	23			10.20	0.213	14.5
<i>Lepus californicus</i> Black-tailed jackrabbit	22	2	11.1	10.80	0.224	15.3
<i>Lepus alleni</i> Antelope jackrabbit	15	1	5.6	10.20	0.213	14.5
Rodentia Indeterminate rodents	5			0.10	0.003	0.2
Sciuridae Squirrels	5			0.30	0.009	0.6
<i>Ammospermophilus harrisi</i> Harris' Antelope Squirrel	15	1	5.6	0.30	0.009	0.6
<i>Spermophilus variegatus</i> Rock squirrel	1	1	5.6	0.10	0.003	0.2
<i>Dipodomys sp.</i> Kangaroo Rats	4			0.6	0.017	1.1
<i>Dipodomys spectabilis</i> Bannertail Kangaroo Rat	1	1	5.6	0.2	0.006	0.4
<i>Perognathus sp.</i> Pocket Mice	3	1	5.6	0.00	0.000	0.0
<i>Neotoma sp.</i> Packrats	1	1	5.6	0.20	0.006	0.4
Carnivora Carnivores	1			0.40	0.012	0.8
<i>Canis latrans/Canis familiaris</i> Coyote/Domestic dog	1	1	5.6	0.50	0.014	1.0
<i>Urocyon cinereoargenteus</i> Gray fox	1	1	5.6	1.80	0.045	3.0
Artiodactyla Even-toed ungulate	5			4.9	0.110	7.5
Cervidae Deer	1	1	5.6	0.9	0.024	1.6
Class Mammalia/Class Aves Unknown Mammal or Bird	12			1.863	0.046	3.1
Total	189	18	100	66.36	1.468	100.0

Taxa	Trash Mound 2					
	NISP	MNI		Weight, g	Biomass	
		#	%		kg	%
Testudines	1	1	5.9	1.3	0.038	2.8
Tortoises and Turtles						
Squamata, Suborder Serpentes	2			0.00	0.00	0.0
Snakes						
<i>Crotalus</i> sp.	1	1	5.9	0.40	0.01	0.4
Rattlesnakes						
Aves	1	1	5.9	0.20	0.005	0.4
Bird, Body Size Unknown						
Mammalia	87			13.80	0.279	20.9
Order Unknown, Body Size Small (e.g. Rodent and Rabbit)						
Mammalia	11			5.40	0.120	9.0
Order Unknown, Body Size Large Mammal (e.g., "artiodactyl")						
Mammalia	6			2.30	0.056	4.2
Order Unknown, Small or Medium Mammal						
Leporidae	3			0.20	0.006	0.5
Rabbits						
<i>Sylvilagus</i> sp.	3	1	5.9	0.60	0.017	1.2
Cottontail rabbit						
<i>Lepus</i> spp.	50			13.60	0.276	20.6
Jackrabbits						
<i>Lepus californicus</i>	23	5	29.4	7.70	0.165	12.3
Black-tailed jackrabbit						
<i>Lepus alleni</i>	10	2	11.8	6.40	0.140	10.4
Antelope jackrabbit						
Rodentia	4			0.00	0.000	0.0
Indeterminate rodents						
Sciuridae	3	1	5.9	0.10	0.003	0.2
Squirrels						
<i>Thomomys</i> sp.	9	1	5.9	1.30	0.033	2.5
Pocket gopher						
<i>Dipodomys</i> sp.	2	1	5.9	0	0.000	0.0
Kangaroo Rats						
<i>Neotoma</i> sp.	1	1	5.9	0.00	0.000	0.0
Packrats						
Carnivora	1			0.20	0.006	0.5
Carnivores						
<i>Canis latrans/Canis familiaris</i>	1	1	5.9	5.10	0.114	8.5
Coyote/Domestic dog						

	Trash Mound 2, Cont'd					
Taxa	NISP	MNI		Weight, g	Biomass	
		#	%		kg	%
<i>Taxidea taxus</i> Badger	1	1	5.9	1.70	0.042	3.2
Class Mammalia/Class Aves Unknown Mammal or Bird	11			1.3	0.033	2.5
Total	231	17	100	61.60	1.339	100.0

