Cooperation through War:
Late Intermediate Period Warfare and Community Formation in the South-Central Andes

By

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Dissertation

Submitted to the Faculty of the

Graduate School of Vanderbilt University

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

In

Anthropology

August, 2016

Nashville, Tennessee

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To my parents, Sue and Bill, for their everlasting encouragement

and

To Mike and Darwin, my never-ending well of love and support

ACKNOWLEDGEMENTS

Pilot research for this project was supported by grants from the Vanderbilt University Center for Latin American Studies and the College of Arts and Sciences. The generous support of a Dissertation Research Grant from the Wenner-Gren Foundation for Anthropological Research provided funding for the field research for this project. Writing support was provided by a Vanderbilt University Humanities and Social Science Dissertation Fellowship. Archaeological field research was carried out under the authorization of Resolución Directoral Nos. 672-2012 and 472-2013.

This project would not have been possible without the support of numerous individuals. I am sincerely grateful to my committee members, Steve Wernke, Tiffiny Tung, John Janusek and Elizabeth Arkush, whose guidance, expertise and constructive feedback contributed significantly to this project. I am particularly indebted to my advisor, Steve Wernke, who first introduced me to the Colca Valley in 2008, and later left me there to search for my own field project. Throughout my graduate career, he has been a generous advisor, an insightful mentor and my sharpest critic. His passion for the field, sharp insight, and tireless work ethic have inspired me to become a better scholar and researcher; and always-useful criticism has actually made me one. Many of my initial thoughts in forming this project emerged through thoughtful discussions with John Janusek, and he has continued to lend insights, and a book or two, throughout the process. Tiffiny Tung has been influential in my thinking of warfare and violence, and has provided generous feedback and support throughout the entire process. I also extend my sincerest thanks to Elizabeth Arkush, who was always willing to sit down with me over coffee at the annual SAA meetings. These conversations were instrumental in making sense of my data as I moved through the analysis and writing stages.

This project could not have happened without the support of a number of individuals in Peru. First to the communities in the Colca Valley who fed and housed us during survey, and especially the village of Tuti, who supported the excavation phase of this project. I would like to thank the archaeologists in the Arequipa office of the Ministerio de Cultura, who work tirelessly and still manage to offer patience and support. I would like to acknowledge Felix Palacios, and all of the staff at the Museo Arqueologico San Martin in Arequipa, who provided lab space, warm conversation, and several talented students who worked on the project. I am grateful to the students from Peru who worked with enthusiasm on the project, despite the challenging conditions. In particular Manuel Angel Mamani, Kevin Ricci Jara, and Jorge Cámara Guerrero, whose incredible work ethic and passion for archaeology made field work so much better. I am indebted to my co-director, Enmanuel Gomez Choque, who guided me through the logistical aspects of fieldwork, and who was an invaluable partner in the field. His thoughtful insights, and vast knowledge benefitted all aspects of this project. I am also thankful to my friend Abel Traslaviña and his family who were always there to provide a warm bed, food, and friendship when I passed through Lima.

I was fortunate to have been surrounded by a group of peers who have provided an intellectually rich and supportive environment. My desk mates, Matt Velasco and Gabriella Oré Menéndez, made the writing process both more productive and more fun, by offering daily writing motivation, stimulating (and frank) discussion, and periodic comic relief. Pomming will never be as fun. I am especially grateful to Matt, with whom I traveled to the field numerous times as our projects developed in parallel, and who was always available for conversation about the particulars of Colca archaeology. I would also like to thank the Graduate Writing Group who saw me through the writing process, holding me accountable, and commiserated and helped me through the difficult parts. You made dissertation writing almost enjoyable.

My family has been a constant source of support and encouragement. My parents, Sue and Bill, have encouraged me to pursue my passions, no matter how strange, and are always eager to hear about my research. My brother, Adam, has always been there to challenge me, and whose fortitude, passion and commitment is truly inspirational. And finally, this project and I are better because of the loving support of my husband Mike and my son Darwin who have been with me along every step in this journey. I could not have asked for a better partner than Mike, whose love, support and confidence sustained me along the way, and whose thoughtful insights and late night discussions have benefitted this project. I am thankful for my son Darwin, whose intellectual curiosity and openness to new adventures continues to amaze and inspire me. I love you both.

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CHAPTER 1

INTRODUCTION: WAR, DESTRUCTION AND COALESCENCE

This is a study of cooperation. Specifically, cooperation built within a context typically associated with factionalization, destruction, and animosity—war. The archaeology of war has been the study of people in conflict. Skeletal trauma, weapons, fortifications are all material indicators of people and groups engaged in armed conflict. Yet even within societies with the highest frequencies of violent conflict, active combat reflects only a small proportion of people's daily experience. "War" is a more totalizing human experience that also engenders novel modes of cooperation and affiliation. These dimensions have received little attention from archaeologists, even as scholars have noted how warfare can crystalize social identities (Arkush 2009; Ferguson and Whitehead 1992a; Kurin 2016; Nielsen 2009), how defensive architecture requires the coordination of labor (Angelbeck 2016; Arkush 2010), and how combat requires the mobilization of willing parties (Kiefer 1972; Meggitt 1977; Roscoe 2013; Sillitoe 1978; Wiessner 2006). Instead, the destructive aspects of warfare continue to be considered the primary mechanisms for change: territorial expansion through conquest (Carneiro 1970; S. A. LeBlanc 1999, 2000, 2006), institutionalized leadership through military prowess (David 1975; Earle 1997; Redmond 1994b, 1998), or fragmentation through endemic conflict (Allen 2008; Arkush 2010).

Many of the traditional frameworks for understanding the consequences of war were narrowly focused on the causes of increasing political centralization, emphasizing the use of warfare to consolidate political authority and increase territorial control (Carneiro 1970, 1990; Cohen 1984; David 1975; Flannery 1999; S. A. LeBlanc 1999, 2000, 2006; Webster 1977, 1998). In the search for universal explanations of cultural evolution, these models, however, decontextualized warfare, transforming it into an object of study disconnected from the broader social field and local histories (Ferguson and Whitehead 1992b; Pauketat 2009; Thorpe 2001). The divorcing of war from social life can also be seen in studies that overlook or diminish the significance of war and effectively pacifiying the past (Arkush and Stanish 2005; Keeley 1996; Otterbein 1999). I suggest that, in part, the work of resituatating war within broader social and histrorical processes requires consideration of war as not only a destructive force, but also a generative one.

This dissertation examines war as a fulcrum for the emergence of new social and political communities—a process which took place both on and off the battlefield. I argue that cooperation for defensive purposes was a central process through which community affiliations were articulated and negotiated. I contend that defense provided a shared concern that drew households and settlements into networks of cooperative relationships that engendered commitments of mutual obligation. The relational and interactionist approach to cooperation I develop here conceives of cooperation as both a means by which groups of individuals seek to achieve collective goals, and practices through which group membership is made manifest and affirmed. I draw on this analytical framework to examine the localized politics of group formation within a particular community—the Collaguas of the Colca Valley in the southern highland Andes of South America—during a period protracted war known as the Late Intermediate Period (LIP; 1000-1450 CE).

A View from the Fragments

The cultural history of the Peruvian highlands is typically divided into oscillating periods of regional integration (horizons) and fragmentation or local developments (intermediate periods). Prior to the Late Intermediate Period, the highlands was dominated by two large states—Wari, with its capital in the central highlands of modern-day Ayacucho, and Tiwanaku, with its center further south on the Bolivian side of Lake Titicaca. Following the collapse of these two highland states around 1000 CE, a number of smaller polities developed across the highlands, marking a roughly 400 year period of regional developments, eventually brought to an end by the expansion of the Inka state. This period of regional developments, known as the Late Intermediate Period (1000-1450 CE) in highland Peru has been viewed as a time of protracted warfare and political fragmentation. Defensive settlement patterns, including hilltop fortifications, known locally as *pukaras*, are found across the highlands, and high rates of skeletal trauma attest to both a heightened threat of conflict and actual experiences of violence during this time (Arkush 2006; Arkush and Tung 2013). At the same time, flattened social hierarchies, and the absence of regional centers, large-scale public, and ceremonial architecture (Arkush 2006; Covey 2008; Parsons and Hastings 1988), suggests war was tied to broader patterns of regional fragmentation and political decentralization (Arkush 2010; Earle 1997; D. G. Julien 1993).

While the broader political landscape of the Late Intermediate Period was highly fragmented, this characterization raises questions about the social and political dynamics *within* each of these fragments. For local communities across the highlands, this was a time of coalescence. In many regions, populations grew and residents moved into increasingly nucleated settlements, connecting households as their daily rythms of domestic tasks and production practices became more fully intwinned with their neighbors (Arkush 2010; Bauer and Kellett 2010; Covey 2008; D'Altroy 1992; Stanish 2003; Wernke 2006). These new patterns of settlement were often accompanied by changing mortuary practices, including collective burials in highly visible above-ground tombs (*chullpas*) through which understanding of group membership and kinship were negotiated and affirmed through death (William Harris Isbell 1997; Mantha 2009; Nielsen 2008). A diversity of local styles of ceramics, architecture, and other cultural products reflect more localized patterns of interaction materialized through shared cultural traditions (Covey 2008). The local tranformations of the LIP produced the complex ethnic and linguistic political mosaic that the Inka encountered as they expanded their imperial domain across the highlands (D'Altroy 1992; Malpass 1993; Malpass and Alconini Mujica 2010; Wernke 2013).

These contrasting patterns of war and fragmentation, on the one hand, and social and political coalescence on the other, would seem to reflect conflicting social realities during the Late Intermediate Period. However, as I show in this dissertation, war and the perceptions and practices of local affiliation were intertwined and mutually reinforcing processes in the production of polity. Many of the large and dense settlements were also fortifications, suggesting that defense was an important motivation for nucleation (Arkush 2010; Arkush and Stanish 2005; Covey 2008; D'Altroy 1987:80-86; D'Altroy and Hastorf 2001:67; Hastorf 1993; Lavallée and Julien 1975:118-119; C. J. LeBlanc 1981:370-372; Meddens 1984:138; Parsons and Hastings 1988:214-215). Coordination for defense is evidenced by the often monumental-scale construction of fortification walls that not only protected the residents, but also produced the physical spaces of residence and daily interaction. Defense was also a shared concern through which supra-settlement scale affiliations were negotiated and affirmed, linking settlements through alliance relationships (Arkush 2010; D. G. Julien 1993).

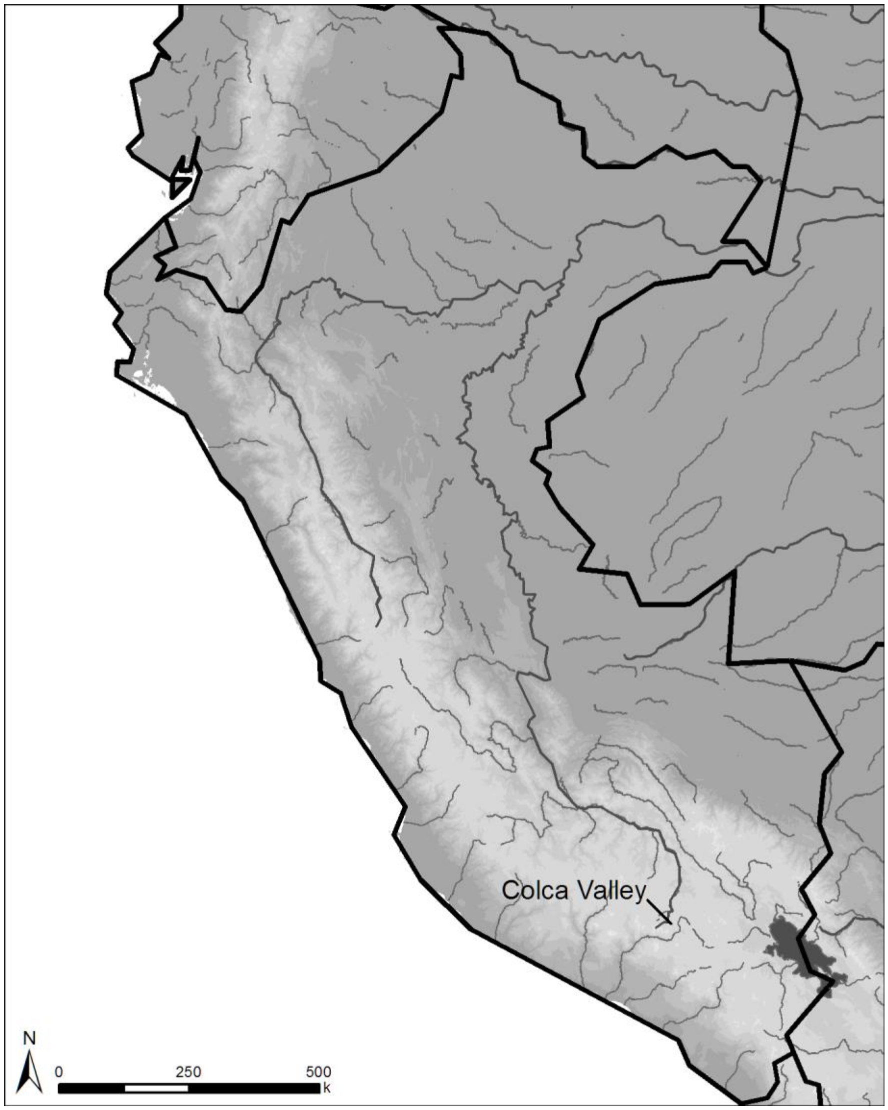

Figure 1.1. Map of Peru showing location of the Colca Valley

This study examines the dynamics of conflict and coordination during the Late Intermediate Period within the specific context of the Colca Valley, a highland river valley in the western cordillera of the south-central Andes of Peru. The earliest documentary sources show that at the time of the Spanish conquest, the valley was home to two distinct ethnic groups. In the lower valley, the Quechua-speaking Cabanas cultivated a diversity of crops along the terraced hillslopes. And in the central and upper valley, the Aymara-speaking Collaguas, who are the subject of this study, practiced a mix of agriculture and pastoralism, gaining distinction for their vast camelid herds. The foundations for these ethno-territorial division undoubtedly trace back at least as far as the Late Intermediate Period (Chapter 3). However, by all indications, both groups remained largely decentralized until Inka colonization of the region. As I show in this dissertation, warfare was a persistent concern for the valley's residents, evidenced by widespread fortification across much of the valley. While this pattern of political decentralization and frequent conflict could reflect a pattern of local raiding as settlements sought to maintain control over resources and territory, similarities in material culture and the dynamics of Inka administration indicated the significant ongoing regional interaction and underlying social and political networks during the Late Intermediate Period. At a local level, this research examines the interplay of warfare and the emergent Collagua political community.

To investigate these dynamics, this research was designed to examine how war shaped emergent social and political relationships at both local and regional scale. Three primary research questions guided this research. What was the nature of violent conflict in the Colca Valley during the Late Intermediate Period? How did violent conflict relate to the process of Collagua social and political formation? How were fortifications reconfigured as local populations were integrated into the Inka state? Field research was conducted at multiple scales: (1) regional-scale documentation of defensive sites and their spatial distribution, (2) site-level analysis of settlement patterns and artifact distributions, (3) test excavations at the site of Auquimarka, a large fortified settlement with occupation spanning both the LIP and Late Horizon. At a broader level, this project was designed to contribute to a broader understanding of the consequences of war by examining the changing processes of affiliation and integration within communities engaged in conflict.

In this dissertation, I argue that warfare was central to drawing households and settlements into broader networks of cooperative relationships that were grounded in a shared concern for defense. Such relationships of mutual obligation both cultuivated and emerged through practices of affiliation and mutual obligation that were central to the production of Collagua communities. The results of this study show a complex network of nested cooperative relationships, enacted across multiple social and spatial scales within the valley. At a minimal level, households coordinated their labor and resources to construct hilltop fortifications. The defensive constructions at these pukaras were massive corporate projects often monumental in scale. Defensive concerns further drew individuals from across multiple settlements into broader networks of mutual obligation—linking them both through corporate labor projects and through local defensive alliances. At an even larger scale, patterns of fortification suggest the presence of broader regional defensive networks that allowed residents of the valley to monitor and control key access points and communicate advancing threats. These relationships, while built on shared defensive concerns, were also actively cultivated and maintained through commensalism, commemoration and production. I argue that shared defensive interests and relationships of mutual obligation formed the basis for emergent self-organization and collective action during the Late Intermediate Period that was not dependent upon and did not result in political centralization or hierarchization.

Following the region's incorporation into the Inka state, the results show that most fortifications were abandoned, signaling both a change in settlement patterns and and changing defensive needs (Chapter 8). At the same time, the largest fortified settlements in the valley, Malata (IC-195) and Auquimarka (TU-188), not only continued to be occupied, but were also transformed into secondary Inka administrative centers in the valley. At Malata, the transformation to local Inka administrative center shifted the focus away from the massive defensive hilltop that occupied the western third of the site, towards the new central plaza and Inka great halls. By contrast, at Auquimarka the area within the defensive walls became an elite residential area that was physically demarcated and spatially separated from both the commoner residences to the north and the Inka administrative complex to the west. The shift from autonomous to Inka administration both heightened distinctions between public and domestic spaces, and commoners and elites.

Organization of the Dissertation

In Chapter 2, I survey the literature on warfare, focusing specifically on how scholars have understood the relationship between warfare and political change. I argue that the importance of cooperative relationships generated through war have been underexamined, and provide an alternative path to understanding how war can drive social and political transformation and increasing complexity in the absence of political centralization and hierarchical structures of leadership and authority. This chapter also surveys prior research on the Late Intermediate Period, focusing on the relationship between war, ethnogenesis, and political transformations during the period.

Chapter 3 presents background on the Colca Valley, including the physical and geographic setting, and prior archaeological research in the region. The archaeological and ethnohistorical evidence reflects a complex political landscape of political decentralization, but also ongoing regional interaction, social transformation and ethnogenesis through which new patterns of affiliation and political relationships emerged. In Chapter 4, I present the research questions and overarching methodology.

Chapters 5 through 8 present the results of the study. In Chapter 5, I demonstrate that walled hilltop sites were specifically designed for defense, reflecting an increased concern for defense in the face of ongoing conflict. Chapter 6 examines how defensive concerns drove the formation of new cooperative relationships both within defensive sites and between near-by settlements. Additionally, I show how cooperation in defense was enmeshed in broader practices of commemoration and commensualism through which new community identities were articulated. In Chapter 7, I present two spatial models—one which seeks to identify alliance relationships, and one that examines regional mobility. Drawing on the results of these models, I argue that LIP communities were linked through nested alliance relationships that were in part oriented towards external threat. Chapter 8 examines how the use of fortifications changed following integration into the Inka state in the Late Horizon. Drawing on systematic surface collection at Malata (IC-195) and Auquimarka (TU-188), and test excavation at the site of Auquimarka (TU-188), I show how settlement was reorganized under the new state. Furthermore, I examine how the use and significance of defensive constructions was fundamentally changed. In Chapter 9, I summarize the results of the study and return to the broader research questions.

CHAPTER 2

WAR, COOPERATION, AND THE POLITICAL LANDSCAPE

Introduction

The period immediately preceding the expansion of the Inka Empire in the highland Andes, known locally as the Late Intermediate Period (hereafter LIP), has become nearly synonymous with internecine warfare and political fragmentation. Defensive settlement patterns are found across the highlands and attest to a heightened threat of conflict, while the absence of regional centers and large-scale public and ceremonial architecture suggests a pattern of political decentralization (Arkush 2006; Covey 2008; D. G. Julien 1993; Parsons and Hastings 1988). Scholars have thus concluded that conflict during the LIP inhibited the formation of regional political centralization, by physically fragmenting groups and limiting the ability of local leaders to extend their control over distant sites (Arkush 2010; Earle 1997; D. G. Julien 1993). However, within this broader pattern of regional fragmentation, there is evidence of coalescence at more local scale. In many regions across the highlands LIP populations grew and groups who were previously dispersed concentrated in new settlements (Arkush 2010; Bauer and Kellett 2010; Covey 2008; D'Altroy 1992; Stanish 2003; Wernke 2006).

Warfare has long played a role in theories of polity formation and consolidation (Carneiro 1970, 1994; Cohen 1984; David 1975; Ferguson 1984b; Flannery 1999; Haas 1987; Redmond 1994b), but patterns of conflict without political centralization, like those of the LIP, seem a curious exception. Among decentralized polities, warfare may have presented powerful physical and social barriers to polity formation and consolidation. Fortifications were difficult to defeat, and even when defeated, were difficult to control, particularly where political institutions were weak. Furthermore, fortifications and defensive settlement patterns became physical manifestations of political relationships and perpetuated both antagonistic and cooperative relationships across generations (Allen 2008; Arkush 2010; Mantha 2009). Fortified communities likely saw little advantage in forming a larger polity, particularly if the threat was from raiding by near-by groups of more or less equal size. Fortifications themselves may have encouraged the development of local group identities over regional ones (Arkush 2010; Liu and Allen 1999).

However, the extant corpus of research on this topic and period tends to conflate hierarchization with political integration and complexity. As a result, other practices of affiliation that may have linked households and settlements in the absence of centralized administration have not received adequate attention. Scholars have noted how warfare can crystallize social identities (Arkush 2009; Ferguson and Whitehead 1992a; Kurin 2016; Nielsen 2009), how defensive architecture requires the coordination of labor (Angelbeck 2016; Arkush 2010), and how combat requires the mobilization of willing parties (Kiefer 1972; Meggitt 1977; Roscoe 2013; Sillitoe 1978; Wiessner 2006), and yet the destructive aspects of warfare have largely been considered the primary mechanisms for change: territorial expansion through conquest, institutionalized leadership through military prowess, or fragmentation through endemic conflict.

This dissertation addresses how warfare shapes relationships between households and settlements at multiple scales, to examine how war drives new cooperative relationships that underlie perceptions of community within decentralized societies. In this chapter, I review how scholars have understood and theorized warfare-driven political change. I argue that analytical focus on the destructive (or destructuring) aspects of warfare as mechanisms for change reflect an underlying emphasis on hierarchy and centralization within models of sociopolitical complexity. I instead suggest that consideration of the potential for self-organization through cooperation and collective action is better suited to understanding the relationship between war and emergent sociopolitical complexity. I then review how scholars have understood the relationship between war and the environment, highlighting the need to more fully consider how conflict is enacted in and through particular political landscapes. Finally, I review the literature on Late Intermediate Period society in the highlandAndes, focusing on evidence and explanations of conflict, and political transformation during this period.

Warfare, Complexity, and Political Change

Understanding the consequences of war requires frameworks that can account for both the destructive and generative aspects of war. Synthetic explanations of the consequences of war have focused primarily on the role of warfare in generating increasingly complex political configurations. At least as far back as Herbert Spencer (1967 [1876-1896]), warfare was posited as a prime mover in social evolution, a proposition which has been elaborated in various forms (Carneiro 1970, 1981, 1998; Cohen 1984; David 1975; Earle 1997; Ferguson 1984b, 1999; Haas 1982, 1987; A. W. Johnson and Earle 1987; S. A. LeBlanc 2006; Mann 1986; Redmond 1994b). Warfare has been posited as a central factor sociopolitical change at scales across the spectrum of forms of organization—from the formation of tribal polities to the development of states (Carneiro 1990; Cohen 1984; David 1975; Earle 1997; Haas 1990).

Classic models of warfare-driven political change emphasized the role of conquest warfare as a means for consolidating political power and territorial expansion (Carneiro 1970; Cohen 1984). These models were generally concerned with explaining the rise of large polities, such as states and chiefdoms (Carneiro 1970; Cohen 1984; A. W. Johnson and Earle 1987), reflecting a broader interest among processualist archaeologists in uncovering the universal mechanisms that lead to sociopolitical changes within a cultural evolutionist framework.. Conquest models were often directly tied to ecological explanations of warfare, arguing that polities were brought into conflict as population growth drove the need for territorial expansion to relieve resource stress (Carneiro 1970; Cohen 1984; S. A. LeBlanc 2006).

A second body of research has emphasized the role of warfare as providing avenues for the development of institutionalized and centralized leadership (Carneiro 1998; Earle 1997; Redmond 1994a, 1998; Roscoe 2000). In Webster’s (1975) model, warfare provides an important arena for elites within the group to both take on larger administrative role, and for the acquisition of additional resources which they could use strategically to advance their own political agendas. Many of these approaches draw on ethnographic accounts which have highlighted how political leaders use war to extend their influence and protect territorial claims, and the status gained through military achievements (Chagnon 2012; Roscoe 2000; Sillitoe 1978).