	Exploratory Trench 1						
Taxa	NISP	#	MNI		Weight, g	kg	Biomass %
			%				
Aves Bird, Body Size Large	1	1	25.0		0.40	0.009	4.3
Mammalia Order Unknown, Body Size Unknown	1				0.30	0.009	4.3
Mammalia	7				1.00	0.026	12.7
Leporidae Rabbits	1				0.20	0.006	3.0
<i>Lepus californicus</i> Black-tailed jackrabbit	11	1	25.0		4.10	0.094	45.2
<i>Lepus alleni</i> Antelope jackrabbit	3	1	25.0		2.50	0.060	29.0
<i>Ammospermophilus harrisi</i> Harris' Antelope Squirrel	1	1	25.0		0.10	0.003	1.6
Total	25	4	100		8.60	0.207	100.1

Taxa	Plaza, Grid 329				
	NISP #	MNI %	Weight, g	kg	Biomass %
Aves Bird, Body Size Unknown	1 1	25.0	0.10	0.003	0.2
Mammalia Order Unknown, Body Size Small (e.g. Rodent and Rabbit)	21		39.70	0.723	50.2
Mammalia Order Unknown, Body Size Large Mammal (e.g., "artiodactyl")	4		6.70	0.146	10.1
Mammalia Order Unknown, Small or Medium Mammal	45		14.00	0.283	19.7
Mammalia Ungulate (Large Mammal), Body Size Unknown	5		7.50	0.161	11.2
<i>Lepus californicus</i> Black-tailed jackrabbit	5 1	25.0	2.30	0.056	3.9
Sciuridae Squirrels	1		0.50	0.014	1.0
<i>Spermophilus variegatus</i> Rock squirrel	1 1	25.0	0.70	0.019	1.3
<i>Odocoileus</i> sp. Mule Deer/White-tailed deer	4 1	25.0	0.4	0.012	0.8
Class Mammalia/Class Aves Unknown Mammal or Bird			0.9	0.024	1.7
Total	87 4	100	72.80	1.439	100.0

APPENDIX F:

DETAILED DIVERSITY TABLES FOR MARANA PLATFORM MOUND, LOS
MORTEROS, AND MUCHAS CASAS

Marana Platform Mound AZ AA:12:251(ASM) Compound 9 All Proveniences Diversity						
Taxa	NISP	p_i	$\log_e p_i$	$(p_i)(\log_e p_i)$	H'	p_i^2
<i>Bufo</i> sp.	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
Reptilia		0		0		0
Kinosternidae	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
<i>Gopherus agassizii</i>	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
Sauria		0		0		0
<i>Sceloporus</i> sp.	9	0.032727273	-3.4195465	-0.111912432		0.001071074
Aves, Body Size Unknown		0		0		0
Aves, Body Size Small		0		0		0
Aves, Body Size Medium		0		0		0
Phasianidae		0		0		0
<i>Callipepla gambelii</i>	2	0.007272727	-4.9236239	-0.035808174		5.28926E-05
<i>Colinus virginianus</i>	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
Tytonidae	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
<i>Buteo regalis</i>	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
Corvidae	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
Mammalia Body Size Unknown		0		0		0
Mammalia Body Size Small		0		0		0
Mammalia Body Size Medium		0		0		0
Mammalia Body Size Small/Medium		0		0		0
Mammalia Body Size Large		0		0		0
Mammalia Body Size Small Ungulate		0		0		0
Mammalia Body Size Large Ungulate		0		0		0
Chiroptera	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
Leporidae		0		0		0
<i>Lepus</i> sp.		0		0		0
<i>Lepus alleni</i>	39	0.141818182	-1.9532095	-0.277000613		0.020112397
<i>Lepus californicus</i>	124	0.450909091	-0.7964895	-0.359144371		0.203319008
<i>Sylvilagus</i> sp.		0		0		0
<i>Sylvilagus audubonii</i>	9	0.032727273	-3.4195465	-0.111912432		0.001071074
Rodentia		0		0		0
Sciuridae		0		0		0
<i>Ammospermophilus harrisi</i>	15	0.054545455	-2.9087209	-0.158657503		0.002975207
<i>Spermophilus</i> sp.		0		0		0
<i>Dipodomys</i> sp.		0		0		0
<i>Dipodomys merriami</i>	5	0.018181818	-4.0073332	-0.072860603		0.000330579
<i>Dipodomys desertii</i>	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
Sigmodontinae		0		0		0
<i>Neotoma</i> sp.		0		0		0