These synthetic models have been criticized from a number of angles, including their reliance on unidirectional models of cultural evolution (Arkush 2010), their a-historicity (Ferguson and Whitehead 1992b; Nielsen and Walker 2009a), and on empirical grounds (Arkush 2010). However, several points are worth highlighting here. The first is that models focusing on the consequences of war in the abstract have largely ignored situations where warfare does not result in more centralized or hierarchical forms of political organization (Allen 2008; Allen and Arkush 2006; Arkush 2010; Marcus 1998). Scholars have noted that in many cases protracted warfare may have instead actively prevented the formation of more expansive and centralized polities (Allen 2008; Arkush 2010; Kirch 1991; Liston and Tuggle 2006). In his ethnohistoric and archaeological examination of Marquesas Island chiefdoms in Polynesia, Kirch (1991) argues that warfare, along with environmental degradation and rapid population growth, led to competition, resulting in an ongoing cycle of rivalry and competition, rather than increasing political centralization. Similarly, Liston and Tuggle (2006) argue that Palau warfare may have served as a leveling-mechanism, maintaining segmented power, rather than consolidating it. More recently, both Allen (2008) and Arkush (2010) have argued that in areas with extensive fortification, strong defenses may make conquest particularly difficult and heighten perceptions of group identity and difference thus discouraging regional political consolidation and contributing to cycles of internecine conflict.

Secondly, synthetic models of the consequences of war rely heavily on top-down mechanisms of political change, emphasizing the importance of conquest and subjugation, and elites and war-leaders as catalysts for increasing stratification, political centralization and hierarchical structures of authority. By focusing on top-down mechanisms for change, such models have generally ignored consideration of local context and history, agency or practice (Ferguson and Whitehead 1992b; Nielsen and Walker 2009a; Pauketat 2009). When the individual is considered, agency is often restricted to the motivations of leaders or elites, who are often portrayed as little more than rational decision makers (Nielsen and Walker 2009a). More recent scholarship of warfare has responded to dissatisfaction with more positivistic models, by examining how motivations and practices of war are situated within social and historical contexts (Allen 2006; Nielsen 2009; Nielsen and Walker 2009b; Pauketat 2009; Solometo 2006).

The critiques presented above reflect a broader move to disentangle the consequences of war from models that conflate political complexity, hierarchy and centralization of authority. There are many cases in which war did not result in lasting transformations from tribes to chiefdoms, or from chiefdoms to states, but instead perpetuated patterns of regional fragmentation (Allen 2008; Arkush 2010), or reinforced egalitarian practices (Angelbeck 2016; Angelbeck and Grier 2012; Wiessner 2006). However, this raises the question: does the absence of centralization in contexts of war indicate the mainentance of a status quo, or does it instead reflect transformative processes that fundamentally conflict with expectations of increasing political centralization? This highlights the need for analytical frameworks that can account for coalescence in the absence of centralization. Second, these critiques expose the need for analytical frameworks that can bridge individual agency and broader cultural transformation. To do this, I call attention to how households and settlements engaged in war built new relationships of obligation across multiple spatial scales—relationships that are best understood as cooperative.

Cooperation through War: Alternative Paths to Complexity

My approach to cooperation is informed by a broader body of literature that envisions complexity as a heuristic framework for understanding the interaction between various types of social relationships operating at overlapping scales. During periods of war, these relationships may be very local—residents that take up arms to defend their settlement—or very large—such as the modern nation state—reflecting different scales of community articulation during periods of conflict. The particular contexts of war, however, force us to consider not only how conflict drives individuals to affiliate with particular social groups or communities, but also how such groups can come to *act collectively* through organized violent conflict. That is, conflict and shared identity are often mutually reinforcing social processes through which communities are articulated and maintained. This perspective offers the opportunity to examine how social complexity and social transformation can emerge through self-organized networks of relationships and interaction in contexts of conflict.

Cooperation, Community and Complexity

Within traditional models of political organization, complexity has been conceived as a state or category that a society may or may not attain, and typically intimately intertwined with the presence of hierarchical political structures comprised of multiple ranked segments with clear lines of authority (Earle 1991; Feinman and Marcus 1998; Flannery 1972). However, more recent scholarship has moved toward understanding complexity as a conceptual tool for thinking about the complex, scaler and overlapping social relationships that are inherent to all societies (Angelbeck and Grier 2012; Crumley, et al. 1995; DeMarrais 2011; Honeychurch 2014; Wynne-Jones and Kohring 2007). The concept of heterarchy has been one way that scholars have sought to reframe relationships between societal segments that are either unranked, or can be variously ranked (Brumfiel 1995; Crumley 2007; Crumley, et al. 1995). However, heterarchy presents a broad metaphor that can encompass any number of potential organizational forms, and thus provides a starting point that compels us to investigate more specific social, political and economic relationships and dynamics (DeMarrais 2013; Saitta and McGuire 1998).

Others have drawn on theories of practice to situate social structures as not simply encompassing or static frameworks of power, but rather dialectically constituted and potentially destabilized by agents (Brumfiel 1994; Dietler and Herbich 1998; Dobres 2000; Emerson 1997; Guengerich 2014; Hendon 1996; M. Johnson 1996; S. Jones 1997; Lightfoot, et al. 1998; Pauketat 1994, 2000, 2001). Following the practice and structuration theories elaborated by Bourdieu (1977) and Giddens (1979, 1984), these approaches view structures or practices as dynamic and emergent phenomena arising from the agency of individuals. Practices, in this sense, are both patterned and reenacted over time, but are also subject to change and destabilization in the face of shifting circumstances, surroundings and participants (Ohnuki-Tierney 1990, 1995; Sahlins 1985). These approaches draw attention to the importance of examining how structures and institutions, relationships of power, social identities and action are constituted through relationships and interaction between individuals situated within specific historical and spatial contexts (Ohnuki-Tierney 1990, 1995; Robb 2010).

This interactionist and relational framework underlies recent approaches to community, as emergent social institutions recursively constructed through shared identity and shared practice (Yaeger and Canuto 2000:6). Rather than seeking to identify "the community," these approaches instead investigate the relationships that draw individuals into durable relationships, recognizing community formation as an ongoing process at multiple scales (Goldstein 2005; Knapp 2003; Mac Sweeney 2011; Wernke 2007; Yaeger 2000; Yaeger and Canuto 2000). Co-residence and spatial proximity can provide particularly powerful contexts for generating shared cultural norms and practices through everyday patterns and practices of interaction (Bourdieu 1977; DeMarrais 2001; Yaeger 2000). However, community identities often extend beyond the typical boundaries of shared residence (Goldstein 2000, 2005; William H Isbell 2000; Pauketat 2008; Schachner 2008; Yaeger 2000). "Imagined" communities can draw together individuals with little direct face-to-face contact, who nonetheless maintain important ties through shared interest and professed social identities (B. R. Anderson 2006). Ties between more distant or dispersed communities may draw more substantially on intentional "practices of affiliation" (Yaeger 2000:125), which make community membership explicit through public gatherings, staged rituals, exchange, and real or fictive extended kin relationships (Allison 2008; DeMarrais 2013; Moore 2007; Yaeger 2000, 2003).

Understanding community as an emergent social institution highlights the importance of attending to the relationships and practices that generate a sense of shared identity and common purpose. It also speaks to the importance of scale—both in terms of understanding how social and spatial distance inform practices of affiliation, and in terms of the need for analysis at the intermediate scales between individual and polity (Voss 2008; Yaeger 2000; Yaeger and Canuto 2000). Rather than view complexity as a state of being tied to particular organizational structures, the approaches presented above compel us to think about complexity as a process emerging through overlapping detworks of relationships and interaction.

In this dissertation, I propose a relational and interactionist approach to cooperation, which conceives of cooperation as both a means by which groups of individuals seek to achieve collective goals, and practices through which group membership is made manifest and affirmed. On the one hand, this approach sees cooperation not as a mode of action tied to specific forms of social or political organization, but instead "a process that can be mediated by any number of social institutions" (Carballo 2013b:15). Simultaneously, working collectively toward a common purpose generates relationships of mutual obligation that involve cultivating networks of social relationships through which group membership and identity are made explicit (Roscoe 2013).

This approach to cooperation dovetails with interactionist frameworks of community, which conceive of communities as emergent social institutions that are both grounded in and affirm a sense of shared identity and common purpose (Wernke 2013:22-31; Yaeger and Canuto 2000). At a basic level, cooperation can be viewed as a process by which communities manifest common interest through collective action. Within an interactionist framework, however, cooperation is not simply an epiphenomenon of communities, but instead is an actively negotiated process which manifests at multiple and overlapping scales. Thus, cooperation in one context does not determine or ensure cooperation in others (Carballo 2013b), and in this way, has the potential to both affirm and undermine community membership.

At a basic level, cooperation involves mutualism, or the practice of multiple individuals working together to realize a common goal (Carballo 2013a; Mead 1937; Tomasello 2009:41; West, et al. 2007:416). Studies of the evolutionary basis for cooperation have tended to emphasize the difficulty of overcoming self-interest in order to work in a group towards a common goal, focusing in particular on the role of altruism (giving without the expectation of reward) and free-rider dilemmas (non-cooperative members who nonetheless benefit from cooperative practices) (cf Blanton and Fargher 2008; Bowles and Gintis 2011; Eerkens 2012; Henrich 2006). Individuals, however, cooperate across multiple scales, which may be complementary, overlapping or even conflicting (Carballo 2013b:5). And these different arenas of cooperation can entail varying levels of personal risk and obligations, and thus are likely to draw on distinct networks of relationships.

The cross-cutting effects of cooperation are evident in contexts of war. For example, building a defensive wall is best achieved when labor and resources can be distributed collectively. However, once constructed, the wall protects everyone who lives within it, even those who did not participate in its construction. However, even in cases where all individuals cannot be compelled to assist with the construction, the benefits of working together outweigh the potential cost of free-riders. Additionally, construction of defensive walls reflects a confluence of both personal and group interest in defense, which lowers the barriers to cooperation and makes it more likely that most individuals will participate in the building process (Roscoe 2013). On the other hand, individuals who participate in a raiding party put themselves at great risk. Thus, individual decisions about whether to participate must be carefully considered against the motivations for attack and the potential benefits to the individual and the group. Raiding parties may thus be comprised of direct kin who have established ties of mutual obligation that extends beyond warfare, or may require more explicit negotiation of how to distribute material goods obtained from the raid (Helbling 2006; Roscoe 2009; Wiessner 2006).

These two examples highlight how particular practices and patterns of cooperation are highly contextual and require consideration of the relationships between individuals, and the costs and benefits of cooperating in particular contexts. Immediate kin, for example, are more likely to cooperate in a variety of contexts, in part because of established reciprocal ties, and broader social commitments. These same dense ties of mutual obligation can also facilitate cooperation among non-kin, particularly those living in close proximity and are otherwise tied through broader economic relationships and social networks. In the absence of strong ties, cooperation may rely more on alignment between individual and group aims, like in the case of defensive constructions, or may require more explicit cultivation of reciprocity and affiliation through exchange relationships or commensalism.

Cooperation is dependent on a sense of common interest, and the scale and duration of that common interest has important implications for the organization of social groups (Carballo, et al. 2014; Roscoe 2013). A small raiding party, for example, may consist of only half a dozen individuals and last a total of a few hours. By contrast, construction of a large-scale irrigation system may involve cooperation across several settlements who regularly negotiate water access and participate seasonal maintenance and persist across many generations. The scale and duration of cooperation has important implications for whether cooperation is likely to result in the formation of durable social or political communities or only more ephemeral “task groups” (Carballo 2013a; Carballo, et al. 2014; Roscoe 2009, 2013). In contexts of war, cooperation in defense at the level of the settlement is facilitated not only by the convergence of individual and collective interests in defense, but also the dense, often taken-for-granted ties that emerge through daily interaction (Bourdieu 1977; Yaeger and Canuto 2000). In this way, cooperation in defense provides a context for reaffirming commitments to one’s neighbors that is likely to reinforce a sense of shared community identity. By contrast, individual participation in raiding groups is likely to shift from one raid to the next based on the particular contexts, and is likely to produce more ephemeral cooperative groups.

At any given time, an individual is enmeshed in a number of cooperative relationships, each involving different groups of individuals. Recognition of these multiple, overlapping and scalar forms of cooperation provides an alternative way of conceptualizing how complexity can emerge through networks of relationships. A contextual examination cooperation offers the potential to move beyond top-down models of political change and their emphasis on elite agency, by examining the potential for self-organization across multiple scales (Blanton and Fargher 2008).

Scales of Cooperation in War

During times of conflict, individuals and groups form many different kinds of cooperative relationships. Cooperation may involve only a few individuals who band together to launch a raid, or on the other end of the spectrum, may involve a coalition of several large ethnic groups untied against a common enemy. While a band of raiders and a military coalition are both examples of cooperation in the face of war, they involve very different expectations, commitments, and obligations, and present very different barriers to entry. Here, I draw on the vast ethnographic literature on warfare to highlight the different forms that cooperative relationships can take.

Cooperation for defense

Perhaps the most central and universal form of cooperative relationship in war is that of the *defensive group*, or an enduring group of individuals who engage in mutual defense (Roscoe 2013). In village contexts, the defensive group and the village may very often be roughly one in the same. In fact, defensive concerns frequently propel settlement nucleation (Fadiman 1982; Kiefer 1972; Roscoe 2013). Ethnographic sources, in particular those from New Guinea (Roscoe 2009:80-85), frequently emphasize the village community as united in defense. In addition to providing mutual aid during battle, the defensive group may also coordinate in other defensive strategies. This may include construction of defenses, such as walls, palisades, or stockades (Angelbeck and Grier 2012; Fadiman 1982:105; Roscoe 2009); or manning outposts to monitoring for threats (Fadiman 1982:106-107).

While defensive groups may pertain to a village-based community, this is not always the case. Among dispersed communities, such as the Mae Enga, households live in widely distributed homesteads within their clan territory. Meggitt (1977) describes how the in this setting, households were primarily responsible for building light defenses around their homesteads, but the clan as a whole provided defensive aid during attacks. By contrast, among Coast Salish communities, the primary defensive group likely consisted of smaller grouping within the larger village—perhaps only two to four allied households, with each maintaining their own nearby fortification (Angelbeck 2016; Sutles 1958).

Cooperation for defense provides a relatively low barrier to entry in part because personal interest in protection is in alignment with the interests of the other members of the defensive group. Thus, coordination for the purposes of defense does not necessarily require institutionalized leadership or centralized authority to mobilize participation, particularly in small-scale societies (Roscoe 2013). This is not to say that leadership is absent from defensive coordination. Ethnographic literature indicates that individuals with greater experience or ability often play an important role in coordinating efforts; however, these roles tend to be limited to contexts of war , particularly in the absence of formal adiminstriatve hierarchies (Roscoe 2000).

Kinship ties also play an important role in cooperation within the defensive group. Within groups with strong patterns of either matrilocal or patrilocal residence, settlements are often comprised of households with direct and extended kin relationships. In these cases, defensive groups were enmeshed in broader relationships of kinship, extending ties beyond defense. Even in cases where households are not directly linked through kinship, living in nucleated settlements increases the sort of daily, face-to-face interactions that foster perceptions of common interest and shared identity that can facilitate cooperation that extends to defense.

While defensive groups may draw primarily from individuals living in the same village or clearly defined territory, allied communities can also be drawn on for additional support during attack. I refer to these relationships of mutual aid that extended beyond the core defensive group as *defensive alliances*. Except in cases of pitched battles or extended sieges, an element of surprise is often an essential component of warfare and most communities had little time to rally defenses and thus defensive allies were typically drawn from one’s nearest neighbors. While the core defensive group for the Meru was the village community, Fadiman (1982:116) describes how smoke, fire and horns were used to alert near-by villages of an attack. In these cases, individuals from the surrounding villages would often come to assist, in particular to cut-off the retreat of the attackers attempting to make off with some of the herd animals. Vayda (1960:59) summarizes a similar tactic among the Maori, where warriors from nearby communities would position themselves in order to ambush attackers from the flank or rear.

In societies organized in segmentary lineage groups, which consist of villages or small lineage groups situated within larger clan or tribal confederations traced through lines of genealogical relatedness, nested relationships of affiliation can be particularly salient to the formation of alliances. In an ideal structure, conflicts between larger segments—such as phratries, for example—each phratry could rally the support of each of their smaller segments (Barth 1953; Boehm 1984; Evans-Pritchard 1940; Harrison 1993; Meggitt 1977). In Potosi, Bolivia, for example, Platt (2009) describes how even minor segments who were in conflict with one another were expected to draw together during conflicts between macro-segmentary conflicts. In practice, however, patterns of marriage, residence, and economic relationships often complicate these ideal patterns (Black-Michaud ; Fadiman 1982; Posposil 1994), and proximity is often a more significant factor (Roscoe 2009). Even in the example from Potosi above, individuals would sometimes choose to defend their neighbors—whome they had more entrenched ties to—even against their own macro-affiliations (Platt 2009; see also Roscoe 2009).

One of the primary problems among defensive allies concerns how to ensure that neighboring communities would provide aid when needed. Unlike the defensive group, where both the individual and group benefit from cooperating in defense, defensive alliances required the support from individuals who were not themselves under attack. For this reason, defensive alliances involved individuals and groups that maintained dense social ties through marriage and kin relationships, and ongoing exchanges of food, resources, or services (Evans-Pritchard 1940; Meggitt 1977; Witherspoon 1975). Neighboring groups may be more willing to offer support when they believe that the attacking group also poses a threat to their own security. Overall, however, the efficacy of defensive alliances in more directly tied to proximity and the density of social and economic ties that cultivated senses of mutual obligation across multiple fields—including defense.

Cooperation in offense

While defensive groups are often comprised of individuals living in the same village or dispersed within a clearly defined territory, coordination for offensive attacks is far more varied. Decisions about whether to launch an offensive attack and who should participate depends largely on the scale of the groups in conflict and networks of kinship and alliance ties between individuals and groups. In some cases, individual deaths, even in the context of warfare, may be reckoned at the level of direct kin. Thus, an offensive attack in retaliation may draw primarily on direct kin and not all members of the village (Chagnon 2012; Fadiman 1982; Meggitt 1977; Roscoe 2009).

Even in cases where an offensive attack targets a common enemy to the entire defensive group, smaller-scale raids may be organized and executed by only a sub-set of individuals because they were more effective, and because kin or other ties prevended many members from participating. Among the Middle-Sepik Manambu of New Guinea, for example, factions within a village tended to lead attacks, often with the help of external allies, rather than by the village as a whole (Harrison 1993:68). Within small-scale societies, an offensive attack by a village or clan would often require consensus at the village or clan level (Fadiman 1982; Meggitt 1977). Even then, this decision may have to be carefully weighed against the specific kin or alliance ties between individual members and the proposed target. Drawing on oral histories of the Meru, Fadiman (1982:97) describes:

> The first step in such discussions was to determine whether the *mwiriga* [village] selected for attack contained members related to any of their own lineages, whether by blood or ritual. This involved culling the memories of the oldest men of the community, to insure that such alliances remained intact.

Such cross-cutting ties may lead individuals to abstain from the attack, or even result in a failure to gain consensus (Black-Michaud 1975; Fadiman 1982; Meggitt 1977).

The role of inter-village or inter-clan kin ties in guiding who participates in offensive attacks is particularly relevant to local conflicts in groups where marriages are typically exogamous (Black-Michaud 1975; Fadiman 1982). While the abundance of ethnographic literature affirms that exogamy does not prevent conflicts between lineage groups, it may significantly shape whether individuals choose to join offensive groups. However, kin ties are clearly not the only consideration. In many cases, individual households, or factions within a community may forge alliance relationships with members of external groups (Kiefer 1972).

While the village or a sub-set of individuals within the village frequently coordinated small-scale raids, a group planning an attack may also attempt to draw support from allies outside the local settlement. Although allies could provide greater numbers, these relationships were more tenuous, and could be potentially costly. Meggitt (1977) describes how allies were often less committed to the attack and thus more likely to retreat from fighting. Other sources emphasize that allies often incurred economic costs associated with feeding and provisioning allies, considering them in the distribution of raided animals, or bearing responsibility for any deaths that occurred during the fighting (Meggitt 1977; Andrew Peter Vayda 1960). Additionally, potential allies also had their own kin and alliance relationships to consider, which may oblige them from abstaining from the attack, or even giving advanced warning to proposed target (Fadiman 1982; Kiefer 1972; Meggitt 1977). Even segments of the same tribe, chiefdom or ethnic group may forge alliance or kinship relationships with segments of neighboring external groups, which could make it difficult to organize segments under the auspices of some sort of macro-organization.

While much of the ethnographic literature on warfare deals with conflict in small-scale societies, there is evidence that groups were able to forge larger coalitions, particularly in the face of a common, external threat. Angelbeck, for example, describes how a number of Coast Salish communities, even those with long-standing patterns of conflict between them, were nonetheless able to forge a large coalition against an external threat. Similarly large coalitions have been recorded in historical encounters with colonial states (Abler 1992; Black-Michaud 1975; Evans-Pritchard 1940; Kiefer 1972:60).

Neutral relationships

Given the intricacies of networks of kinship ties and alliances between communities, alliances were often more neutral in nature—providing neither defensive nor offensive support. This could involve standing agreements to abstain from fighting, granting safe passage through ones territory, or agreeing to share information about planned attacks or the defenses of an enemy group (Fadiman 1982; Maquet 1961; Meggitt 1977; Roscoe 2009; Witherspoon 1975). These relationships were often forged between neighboring communities, in part to minimize conflict, but also to extend safe areas for travel, and to strengthen existing relationships of marriage and economic exchange (Roscoe 2009). In general, these relationships did not entail taking up arms either for defensive or for offensive attacks, and thus were less costly to engage in. They also offered significant benefits to both groups by minimizing conflict between one's nearest neighbors.

Discussion

As the preceding discussion demonstrates, cooperation during times of war can take various forms, each entailing different sets of expectations and requiring different levels of commitment and obligation. These relationships were multiple and overlapping, and thus often required negotiating competing sets of obligations, including broader social and economic networks simultaneously. At the smallest scale, the primary defensive group typically involved one's closest relations. Cooperation in defense, in this case, was in large part an intrinsic part of being a member of a village or territorially discrete group, and required little explicit cultivation or formalization.

Even at larger scales, cooperation between villages was enmeshed in broader relationships of kinship, and social and economic networks. In the case of segmentary lineage groups, nested affiliations at times provided an avenue for generating larger coalitions. Yet, even these principles of affiliation were negotiated through relationships of proximity and other extended ties. In general, cooperation across larger social and spatial scales required more deliberate negotiation and formalization, and required periodic affirmation through commensalism, gifts, and formal rituals which made explicit the commitment to mutual aid (Baxter and Butt 1953; Fadiman 1982; Witherspoon 1975).

Warfare and the Political Landscape

Recognition of the various nested and overlapping scales of cooperation, mutual obligation and collective action calls for greater attention to how community affiliations and common interest are constructed through the landscapes people inhabit. While communities are not bounded by proximity, the practices that underlie their construction and affirmation are informed by both social and spatial distance (Yaeger and Canuto 2000). Community relationships at all scales draw both on connections that are taken-for-granted and those more consciously orchestrated, yet the balance of each can be expected to vary in important ways as face-to-face interaction becomes less frequent. Thus, these relationships cannot be excised from the spaces through which they are enacted, and instead require attending to how relationships are constituted through socio-natural landscapes that are thus intrinsic to political processes (A. T. Smith 2003). Consideration of the production of such relational landscapes is particularly relevant in the context of war. Conflict shapes relationships to the landscape in fundamental ways, informing decisions about where to live, who to trust, and where it is safe to travel. War also materializes relationships of cooperation and antagonism in landscape through the construction of nucleated settlements, alliances, buffer zones, and political boundaries.

Archaeologists and social theorists have increasingly viewed the physical environment as neither a passive backdrop nor a determinant of human activity, but rather a medium for practice (e.g. Arkush 2011; Ashmore and Knapp 1999; Contreras 2010; Rodning 2010; M. P. Smith 2005; Ucko and Layton 1999). These perspectives are united by their consideration of not only the material properties of the environment, but how it is experienced and perceived by actors (Heidegger 1977; Ingold 2000; Merleau-Ponty 2005; A. T. Smith 2003; Thomas 1993, 1996; Tilley 1994; Tuan 1977). From this perspective, the physical environment is conceived as both material and analytically inseparable from how it is experienced, perceived, and imagined by the people who inhabit it (Lefebvre 1991; A. T. Smith 2003). Within archaeology, landscape approaches have drawn on a variety of theoretical and methodological traditions to understand the relational aspects of human-landscape interaction. Many considerations of landscape have drawn upon agency and structuration theories to understand how landscapes are both constructed by and constrain possibilities for practice. These analytical frameworks have been particularly influential in studies of the built environment to examine the recursive and instrumental relationship between the spaces we produce and the social and political structures these spaces reproduce through time (Brand 1994; Gieryn 2002; Guengerich 2014; Robben 1989; Schiffer 1983).

Archaeologists have also employed interpretive approaches to investigate the subjective experience of human-environment interactions (Bender 1993, 1999; Thomas 1993, 1996; Tilley 1994). Building on the perspective that the body is the point of interaction with the world, phenomenological and interpretive approaches shift the focus toward the internal, embodied experiences of perception. Methodologically, these approaches have frequently placed central importance on the archaeologist's observations of their own direct engagement with the landscape (Thomas 1993, 1996; Tilley 1994). The subjective nature of phenomenological methods has been criticized—both for the lack of systematic or clear results, and for their emphasis on the archaeologist (Brück 2005; Llobera 2012; A. T. Smith 2003:67-68).

GIS and other spatial technologies offer the potential to develop more systematic means for integrating the particulars of human experience and perception into understandings of the landscape. Scholars have used GIS technologies to examine visual perception of the landscape by modeling the visibility of particular places or the extent of visual fields (Ayala and Fitzjohn

2002; Briault 2007; Gaffney, et al. 1996; Llobera 1996, 2006, 2007; Maschner 1996; Nair 2007; Wheatley 1995; Wheatley and Gillings 2000). Arkush (Arkush 2010), for example, uses line-of-sight analysis between fortifications to identify ethno-political boundaries. She demonstrates how these boundaries were constructed through conflict and antagonism within the specific landscape of the Lake Titicaca Basin, and how those boundaries, in turn, reinforced perceptions of difference and enabled continuing conflict. Others have addressed questions of movement using least-cost paths, spatial network analysis or other means (Covey, et al. 2013; Harrower and D'Andrea 2014; Howey 2007, 2011; Llobera 2000; Wernke 2012). While these approaches are not without criticism (Lake and Woodman 2003; Llobera 2007; Tschan, et al. 2000; Wheatley and Gillings 2000), they represent an important move toward developing analytic methods that consider how subjective experience of the environment shapes the political processes (Covey, et al. 2013; Kosiba and Bauer 2013).

In this dissertation, I draw on a relational approach to human/landscape interaction, examining the ways in which war was constituted through the landscape in ways that informed and constrained relationships of cooperation and antagonism, and perceptions and practices of affiliation and conflict. To do this, I employ a spatially-integrated approach which draws on spatial analysis as a tool for examining how human-scale spatial practices, such as visibility and movement, were mediated through the local landscape. I argue that these practices were not incidental to understanding the nature of warfare in the valley, but rather were integral to the constitution of new relationships of cooperation, affiliation, antagonism and conflict.

Transformations in the Late Intermediate Period Andes

The Late Intermediate Period has traditionally been understood as a period of regional fragmentation, frequent conflict and local polity development (Covey 2008; Parsons and Hastings 1988). The only written sources on this period come from a series of colonial texts, written in the early post-conquest period, which recorded histories of the time before the Inka. These histories frequently speak of this time as a period of unrest, where local groups, organized under their own war leader, engaged in frequent conflict with their neighbors, fighting to acquire women, fields, or high-status goods (C. J. Julien 2006). However, sources also refer to large ethno-territorial *senorios or kurakazgos* led by a paramount lord growing their power and territory through the conquest of weaker groups (Betanzos, et al. 1996; Cieza de León and Ballesteros Gaibrois 1985; Santillán 1968 [1563]).

These contrasting narratives of conflict during the Late Intermediate Period highlight the dynamics of both frequent conflict, but also the emergence of salient new social identities and political communities that produced a cultural mosaic across the highlands. In this section, I review the archaeological evidence for conflict during this time, and highlight the key explanations of warfare in the region.

Evidence for Conflict

Recent review articles by Arkush and Tung (Arkush 2006; Arkush and Tung 2013) draw on both archaeological and bioarchaeological evidence that attest to the frequent and pervasive conflict across much of the highlands and into some coastal areas during the Late Intermediate Period. Hilltops and promontories enclosed by one or more large defensive walls have been identified across the highlands and upper coastal valleys, as far north as Ecuador and south into parts of Bolivia, Chile, and Argentina (Arkush 2006; Arkush and Tung 2013; D'Altroy and Hastorf 2001; Earle, et al. 1980; Hastorf 1993; Kellett 2010; Nielsen 2002; Owen 1995; Seltzer and Hastorf 1990). In addition to fortification walls, these sites share other defensive features, such as ditches, restricted entrances, parapets, bastion, and defensible sitting (Arkush and Stanish 2005).

Hilltop forts often enclose residential areas, and would have provided strong defenses for the community inside (Arkush 2010; D'Altroy and Hastorf 2001; Earle, et al. 1980; Hastorf 1993; Kellett 2010; Nielsen 2002). In some cases, the populations within the walls were very large, some possibly home to as many as 8,000-13,000 people at one time (D'Altroy and Hastorf 2001:68). However, not all walled hilltops enclosed residential areas but instead may have served communities settled nearby or other defensive needs (Arkush 2010; Parsons, et al. 2000). In many regions, even non-fortified settlements were situated in strategic or defensible locations, such as hilltops or promontories where elevated locations would have provided greater visibility of the landscape and steep slopes, rock outcrops or escarpments limited access from one or more sides (Bauer and Kellett 2010; Doutriaux 2004). The extent and prevalence of these defensive settlement patterns lend broad support to an increased concern for defense across much of the highlands during the LIP.

There is also a documented increase in violent conflict during the LIP, evidence by rates of cranial trauma (Andrushko 2007; Arkush and Tung 2013; Kurin 2012; Christina Torres-Rouff, et al. 2005; Tung 2008; Velasco 2016b). Across the Andes as a whole, rates of cranial trauma are highest during the LIP, rising to just over 30% percent within studied skeletal populations (Arkush and Tung 2013:316). The violence that drove the trauma appears to have taken different forms. High levels of antemortem trauma and low rates of perimortem trauma in LIP populations in San Pedro de Atacama, Chile, have been interpreted as a form of conflict resolution (Christina Torres-Rouff and Costa Junqueira 2006). By contrast, in Andahuaylas, high rates of perimortem and antemortem trauma disproportionately affected individuals exhibiting cranial modification. The concordance between this highly visible marker of ethnic identity and trauma indicates violence was directed at specific ethnic groups (Kurin 2012). Finally, the highest rates of trauma were found among LIP-period individuals interred at the site of Huari—the Wari capital in Ayacucho. The high rates of trauma—84%—and likely represent individuals killed in a specific massacre event (Tung 2008).

In areas where conflict was pervasive, warfare played a central role in the organization of Late Intermediate Period polities. In many highland areas, there is evidence of increasing settlement nucleation evidenced in both defensive and non-defensive settlements (Arkush 2010; Earle, et al. 1980; Hastorf, et al. 1989; Kellett 2010; Parsons, et al. 2000). This shift toward larger and denser settlements was driven, at least in part, by concerns for defense. Colonial texts that recount history before the Inka describe large ethnic-territorial senoríos or kurakazgos led by a paramount lord growing their power and territory through the conquest of weaker groups Many areas did experience population growth, greater nucleation and increasing political centralization across the more than 400 year period (Covey 2008; Earle, et al. 1987; D. G. Julien 1993; Parsons, et al. 2000; Stanish, et al. 1997; Wernke 2006), and Inka provincial administration later build upon the social and political structures that developed during this time (D'Altroy 1987; Malpass 1993; Malpass and Alconini Mujica 2010; Morris and Covey 2006; Pärssinen 1992; Silverblatt 1988; Wernke 2006). However, archaeological research indicates that outside of the Cuzco area and some coastal polities, political centralization remained relatively weak (Arkush

2010; Christina A. Conlee, et al. 2004; Covey 2008; D'Altroy 1987; Parsons, et al. 1997; Wernke 2013).

Explanations of Conflict

Scholars have long suggested that LIP warfare was a reaction to the dissolution of the dominant Middle Horizon states of Wari and Tiwanaku around 1000 CE (Hyslop 1976; Kolata 1993; Parsons and Hastings 1988). The collapse of the political, economic and relationships that bound these large polities together, may have resulted in a rise in violent conflict as local groups sought to rebuild themselves in the absence of integrative state institutions and ideologies. Moreover, the roughly simultaneous collapse of two major states likely had broader reverberations across the Andes. At the eponymous Wari capital, analysis of post-collapse human remains interred in the city found significantly higher rates of antemortem trauma among adult populations when compared to nearby Wari-era populations—affecting 71% compared to 23% in the Wari-era populations (Tung 2008) Given that juveniles are underrepresented in the burial sample (an indication that this was not a normal village population), and the extremely high rates of antemortem trauma, this is a unique burial population and may be evidence a massacre, perhaps tied to the collapse of the Wari state (Tung 2008). However, evidence from other regions that were previously within the Wari sphere also show an increase in violent conflict in the early LIP. High rates of post-collapse trauma have also been found in Andahuaylas, approximately 1000 km north found a significant increase in cranial trauma, and in particular, lethal cranial trauma from the late MH to the early LIP (Kurin 2012). Additionally, survey and excavation in the region found a marked settlement shift to defensive and defensible ridgetop settlements around 1000 CE, broadly coinciding with the collapse of the Wari state in the region (Bauer and Kellett 2010; Kellett 2010). Further north in the Cajamarca region, re-occupation of earlier fortifications and construction of new ones also date to the early LIP (Toohey 2009).

There is also evidence for a rise in violent conflict in areas within the broader Tiwanaku sphere. In San Pedro de Atacama, cranial trauma rates peak in the MH-LIP transition, during the time Tiwanaku was in decline. Here, trauma rates rose from 10.9% to 35.6% during the transition period and remained high throughout the LIP (Christina Torres-Rouff and Costa Junqueira 2006).

While there are examples of violent conflict erupting shortly after the collapse of the Middle Horizon states, this was not a universal response—even in areas that had been more directly integrated into the states of Wari and Tiwanaku. For example, in the Nasca drainage, which was likely directly administered by the Wari state, collapse was accompanied by a drastic decline in population, with an overall decrease in the number and size of settlements, and abandonment of previously occupied settlements (Christina A. Conlee 2006; Christina A. Conlee and Schreiber 2006). However, fortified settlements do not appear in the region until the middle Late Intermediate Period (circa 1300 CE) (Christina A. Conlee and Schreiber 2006). Early LIP fortification construction and cranial trauma suggest that in some areas, the collapse of these expansive states quickly ushered in a period of greater conflict. However, warfare was not limited to the immediate post-collapse period. In fact, conflict became more intense and throughout the entirety of the Late Intermediate Period, growing to include areas that were only peripheral to either MH state.

Others have suggested that LIP warfare was the result of growing chiefdoms that fought to expand and secure their territorial and political domain. Early documentary sources often describe large pre-Inka curicazcos, led by war lords fighting to gain access to lands, women and tribute (Levillier 1935; Vega 1965 [1582]). Indeed, archaeological research demonstrates that throughout the LIP, many regions experienced greater nucleation, population growth, and increasing social inequality across highland polities (Covey 2008; Earle, et al. 1987; D. G. Julien 1993; Parsons, et al. 2000; Stanish, et al. 1997; Wernke 2006). The most suggestive evidence for this comes from the Upper Mantaro Region where residential populations of fortifications were indeed very large, with as many as 13,000 residents (D'Altroy and Hastorf 2001). Clear settlement hierarchies and large public plazas at several sites suggests growing political centralization (D'Altroy and Hastorf 2001).

However, evidence for conquest or political expansion of LIP polities is rare outside of the Inka heartland (Arkush 2006). Archaeological research in the regions occupied by Colla, Lupaca, and Chanka, which have long been considered classic examples of large, unified polities who mounted substantial resistance to the Inka, has shown that these groups were not strongly centralized or hierarchical, or even necessarily cohesive, polities during the LIP (Arkush 2010; Bauer and Kellett 2010; Frye and de la Vega 2005; Kellett 2010). Work by Arkush (2010) demonstrates that in contrast to the aggrandizing narratives of the colonial texts, the Colla comprised an amalgamation of local, decentralized communities that were engaged protracted small-scale conflict. While these communities may have formed alliances with nearby communities, and even formed larger—albeit temporary—coalitions in response to particular threats—such as the Inka—they remained largely autonomous and decentralized (Arkush 2010). Similar interpretations have been made of archaeological survey in the Lupaca (Frye and de la Vega 2005) and Chanka (Bauer and Kellett 2010) territories.

A third line of interpretation has posited ecological changes—such as drought and cooling—were the cause of widespread LIP conflict. Paleoecological reconstructions from several sources suggest periods of significant drought and overall cooler temperatures (Abbott, et al. 1997; Binford, et al. 1997; Chepstow-Lusty, et al. 2003; Engel, et al. 2014; Thompson 1995; Thompson, et al. 1994; Thompson, et al. 1985). While there are points of both overlap and incongruence between the sources, they do indicate a period of significantly drier conditions from roughly 1250—1310 CE. Climate change is an appealing explanation of LIP warfare in particular because it provides an explanatory scale of analysis that aligns well with the large regional scale of conflict evidenced in the archaeological record (Arkush 2008). A series of radiocarbon dates from fortifications in the northern Lake Titicaca Basin show that the constructions dates for most forts fall after 1275, which coincides with this period of drought (Arkush 2008). Further south in the Atacama desert, the appearance of defensive sites in the mid-LIP (around 1250 CE, roughly), along with evidence of more intensive and extensive agricultural strategies is also attributed to this recorded period of drought (Zori and Brant 2012). Drought and resource stress have also been used to explain the rise in cranial trauma during the LIP in San Pedro de Atacama, Chile (Christina Torres-Rouff and Costa Junqueira 2006). The implication for this line of explanation is that LIP warfare likely consisted of raiding for stored goods and livestock, rather than sieges or territorial conquest (Arkush 2010).

Scholars have cautioned the use of paleoclimactic data as causal explanations for social and political changes, highlighting challenges with incongruent time scales, the generalizability of source data, the precision of the dating techniques, and a broader concern for environmental determinism (Calaway 2005; Erickson 1999). While materialist and ecological models have been prominent in theories of war (Carneiro 1970; Cohen 1984; Ferguson 1984a, 1990; S. A. LeBlanc

2006), Andean scholars have recognized response to climate change as one factor among many that likely drove LIP warfare. Arkush (2010) argues that while drought and resource stress likely precipitated violent conflict over lands, stored goods and livestock, fortification construction continued long after droughts eased—evidence that conflict over resources gained its own momentum resulting in “durable antagonisms” that were likely driven by the social and political landscape that emerged. Similarly, Bauer and Kellett (2010) argue that in Andahuaylas, changing environmental conditions drove shifts in household production and a greater reliance on pastoralism. They attribute the shift to defensible ridgetop settlements to both defensive concerns and changes to the domestic economy. However, the move to ridgetop settlements from valley bottom areas likely resulted in greater autonomy and isolation between settlements, which could have amplified antagonisms and conflict (Arkush 2010; Bauer and Kellett 2010).

A final possible explanation of LIP warfare is Inka conquest. Colonial texts present extensive narratives of Inka conquest as the sought to extend their control across the highlands (Betanzos, et al. 1996; Cieza de León and Ballesteros Gaibrois 1985; Santillán 1968 [1563]). There is some archaeological evidence of some of these campaigns. Inka fortifications have also been identified along the far northern and southern frontiers of the empire (Alconini 2004; Bray 1992; D'Altroy, et al. 2000; Pärssinen, et al. 2003). Most archaeological evidence for Inka conquest, however, has focused on Inka military installations, and far less is known about local defensive strategies that emerged in response to Inka threat. One example comes from the Lucre Basin, southeast of Cuzco, where the large fortified settlement of Tipón protects the primary access between the basin and Cuzco. Beyond this hillfort, there was a large area devoid of LIP settlement marking a buffer zone between the two groups, which was only settled after the Inka gained control over the area (Bauer and Covey 2002).

Outside of the frontier zones, it is less clear whether fortifications were built in response to Inka threats, or were instead extant defenses constructed in response to local conflict that were later leveraged against this more distant threat. There is evidence that fortification defenses in some regions were extended or amplified late in the use of fortifications. Toohey's (2009) research at the fortified settlement at Yanaorco in Cajamarca suggests that later additions to the site's defenses may have coincided with the expansion of the Inka state into the region. Additionally, Arkush suggests that several fortifications in the Colla region near Lake Titicaca with later construction dates (post-1390) may have been constructed in response to Inka threat (Arkush 2008). Several scholars have suggested that the coalescence of the distinct ethno-political identities, referred to in the colonial texts as senorios or kuricazcos, were reflections of regional coalitions of decentralized communities who presented a united front to impending Inka attack (Arkush 2010; Bauer and Kellett 2010; Wernke 2013:81).

Arkush (2008) has argued that Inka (or other external group) threat likely did not drive most fortification construction precisely because fortification is so prevalent across the Andes, and does not fit expectations for a fortified frontier. Additionally, the long occupations at many of these sites indicates that they were built in response to prolonged conflict, rather than a more episodic conquest (Arkush 2008). Finally, in many regions, fortifications lacked year-round water sources, which would have made it difficult, if not impossible, to withstand the type of siege-style warfare that could be mounted by an invading group (Arkush 2008).

However, part of the viability of this interpretation rests on our understanding of the nature and chronology of Inka expansion. Traditional chronologies place the start of Inka imperial expansion around 1438 (Rowe 1945), coinciding with the chronicler Cabello Valboa's (1951 [1586]) proposed dates for the later Inka rulers. While scholars have maintained rapid expansion of the Inka state (Bauer and Covey 2002; Covey 2003), radiocarbon dates from both the northern reaches in southern Ecuador (Dennis E Ogburn 2012) and the southern areas of the Empire in Chile and Argentina (D'Altroy, et al. 2008), indicate that imperial expansion into these regions may have occurred as much as 30-60 years earlier than expected by traditional chronologies. It is also possible that military conquest was preceded by a longer period of interaction, which could have also been a source of tension (Pärssinen and Siiriäinen 1997).

The long period of LIP warfare and widespread fortification likely had multiple causes that operated on distinct scales (Arkush 2008). It is possible that the social, political and economic flux that resulted from the collapse of the Wari and Tiwanaku states, resulted in a more competitive atmosphere, particularly in areas that were part of their broader spheres of influence. The frictions that emerged may also have been exacerbated by a changing climate which likely drove changes to the domestic economy resulting in greater reliance on and competition over irrigation water for agricultural fields and perhaps an expanded pastoralist economy. These mounting conflicts clearly drove changes to the social and political landscape which, in many areas, included greater nucleation in more isolated hilltop fortified settlements, and may have reinforced local autonomy over regional centralization. As the Inka expanded across the Andes, the threat of an external, colonizing polity may have changed the social and political contexts of war, drawing together communities that were previously in conflict, into broader defensive alliances and coalitions.

Alternative Explanations

The extent to which walled hilltop sites reflect defensive concerns in response to warfare—versus serving a symbolic function or a response to changing ecological factors—has been strongly debated in archaeology generally (Keeley 1996), and in the Andes specifically (Arkush and Stanish 2005). Keeley's (1996) influential book argued that artificial distinctions between "civilized" and "primitive" warfare led archaeologists to minimize the seriousness and impacts of warfare in the past. While his historiography of anthropological and archaeological treaties of warfare has been contested (Otterbein 1999), the broad strokes of his argument are reflected in archaeological interpretations of walled hilltop sites in the Andes (Arkush and Stanish 2005). Two particular objections have been raised. The first deals with the effectiveness of these constructions for defense, and the second has relied on analogies with ethnographic and historic descriptions of *tinku*, or a regional form of ritual battle. While Arkush and Stanish's 2005 article addresses these issues in depth, I will briefly outline the key arguments and counter arguments here.

Arguments regarding the defensibility of these sites has focused on walls that do not fully enclose residential areas, the presence of multiple access points through the walls, and interpretations that walls appear too small to have provided adequate defenses (Parsons, et al. 2000; Topic and Topic 1987). However, at many fortifications, unwalled areas are also the most difficult to access, with escarpments, cliffs, of steep slopes providing natural barriers. These strategies likely served to labor and resource costs (Arkush and Stanish 2005:8). Multiple doorways can increase the vulnerability of a site, but access is also essential for residents going about their daily activities. Furthermore, ethnographic and historic literature also indicates that multiple accesses can be strategic, providing escape routes and serving as sally ports to allow fighters to exit the fortification to attack without compromising the security of the interior area (see Arkush and Stanish 2005:8-9).

Some scholars have suggested that the walls at hilltop sites may have instead served to delimit ritual space or community boundaries (e.g. Dean 2005; Hastorf and Johannessen 1993:65; Parsons, et al. 1997; Parsons, et al. 2000:167-168). While walls are frequently used to define and delimit specific places, walled hilltop sites frequently contain a diversity of defensive constructions—such as parapets, guard towers, bastions, baffled gates, and ditches—that would not be expected for ritual or community boundary markers.

Others have argued that LIP warfare may have been more akin to *tinku*, a ritual form of conflict that is recorded in both the historic and ethnographic literature for many highland areas (e.g. Browne, et al. 1993; Hastorf and Johannessen 1993; Morris 1998; Parsons, et al. 2000:171-172; Silverman 1993:221, 224). In written accounts, *tinku* involved pitched conflict between communities, ranging from non-lethal "weapons" such as fruit or flowers, to hand-to-hand fighting, to the use of slingstones and other potentially-lethal implements. While scholars have argued that distinctions between "ritual" and "real" conflict are rather arbitrary distinctions; highlighting how *all* conflict—including modern military engagements include many ritualized components, and that "ritual" battles are often lethal—there are certain characteristics of *tinku* battles that make it an untenable analogy to LIP warfare. Ethnographic examples of tinku battles describe the contests, which were frequently associated with annual religious festivals, as highly circumscribed and formalized in terms of time, place and individuals involved (Platt 2009). The formality of the engagement means that community members know exactly when the battle will take place, and the violent conflict does not extend into the day-to-day lives of the community, making investment in large-scale defensive constructions, often enclosing settlement areas, unlikely (Arkush and Stanish 2005). Additionally, the extent of fortification construction during the LIP attests to an entrenched concern for unplanned attack that permeated many communities during that time.

Beyond the specific concerns presented above, there appears to be a more general concern that defining walled hilltop sites as fortifications privileges their defensiveness and limits our ability to understand the myriad activities that took place within the sites (A. M. Anderson 2014; Dean 2005). While I argue that these sites were clearly defensive, they were not simply defensive. Many of the fortifications were home to large, permanent communities and were undoubtedly loci for a variety of activities. However, I maintain that treating these sites as though they were the same as any other settlement, only with the addition of defenses, perpetuates the tendency to view war more narrowly as warfare—or the episodic violent engagements that punctuate a state of war. The construction and habitation of defensive sites is not simply a correlate that communities engaged in violent conflict; they are a broader reflection of how communities, economic networks, political relationships and relationships to the landscape were constituted, lived, and practiced in an environment of war.

Political Transformations

Despite evidence for greater nucleation, population growth, and increasing social inequality (Covey 2008; Earle et al. 1987; Julien 1993; Parsons et al. 2000; Stanish et al. 1997; Wernke 2006), archaeological research indicates that outside of the Cuzco area and some coastal polities, political centralization remained relatively weak (Arkush 2010; Conlee et al. 2004; Covey 2008; D'Altroy 1987; Parsons et al. 1997; Wernke 2013). Prominent political centers and multi-tiered settlement hierarchies are absent from most highland regions, and social hierarchies remained relatively weak (Covey 2008). Across the highlands, diversity in material culture (especially ceramics and textiles), domestic and public architecture, and mortuary patterns, indicate a cultural mosaic of local polities.

The apparent failure of centralized polities to develop during the Late Intermediate Period has led some to suggest that the constant threat of warfare may have instead limited political centralization. Colonial documents also speak of sinchis, local warlords whose leadership rose and fell with their success in battle (Cieza de León and Ballesteros Gaibrois 1985; Santillán 1968 [1563]; Sarmiento de Gamboa 1949 [1572]). Warfare-dependent leadership may ultimately have made political power impermanent and could have driven more conflict as sinchis sought to maintain their tenuous position (Earle 1997). Fortifications also provided effective defenses making them both difficult to conquer, and if conquered, difficult to control sustainably, especially where political leadership was weak (Arkush 2010). Nucleation within spatially discrete fortifications may have also cemented and reinforced perceived ethnic differences, further fragmenting regions into multiple autonomous polities (Arkush 2010).

While evidence for political centralization is overall weak during the Late Intermediate Period, in many regions Inka provincial administration built upon and leveraged pre-existing social and political structures as they expanded their rule across the Andes (D'Altroy 1987; Malpass 1993; Malpass and Alconini Mujica 2010; Morris and Covey 2006; Pärssinen 1992; Silverblatt 1988; Wernke 2006). This raises the questions: how do we conceptualize the political formations that preceded Inka imperial occupation and what role did warfare play in their development in the Late Intermediate Period? Social cohesion in the absence of political unity is often explained in terms of 'ethnic unity' (e.g. D. G. Julien 1993). However, even a shared sense of common identity requires explanation of its formation (Stovel 2013). Settlement pattern studies from various highland regions indicate that settlements—fortified and not—formed discrete clusters. These settlement changes likely provided a context for drawing residents from distinct communities into broader social and political networks. Parsons and colleagues have argued that many LIP settlements in the Tarma-Chinchaycocha region served as the locus of ritual interaction between herders and cultivators (Parsons, et al. 1997). Additionally, in the Mantaro valley, evidence for the increased use of maize throughout the LIP suggests that communities were being brought together through feasting events (Hastorf 1993; Hastorf and Johannessen 1993).