Marana Platform Mound AZ AA:12:251(ASM) Compound 9 All Proveniences Diversity, Cont'd						
Taxa	NISP	p_i	log_ep_i	(p_i)(log_ep_i)	H'	p_i²
<i>Neotoma albigula</i>	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
<i>Microtus</i> sp.	3	0.010909091	-4.5181588	-0.049289005		0.000119008
Canidae		0		0		0
<i>Canis latrans/Canis familiaris</i>	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
<i>Urocyon/Vulpes</i> sp.		0		0		0
<i>Vulpes</i> sp.		0		0		0
<i>Vulpes macrotis</i>	4	0.014545455	-4.2304767	-0.061534207		0.00021157
<i>Felis rufus</i>	2	0.007272727	-4.9236239	-0.035808174		5.28926E-05
<i>Taxidea taxus</i>	1	0.003636364	-5.6167711	-0.020424622		1.32231E-05
Artiodactyla		0		0		0
Cervidae		0		0		0
<i>Odocoileus</i> sp.		0		0		0
<i>Odocoileus hemionus</i>	5	0.018181818	-4.0073332	-0.072860603		0.000330579
<i>Odocoileus virginianus</i>	2	0.007272727	-4.9236239	-0.035808174		5.28926E-05
<i>Ovis canadensis</i>	5	0.018181818	-4.0073332	-0.072860603		0.000330579
<i>Antilocapra americana</i>	5	0.018181818	-4.0073332	-0.072860603		0.000330579
Vertebrata, Class Unknown		0		0		0
Vertebrata, Class Mammalia/Aves		0		0		0
Total	241			-1.773412964	1.773413	0.23018843
						4.344267004
				S		26
				log_eS		3.2580965
				V'		0.54431

Marana Platform Mound AZ AA:12:251(ASM) Compound 1 All Proveniences Diversity						
Taxa	NISP	p_i	$\log_e p_i$	$(p_i)(\log_e p_i)$	H'	p_i^2
Osteichthyes	1	0.0034364	-5.6733233	-0.019496		1.181E-05
Testudines	10	0.0343643	-3.3707382	-0.1158329		0.0011809
Serpentes		0		0		0
Colubridae		0		0		0
<i>Crotalus</i> sp.	4	0.0137457	-4.2870289	-0.0589282		0.0001889
Aves Body Size Unknown		0		0		0
Aves Body Size Large		0		0		0
<i>Buteo</i> sp.		0		0		0
<i>Buteo regalis</i>	1	0.0034364	-5.6733233	-0.019496		1.181E-05
Phasianidae	2	0.0068729	-4.9801761	-0.034228		4.724E-05
Columbidae	1	0.0034364	-5.6733233	-0.019496		1.181E-05
Mammalia Body Size Unknown		0		0		0
Mammalia Body Size Small		0		0		0
Mammalia Body Size Small/Medium		0		0		0
Mammalia Body Size Large		0		0		0
Mammalia Ungulate Body Size Unknown		0		0		0
Leporidae		0		0		0
<i>Sylvilagus</i> sp.	17	0.0584192	-2.8401099	-0.1659171		0.0034128
<i>Lepus</i> sp.		0		0		0
<i>Lepus californicus</i>	156	0.5360825	-0.6234673	-0.3342299		0.2873844
<i>Lepus alleni</i>	49	0.1683849	-1.781503	-0.2999782		0.0283535
Rodentia		0		0		0
Sciuridae		0		0		0
<i>Ammospermophilus harrisi</i>	16	0.0549828	-2.9007345	-0.1594906		0.0030231
<i>Spermophilus variegatus</i>	3	0.0103093	-4.574711	-0.047162		0.0001063
<i>Thomomys</i> sp.	9	0.0309278	-3.4760987	-0.1075082		0.0009565
<i>Dipodomys</i> sp.		0		0		0
<i>Dipodomys desertii</i>	1	0.0034364	-5.6733233	-0.019496		1.181E-05
<i>Dipodomys spectabilis</i>	1	0.0034364	-5.6733233	-0.019496		1.181E-05
<i>Perognathus</i> sp.	3	0.0103093	-4.574711	-0.047162		0.0001063
<i>Peromyscus</i> sp.	3	0.0103093	-4.574711	-0.047162		0.0001063
<i>Neotoma</i> sp.	5	0.0171821	-4.0638854	-0.0698262		0.0002952
Carnivora		0		0		0
<i>Canis latrans/Canis familiaris</i>	3	0.0103093	-4.574711	-0.047162		0.0001063
<i>Urocyon cinereoargenteus</i>	1	0.0034364	-5.6733233	-0.019496		1.181E-05
<i>Taxidea taxus</i>	1	0.0034364	-5.6733233	-0.019496		1.181E-05
Artiodactyla		0		0		0
Cervidae		0		0		0
<i>Odocoileus</i> sp.	4	0.0137457	-4.2870289	-0.0589282		0.0001889
Vertebrata		0		0		0
	291			-1.7299871	1.7299871	0.3255394
						3.071825
				S		21
				log_eS		3.0445224
				V'		0.568229