By all accounts, highland LIP polities outside of the Cuzco region remained largely decentralized and local in scale. Yet, the chroniclers speak of large, organized opposition to Inka conquest and incorporation (Betanzos, et al. 1996; Cieza de León and Ballesteros Gaibrois 1985; de la Vega and Spalding 2007; Sarmiento de Gamboa 1949 [1572]). If we accept that the chronicles at least partially reflect historical processes, how then do we account for unified, or at least united, opposition by key antagonists in these stories such as the Chanka and the Colla? It is possible that hilltop settlement and fortification may have reinforced local autonomy, making these groups more difficult to conquer, particularly in the face of well-developed defenses (Arkush 2010). However, the seeming contradiction between archaeological evidence and the tales recounted in the chronicles forces us to consider the ways in which seemingly atomistic communities were nonetheless entrenched in local and regional networks of exchange, intermarriage, and alliance that ultimately may have allowed for the mounting of a unified front against a common enemy.

Discussion

The LIP was a time of prolonged conflict in many parts of the highland Andes, and yet, outside of the Cuzco region, most polities remained largely decentralized. The absence of evidence for increasingly hierarchical, stratified, and politically centralized polities highlights the limitations of processualist models of warfare-driven political change. From a regional perspective, the political landscape of the Late Intermediate Period in the highland Andes was one of fragmentation. But while fragmentation may be useful for describing the broader regional patterns across the highlands, this was also a time of important social and political transformations that resulted in coalescence at more local scales. Populations in many areas grew, settlements became more nucleated, and communities cooperated to construct large public defenses. Variation in material culture, burial patterns, and architecture highlight the proliferation of distinct social and political communities and the importance of local interaction.

The fragmented political landscape of the Late Intermediate Period highlights the need for analytical approaches to the consequences of war that can account for such transformation in the absence of centralization. In part, this requires shifting our focus away from the dynamics of fragmentation, to focus more closely on the social and political dynamics taking place *within* each fragment. In this chapter, I have argued that consideration of the cooperative processes that emerge through war provide an important avenue for understanding how warfare can drive new relationships of affiliation at multiple scales. The approach presented frames cooperative relationships as nested, scalar and overlapping, and constructed through the landscape. A relational and interactionist approach to cooperation provides an alternative way of conceptualizing how complexity can emerge through networks of relationships, and offers the potential to move beyond top-down models of warfare-driven political change.

CHAPTER 3

CONTEXT AND SETTING: THE COLCA VALLEY

Introduction

> "[The *Collaguas*] come from a *huaca* or ancient shrine that is located in the neighboring province of *Vellilli*, which is a snowcapped peak in the shape of a volcano, distinct from the other peaks in the area, which they call *Collaguata*. They say that from this peak emerged many people and they descended to this province and its valley, where they have settled in this riverbed. They vanquished the natives and cast them out by force, and remained themselves. They prove this with some forts, which they call *pucara* in their language, which are situated in several high peaks in the valley, from which they would descend to make war. Because the volcano they say they come from is called *Collaguata*, they call themselves *Collaguas*."[1] (Ulloa Mogollón 1965 [1586]:327)

In the history recorded by 16th century Spanish magistrate Juan de Ulloa Mogollón, the Collaguas traced their origins from the volcanic peak of Collaguata, approximately 100 km north of the valley. From there, they descended into the valley, waging war and displacing the native population. The evidence of this violent conflict, say the informants, can be seen fortified high peaks around the valley.

It is unlikely that this origin story—a conscious act of self-representation on the part of local elites interpreted and recorded by a Spanish colonial official—presents a straightforward historical record. Tales of invasion, especially from highland herder populations, are a common motif in Andean charter myths (Salomon, et al. 1991; Urton 2012). Two groups of ancestors

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[1] [Los *Collaguas*] que proceden de una *guaca* o adoratorio antiquo questá en los términos de la provincia de *Vellilli*, comarcana desta, ques un cerro nevado a manera de volcán, señalado de los otros cerros que por allí hay, el cual se llama *Collaguata*; dicen que por este cerro o de dentro dél salió mucha gente y bajaron a esta provincia y valle della, ques este río en que están poblados, e vencieron los que eran naturales e los echaron por fuerza e se quedaron ellos; aprueban esto con algunos fuertes, que llaman *pucara* en su lengua, questán hechos en algunos cerros altos del valle, de donde bajaban a hacer guerra; y porque (*así*) aquel volcán de donde dicen que proceden, llamado *Collaguata*, se llaman ellos *Collaguas*

often appear in these stories—*huaris*, often portrayed as the original agriculturalist inhabitants, and the invading *llacuazes*, pastoralist groups who descend from the highlands displacing or at least dominating the huaris (Urton 2012). However, these mythohistories often describe multiple invasion events, which suggests they were changed or augmented over time to reflect shifting political relationships and to reconcile and reinforce ranked yet complementary relationships between polity divisions (Gose 2008:18; Urton 2012).

This narrative structure likely represents local attempts to reconcile then distant Late Intermediate Period conflict with current social and political relationships. In this telling, the invading Collaguas could represent the ranked relationship between Collagua moiety divisions, or perhaps the ethno-political dynamics between the two dominant groups in the valley: the Collaguas, Aymara-speaking agro-pastoralists living in the upper half of the valley, and the Quechua-speaking Cabanas with their extensive agricultural fields in the lower valley (Wernke 2013:58). At another level, however, the story reveals how this local history was constructed through the particular socio-natural landscape of the Colca Valley. What unifies the Collaguas is their common descent from the volcanic peak of Collaguata—a kinship traced through the landscape. Perched atop the high peaks that surround the valley, the remains of the pukaras are not just relics of the past, but are agents in the history of how the Collaguas came to occupy the valley.

This chapter describes the geography and climate of the Colca Valley and the people who lived there. The first part of the chapter describes the physical setting, including the particular geographic, environmental and climatological contexts through which residents of the valley mediated ethnic identities, political territories, production practices, practices of war. The second part draws on the now extensive archaeological research in the valley to trace the cultural transformations in the valley, focusing in particular on the late pre-hispanic periods that are the focus of this dissertation. The final section turns to the colonial documents and what they might reveal or obscure about pre-colonial social and political organization.

Geography and Climate

The Colca Valley forms an impressive landscape—a rugged montane environment punctuated by several volcanos and split by the Colca River which forms, in the lower part of the valley, one of the world's deepest canyons. Located in the Department of Arequipa, Province of Caylloma, the Colca River cuts through a high grassland plateau, forming a vertical landscape conducive to both agricultural and pastoral activities. The river itself continues westward, changing names to Majes around the village of Viraco, and to Camaná before emptying into the Pacific Ocean at the village of Camaná (Figure 3.1).

The Colca Valley is located in the western cordillera of the Andes, a volcanic mountain range that extends 5000 km along the western coast of South America. The Colca River carved the valley out of the high altitude grassland (puna). At its deepest, the river cuts an impressive gorge 3400 m deep just west of the village of Pinchollo. The valley is surrounded by a number of stratovolcanic peaks, including Mismi (5597 masl), Ampato (6288 masl), Hualca Hualca (6025 masl), and Sabancaya (5676 masl). Sabancaya is the most active of the volcanos and has had several historically recorded eruptions dating back to 1750 and as recently as 2003 (Institution 2013), and continues to contribute substantially to seismic activity in the region.

Figure 3.1. Map of southern Peru with the study area highlighted.

The valley was formed during the Pleistocene through a process of uplift, fluvial incision, and mass wasting. The valley presents eight stepped alluvial terraces, formed through climactic change and tectonic activity (Eash and Sandor 1995). The youngest of these surfaces is near the valley bottom, and they increase in age with elevation. Level 1 consists of the river channel and floodplain. Above this, Levels 2-5 extend from about 5-100 m above the river and consist primarily of gravel colluviums, fine-grained alluvium and volcanic ash. Levels 6-7 are high alluvial terraces, portions of which may be the result of slower moving water associated with periodic river blockages (Eash and Sandor 1995). The eighth consists of the high elevation plateaus (over 4000 m) which surround the valley and form part of the altiplano (Denevan, et al. 1986).

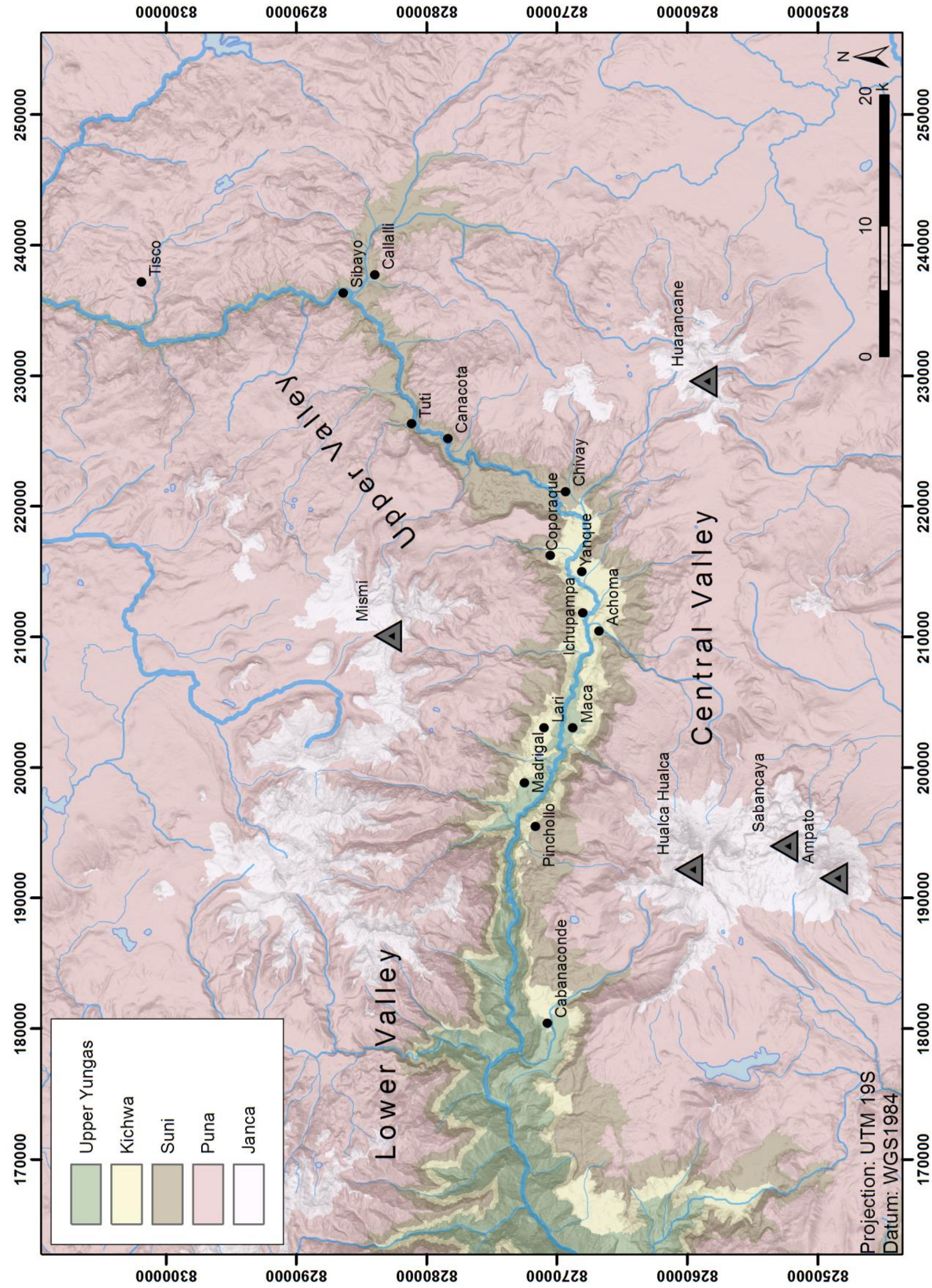

Figure 3.2. Map of the Colca Valley.

Between Chivay and Tuti is a mid-late Pleistocene andesitic lava flow (172,000 ±14,000 yr B.P.) which creates an undulating plain (Eash and Sandor 1995). A second, younger flow (64,000 ± 14,000 BP) extends to just east of Coporaque (Eash and Sandor 1995). The flat-topped table mountain near Coporaque, known as Pampa Finaya, appears to have been formed by a Quaternary volcanic lava plateau (Brooks 1998).

Valley Divisions and Ecozones

Elevations across the valley gradually descend as and the river flows westward towards the Pacific Ocean. The valley can be divided into lower, central and upper sections following changes in the nature and course of the river (Figure 3.2). The lowest part of the valley lies to the west, around the village of Cabanaconde, extending as far east as the deep canyon between the villages of Pinchollo and Cabanaconde. This portion of the valley lies predominantly in the *kichwa* zone (3300-3600 masl) with a warmer and milder climate that supports a range of agricultural crops. At least as far back as the Late Horizon, maize has been a particularly important crop in the region. In addition to middle-elevation crops, accessible portions of the lower valley gorge are warm enough for tree fruits.

The study area includes much of the central and upper valley. In the central valley, located roughly between the villages of Pinchollo and Chivay, the river is deeply incised and remains largely inaccessible for both drinking and irrigation water. Cultivation is most heavily concentrated in the kichwa zone that includes the broad alluvial terrace above the river channel and the lower slopes along the valley walls, which are lined with agricultural terraces; many of which were constructed in the late prehispanic period.


Figure 3.3. View of the landscape of the central valley.

The northern and southern slopes of the valley walls lie in the *suni* (3600-4000 masl) ecozone, which is cooler and subject to more frequent frosts. This zone supports tuber cultivation, along with a limited number of native and recently-introduced grains—such as quinoa, kiwicha, barley, wheat, and oats—and some legumes—including common beans, fava beans and lentils. Around the valley, the extensive puna (4000-5000 masl) grasslands provide pasturage for camelid herds and more recent European domesticates, such as cattle and sheep. The high grassland puna that surrounds the valley is more easily accessible here than in the lower valley, contributing to a more mixed economy which includes agriculture and pastoralism.


Figure 3.4. Panoramic view of the upper valley area.

In the upper valley, the river widens and the gorge broadens. This is the highest part of the valley and the near-constant freezing temperatures make most agriculture unviable and risky. In general, cultivation in the upper valley is limited to lower hillslopes, and small pockets of terrain with ample sun exposure and protection from the winds. Most of the upper valley area consists of wide expanses of puna grasses. The primary vegetation across the broad expanses of puna is bunch grasses, such as *ichu* (*Jarava ichu*).

The climate of the valley poses a number of challenges: cold temperatures, frequent frosts, hail, and highly variable precipitation. Diurnal temperatures vary more than seasonal temperatures due to the high altitude (Figure 3.5). As a result, frost is a near constant risk, particularly in elevations above 3600 masl. Precipitation varies both across the valley and throughout the year. The Central Andes is positioned between tropical and mid-latitude atmospheric circulation systems, which results in marked seasonal variation in precipitation (Engel, et al. 2014). Approximately 70% of the total precipitation falls during the months of January, February and March, and there is almost no accumulation from June through August, resulting in distinct rainy and dry seasons (Oficina Nacional de Evaluación de Recursos Naturales 1973) Figure 3.7. Precipitation varies across the valley as well, with the highest accumulation in the upper valley (Figure 3.6). Here, however, the cooler temperatures result in frequent frosts and hail, and thus cultivation is limited to only the most frost resistant crops in a much smaller total area.

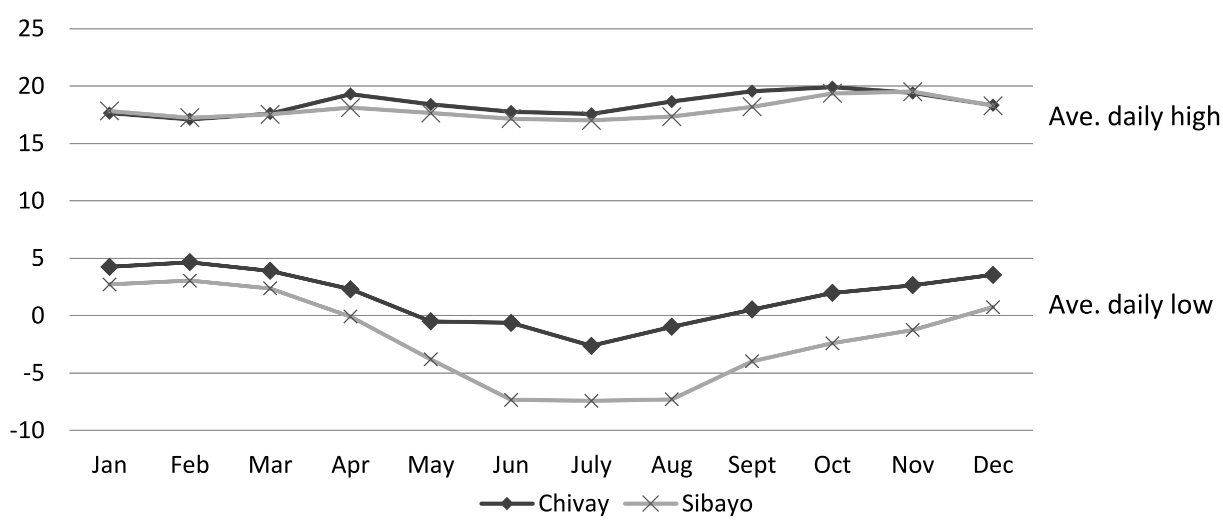

Figure 3.5. Average monthly temperatures in degrees Celsius from the villages of Chivay (central valley) and Sibayo (upper valley).

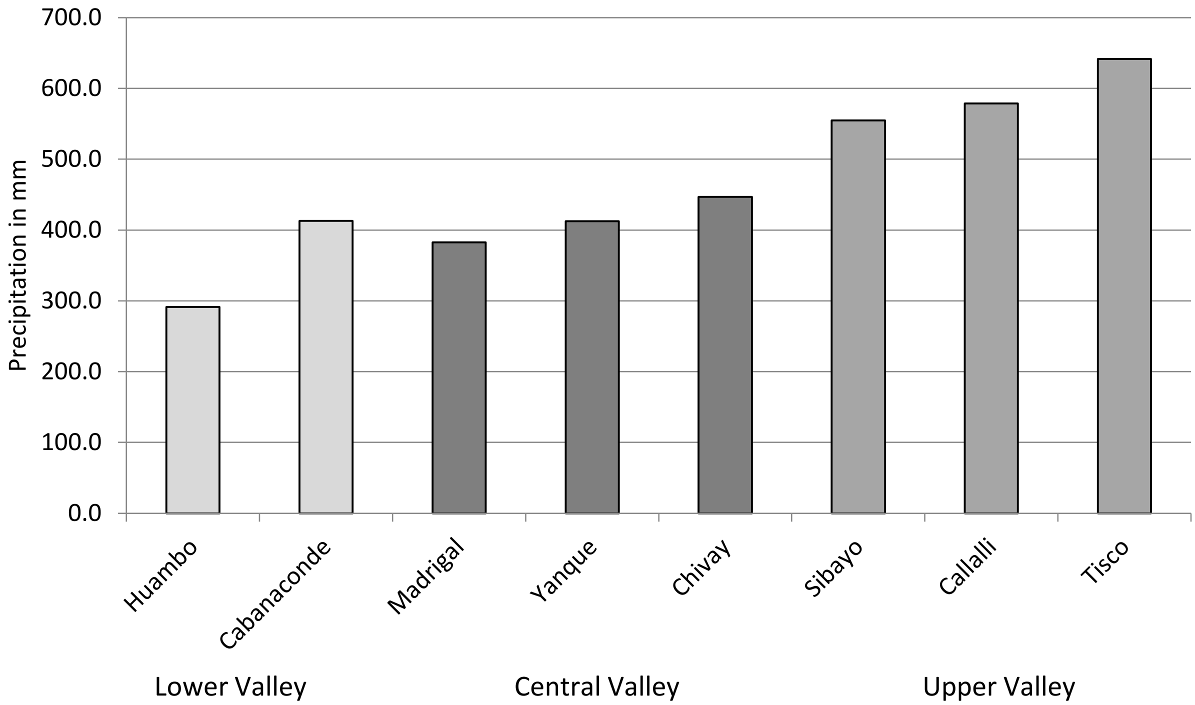

Figure 3.6. Annual total precipitation in millimeters.

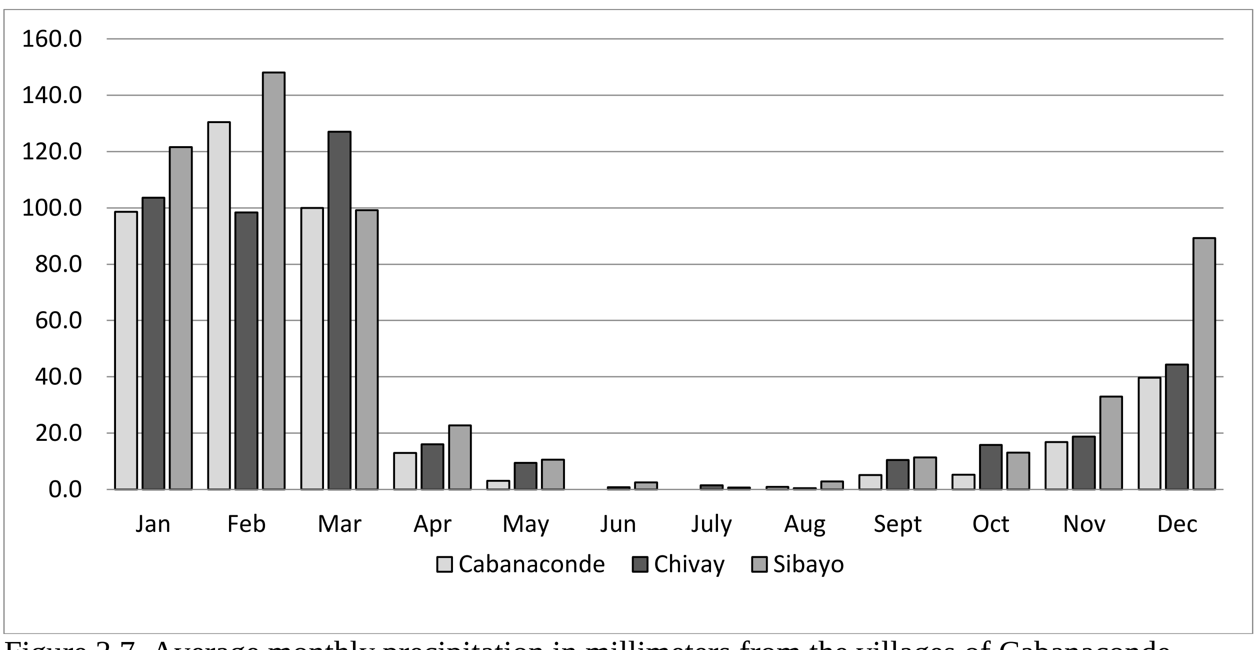

Figure 3.7. Average monthly precipitation in millimeters from the villages of Cabanaconde (lower valley), Chivay (central valley), and Sibayo (upper valley).

Fluctuations in rainfall introduce great risk to crop yields in the lower and central stretches of the valley. Here, the landscape has been intensively modified to help ameliorate these risks. Artificially-leveled terraces cover nearly all areas below 3800 masl (Treacy 1989), many fed by an extensive system of irrigation canals. The river itself has cut a gorge so deep that it is inaccessible for irrigation; instead, water from numerous streams, springs and seasonal snowmelt supplies water to the fields in the valley. Snowmelt from the peaks of Mismi, Huillcaya and Quehuisha feeds the irrigation canals on the north side of the river, while the peaks of Huarancate, Sabancaya, Ampato and Hualca Hualca supply the south side. Many of these terraces were initially constructed during the Late Intermediate Period, and may have been important for mitigating particular risks associated with a period of drought and cooler temperatures.

Prehistoric Climactic Reconstructions

Paleoclimatic data from the Central Andes provide a record of climate variation during the Holocene, and marked variation in both temperature and precipitation have been central to many explanations of warfare during the Late Intermediate Period. Key data comes from peat cores from the Carhuasanta Valley near Nevado Mismi just north of the valley (Engel, et al. 2014), a series of ice cores from the Quelccaya Ice Cap, approximately 200 km northwest of the valley (Thompson 1995; Thompson, et al. 1994; Thompson, et al. 1985), and sediment cores from Lake Titicaca and other nearby lakes (Abbott, et al. 1997)(Figure 3.8).

Figure 3.8. Location of paleoclimactic sources discussed in the text.

Recent data from a peat core extracted from the Carhuasanta valley, just north of Nevado Mismi provide the nearest source of paleoclimactic data for the Colca Valley. Engel and colleagues (2014) traced both temperature and precipitation variation over the past 4300 years by measuring stable carbon isotope composition and carbon and nitrogen isotope ratios of preserved plant remains in the peat, and identified seven major periods in the record. The earliest (2330—1090 BCE) was a relatively warm and moist period. This was followed by a short period of rapid warming followed by abrupt cooling after which temperatures gradually warmed through 800 BCE, and remained relatively dry. Dry conditions and moderate temperatures continued through

1 CE. The following period (1—970 CE) was more variable, oscillating between warm moist conditions and drier and cooler periods. From 970—1310 CE, temperatures were cooler and drier, punctuated by two wet episodes (1085 and 1170 CE). Dry conditions appear to have persisted until around 1520 CE, while temperatures progressively warmed. Cool and wet conditions predominated until a drier period beginning in 1835, and rapid warming beginning in 1960.

Glacial and lake sediment cores from the Lake Titicaca watershed provide comparative data for the Carahuasanta data. Glacial cores from the Quelccaya Ice Cap provide an annual record of ice accumulation extending back approximately 1500 years. Measurements of the thickness of ice layers within the cores indicate various wetter and drier periods (Figure 3.9). Additional data from sediment cores from lakes around the Lake Titicaca Basin also provide a measure of changes in precipitation through time (Abbott, et al. 1997). Significantly, an extended dry period reflected in the ice cores from 1250-1310 CE corresponds to a drop in lake levels in the Lake Titicaca Basin Precipitation during this period may have been as much as 10-15% below the modern average, which could have caused lake levels to drop 12-17m (Binford, et al. 1997).

It has been suggested that oxygen isotope ratios from the ice cores could serve as a proxy for precipitation, and thus an additional line of evidence in reconstructing periods of drought (Arkush 2008, 2010). If this is the case, higher oxygen isotope values from AD 1305 and 1380 could indicate a period of extended drought (Arkush 2008). However, oxygen isotope ratios from the ice cores reflect both the precipitation over the Amazon basin, as well as the temperature over Amazonia and the Pacific sea surface, and it is unclear how each factor impacts these ratios (Baker, et al. 2001; Hastenrath, et al. 2004; Hoffmann, et al. 2003; Thompson, et al. 2003;

Thompson, et al. 2000). Though recently, Thompson and colleagues found no statistically significant relationship between the amount of precipitation (measured by ice core thickness) and oxygen isotope signatures (Thompson, et al. 2013:946). Instead, Vuille and collegues (2003) found that Pacific sea surface temperatures exerted the strongest influence over oxygen isotope ratios.

The existing paleoclimactic data by no means provides a unified record of changing climate during over the 1500 year period for which data from the three sources is available. This variation reflects both the particular strengths and weakness of each source, and the influences of local conditions. All three sources, however, indicate a period of significantly drier conditions from roughly 1250—1310 CE, a time that is contemporaneous with the Late Intermediate Period (1000-1450 CE). Lake cores show the lowest lake levels dating to between 1030 and 1280 CE, with shallow water returning around 1350 CE and deeper water returning around by 1500 CE with the onset of a wetter period (Abbott, et al. 1997). The Quelccaya ice cores prove a more precise annual chronology and indicates a period of exceptional dryness from approximately 1240 and 1310 CE. Data from the Carhuasanta peat cores just north of the valley, however, indicate a much longer dry and cool period beginning around 970 CE and continuing through 1310 CE. Additionally, the data here indicate that levels of precipitation remained low until the 16th century, even as temperatures began to warm.

Scholars have linked these climactic shifts with a number of cultural changes, including the collapse of Tiwanaku (Kolata 1993; Ortloff and Kolata 1993) and the widespread violent conflict during the LIP (Arkush 2008, 2010). Several critiques of the paleoecological reconstructions have been raised and caution the use of paleoclimactic reconstructions to explain significant cultural changes. While the distinct dry season leaves a marked dust layer in the glacial ice cores, providing an annual stratigraphy, compression in the lower (older) layers make it difficult to distinguish annual layers (Calaway 2005). Additionally, differences in ice thickness between the two original cores leads Calaway (2005) to suggest that cores may be more reflective local precipitation, rather than regional trends. Calaway (2005) and Erickson (1999) also suggest that the samples taken for AMS dating from the lake cores—marsh reed seeds and freshwater snails—may be subject to stratigraphic movement, and thus may not accurately provide a chronology of low water events.

Overall, the relationship between climate and major cultural changes in the Andes remains tentative. However, the convergence of multiple data sets indicating a period of significantly drier conditions during the Late Intermediate Period that were perhaps most pronounced in the mid to late part of the period (Figure 3.9). Climate changes, particularly drought and cooler temperatures, would have increased risks to both agricultural production and camelid pastoralism and thus provide an appealing explanation for the pattern of widespread conflict across the highlands. However, raiding for land and resources is just one possible response. Erickson (1999) rightfully highlights how Andean communities also changed and innovated production practices in response to climactic shifts (Bauer and Kellett 2010; Kellett 2010). In the Colca Valley, the drier conditions that pervaded the Late Intermediate Period almost certainly provided a strong impetus for the construction of large-scale irrigation canal networks.

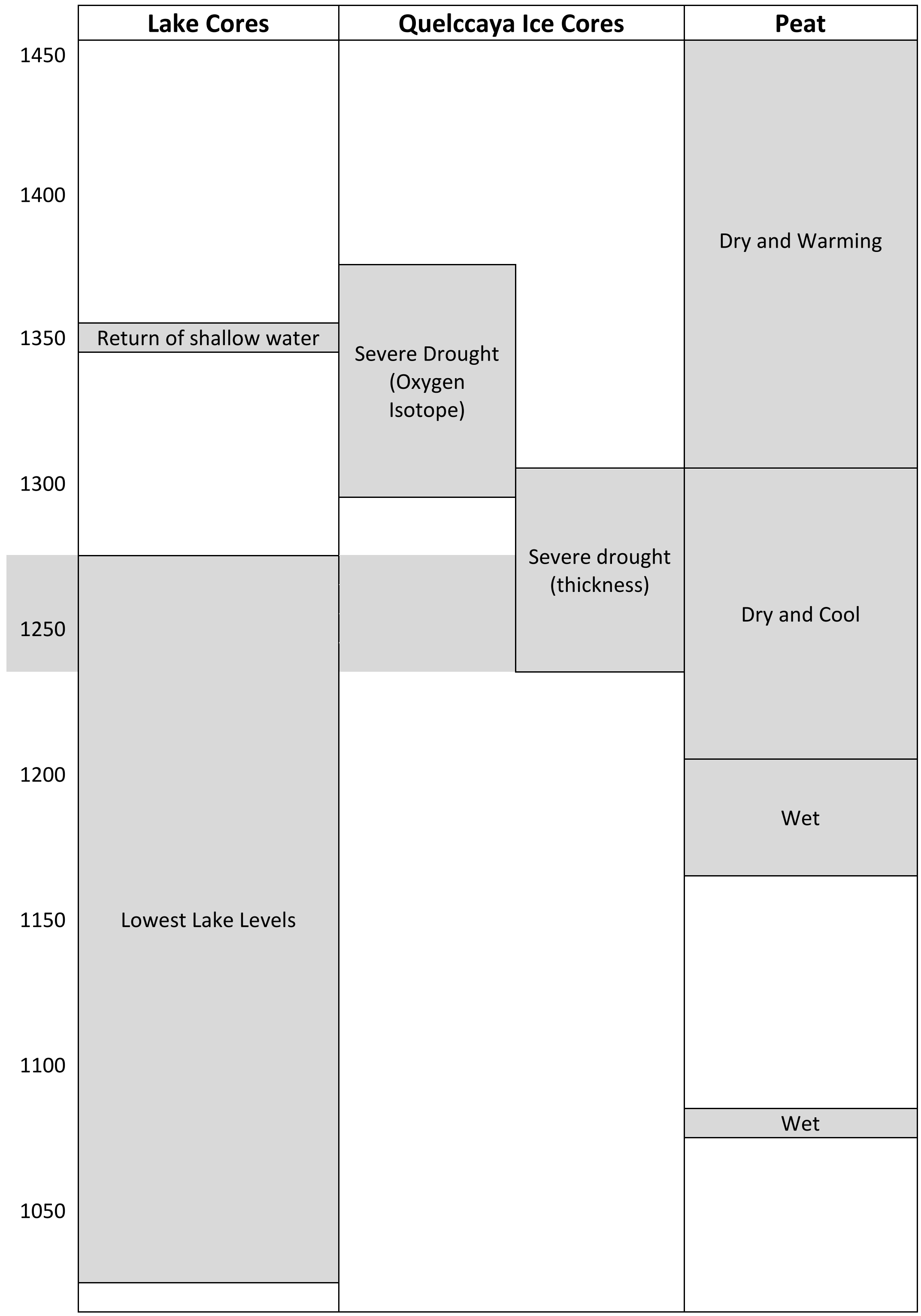

Figure 3.9. Comparison of evidence for drought across paleoclimate sources. Data from Abbott, et al. 1997; Engel, et al. 2014; Thompson, et al. 1985.

Prior Archaeological Research

This dissertation builds on a long history of archaeological research in the Colca Valley. Máximo Neira Avendaño conducted the first modern archaeological survey of the region in 1961 (Neira Avendaño 1961). Neira's survey recorded most of the major villages in the lower and central valley and provided preliminary descriptions of the major ceramic styles and attributes of the distinctive local architecture. Subsequent research in the 1980s and 90s focused extensively on the agricultural terraces around Coporaque (Denevan 1986). Additionally, some work was carried out in the domestic areas of the villages around Chivay (Brooks 1998; Guerra Santander and Aquize Cáceres 1996), Coporaque (Malpass and de la Vera Cruz Chávez 1986; Martin 1986; Neira Avendaño 1986; Treacy and Denevan 1986), Achoma (Oquiche Hernani 1991; Shea 1986a, 1987, 1997a), and Cabanaconde (de la Vera Cruz Chávez 1987).

In the 2000s, surveys by Steven Wernke (2003, 2006, 2007, 2013) and Miriam Doutriaux (2004) examined the settlement patterns around Yanque and Coporaque, and Cabanaconde and Lari, respectively. Wernke's full coverage survey of a large area of Yanque and Coporaque examined long-term processes of settlement and landscape transformations in the region from the Archaic through subsequent waves of Inka and then Spanish colonialism. Doutriaux's survey of Cabanaconde and Lari examined variation in Inka incorporation across the valley. Additionally, Wernke further refined the ceramic serration for the valley (2003:470-537), and importantly distinguishing between the Late Intermediate Period and Late Horizon ceramics providing firmer chronological controls for the valley. Systematic survey and test pit excavation by Nico Tripcevich (2007) around the Chivay obsidian source and portions of the upper valley helped to define the role of obsidian in local and regional trade networks.

Most recently, Matthew Velasco (2016a) has conducted excavations of two large groups of Late Intermediate Period chullpas around the village of Coporaque. Additionally, Agusto Cardona has recently completed excavation at the site of Uyu Uyu, an important Late Intermediate Period and Late Horizon settlement near Yanque. Continuing work by Wernke has focused on the Colonial transformations in the valley following Spanish conquest through excavations at early doctrinal and reduccion settlements in the upper valley.

Early Settlement: The Archaic (8800 BCE – 500 CE) and Middle Horizon (500 – 1000 CE)

The archaeological record reveals a history of continuous occupation dating back to the early Archaic (8800 - 6800 BCE), when the first hunter-gather occupations have been recorded. Archaic period sites demonstrate the valley was an important node in regional trading networks tied to an important obsidian source located above the village of Chivay by the Late Archaic (5000 - 3300 BCE) (Tripcevich 2007). Obsidian from the Chivay source has been found in several Archaic Period contexts across the south-central Andes, including the site of Asana (Osmore drainage of Moquegua) (Aldenderfer 1998), Quillqatani (Moquegua) (Aldenderfer 2005), Sumbay (Arequipa) (Neira Avendaño 1990), and the Ilave Valley (Puno) (Craig 2005). The earliest agriculture—and sedentism—occurred sometime during the Late Archaic (3000-1500 BCE) to Formative transition (Wernke 2003). During this time, people lived in dispersed hamlets in a variety of ecological zones across the valley (Wernke 2003).

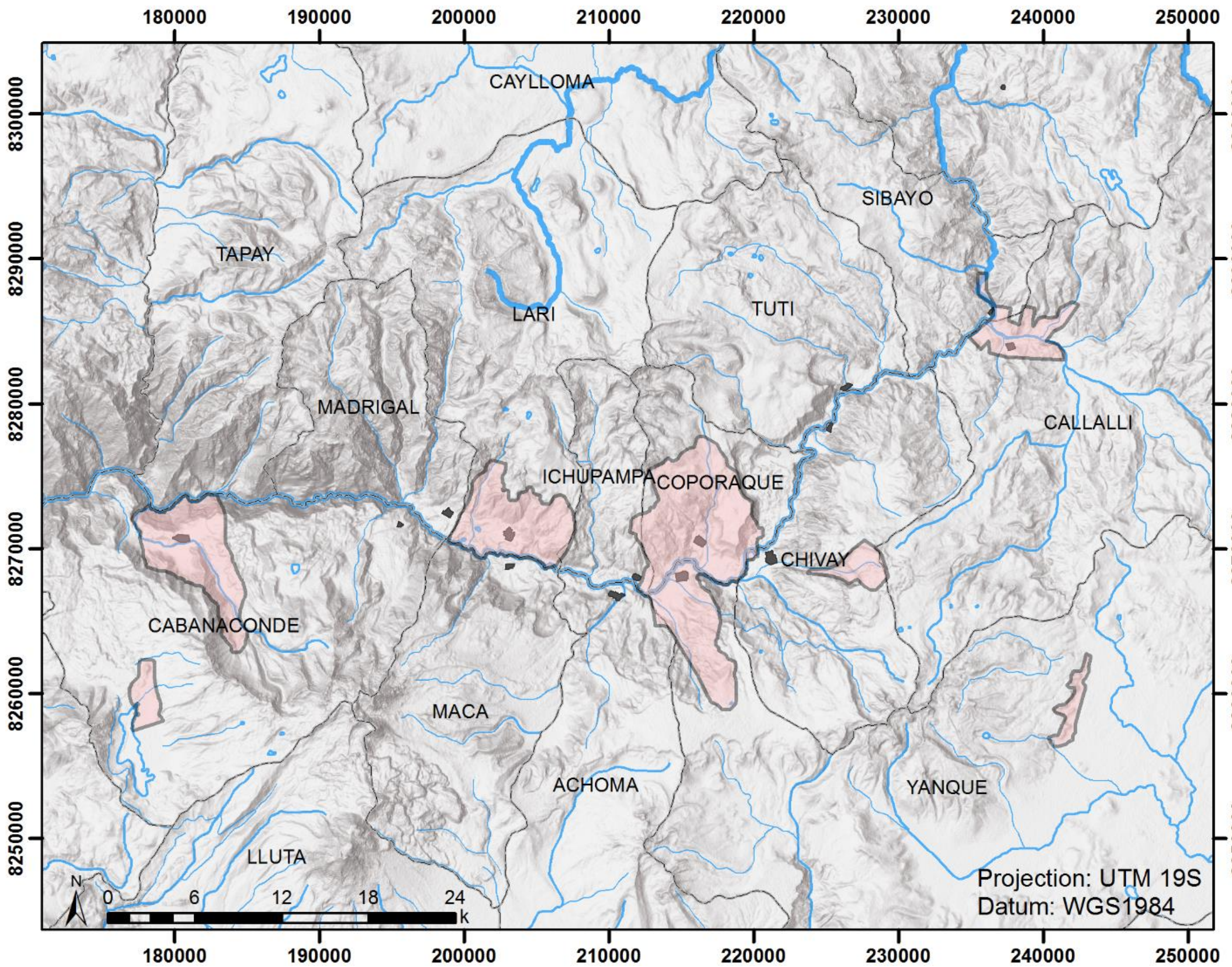

Figure 3.10. Prior survey areas in the valley. Data from Doutriaux 2004, Tripcevich 2007, and Wernke 2003, 2013.

During the Middle Horizon, the valley occupied an intermediary position between the states of Wari and Tiwanaku. In the lower valley, sites such as Charasuta, near the village of Lari, and Achachiwa, near the village of Cabanaconde (de la Vera Cruz Chávez 1987; Doutriaux 2004) show evidence of Wari influence. Charasuta in particular follows the orthogonal architectural pattern typical of Wari administrative centers (Doutriaux 2004:212-220). However, the central and upper valley remained outside of direct Wari administrative control, although local ceramics show evidence for Wari influence (Tripcevich 2007; Wernke 2013).

At the same time, obsidian from the Chivay source has been found within Tiwanaku sites (Burger, et al. 2000; Tripcevich 2007), indicating continued trade interaction with the altiplano during the MH. Curiously, no Tiwanaku style ceramics have been found in the valley (Tripcevich 2007; Wernke 2013). In the upper valley, Middle Horizon assemblages were dominated by local styles. Thus, while the lower valley was apparently situated within the broader Wari sphere of influence, that influence diminishes in the central and upper valley. The central and upper valley, while engaged in broader trading networks with the Tiwanaku state, appears to have remained largely autonomous during this period.

Middle Horizon settlement across the lower and central valley was concentrated in the kichwa zones and was accompanied by the construction of more extensive agricultural infrastructure. The construction of terraces across the lower and central valley point to the increasingly important role of agriculture and overall exploitation of valley-bottom resources (Doutriaux 2004; Wernke 2003). Most of these settlements were new occupations, indicating broad shifts in settlement from the preceding formative period (Doutriaux 2004:197; Wernke 2003:170).

Late Intermediate Period (1000-1450 CE)

The Late Intermediate Period in the broader Andean chronology is marked by the collapse of the two prominent Middle Horizon states of Wari and Tiwanaku. Across the highlands, the LIP also coincides with a period of heightened violent conflict (Arkush 2006, 2008; Arkush and Tung 2013), and in some areas, a greater emphasis on camelid pastoralism (Arkush 2010; Bauer and Kellett 2010; Kellett 2010). This period is best described as a time of regional developments, marked by the emergence of new ethnic and social identities, and the development of independent, local polities (Covey 2008).

Many of these broader patterns can be seen in the Colca Valley. Across the valley, populations grew, the number of settlements expanded and were more nucleated than in previous periods (Wernke 2013). A distinctive local ceramic style, consisting primarily of slightly constricted to slightly open bowls decorated in a cherry red slip with curvilinear and geometric decorative motifs painted in black, proliferated across the entirety of the valley along with a recognizable local style of domestic architecture (Doutriaux 2004; Tripcevich 2007; Wernke 2013). Residents of the valley also began to mark their identity more clearly in the particular way they modified their skulls (Velasco 2016a).

The residents of the valley also made significant investments in agricultural infrastructure, perhaps in response to a changing and increasingly risky environment (discussed above). Canal networks and irrigated terraces were constructed to capture and manage water. These systems increased agricultural production, but also linked settlements along the canal systems into broader networks of interdependence.

The threat of violent conflict became an increasing concern for many valley residents. Most settlements were defensibly located on hilltops or ridges which offered greater protection. However, these threats were not experienced equally across the valley. A number of hilltop fortifications were constructed in the central and upper valley, but investment in defensive architecture was absent from the lower valley (Doutriaux 2004; Tripcevich 2007; Wernke 2013).

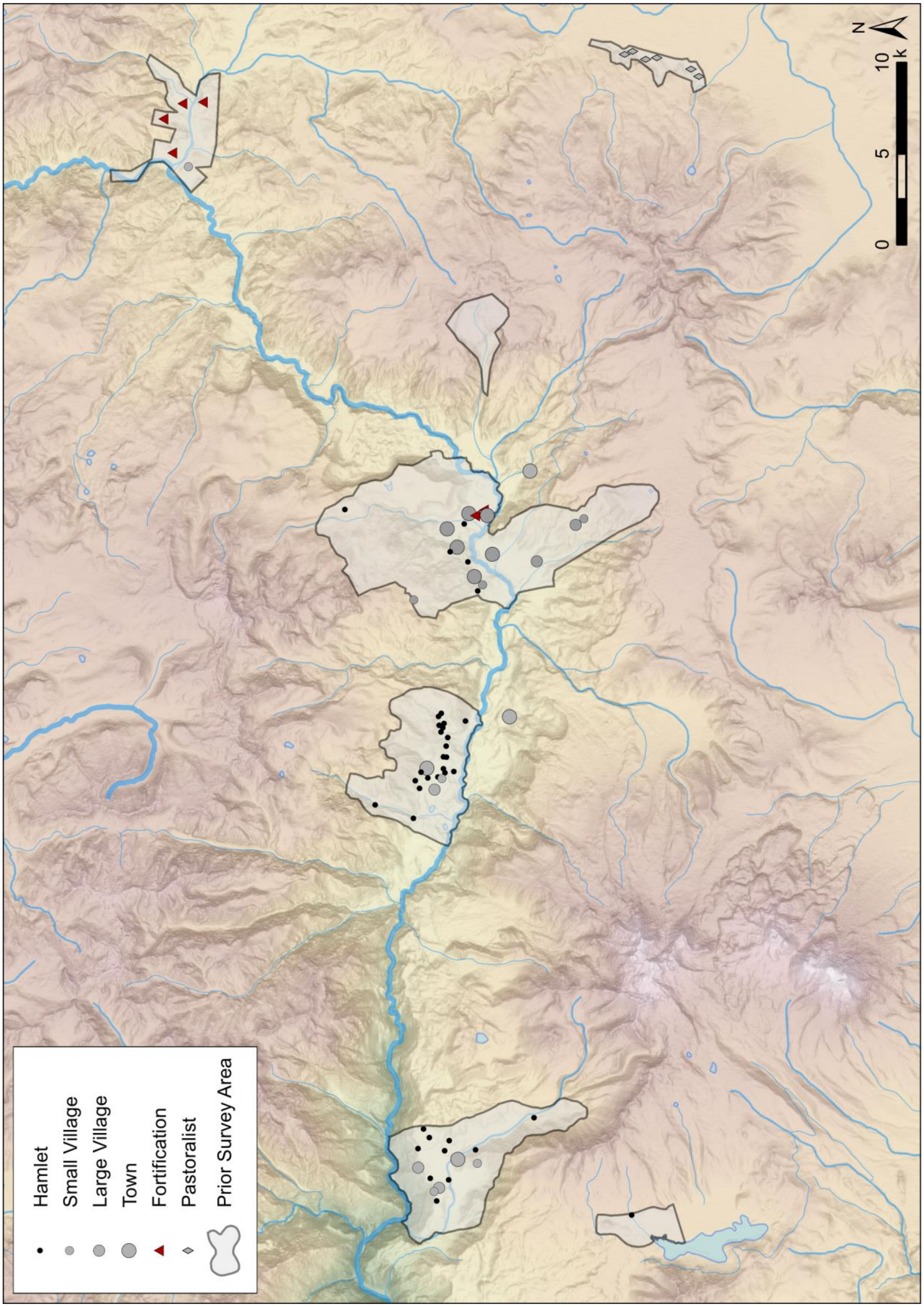

Figure 3.11. Overview of LIP settlement in the valley based on prior research. Data from Brooks 1998, Doutriaux 2004, Oquiche 1991, Shea 1986. Tripcevich 2007, Wernke 2013.

Despite growing status differentiation within and between settlements, the valley as a whole remained largely decentralized, with no clear centers of power. Elites were present at most large settlements, reflecting diffuse, rather than centralized, leadership throughout the valley. Yet within this atmosphere of conflict and political decentralization, shared cultural traditions suggest ongoing interaction across the entire region, and the genesis of new expressions of ethnic identity.

Lower Valley

Late Intermediate Period settlement patterns around Cabanaconde in the lower valleyshow both continuity and change from the preceding Middle Horizon. While more than half of the Middle Horizon settlements (61%, 8 of 13) continued to be used, most diminished in size (Doutriaux 2004:197). The settlements with the strongest Wari influence were abandoned following the state's collapse, perhaps reflecting an intentional distancing from the earlier centers of power. Half of all LIP sites were new settlements established in previously unoccupied locations (9 of 17).

While most sites in this area are located along defensible hilltops and promontories, Doutraiux (2004) found no defensive architecture at any of the sites in her survey. One of the largest LIP sites, Kallimarka (CA-18/CA-19) consists of several hundred structures situated on a narrow hilltop approximately 550 m long and surrounded by narrow hillsides (Doutriaux 2004:233-235). The remaining three largest settlements all occupy elevated locations with impressive visibility of the surrounding landscape. While LIP settlements appear to have been strategically located, there was little investment in defensive architecture, suggesting that conflict was less intense in the lower valley than in the central or upper valley (discussed below).