Muchas Casas AZ AA:12:2(ASU) All Proveniences Diversity						
Taxa	NISP	p_i	$\log_e p_i$	$(p_i)(\log_e p_i)$	H'	p_i^2
Amphibia	1	0.0012407	-6.6920837	-0.0083028		1.539E-06
Reptilia		0		0		0
<i>Pituophis melanoleucus</i>	1	0.0012407	-6.6920837	-0.0083028		1.539E-06
Aves Body Size Unknown		0		0		0
Aves Body Size Medium		0		0		0
<i>Buteo swainsoni</i>	1	0.0012407	-6.6920837	-0.0083028		1.539E-06
Mammalia Body Size Small		0		0		0
Mammalia Body Size Small/Medium		0		0		0
Mammalia Body Size Medium		0		0		0
Mammalia Body Size Medium/Large		0		0		0
Mammalia Body Size Large		0		0		0
Mammalia Body Size Unknown		0		0		0
Lagomorpha		0		0		0
Leporidae		0		0		0
<i>Sylvilagus audubonii</i>	59	0.073201	-2.6145463	-0.1913874		0.0053584
cf. <i>Lepus</i> sp.		0		0		0
<i>Lepus</i> sp.		0		0		0
<i>Lepus californicus</i>	259	0.32134	-1.1352557	-0.364803		0.1032594
<i>Lepus</i> cf. <i>alleni</i>		0		0		0
<i>Lepus alleni</i>	87	0.1079404	-2.2261756	-0.2402944		0.0116511
Rodentia		0		0		0
<i>A. harrisi</i> or <i>S. tereticaudus</i>	5	0.0062035	-5.0826458	-0.0315301		3.848E-05
<i>Spermophilus</i> sp.		0		0		0
<i>Spermophilus tereticaudus</i>	5	0.0062035	-5.0826458	-0.0315301		3.848E-05
<i>Thomomys bottae</i>	2	0.0024814	-5.9989366	-0.0148857		6.157E-06
<i>Dipodomys</i> cf. <i>desertii</i>	1	0.0012407	-6.6920837	-0.0083028		1.539E-06
<i>Peromyscus</i> sp.	9	0.0111663	-4.4948592	-0.0501907		0.0001247
<i>Neotoma</i> sp.		0		0		0
<i>Neotoma</i> cf. <i>albigula</i>	2	0.0024814	-5.9989366	-0.0148857		6.157E-06
Carnivora	2	0.0024814	-5.9989366	-0.0148857		6.157E-06
Artiodactyla		0		0		0
<i>Odocoileus/Antilocapra</i>		0		0		0
<i>Odocoileus/Ovis</i>		0		0		0
<i>Odocoileus/Antilocapra/Ovis</i>		0		0		0
cf. <i>Odocoileus</i> sp.		0		0		0
<i>Odocoileus</i> sp.		0		0		0
<i>Odocoileus hemionus</i>	1	0.0012407	-6.6920837	-0.0083028		1.539E-06
<i>Antilocapra americana</i>	2	0.0024814	-5.9989366	-0.0148857		6.157E-06
<i>Ovis canadensis</i>	369	0.4578164	-0.7812871	-0.357686		0.2095958
Vertebrata		0		0		0
	806			-1.3684786	1.3684786	0.3300987
						3.029397
	16			S		16
				log _e S		2.7725887
				V'		0.493574