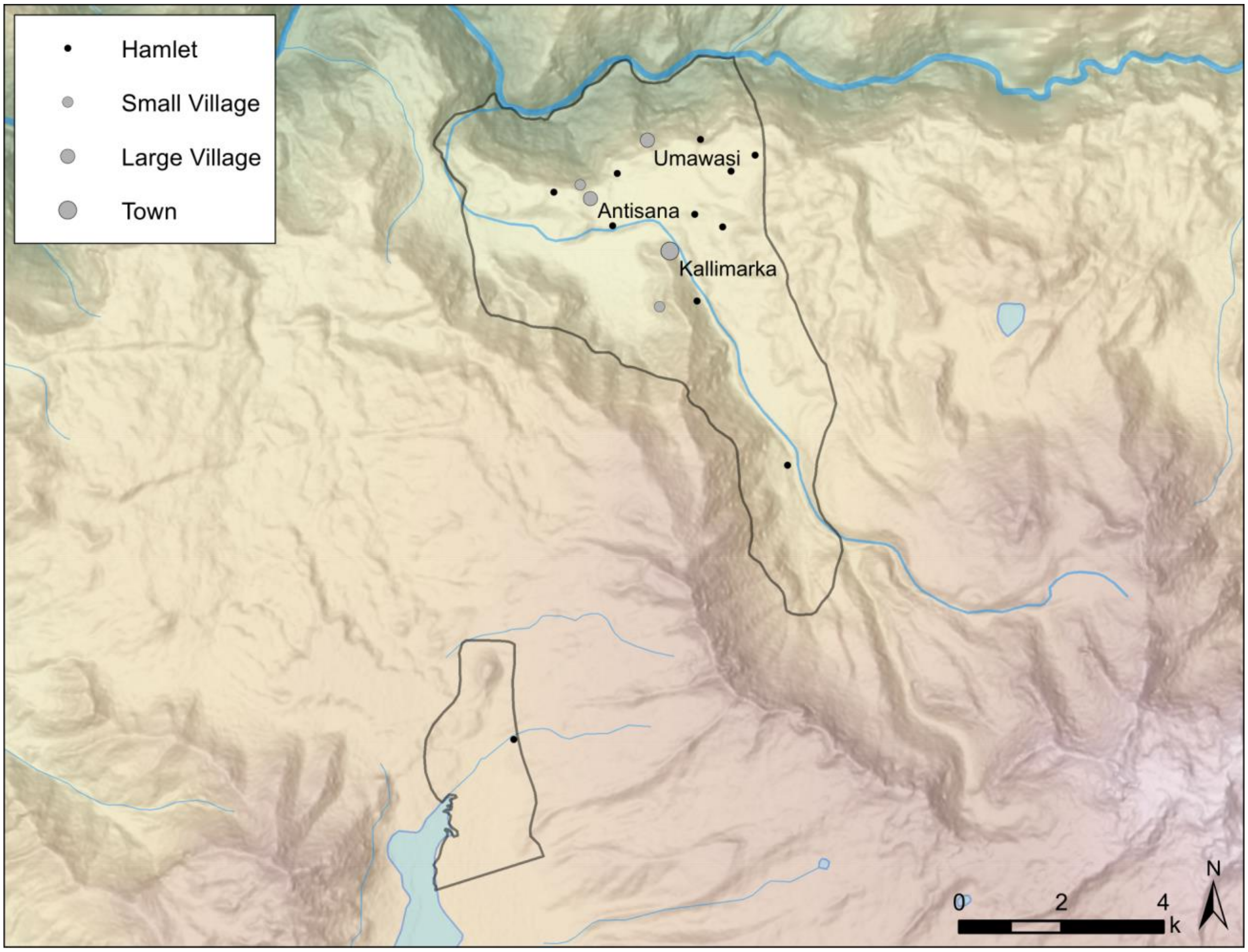

Figure 3.12. Late Intermediate Period settlements in the lower valley. Data from Doutriaux 2004.

Overall, evidence from Cabanaconde suggests the region was not strongly centralized during the LIP. The three largest settlements—Kalliamarka (9.99 ha), Umawasi (7.86 ha), and Antisana (6.30 ha) are roughly equal in size. Architectural preservation is poorer in this part of the valley than in the central and upper, making it impossible compare structure counts or their relative elaboration between sites. At the site of Kallimarka, where domestic architecture is best preserved, variation in the size and elaboration of domestic structures at the site indicates growing status differentiation; however, the intermixing of structures of various sizes throughout the site suggests the community was not strongly stratified (Doutriaux 2004:238-242).

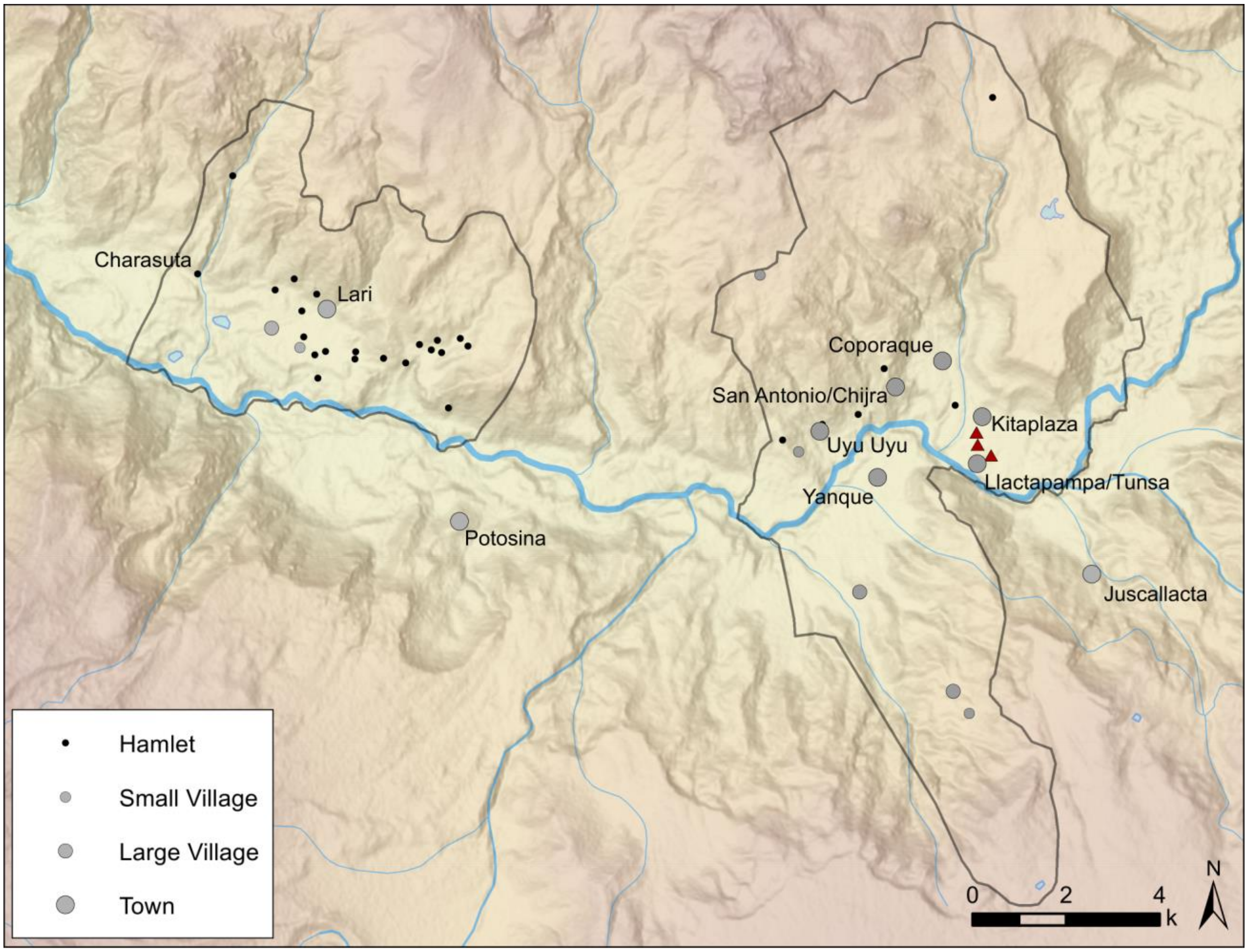

Figure 3.13. Late Intermediate Period settlements in the central valley. Data from Brooks 1998, Doutriaux 2004, Shea 1987, and Wernke 2013

Central Valley

In the central valley, residents abandoned the possible Wari administrative site of Charasuta (LA-99) in Lari and dispersed to a series of new hilltop settlements (Doutriaux 2004:244). These settlements were small, with only a few households each. The densest concentration of LIP ceramics if found around a series of knoll sites around the perimeter of a bofedal—Kankupampa/Lloclla (LA-16, 0.5 ha), Kantupampa (LA-21, 3.6 ha), Ch'apimoqo (LA-27, 5.0 ha), and Qollopata (LA-3, 3.4). Thus, it appears that the settlement in Lari during this time consisted of a relatively dispersed populations concentrated in the central plateau.

Outside of Lari, Wari ties were weaker during the Middle Horizon and settlement had been more dispersed. In the area around Yanque and Coporaque, the Late Intermediate Period was a time of population growth and nucleation. While nearly half of the Late Intermediate Period settlements were new constructions (14 of 31), two-thirds (17 of 25) of MH settlements continued to be occupied into the LIP—indicating both growth and continuity with earlier periods (Wernke 2003:176). At sites with both Middle Horizon and Late Intermediate Period components, LIP ceramics appear more frequently, at a rate of four to one. While not a direct measure, it does suggest an overall increase in the intensity of occupation during the LIP.

Despite evidence for growing status differentiation, both within and between sites, the central valley remained largely decentralized during the Late Intermediate Period. There are no clear centers and no site stands out in terms of size or elaboration. Several large settlements have been recorded in Coporaque (San Antonio/Chijra, Tunsa/Llactapampa), Yanque (Uyu Uyu) and Chivay (Juscallacta) (Brooks 1998; Guerra Santander and Aquize Cáceres 1996; Wernke 2013:85). These settlements are roughly equal in size, with between 90 and 140 house structures each. Domestic structures reflect a diverse range of sizes and elaboration, indicating internal social differentiation, but also a dispersion of elites across the largest settlements. Only the site of Juscallacta stands out in terms of the large size of the domestic structures, which were twice as large as those found at settlements of comparable size[2]. While this suggests important status differences between even the largest settlements in the valley, the absence of public or administrative architecture suggests this was not a political center (Brooks 1998).

Even within this politically decentralized context, residents of the central valley undertook massive corporate projects that dramatically transformed the local landscape. While

[2] Median house size at Juscallacta is 80.6 m^2, compared to just 41.7 m^2 at Uyu Uyu and 37.4 m^2 at San Antonio/Chijra. Juscallacta data from Brooks 1998, Uyu Uyu and San Antonio/Chijra data from Wernke 2003.

absolute dating of terraces is difficult, due to ongoing movement and turning of soils, several lines of evidence suggest that the initial construction and use of irrigated bench terraces, and their associated canal systems, began in the Late Intermediate Period, likely sometime between 1000 and 1100 CE. Reconnaissance of terraces around Coporaque by Treacy (1989:106-117) found heavy concentrations of Late Intermediate Period and Late Horizon ceramics associated with irrigated terraces, while Middle Horizon ceramics were more strongly associated with unirrigated sloping fields and segmented terraces. Excavations of bench terraces by Treacy (1989) and Sandor and Eash (Eash and Sandor 1995; Sandor 1986, 1987) further support a transition to irrigated terrace systems around the start of the Late Intermediate Period.

The canal systems that supplied water to irrigated terraces in the valley drew on glacial meltwater, natural springs, and drainage systems (*quebradas*) from around the high peaks on both sides of the river valley. These systems drew residents in the valley into broader networks of interdependence. Coordinated water management was crucial for ensuring that sufficient water reached lower irrigated terraces, and determining the timing of water supply to secondary and tertiary canals along the path. Additionally, feeder canals often cut across smaller watersheds, capturing this water and diverting away from its natural course (Wernke 2013:145). These changes could be substantial. For example, the Sahuara, a hybrid river/canalized stream that supplies roughly 80% of the irrigation water for fields around the LIP/LH settlements around Coporaque, gets most of its water from two streams; one of which, if left to drain naturally, would flow towards the fields around the prehispanic settlements in the upper valley around Tuti (Treacy 1989:144-147; Wernke 2013:145-146).

The puna area of San Bartolomé to the west of Chivay, was occupied by pastoralists with strong connections to the Colca Valley during the Late Intermediate Period. Today, this region is home to several annexed communities of the village of Yanque, and local LIP style ceramics were found throughout this area, indicating prehispanic ties to the valley area. However, a number of Colla style ceramics from the Altiplano LIP tradition were also found, suggesting a point of interaction between valley communities and the Altiplano communities near Lake Titicaca (Tripcevich 2007:652).

Compared to the lower valley, data from the central valley shows a greater concern for defense indicating more intense and frequent conflict. Nearly all settlements were located on hilltops, and a number of hilltop fortifications have been previously identified in Maca, Achoma, Coporaque and Chivay (Brooks 1998; Doutriaux 2004; Neira Avendaño 1960, 1961; Oquiche Hernani 1991; Shea 1986b, 1997b; Wernke 2013). Most settlements, particularly those located in non-defensible locations, were within a kilometer of a fortification (Wernke 2013). Further evidence of violent conflict come from recent bioarchaeological analysis of human remains from two sets of Late Intermediate Period burial tombs in Coporaque, which show high rates of cranial trauma greater than 50% (Velasco 2016b).

Upper Valley

Comprehensive settlement pattern data is lacking for the upper valley, and so our understanding of the nature of sociopolitical organization during this time is limited. The results of the present work include descriptions of several fortified settlements in this area, however, it does not cover the full diversity of settlement during this period. Tripcevich's survey (2007) was focused primarily in the puna surrounding the upper central and upper valley, providing some details of herding and pastoralist activities in the area. Additionally, survey around the village of Callalli provides some data on settlement in the upper valley during the LIP. The primary evidence of LIP occupation of this area recorded by Tripcevich comes from three pukaras, several *chullpas*, and some areas of agricultural production along the margins of the Río Llapa (2007).

LIP Discussion

The Late Intermediate Period in the Colca Valley was a time of intense local interaction and transformation. In the agricultural core of the valley, communities built an extensive network of canals, which were used to irrigate agricultural terraces (Brooks 1998; Treacy 1989; Wernke 2013). These were major corporate only possible through large-scale labor mobilization and resources for both their construction and maintenance. The water management systems that required coordination and negotiation between the communities that relied on the canal system in order to ensure equitable access across upstream and downstream fields.

Over the course of the Late Intermediate Period, there is evidence of the emergence of a new Collagua identity. Writing in the 16th century, Ulloa noted the distinct forms of cranial modification performed by the Cabanas of the lower valley, and the Collagua of the central and upper valley (Ulloa Mogollón 1965 [1586]:327). Recent bioarchaeological analysis by Matt Velasco shows that over the course of the LIP, cranial modification became more widespread and more standardized (Velasco 2016a).

Similarities in material culture—especially ceramics and domestic architecture—point to a broadly shared cultural tradition throughout the entire valley. While Doutriaux (2004) found some differences in paste composition between Lari and Cabanaconde sites, firing, surface treatment, and surface decoration are largely consistent across the valley during this period. In terms of domestic architecture, while house forms tend to shift from quadrangular in lower elevations, to circular in higher elevations, they all display a very distinctive tall and extremely narrow doorway, along with tall gables on quadrangular houses.

But despite a growing population and evidence of increasing status differentiation throughout the LIP, the valley does not appear to have been politically centralized. In the portions of the valley where complete settlement data is available—Cabanaconde, Lari, Yanque and Coporaque—no clear centers can be identified based on size or elaboration. Instead, several coequal settlements occupy the largest size category, suggesting that political power was dispersed, and elites were present at multiple sites.

Additionally, the LIP brought about increasing defensive posture across the valley. In contrast to the Middle Horizon, settlements are located at higher elevations overall, marking a shift away from the dispersed valley-bottom settlements of the past. A majority of settlements are defensibly located and many in close proximity to fortifications—the focus of this study. However, prior research also suggests that conflict was not experienced equally across the valley during this time. By all indications, violent conflict was more frequent and more intense in the central and upper valley, than the lower valley.

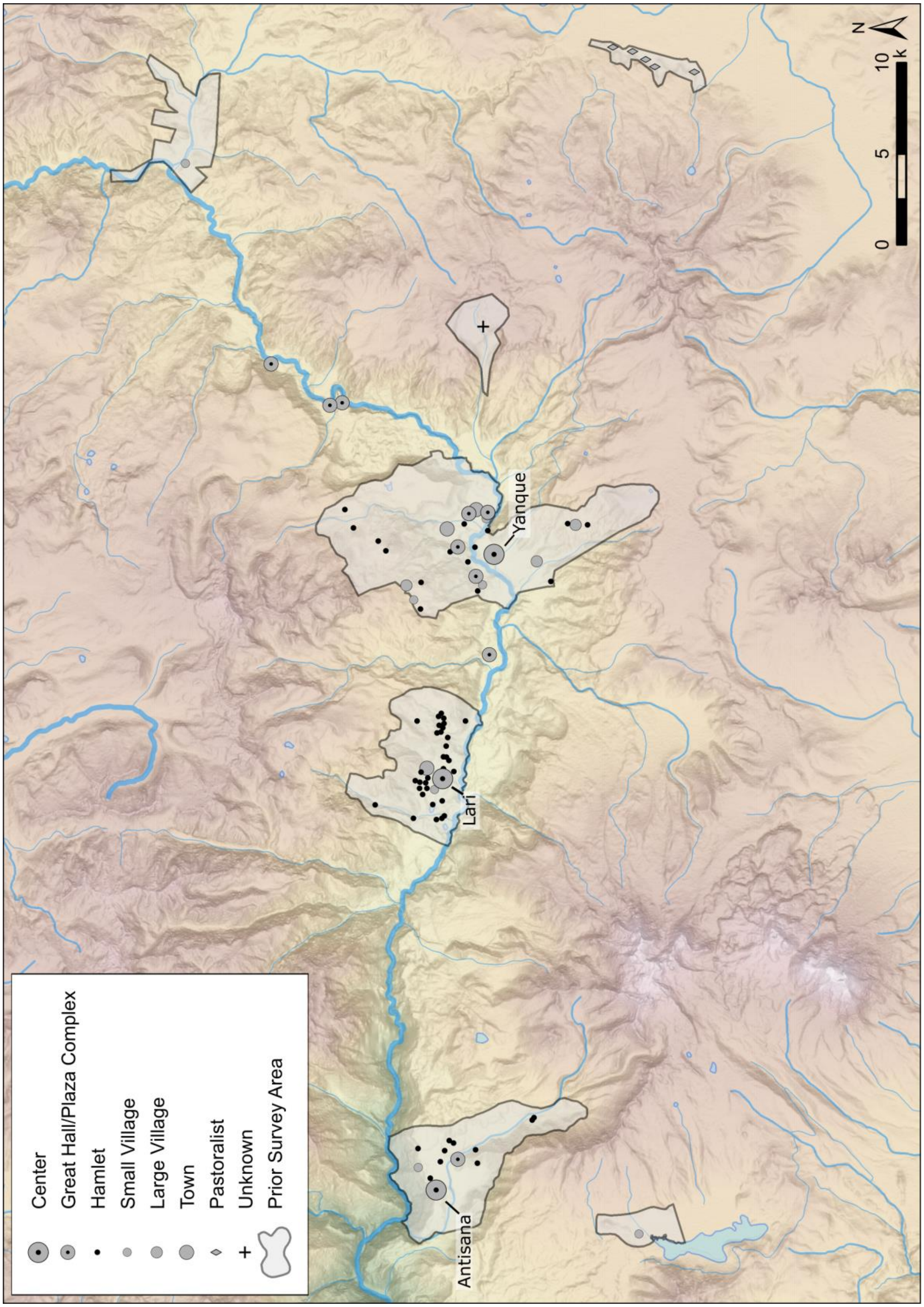

Figure 3.14. Overview of Late Horizon settlements across the valley. Data from Brooks 1998, Doutriaux 2004, Oquiche 1991, Shea 1986. Tripcevich 2007, Wernke 2013.

Late Horizon (1450-1532 CE)

The documentary sources from the early colonial period suggest a centrally administered Inka province in which local communities were thoroughly reordered to fit an ideal nested administrative hierarchy. As Ulloa describes:

> Their governance conformed to that which the Inka put in place, which was, for each *ayllu* and moiety was named a leader, and there were three *ayllus*, called *Collana, Pasana, Cayao*. Each of these *ayllus* had three hundred indians and a leader whom they obeyed, and these three leaders obeyed the central leader, who ruled above them all.[3] (Ulloa Mogollón 1965 [1586]:330)

According to Ulloa, these divisions followed the same tripartite divisions as the ceque system of Cuzco. However, administrative *visitas* (censuses), from the late 16th and 17th centuries (discussed below) and archaeological evidence suggest a more complicated blend of local continuity and imperial transformation.

Across the valley, the Late Horizon was a time of population expansion, political centralization and hierarchization within the valley. There was no single Inka administrative center in the region. Instead, the region appears to have been separated into three administrative divisions: Cabanaconde in the lower valley, Laricollaguas in the lower-central valley, and Yanquecollaguas in the central and upper valley. Each area had their own primary administrative center, all of roughly equal size: Antisana in Cabanaconde, Lari in Laricollaguas, and Yanque in Yanquecollaguas (Doutriaux 2004; Wernke 2013). These villages were all destroyed by subsequent construction of first the reduction villages, and later the modern villages, making it impossible to determine their original extent. However, concentrations of Inka ceramics, especially fine decorated ones, suggests these sites held particular importance during the LH.

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[3] Gobernábanse conforme a lo quel inga tenia puesto, que era, por sus *ayllos* e parcialidades nombraba de cada *ayllo* un cacique, y eran tres *ayllos*, llamados *Collana, Pasana, Cayao*; cada *ayllo* destos tenia trecientos indios y un principal a quien obedecían, y estos tres principals obedecían al cacique principal, que era sobre todos.

Additionally, the only examples of Inka cutstone masonry were found in Yanque and Cabanaconde, albeit in secondary contexts (Doutriaux 2004; Wernke 2013). Significantly, all three of these primary centers were located in open plains near the valley bottom, rather than in defensive or defensible locations, suggesting that the conflict that pervaded during the Late Intermediate Period had largely vanished.

Below the first tier of settlements consisting of the major centers of Antisana, Lari and Yanque, a second level of administration was established in numerous settlements throughout the valley. Inka investment in these sites is clear in the presence of rustic Inka great halls (*kallankas*)*;* long, multi-door structures facing a plaza. This architectural pair has been found in nine sites across the valley, and are mostly commonly seen in what were large Late Intermediate Period settlements (Doutriaux 2004; Wernke 2013). These spaces likely served as central ceremonial spaces used for large public feasting events hosted by state elites (Hyslop 1990; Morris and Thompson 1985). Excavations of great hall structures in the valley, including extensive excavations of one at a LH/early colonial settlement named Malata in the upper valley near Tuti by Wernke (2013:121) and the more limited ones presented in this study (Chapter 8), have found a preponderance of Late Horizon style serving vessels.

Inka style architecture in the valley, however, is limited to those local centers and secondary sites. And even then Inka architectural forms, were constructed using local materials, building techniques, and almost certainly local labor. At most sites, evidence of imperial influence visible only in the proliferation of a new local Inka-influenced ceramic style. Across the valley, there is a great deal of settlement continuity across the LIP and LH. In fact, continuity was so great that in most settlements LIP and LH components are so intermixed that it is impossible to distinguish between the two. Where detailed settlement pattern data is available, nearly all LIP settlements in the valley continued to be occupied through the Late Horizon. In Cabanaconde and Lari, all LIP sites continued to be occupied into the LH (Doutriaux 2004:259, 270), while in Yanque and Coporaque, 96% of LIP settlements continued to be occupied (Wernke 2003:182). The overwhelming quantity of LH ceramics compared to LIP ceramics—5:1 measured by Doutriaux and 3:1 measured by Wernke—indicates that the residential populations at these sites grew during the Late Horizon.

New sites were also established during the Late Horizon—five in Cabanaconde (Doutriaux 2004:259), 12 in Lari (Doutriaux 2004:270), and 19 in Yanque and Coporaque (Wernke 2003:182). Importantly, many of these new settlements were located in the puna, suggesting an intensification in camelid herding, perhaps driven by the need to fulfill tribute obligations to the Inka state (Wernke 2013:151).

Archaeological data from the Late Horizon suggests both continuity and imperial transformation as the region was brought into the larger Inka state administrative structure. In contrast to many directly administered regions, the Inka did not establish a single administrative center. Instead, the valley was divided into three administrative districts, each with their own center. Below these centers, many of the large and prominent Late Intermediate Period settlements reveal more clearly the tension between continuity and transformation. Rather than relocating residents to new settlements, the Inkas imbedded smaller and more rustic ceremonial spaces, providing a number of small theaters for enacting subject-state relationships that likely drew on existing patterns community and kin relationships (Wernke 2013).

An Ethnohistoric View of the Colca Valley

Early documentary sources, in particular, a large collection of administrative visitas from the valley provide both conflicting and complementary accounts of Inka administrative practices and the nature of ethnic and social relationships as they existed in the period immediately after the Spanish conquest of the region. In particular, close readings local visitas, and spatial reconstructions of land tenure practices provide hints of the local social and political relationships whose antecedents may trace back to the Late Intermediate Period.

The earliest descriptions of the valley's residents come from Juan de Ulloa Mogollón, a Corregidor (provincial magistrate), who surveyed the area for the *Relaciones geográficas de Indías* (Ulloa Mogollón 1965 [1586]). The testimony was collected from native elders in a single day in 1586 at the plaza in Yanque, and provides early insights into the social and political organization as well as the ethnic composition of the valley, albeit filtered through the politics of local elite self-representation and Spanish rendering (Wernke 2013:57).

A second major body of documentary information comes from a series of colonial visitas (censuses) recorded between 1591 and 1645. Many of these visitas were found in the parish archives in the village of Yanque, and have since been transcribed and published, most notably by Pease (1977), and most recently by Robinson (2003, 2006, 2009, 2012). These administrative records are impressive, both in their completeness, and the length of time covered, and provide detailed records of households and landholdings by ayllu for all the villages in the valley.

Table 3.1. Table of known visitas for the Colca Valley. From Wernke 2003 with updates for recently published transcriptions

Year	Repartimento	Parcialidad	Completeness	Published in
1591	Yanque Collaguas	Hanansaya	Fragment	Pease 1977, Robinson 2012
1591	Lari Collaguas	Urinsaya	Large fragment	Pease 1977, Robinson 2012
1596	Cabanaconde	Hanansaya	Nearly complete	Robinson 2009
1604	Lari Collaguas	Hanansaya	Large fragment	Robinson 2003
1604	Yanque Collaguas	Urinsaya	Large fragment	Robinson 2006
1604-1605	Lari Collaguas	Urinsaya	Complete	Robinson 2003
1615-1617	Yanque Collaguas	Hanansaya	Large fragment	Robinson 2006
1645	Cabanaconde	Urinsaya	Fragment	Robinson 2009
1667	Yanquecollaguas	Hanansaya	Small fragment	Galdos Rodriguez 1984

Ethnic Groups: Collaguas and Cabanas

In his description of the valley, Ulloa (1965 [1586]) recounts a region occupied by two distinct ethnic groups—the Cabanas and Collaguas—who occupied the lower valley, and central and upper valley, respectively (Figure 3.15). The narrative presented by Ulloa paints a picture of two territorially distinct ethnic groups, with distinct forms of cranial modification and language.

The Collaguas, by contrast, are described by Ulloa as an Aymara-speaking group who traced their origins to Mount Collaguata, a volcanic peak approximately 100 km north of the valley, near the village of Vellille in Epsinar, Cuzco. The Collaguas were said to have elongated their crania to reflect this origin place. He describes those living in the upper reaches of the valley as pastoralists, living off their camelid herds, and those further down the valley cultivated maize, quinoa and potatoes. The Cabanas, by contrast, were a Quechua-speaking group who traced their origins to the peak of Hualca Hualca, which lies immediately above the village of Cabanaconde. Hualca Hualca is a blocky glaciated peak and the Cabanas were said to flatten and widen their crania to mimic their origin place. The lands of the Cabanas, which lay further down the valley, were more temperate and fertile.

Ulloa describes how the Collagua were internally divided into two sub-ethnic divisions, Laricollaguas and Yanquecollaguas, whose relationship was reckoned in hierarchical kin terms (Figure 3.15). *Yanque*, according to Ulloa, was the local term used to venerate the paramount lords in the valley, while *Lare* was a local honorific meaning uncle or kinsman. Zuidema translates the term specifically as "mother's brother" (Zuidema 1964:115-118). During the colonial period, these three primary divisions—Yanquecollaguas, Laricollaguas and Cabanaconde—were administered under three separate repartimeintos, through their eponymous capital villages—Yanque, Lari and Cabanaconde. Yanque, which was the capital of the higher ranking Yanquecollaguas additionally served as the capital for the whole province (Wernke 2013:62).

The ethnic mosaic of the Colca valley was certainly more complex than the narrative Ulloa presents. Close readings of the visitas clearly document that that individuals from even the highest reaches of the valley had access to maize lands in the lower valley and that members of both communities maintained more distant lands around Arequipa (Treacy 1989:218-220; Wernke 2013:232-237). In these more distant colonies, Collaguas and Cabanas, may have lived side-by-side, occupying separate, but neighboring settlements (Pease 1977; Wernke 2013). Similarly, the linguistic boundaries, especially by the time the Spanish arrived, were likely far more fluid than Ulloa describes. Following the arrival of the Inka to the valley in the mid-15th century, Quechua likely became more common among the Aymara-speaking Collagua—especially among the elite classes. Concrete examples can be seen in many of the ayllu names used in Yanquecollaguas and Laricollaguas, which reflect Inka—and thus Quechua—

administrative divisions. And though Aymara toponyms predominate in the central and upper valley, Wernke (2013) has identified some Quechua toponyms which may reflect agricultural intensification and expansion during the Late Horizon. Additionally, Ulloa himself describes discrete populations around the villages of Pinchollo, Calo, Tapay, and in the province around Cabanaconde, who speak neither Aymara nor Quechua, but discrete local, unspecified languages.

While Ulloa, and perhaps his informants, undoubtedly simplified what was likely a more complex constellation of ethnic identification and linguistic variation it is clear that the Cabanas and the Collaguas were the largest ethnic groups in the valley. However, it is difficult to determine how far back in time these ethnic identities extend. The linguistic differences in the valley undoubtedly pre-date Inka arrival in the valley. Quechua was the *lingua franca* of the Inka Empire, and there is evidence of Quecuaization of toponyms and ayllu names within the Collaguas territory that likely originated during the Late Horizon (Wernke 2013). While the timing and nature of the spread of the Aymara language is not settled, there is convincing evidence that took hold in the south-central Andes sometime during the Late Intermediate Period (Sillar 2012). Thus, linguistic differences within the valley were likely in place during the Late Intermediate Period.

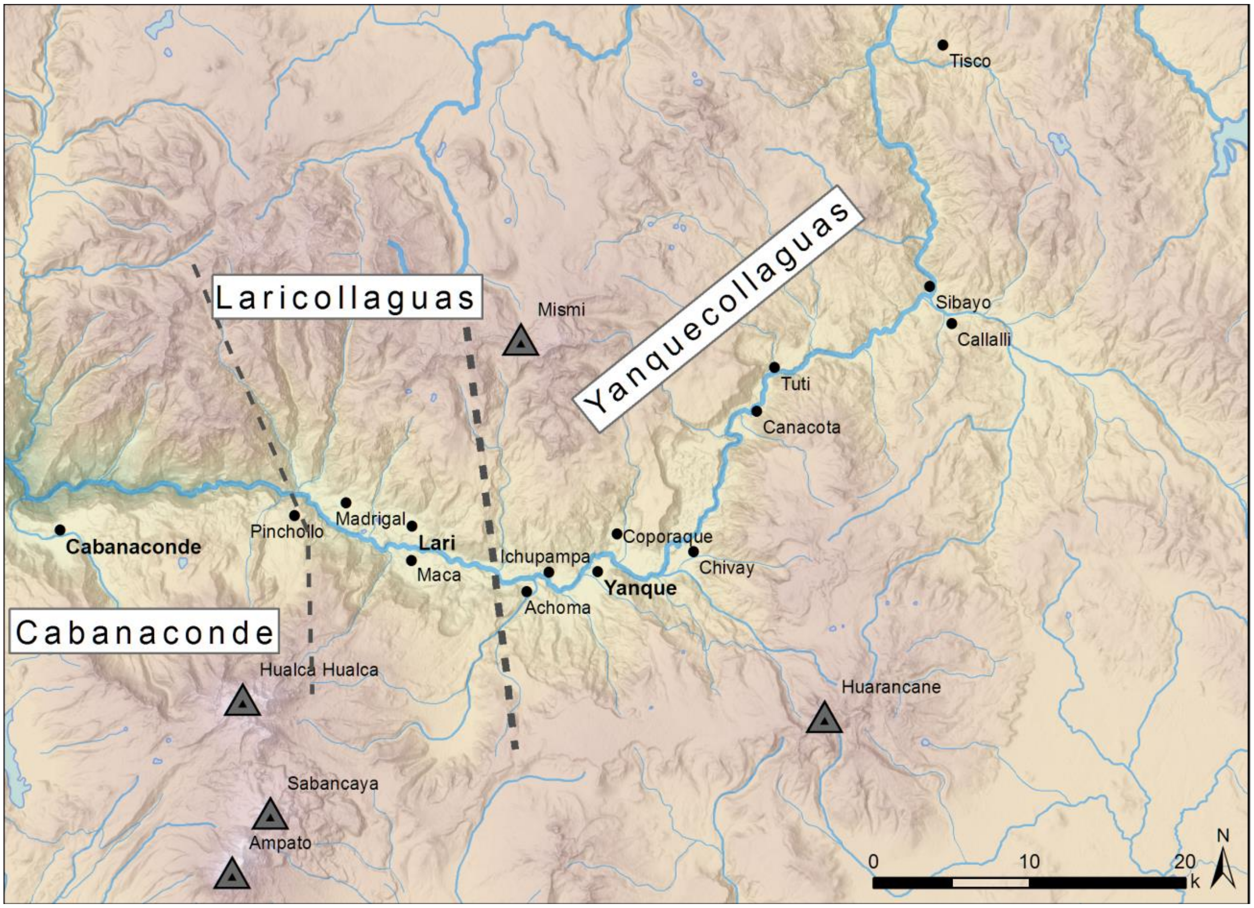


Figure 3.15. Ethnic and political divisions during the Colonial period.

As I discussed above, archaeological evidence of ethnic, social or political divisions is less conclusive. Ceramic styles, domestic and mortuary architecture were broadly shared across the valley during the Late Intermediate Period and do not point to clear cultural boundaries within the valley. However, variation in cranial modification styles are evident in the valley, with annular forms more prevalent in the central valley, and tabular-erect forms more concentrated in the lower valley, and may reflect the different styles described by Ulloa (Doutriaux 2004). Additionally, new research by Velasco (2016a) from the central valley demonstrates that forms of cranial modification became more homogenous and more prevalent over the course of the

Late Intermediate Period. Taken together, this suggests that these ethnic identities were in the process of formation and formalization prior to the arrival of the Inka.

Hanansaya, Urinsaya and Local Ayllu Divisions

Within each of these three repartimientos, groups were further divided into ranked moieties—Hanansaya, the upper moiety, and Urinsaya, the lower. Each moiety was further divided into a tripartite series of ranked ayllus—Collana, Pahana and Cayao—the same Inka kinship classifications within the royal ayllus of Cuzco (Wernke 2013). In Ulloa's description, these ayllus correspond with the decimal administrative structure used by the Inka, with each ayllu containing 300 tributaries (Ulloa Mogollón 1965 [1586]:330), each of which would have been divided into smaller ayllus of 100 tributaries (*pataca ayllus*) following the same pattern (Pärssinen 1992; Wernke 2013)

However, this ideal structure incompletely implemented among the Collaguas. Close reading of the visitas by Wernke (2013:222-226) shows that this tripartite division is most common within Urinsaya ayllus. However, most Hanansaya ayllu names are Aymara words that do not fit tripartite or decimal naming conventions. Wernke suggests that the preponderance of Aymara names and deviation from the ideal Inka tripartite decimal structure within Hanansaya ayllus may reflect the pre-Inka ayllus that were incorporated into the Inka administrative structure largely unmodified. Some of these ayllus names appear to reflect "right/left" dualistic divisions, common within late-prehispanic Aymara polities, that more broadly refer to the locations of their agricultural fields, and perhaps even pre-hispanic patterns of residence (Wernke 2013:262-270). Importantly, this same type of spatial patterning does not exist for lower-ranked Urinsaya ayllus, which may suggest that lower-ranking moieties were more substantially reorganized under Inka rule (Wernke 2013: 270-273).

It would be unwise to assume that ayllus recorded in 16th and 17th century were a transparent reflection of pre-Inka social and political organization, but the documentary sources do provide hints of the social and political relationships that the Inka encountered and later transformed as the valley was brought into the broader administrative structure. The continued use of Aymara names and the reconstructed land tenure patterns of many of the Hanansaya ayllus suggests that higher-ranking ayllus remained more intact than those of the lower-ranking Urinsaya moity. Additionally, the right/left dualism reflected both in many of the ayllu names and in the spatial distribution of landholdings, and which is common in Aymara communities, may reflect vestiges of local social logics of pre-Inka communities in the valley.

Accounts of War

Documentary descriptions of war in the valley are limited, especially compared to the often epic accounts of other groups, such as the Chanka and the Colla. There are only two significant mentions of warfare among the Collaguas. The first, presented in the introduction to this chapter, is by Ulloa who describes how local informants referenced the hilltop fortresses as evidence of their violent conquest of the region. The second comes from Luis Jerónimo Oré, a friar who served as the curate in Coporaque. He recounts:

> The Viceroy don Francisco de Toledo put diligent effort in uncovering the true origin of the Inka Kings of this realm, and found out that in truth there was no general lord of all the land, but rather that in each province, each kindred and generation was governed in barbarism by its most principal curaca or cacique, and their little villages and houses without order, separated by kindred, or *ayllo* one from the other on the hilltops and escarpments because these served as fortresses, which (as they were all at war) they shared among nearest neighbors between them above the lands and fields where they planted, and in this way they expanded and defended them by force of slings, because

> Indians of the sierra are very skilled slingsman. I knew an Indian that had saved a shirt covered with the fingernails of the Indians that his elders had killed, and as a heroic memory it was admired for the many lives lost that it represented, and it was in defense of the fields of that province, that they possessed[4]. (Oré 1992 [1598]:155 [139])

Oré's account provides an alternative motivation for war—the defense and acquisition of fields. This account mirrors more closely a scenario of inter-ayllu conflict over lands that suggests a scenario of competition over scarce resources. By contrast, the narrative presented by Ulloa suggests an invasion of ancestral Collaguas into the valley that displaced the native population. These two descriptions also differ in terms of the scale of conflict. According to Oré, these were local ayllus, each competing to maintain control over their lands. Ulloa, on the other hand, suggests a larger-scale conflict between invading forces and local valley inhabitants.

The accounts presented by each suggests different motivations and scales of conflict that can be compared to the archaeological record. Ulloa suggests an invading force descending from the area north of the valley. If this were the case, we would expect to find hilltop fortifications concentrated along the northern side of the valley, likely dating to early in the Late Intermediate Period. By contrast, the scenario of local inter-ayllu conflict over lands would be expected to result in more extensive fortification across the valley, perhaps dating to the mid to late Late Intermediate Period when drought and cooler temperatures resulted in greater risks for agricultural production. Alternative scenarios can be suggested based on the historically documented ethnic and political divisions in the valley presented above. It is possible that

[4] "El Virrey don Francisco de Toledo puso diligenia en sacar verdadera aueriguacion del origen de los Reyes Yngas deste reyno, halló ser verdad que antiquamente no vue en el, señor general de toda la tierra, sino en cada prouincia, y en cada parentela y generacion se gouernauan con behetria, por el mas principal curaca o cacique della, y tenian sus poblezuelos y casas sin orden, apartada vna parentela, o ayllo de la otra en los cerros o collados porque les seuian de fortaleza, por tener (como tenian todos ellos guerra) los vnos con los otros entre los vezinos mas ceracanos sobre las tierras y chacras donde hazian sus sementeras, y assi las ampliauan y defendian a fuerça de Hondas, porque comunmente son los indios serranos muy diestros fundibularios. Y en la prouincia dlos Collahuas conoci vn indio que tenia guardada vna camiseta, sembrada toda ella de vñas de indios que sus abuelos auian muerto y por memoria hazañosa se preciaua tener prendas de tantas vidas como alli se vian que faltauan, y fue por defender las chacras de aquella prouincia, que ellos posseyan." Translation from Wernke 2013.

conflict erupted between the Collaguas and Cabanas ethnic groups in the valley, or perhaps played a role in cementing the ethnic divisions between them. If this were the case, we would expect to see fortifications distributed across the valley, with perhaps a concentration of defenses along the border between the two groups. Alternatively, it is plausible that conflict erupted between the moity divisions of Yanquecollaguas and Laricollaguas. In this case, we would expect a similar pattern of fortifications across both territories, possibly with greater defenses along a border between the two groups.

As I explore in this dissertation, the spatial patterning of fortifications across the central and upper valley do not support any of these scenario entirely. As I have already shown, there are no recorded fortifications in the lower valley, despite comprehensive survey of a large portion of the core Cabana territory around Cabanaconde, making ethnic conflict between the two major ethnic groups in the valley unlikely. Discussion of the other possible scenarios will be discussed more fully in Chapter 9.

While neither narrative presents a transparent explanation of warfare in the valley, in their own ways, each highlights how the hilltop fortifications constructed long before these 16th century histories were recorded, remained significant features on the landscape. Their permanence, and also their prominence—perched atop the hills and ridges that surround the valley—left them open to reinterpretation as local residents made and remade their own history in the face of significant social and political transformations.

Discussion

As with many highland regions, the Late Intermediate Period in the Colca Valley was a time of political decentralization and heightened conflict. Populations grew and increasingly settled in more nucleated settlements, most located high above the valley floor. Despite growing status differentiation both within and between settlements, there is no evidence of political centers of power. Instead, elites were present at multiple settlements. Most settlements were located in defensible positions along hilltops and ridges, and the construction of fortifications across the central and upper valley attest to the heighten concern for conflict. The colonial documents, as well as emerging archaeological evidence, also suggest that emergent ethnic identities became increasingly salient across the period.

The limited documentary references to warfare in the valley suggest two alternative scenarios of conflict. Oré (1992 [1598]) suggests a pattern of local inter-ayllu conflict over access to lands and territories. By contrast, Ulloa (1965 [1586]) presents a narrative of conquest, which could reflect larger-scale conflict either between the Collaguas and Cabanas ethnic groups, or proto-moiety divisions within the Collaguas group. However, archaeological evidence suggests intense regional interaction within the valley. Ceramic styles, as well as domestic and mortuary architecture, were widely shared during this time, reflecting a distinctive valley-wide cultural tradition. There is also evidence of more local supra-settlement affiliations, particularly in the development of large networks of irrigation canals, which linked settlements through water management practices.

The Colca Valley presents a dynamic context of political decentralization and conflict, but also ethnogenesis and regional interaction. The remainder of this dissertation examines the complex interplay between warfare, political decentralization, and regional interaction in the valley.

CHAPTER 4

RESEARCH QUESTIONS AND METHODOLOGY

Introduction

Narrative and archaeological accounts of the LIP provide contrasting views of life during this period. On the one hand, a proliferation of pukaras points to a time of heightened conflict; conflict that in some cases may have limited the development of strong centralized polities (Arkush 2010). On the other hand, by most accounts, Inka imperial strategy was informed by the local context and in many cases, the strategy was to build upon pre-existing political, social and economic structures (D'Altroy 1992; Malpass 1993; Malpass and Alconini Mujica 2010). Prior research in the Colca Valley suggests that Inka colonization was locally-mediated, and built upon a pre-existing socio-political structure which developed throughout the Late Intermediate Period (Doutriaux 2004; Wernke 2013). However, the nature of this polity has remained elusive. Because the tenor of Inka practices of incorporation and colonization was likely informed by the pre-existing political structures, understanding the nature of the Late Intermediate Period/Late Horizon transition was seen as crucial for both better understand the nature of LIP social and political organization and defining the nature of Inka colonization of the valley.

In this chapter, I highlight the central research questions and explain the key hypotheses and their archaeological correlates. I then describe how the multi-scalar research design was used to address these questions and hypotheses. Finally, I describe the methods employed during each of the four phases of research.

Research Questions and Hypotheses

The project addresses several key research questions. What was the nature of violent conflict in the valley during the LIP? How did violent conflict relate to processes of local polity formation? How were fortifications reconfigured as local populations were integrated into the Inka state?

Conflict, Community and Political Organization

One of the primary aims of this research was to understand the relationship between violent conflict and local polity formation. Several possible hypotheses were proposed.

<u>(1) Defensive settlements fostered community formation at the site level.</u> Defensive constructions required the coordination of labor and military engagement required cooperation between households, and thus provide a baseline of cooperation at the level of the settlement. However, as discussed in Chapter 2, explicit practices which generate senses of affinity, shared interest and collective action are also for fostering a sense of community that extends beyond defensive need. Scholars have suggested that the LIP was an important period of ethnogenesis (Kurin 2012; Lozada and Buikstra 2005; Sutter 2005; Velasco 2016a), and the emergence of new, or more strongly articulated social identities may have been tied to prolonged conflict. Such practices may include commensal activity in public spaces, such as plazas and mortuary complexes. Internal divisions at fortifications have been noted in other parts of the Andes (Arkush 2010; Lau 2010); the presence of such divisions could suggest coordination between distinct lineages or other socially-delimited groups. Additionally, centralized storage and supra-household production of material goods, such as ceramics and lithics, would suggest coordination of production at the level of the settlement. Alternatively, the absence of public

ritual areas, household-level commensal activity, and dispersed storage and production would suggest that coordination was primarily directed toward direct defensive needs. In this study, detailed mapping of individual fortifications, architectural registries, and ceramic analysis were used to collect data to address this hypothesis.

(2) Fortifications formed networks of local defensive allies. Other studies of war in both the ethnographic and archaeological record highlight the importance of inter-site alliances for both defensive and offensive action (e.g. Arkush 2014; Helbling 2006; S. A. LeBlanc 2000, 2001; Roscoe 2009; Simon and Gosser 2001; Simon and Jacobs 2000). This pattern of relationships between settlements and fortifications are generally present in cases where conflict in not restricted to raiding or revenge between neighbors, but can exist in tandem with more local-scale conflict (Arkush 2014). As described in Chapter 2, defensive alliances are typically formed between near neighbors who also maintain social and economic ties. Spatial clustering of intervisible sites, within a few hours walk, would suggest the presence of local defensive alliances. These spatial patterns were examined using GIS-based analyses of viewshed and hiking model algorithms (Chapter 7). Regional defensive structures would also be expected to show greater differentiation and/or specialization in terms of specific defensive function. Greater defenses would also be expected at border areas, related to ethnic or polity boundaries, or areas that are otherwise more vulnerable. Allied sites are expected to have shared material traditions—in the form of ceramics or domestic architecture. Alternatively, more dispersed fortifications, limited visual connections, and local variation in ceramic styles would suggest the absence of local defensive allies

(3) Fortifications were engaged in distant defensive alliances. In contexts where conflict is directed to external threats, settlements often develop more extensive defensive relationships

that can facilitate broader defensive responses in combat, provide more strategic monitoring of the landscape, allow for relaying of information of arriving threats, and at time provide a larger population base to support offensive campaigns (Helbling 2006; S. A. LeBlanc 2014; Roscoe 2009; Simon and Gosser 2001; Wiessner 2006). It is expected that distant allies would have emphasized visual connections, rather than spatial proximity. The presence of visual connections between sites further than a few hours walk would suggest the presence of defensive alliances built on long-distance communication, such as smoke and fire signals. Evidence for concentrated areas of burning outside of residential areas would provide confirmation of the use of smoke and fire signals. Additionally, alliances would have likely been formalized and affirmed through exchange or commensal activities (Helbling 2006; Junker 2001; Knight 2001; Perodie 2001; Wiessner 2001, 2006). Thus, homogeneous ceramic styles, or evidence for exchange of locally produced ceramics and other goods (such as obsidian), would further suggest affiliation across the valley.

<u>(4) Local conflict in the absence of external conflict.</u> In areas where conflict is pervasive and primarily directed toward immediate neighbors, such as cases of small-scale raiding and revenge, coordination for defense is primarily managed and maintained at the settlement level. In ethnographic and archaeological examples, most if not all settlements are equally fortified (Chagnon 2012; Keeley 1996:190-196; Redmond 1994b; Roscoe 2009). In the absence of broader settlement hierarchies or larger-scale coordinated defenses, it would be expected that the elaboration of fortifications would be driven primarily by the size of the residential population, and there would otherwise be little differentiation or specialization in defenses.

<u>(5) Centralized defensive structure.</u> Expansive or conquest-style warfare, which is typically seen only in cases of complex chiefdoms or states, defenses typically reflect a concern

with protecting key political centers and frontier areas, with little or limited defenses in smaller settlements closer to the political center (D'Altroy 2002; Hyslop 1990; Milner 1999; Steinen 1992). If the Collaguas were highly centralized, we would expect to find large political centers with elaborate defenses, with most other settlements unfortified or only lightly fortified or defensibly situated. Outside of this core area, we would expect to see defenses concentrated at frontier areas at the limits of the polity. This type of pattern would be expected if, for example, the Collaguas and the Cabanas were highly centralized during the LIP and competing for territory or access to other resources. In this case, we would expect to see fortifications concentrated along a key boundary area between the two groups.

Changing Fortification Use in the Late Horizon

A final major research question was: how did incorporation into the Inka state shape fortification use? If warfare declined in the region following the valley's integration into the broader Inka state, how did this shape the use of defensive features and settlements? Targeted excavation at the site of Auquimarka (TU-188) was indented to collect data on how the organization and use of the site change across these two periods. Early visits to the site identified a long rectangular structure that likely served as a public or administrative building, with multiple doorways opening onto a walled plaza, a pattern typical in secondary and tertiary Inka administrative sites in the valley. A small number of residential structures were located around this public architecture, forming a discrete sector located outside of and distanced from the large and densely settled defensive sector. Excavations at the site were thus designed to capture data that could address the settlement history and relative chronology of the two sectors, as well as to better understand the nature of Inka administration at the site, and changing social relationships.