Los Morteros AZ AA:12:57 (ASM) Late Rincon-Tanque Verde Period Proveniences, Diversity						
Taxa	NISP	p_i	$\log_e p_i$	$(p_i)(\log_e p_i)$	H'	p_i^2
<i>Scaphiopus couchi</i>	2	0.0019231	-6.2538288	-0.0120266		3.698E-06
Unid. Turtle		0		0		0
<i>Sceloporus</i> sp.	1	0.0009615	-6.946976	-0.0066798		9.246E-07
<i>Crotalus</i> sp.	2	0.0019231	-6.2538288	-0.0120266		3.698E-06
<i>Callipepla</i> sp.	2	0.0019231	-6.2538288	-0.0120266		3.698E-06
Indet. Owl		0		0		0
<i>Corvus corax</i>	5	0.0048077	-5.3375381	-0.0256612		2.311E-05
<i>Buteo</i> sp.	1	0.0009615	-6.946976	-0.0066798		9.246E-07
<i>Geococcyx</i>	8	0.0076923	-4.8675345	-0.0374426		5.917E-05
Unid. Bird		0		0		0
<i>Lepus alleni</i>	98	0.0942308	-2.3620085	-0.2225739		0.0088794
<i>Lepus californicus</i>	565	0.5432692	-0.6101503	-0.3314759		0.2951415
<i>Lepus</i> sp.		0		0		0
<i>Sylvilagus</i>	305	0.2932692	-1.2266642	-0.3597429		0.0860068
<i>Spermophilus tereticaudus</i>	2	0.0019231	-6.2538288	-0.0120266		3.698E-06
Indet. Small Squirrel		0		0		0
<i>Thomomys</i> sp.	6	0.0057692	-5.1552165	-0.0297416		3.328E-05
<i>Perognathus</i> sp.	4	0.0038462	-5.5606816	-0.0213872		1.479E-05
<i>Dipodomys</i> sp. small	1	0.0009615	-6.946976	-0.0066798		9.246E-07
<i>Dipodomys</i> sp. large	1	0.0009615	-6.946976	-0.0066798		9.246E-07
Cricetid mouse		0		0		0
<i>Sigmodon</i>	6	0.0057692	-5.1552165	-0.0297416		3.328E-05
<i>Neotoma</i> sp.	16	0.0153846	-4.1743873	-0.0642213		0.0002367
<i>Canis</i> sp.	3	0.0028846	-5.8483637	-0.0168703		8.321E-06
<i>Vulpes macrotis</i>	1	0.0009615	-6.946976	-0.0066798		9.246E-07
Indet. Fox		0		0		0
<i>Taxidea taxus</i>	2	0.0019231	-6.2538288	-0.0120266		3.698E-06
<i>Odocoileus hemionus</i>	9	0.0086538	-4.7497514	-0.0411036		7.489E-05
<i>Odocoileus</i> sp.		0		0		0
Unid. Rodent		0		0		0
Unid. Small Mammal		0		0		0
Unid. Medium Mammal		0		0		0
Unid. Carnivore		0		0		0
Unid. Artiodactyla		0		0		0
Unid. Large Mammal		0		0		0
	1040			-1.2734941	1.2734941	0.3905344
						2.5605939
				S		21
				$\log_e S$		3.0445224
				V'		0.41829

Los Morteros AZ AA:12:57 (ASM) All Proveniences, Diversity						
Taxa	NISP	p_i	$\log_e p_i$	$(p_i)(\log_e p_i)$	H'	p_i^2
<i>Scaphiopus couchi</i>	2	0.0010633	-6.8464116	-0.0072795		1.131E-06
<i>Bufo</i> sp. small	1	0.0005316	-7.5395588	-0.0040083		2.826E-07
<i>Bufo</i> sp. large	1	0.0005316	-7.5395588	-0.0040083		2.826E-07
Unid. Toad		0		0		0
<i>Gopherus agassizii</i>	6	0.0031898	-5.7477994	-0.0183343		1.017E-05
Unid. Turtle		0		0		0
<i>Sceloporus</i> sp.	1	0.0005316	-7.5395588	-0.0040083		2.826E-07
<i>Masticophis</i> sp.	4	0.0021265	-6.1532645	-0.0130851		4.522E-06
<i>Crotalus</i> sp.	2	0.0010633	-6.8464116	-0.0072795		1.131E-06
<i>Callispepla</i> sp.	2	0.0010633	-6.8464116	-0.0072795		1.131E-06
Indet. Owl		0		0		0
<i>Corvus corax</i>	5	0.0026582	-5.9301209	-0.0157632		7.066E-06
<i>Buteo</i> sp.	1	0.0005316	-7.5395588	-0.0040083		2.826E-07
<i>Geococcyx</i>	8	0.0042531	-5.4601173	-0.0232222		1.809E-05
Unid. Bird		0		0		0
<i>Lepus alleni</i>	398	0.2115896	-1.5531068	-0.3286212		0.0447702
<i>Lepus californicus</i>	968	0.5146199	-0.6643267	-0.3418758		0.2648336
<i>Lepus</i> sp.		0		0		0
<i>Sylvilagus</i>	407	0.2163743	-1.5307456	-0.331214		0.0468178
<i>Spermophilus tereticaudus</i>	3	0.0015949	-6.4409465	-0.0102726		2.544E-06
Indet. Small Squirrel		0		0		0
<i>Thomomys</i> sp.	8	0.0042531	-5.4601173	-0.0232222		1.809E-05
<i>Perognathus</i> sp.	4	0.0021265	-6.1532645	-0.0130851		4.522E-06
<i>Dipodomys</i> sp. small	5	0.0026582	-5.9301209	-0.0157632		7.066E-06
<i>Dipodomys</i> sp. large	1	0.0005316	-7.5395588	-0.0040083		2.826E-07
Cricetid mouse		0		0		0
<i>Sigmodon</i>	6	0.0031898	-5.7477994	-0.0183343		1.017E-05
<i>Neotoma</i> sp.	19	0.010101	-4.5951199	-0.0464154		0.000102
<i>Canis</i> sp.	3	0.0015949	-6.4409465	-0.0102726		2.544E-06
<i>Vulpes macrotis</i>	2	0.0010633	-6.8464116	-0.0072795		1.131E-06
Indet. Fox		0		0		0
<i>Taxidea taxus</i>	4	0.0021265	-6.1532645	-0.0130851		4.522E-06
<i>Odocoileus hemionus</i>	15	0.0079745	-4.8315086	-0.0385288		6.359E-05
<i>Odocoileus</i> cf. <i>virginianus</i>	1	0.0005316	-7.5395588	-0.0040083		2.826E-07
<i>Odocoileus</i> sp.		0		0		0
<i>Antilocapra americana</i>	3	0.0015949	-6.4409465	-0.0102726		2.544E-06
cf. <i>Ovis canadensis</i>	1	0.0005316	-7.5395588	-0.0040083		2.826E-07
Unid. Rodent		0		0		0
Unid. Small Mammal		0		0		0
Unid. Medium Mammal		0		0		0
Unid. Carnivore		0		0		0
Unid. Artiodactyla		0		0		0
Unid. Large Mammal		0		0		0
	1881			-1.3285437	1.3285437	0.3566856
						2.8035897
				S	28	
				log_eS	3.3322045	
				V'	0.398698	

Marana Platform Mound AZ AA:12:251(ASM) All Compound 9 and Compound 1 Proveniences Diversity						
Taxa	NISP	p_i	$\log_e p_i$	$(p_i)(\log_e p_i)$	H'	p_i^2
Osteichthyes	1	0.0018727	-6.2803958	-0.011761		3.507E-06
<i>Bufo</i> sp.	1	0.0018727	-6.2803958	-0.011761		3.507E-06
Reptilia	1	0.0018727	-6.2803958	-0.011761		3.507E-06
Testudines		0		0		0
Kinosternidae	1	0.0018727	-6.2803958	-0.011761		3.507E-06
<i>Gopherus agassizii</i>	1	0.0018727	-6.2803958	-0.011761		3.507E-06
Serpentes		0		0		0
Colubridae		0		0		0
<i>Crotalus</i> sp.	4	0.0074906	-4.8941015	-0.0366599		5.611E-05
Sauria		0		0		0
<i>Sceloporus</i> sp.	9	0.0168539	-4.0831713	-0.0688175		0.0002841
Aves, Body Size Unknown		0		0		0
Aves, Body Size Small		0		0		0
Aves, Body Size Medium		0		0		0
Aves Body Size Large		0		0		0
<i>Buteo</i> sp.		0		0		0
<i>Buteo regalis</i>	2	0.0037453	-5.5872487	-0.020926		1.403E-05
Phasianidae	4	0.0074906	-4.8941015	-0.0366599		5.611E-05
Columbidae	1	0.0018727	-6.2803958	-0.011761		3.507E-06
<i>Colinus virginianus</i>	1	0.0018727				3.507E-06
<i>Callipepla gambelii</i>	2	0.0037453	-5.5872487	-0.020926		1.403E-05
Tytonidae	1	0.0018727	-6.2803958	-0.011761		3.507E-06
Corvidae	1	0.0018727	-6.2803958	-0.011761		3.507E-06
Mammalia Body Size Unknown		0		0		0
Mammalia Body Size Small		0		0		0
Mammalia Body Size Medium		0		0		0
Mammalia Body Size Small/Medium		0		0		0
Mammalia Body Size Large		0		0		0
Mammalia Body Size Small Ungulate		0		0		0
Mammalia Body Size Large Ungulate		0		0		0
Mammalia Ungulate Body Size Unknown		0		0		0
Chiroptera	1	0.0018727	-6.2803958	-0.011761		3.507E-06
Leporidae		0		0		0
<i>Lepus</i> sp.		0		0		0
<i>Lepus alleni</i>	88	0.164794	-1.803059	-0.2971333		0.0271571
<i>Lepus californicus</i>	280	0.5243446	-0.6456062	-0.3385201		0.2749372
<i>Sylvilagus</i> sp.		0		0		0
<i>Sylvilagus audubonii</i>	24	0.0449438	-3.102342	-0.1394311		0.0020199
Rodentia		0		0		0
Sciuridae		0		0		0
<i>Ammospermophilus harrisi</i>	31	0.0580524	-2.8464086	-0.165241		0.0033701
<i>Spermophilus</i> sp.		0		0		0

Marana Platform Mound AZ AA:12:251(ASM) All Compound 9 and Compound 1 Proveniences Diversity, Cont'd						
Taxa	NISP	p_i	log_ep_i	(p_i)(log_ep_i)	H'	p_i²
<i>Spermophilus variegatus</i>	3	0.005618	-5.1817836	-0.0291111		3.156E-05
<i>Thomomys</i> sp.	9	0.0168539	-4.0831713	-0.0688175		0.0002841
<i>Dipodomys</i> sp.		0		0		0
<i>Dipodomys merriami</i>	5	0.0093633	-4.6709579	-0.0437356		8.767E-05
<i>Dipodomys desertii</i>	2	0.0037453	-5.5872487	-0.020926		1.403E-05
<i>Dipodomys spectabilis</i>	1	0.0018727	-6.2803958	-0.011761		3.507E-06
Sigmodontinae		0		0		0
<i>Neotoma</i> sp.		0		0		0
<i>Neotoma albigula</i>	1	0.0018727	-6.2803958	-0.011761		3.507E-06
<i>Perognathus</i> sp.	3	0.005618	-5.1817836	-0.0291111		3.156E-05
<i>Peromyscus</i> sp.	3	0.005618	-5.1817836	-0.0291111		3.156E-05
<i>Microtus</i> sp.	3	0.005618	-5.1817836	-0.0291111		3.156E-05
Carnivora		0		0		0
Canidae		0		0		0
<i>Canis latrans/Canis familiaris</i>	4	0.0074906	-4.8941015	-0.0366599		5.611E-05
<i>Urocyon/Vulpes</i> sp.		0		0		0
<i>Urocyon cinereoargenteus</i>	1	0.0018727	-6.2803958	-0.011761		3.507E-06
<i>Vulpes</i> sp.		0		0		0
<i>Vulpes macrotis</i>	4	0.0074906	-4.8941015	-0.0366599		5.611E-05
<i>Taxidea taxus</i>	2	0.0037453	-5.5872487	-0.020926		1.403E-05
<i>Felis rufus</i>	2	0.0037453	-5.5872487	-0.020926		1.403E-05
Artiodactyla		0		0		0
Cervidae		0		0		0
<i>Odocoileus</i> sp.		0		0		0
<i>Odocoileus hemionus</i>	5	0.0093633	-4.6709579	-0.0437356		8.767E-05
<i>Odocoileus virginianus</i>	2	0.0037453	-5.5872487	-0.020926		1.403E-05
<i>Ovis canadensis</i>	5	0.0093633	-4.6709579	-0.0437356		8.767E-05
<i>Antilocapra americana</i>	5	0.0093633	-4.6709579	-0.0437356		8.767E-05
Vertebrata, Class Unknown		0		0		0
Vertebrata, Class Mammalia/Aves				0		0
Total	514			-1.7826757	1.7826757	0.3083996
						3.2425462
	37			S		37
				log_eS		3.6109179
				V'		0.49369

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