Research Design

To address the research questions, the project utilized a multi-scalar design, which incorporated a broad survey of fortifications in the valley, detailed architectural mapping, systematic surface collections at three fortified settlements, and test excavations the fortified settlement of Auquimarka. First, a regional scale survey targeted to fortifications was selected to understand the overall distribution of fortifications in the valley. The survey area encompassed 1200 km^2 of the central and upper valley, which corresponds to the historic territory of the Collagua polity (Figure 4.1). A ridgeline just above the villages of Pinchollo (to the south) and Tapay (to the north) forms the western limit of the survey area. To the east, the survey area ends at roughly the confluence of the Llapa and Vacas rivers east of Callalli. The rest of the survey area was limited to areas equal to or lower than 4600 masl, which was chosen based on the elevation of the highest fortification known at the start of the research. While this elevation provides a somewhat arbitrary cut-off, using this effectively limited the survey to core occupational portions of the valley. By choosing an intermediate-scale of analysis and focusing survey on fortifications, the project was able to register nearly 100% of the fortifications within the specified area and thus to capture the full range of fortification sizes and types—coverage that would have been impossible with a larger survey area.

A meso-scale survey area and focus on fortifications also allowed for more intensive data collection at each site than would typically be afforded in a survey project. Detailed architectural maps were created for all sites including measurements and descriptions of all standing architecture were taken at all sites. Architectural maps were digitally produced in the field to facilitate analysis of the spatial organization of the sites, and comparative analysis of defensive features and domestic architecture. As described below, this project followed the domestic architecture classification developed and employed by Wernke (2003, 2013) in the central valley, which has also been utilized by Doutriaux (2004) in the lower-central and lower valley, allowing for broad comparisons across the region.

Architectural mapping was complemented by systematic surface collections at three large fortified settlements. Analysis of the results of surface collection allowed for a better understanding of overall site chronology, identification of specific use areas, and approximation of internal status differentiation. Additionally, these collections, along with general 'grab-bag' collections allowed for comparisons of sites across the survey area.

The second phase of fieldwork centered on excavation of Auquimarka, a fortified settlement with occupation spanning the LIP and LH. Excavation targeted the interiors of domestic structures, open spaces and defensive features to better define the site chronology, identify public spaces, and to compare domestic assemblages between households at the site.

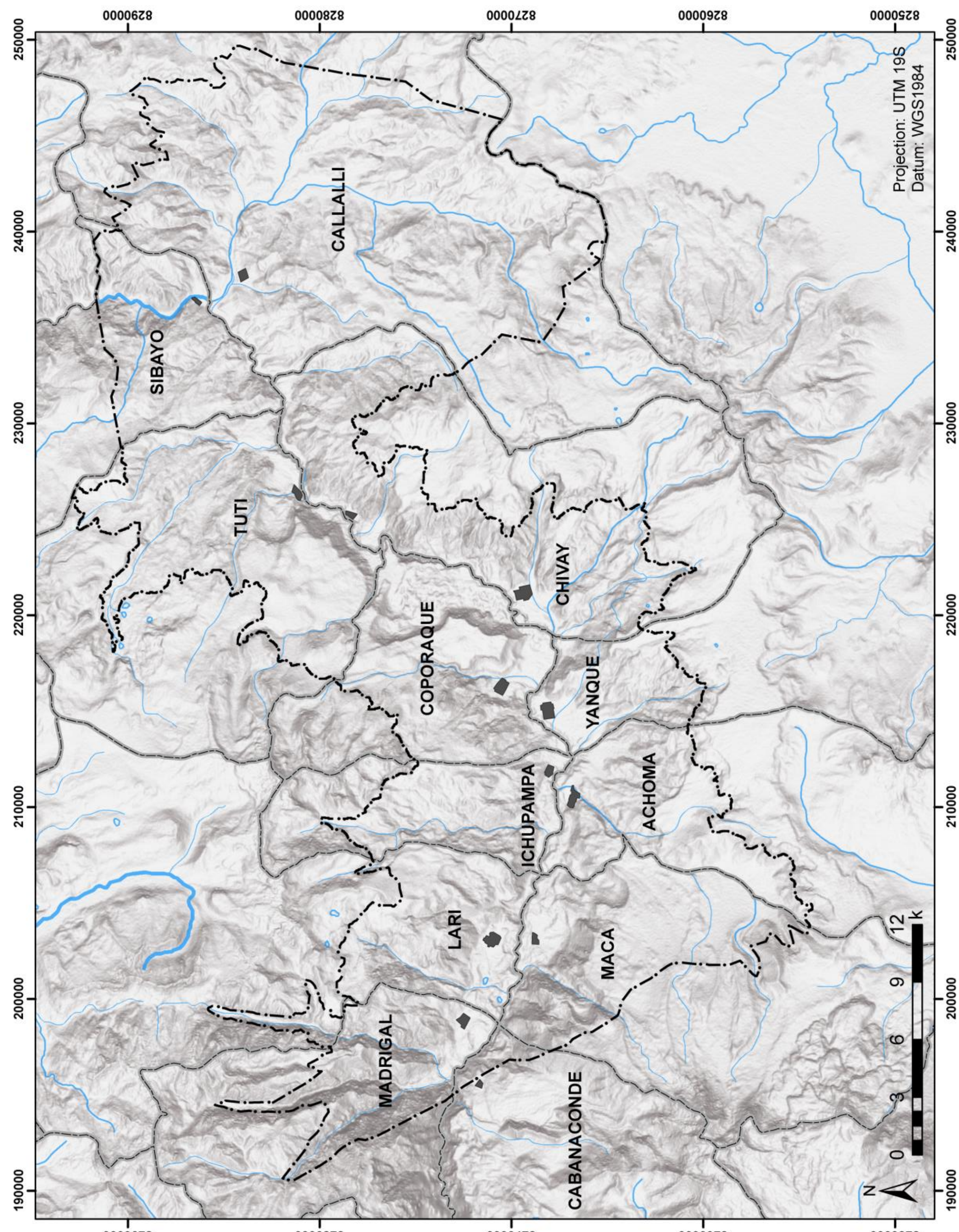


Figure 4.1. Map of the survey area.

Overall, the research was designed to address specific analytic goals: (1) determine the defensiveness of hilltop sites in the survey area; (2) characterize the spatial pattern of fortification in the valley, including both their horizontal and vertical extent; (3) identify patterns in the design and use of individual fortifications; (4) understand the settlement organization within individual sites; (5) examine changing pattern of fortification use from the LIP to the LH.

Methodology

Phase I: Comprehensive Survey of Fortifications

The first phase of fieldwork focused on targeted survey of fortifications in the study area. Due to the large survey area, full-coverage pedestrian survey was impractical, so several other strategies were employed to identify possible fortifications before going into the field. Aerial photography from the Servicio Aerofotográfico Nacional (SAN) of Peru and satellite imagery provided through Google Earth[5] were systematically reviewed for evidence of possible hillforts. Pukaras are distinctive on the landscape. Their location along hilltops, ridges and promontories, the monumentality of defensive walls, and their frequent isolation from contemporary population centers makes them readily recognizable in remote imagery (Arkush 2008; Brown Vega, et al. 2011). Additionally, prior research, including publication, and reports to the Peruvian government were reviewed for sites with characteristics typical of hilltop fortifications. All points of interest were visited and verified in the field. Additional sites were located both through conversations with local informants and visual identification using binoculars throughout the course of survey. The position of pukaras atop hilltops overwhelmingly affords the sites excellent views of the surrounding area, making them the perfect vantage point for identifying

[5] Imagery provided by CNES, DigitalGlobe and Landsat

other fortifications. Overall, I took a liberal approach to identifying potential pukaras; meaning any feature approximating a fortification was verified in the field to ensure maximal coverage. In total, only two points of interest turned out to be non-pukara sites. While this strategy does not ensure complete coverage of fortifications in the valley, I was able to identify several very small fortifications and isolated defensive features (e.g. CO-201, YA-184, TU-204, SI-202, CA-203), indicating it was effective for identifying a wide range of defensive sites.

Due to the nature of the survey design, field survey was conducted in an iterative fashion. In general, my team and I would travel to a particular village having already visually inspected all available sources for points of interest. Once there, we would visit the points of interest while also inspecting the surrounding terrain for fortifications and speaking with local informant about other known sites in the area. Based on the information collected, we would typically remain in the area until all nearby points of interest had been visited.

In general, fortifications in the valley were not easily accessible—most lay far from roads and typically on high, steep slopes. Additionally, most fortifications were not near enough to one another to effectively survey more than one in a day. The complexity of the site also greatly impacted how much time needed to be spent at each site. Some small sites could be surveyed in a few hours, while the site of Malata (IC-195) took nearly two weeks for mapping and surface collections. Survey was completed across two seasons. During the first (June through August 2012), 22 sites were registered. Following this season, new higher resolution imagery became available for large portions of the upper valley. That imagery was inspected and additional survey was completed from May through June 2013, during which time we registered an additional 9 sites.

Site Nomenclature

The primary identifier for each site was a site code that included the first two letters, or first and third letters in the case of duplication, of the contemporary district where the site was located (Table 4.1), followed by a site number (175-204). Site numbers began at 175 to complement and prevent duplicated site codes with prior research in the survey area by Wernke (2003). Five sites that were recorded as part of this study had been previously surveyed by Wernke, and in those cases, this project used the previously established site code. Site sectors were designated using roman numerals (Sector I, II, etc.).

Table 4.1. District prefixes used in site codes for survey.

District	**Code**
Achoma	AC
Callalli	CA
Chivay	CH
Coporaque	CO
Ichupampa	IC
Maca	MA
Madrigal	MD
Sibayo	SI
Tuti	TU
Yanque	YA

When possible, all known site names were recorded as well. Site names were provided by local informants, or less frequently from previous publications or reports. In the case of some small or remote sites, informants were not able or available to provide a name. In these cases, sites will be referred to using their site code.

Architectural Mapping

Once a site was positively identified, detailed architectural maps were drawn of the site using a research-grade GPS (Global Positioning System) linked via Bluetooth to a tablet computer running ArcMap. For areas with high-resolution aerial photography or satellite imagery, these images were georeferenced and pre-loaded onto the tablet to facilitate mapping. All standing architectural features were mapped in the field using point averaging which provided on average a <5m margin of error. All features collected in the field were imported into ESRI ArcGIS (vrs. 10.0-10.3) where they were post-processed and smoothed.

Site perimeters were drawn based on the extent of architectural features and drop-off in artifact densities. The site area reflects the maximum extent of the site, and thus does not adequately reflect changes in occupational extent through time.

Architectural Registry

Additional descriptive data was recorded for all structures, walls, and mortuary features (Appendix B). This architectural registry included basic metric data, such as length, width and height, and a narrative description. Walls were classified by type (defensive, terrace, residential, indeterminate) based on location and associated features. For defensive walls, we recorded the presence of other defensive features, such as parapets, number and location of access points, look outs, etc.). For domestic architecture, structures were classified based a local masonry typology defined by Wernke (2013) (Table 4.2). Further data was recorded on the structure form, location and width of doorways, presence of windows and niches, attic supports, and other features. Mortuary architecture was classified in terms of three broad types: chullpas (above-ground structures), cists, and machay (cave burials). For chullpas and cists, we recorded measurements.

For chullpas we recorded details on form, masonry and location of accesses. In all cases, we documented the types of period-diagnostics ceramics present to provide relative dates of use.

Table 4.2. Colca Valley Masonry Styles.

Type	Description	Shaping Labor	Construction Labor
1	Unworked fieldstone that varies in size, shape, and color. No coursing with unworked corners and lintels	Low	Low
2	Some worked or selected fieldstones, no coursing, with dressed corners and lintels	Medium	Medium
3	Worked and coursed fieldstone with dressed corners and lintels	Medium	High
4	Façade of coursed split river boulders, dressed corners and lintels[6]	Medium	High
5	Coursed tabular slabs with finely dressed corners and lintels	High	High
6	Coursed worked blocks with finely dressed corners and lintels	High	High
7	Worked fieldstone with belt courses of alternating color and finely dressed corners and lintels[7]	High	High

From Wernke 2013

General Artifact Collections

Surface collections were made at all fortifications registered by the survey. For a majority of sites (30, ~91%), grab-bag style collections were made with an emphasis placed on collecting the most diagnostic artifacts. This strategy was designed to facilitate identification of the chronology of occupation at the sites. When diagnostic artifacts were found in particularly important contexts, such as wall mortar or a mortuary context, the context was designated a locus and materials from that context were collected separately. Artifact densities varied widely across

[6] Not present during survey
[7] Not present during survey

sites; some non-habitational fortifications had only one or two ceramics across the entire site, while most fortified settlements had relatively high concentrations.

In addition to surface collections, attempts were made to collect organic inclusions from exposed wall mortar in defensive architecture to assist with radiocarbon dating of their construction. Such collections were not possible at the majority of refuge sites, owing to the fact that defensive architecture at this site consisted predominately of dry-laid walls with no mortar. The fact that many refuge sites contained no diagnostic ceramics makes dating those sites virtually impossible within the scope of this project, and it must be assumed for now that those sites were contemporaneous with the dated sites in the valley, barring future investigation.

Systematic Surface Collections

In addition to the grab-bag collections, a sub-set of three fortified settlements—Achomani (AC-175), Auquimarka (TU-188) and Malata (IC-195)—were selected for systematic surface collection. These sites were selected based on their large size, and extent of residential occupation. A randomized stratified 10% surface sample method was used, which involved dividing each site into sectors, which were determined based on subjective differences in major architectural features. The total area of each sector was calculated and divided by the area of the collection blocks to determine the number of collection blocks needed to obtain a 10% area coverage. Collection block centroids were randomly generated within ArcMap (10.1). In the field, blocks were collected in a dog-leash style, where a stake was placed in the ground and all materials were collected within a predetermined radius around the point. The size of the collection radius was 2.8 m at Auquimarka and Achomani, and 5.0 m at Malata. I decided to expand the collection radius at Malata because many smaller collection blocks would have been entirely inaccessible due to the dense vegetation cover over many parts of the site and extensive clearing was not possible due to time constraints.

In the field, the site maps with the pre-determined collection points were used to locate the appropriate spot for surface collection. At each point, a stake was placed and a flexible measuring tape was used to measure out the appropriate radius. A sketch map was made of each collection circle identifying any architecture or relevant conditions that would impact surface densities (i.e. vegetation coverage, erosive slopes, contemporary paths). Within each collection block, each distinct architectural context was designated its own locus. Collection circles in open areas thus consisted of a single locus. However, other blocks contained two or more loci based on their relationship to standing architecture. For the purposes of collection, standing walls were designated their own locus. Once the sketch map was made and the loci identified, a team of between 2 and 3 members surveyed the area within the radius and collected all exposed materials. The stake coordinates were captured either using in-field GPS (AC-175, IC-195) or total station (TU-188).

Phase II: Excavation

Site Selection—Auquimarka

The site of Auquimarka, an LIP hillfort that was transformed into an Inka administrative outpost, was selected for excavation (Figure 4.2). Located in the upper-central valley, the site occupies a finger-like promontory which extends out above the Colca River and the surrounding undulating pampa formed by a Quaternary lava flow. Located at approximately 3900 masl, Auquimarka occupies the suni transitional ecozone, where both agriculture and pastoralism are supported; however, agricultultural terraces associated with the site extend down along the river gorge which is especially narrow and deep at this point, forming a more temperate micro-climate which supports maize production according to local informants.

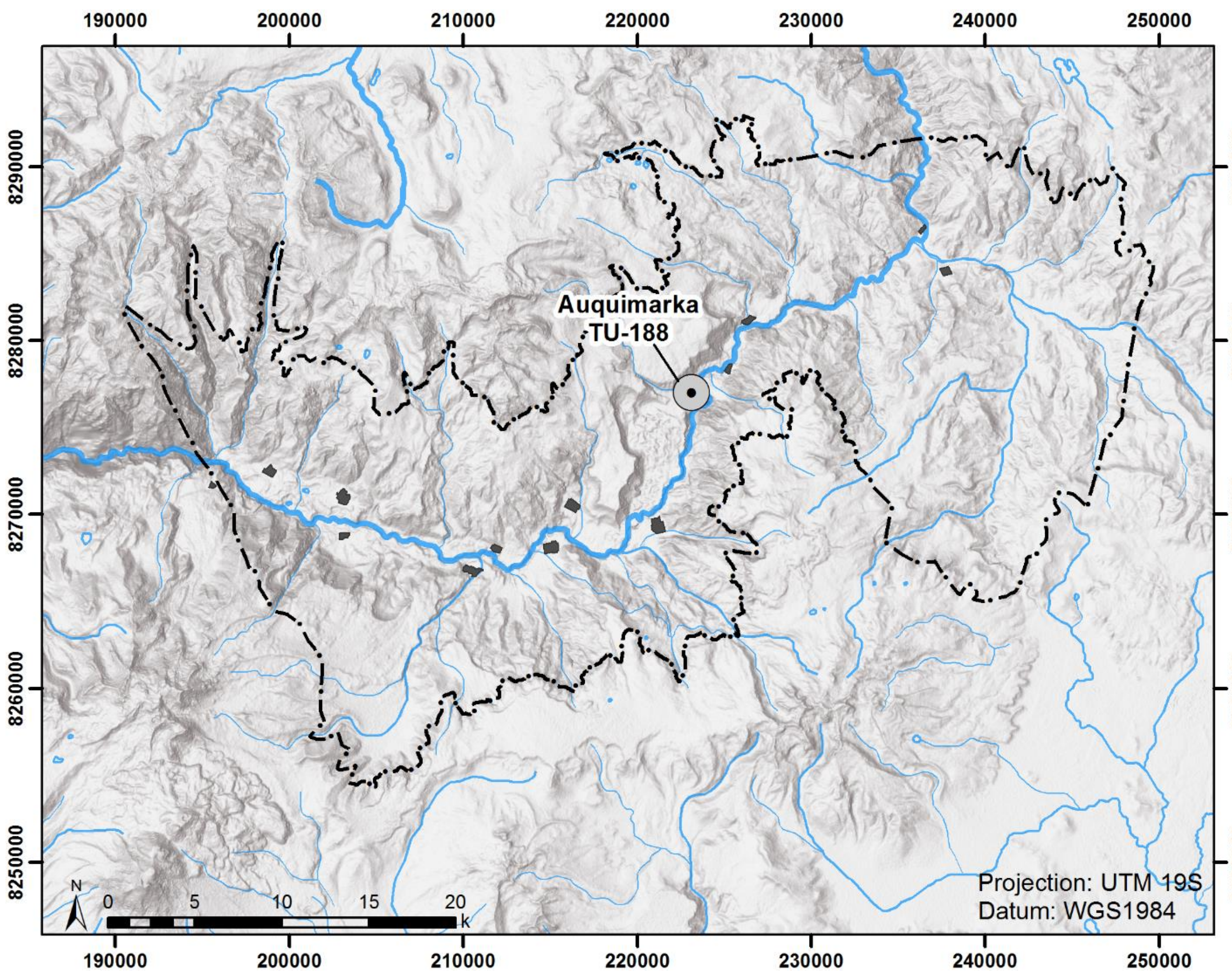


Figure 4.2. Location of Auquimarka (TU-188).

The core of the site consists of two sectors—the defensive sector located on the promontory with a series of defensive walls along the northern edge and dramatic cliff faces along the other three sides; and the Inka administrative core, located to the northwest on an exposed open pampa. While the two sectors adjacent, they are physically separated and distinct in terms of the density of the occupation and architecture present. Sector I conforms to expectations of a fortified settlement, strategically located with defensive constructions augmenting the natural defenses of the location. However, the architecture within sector II suggested the site was used into the Late Horizon, possibly as an Inka administrative center. A third, poorly preserved, sector extends to the north east and consists of agro-mortuary wall complexes, and domestic structures interspersed with fieldstone walls which may have defined agricultural fields.

The long-term occupation of Auquimarka provided a unique opportunity to examine long-term changes in the site's occupation. In addition to providing a deeper understanding of how LIP communities were organized within fortifications, the site provided a unique opportunity to examine how the Inka state interfaced with the local social and political organization. Excavations at the site targeted a representative sample of domestic structures within both sectors to better define their use histories and allow for comparisons of domestic assemblages across both sectors at the site.

Architectural and Topographic Mapping

Architectural mapping was conducted in parallel with all field activities at the site. Sectors I and II were mapped using a total station aligned to a local datum. A total of 7421 points were taken, including 4465 terrain points which were used to create a local, high-resolution DEM (approximately 3 cm resolution) of sectors I and II of the site. Mapping of sector III was completed using a Trimble GPS connected to a tablet computer running ArcMap. Architectural conservation of this area was very poor as many of the architectural stones had been reused to create modern field walls. This mapping strategy was selected due to the conservation issues and time constraints.

Table 4.3. Overview of excavation unit locations.

Unit	Sector	Location
1	I	Domestic Structure
2	I	Domestic Structure
3	I	Plaza
4	I	Domestic Structure
5	I	Domestic Structure
6	I	Domestic Structure
7	I	Domestic Structure
8	I	Domestic Structure
9	I	Plaza
10	I	Domestic Structure
11	I	Domestic Structure
12	I	Walled Platform
13	I	Domestic Structure
14	I	Domestic Structure
15	I	Interior of Defensive Wall
16	II	Inka administrative building
17	II	Domestic Structure
18	II	Domestic Structure
19	II	Domestic Structure
20	II	Plaza

Excavation units

A total of twenty 4 m^2 units were excavated within sectors I and II. Units were placed with three primary goals: (1) to compare domestic structures across sectors I and II; (2) achieve a cross-section of structure sizes and masonry types; (3) and to investigate specific public and/or administrative spaces at the site (Table 4.3).

Domestic structures: A total of fourteen unites were placed within domestic structures—eleven in sector I, and three in sector II. Structures were selected to achieve a cross-section of structure sizes and architectural styles to better understand possible temporal differences in occupation and status differentiation within the site. Within each sector, a broad cross-section of structure sizes and domestic architectural style were selected to verify which structures functioned as residential structures and how size and elaboration related to other indices of social stratification. The number of units placed in each sector reflects differences in the number of total domestic structures present in each. Structures at the site were grouped into three broad size categories and attempts were made to capture roughly a 10% sample of each category. Structure numbers were chosen at random to provide a starting point for unit placement; however, final decisions were made to minimize the amount of post-depositional disturbance from vegetation and structure collapse. Each 2m x 2m unit was placed in the interior of each structure and toward a corner or wall edge to better capture discarded materials on floor levels. Within each structure, the corner or edge with the least amount of structure collapse and vegetation was selected to facilitate excavation and minimize disturbance of the occupational levels. The unit was oriented to follow the orientation of the structure walls.

Public/Administrative Spaces: Several key public and/or administrative spaces were also selected for test excavation in order to better understand their use and how public spaces interfaced with private spaces during both the LIP and LH. In sector I, two units were placed within a small plaza located at the southernmost tip of the promontory. This portion of the site appeared to be artificially levels and was demarcated by small patio walls. Units here were intended to help define the use of the space and the construction sequence of the platform and the southern perimeter wall. One unit was placed within a large circular wall at the apex of the site in an attempt to better define its use. Finally, one unit was also placed along the interior south-face of one of the primary defensive walls to understand the timing of the wall's construction. In sector II, one unit was placed in the interior of a long rectangular structure believed to be an Inka-period kallanka (structure 77), and a second unit was placed inside of its adjacent plaza.

Excavation Strategy

Excavation followed cultural strata in addition to the occasional use of arbitrary levels when a stratum was especially deep. The project recorded all levels and features as loci. Loci are multi-scalar in nature, and refer to any specific and unique cultural context. Thus, a cultural strata and whole ceramic vessel are equally relevant loci. The primary benefit of the locus is that it allows the excavator the ability to declare a locus at any detected a change, without having to specify from the outset what type of element it was—cultural strata, feature, etc. In addition to the cultural materials collected, for each unit we collected approximately 3L of soil samples from occupational levels to screen and float for macrobotanicals. Carbon samples were also collected from occupational levels for radiocarbon dating. All units were dug to subsoil, with the exception of Unit 15, which due to time constraints, only half of the unit was continued to subsoil.

Phase III: Materials Analysis

All materials collected during survey and excavation were cleaned, labeled and processed either in the field house in Chivay or later in the Museo Arqueológico José María Morante in Arequipa. Materials analysis was focused primarily on ceramics. Ceramic analysis included recording of metric and non-metric attributes (Appendix D). Ceramic chronology was based on the ceramic serration established by Wernke (2003). This analysis focused on several key elements—vessel form, slip color, slip coverage, decorative motif.

Phase IV: Spatial Analysis

Spatial analysis was a central feature of the analysis for this study, thus I will briefly review the key data sources used. More detailed explanation of the specific analyses is presented as needed in the results chapters.

A number of geospatial data sources were used throughout the project. The background digital elevation models used three primary sources: (1) hole-filled SRTM DEMs with a 90m resolution for macro-regional scale representations and analysis, (2) ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) gDEM version 2, with a 30m resolution for micro-regional scale representations and analysis, (3) SRTM DEM v2 with 1 arc second (~30 m) resolution. All site elevation data, with the exception of that from Auquimarka (TU-188) was captured from the ASTER gDEM data.

Satellite imagery was provided by CNES, DigitalGlobe, and Landsat accessed through Google Earth. Aerial imagery consisted of 1:17,000 scale airphotos from the Servicio Aerofotográfico Nacional (SAN) taken in 1974. These images were scanned and georeferenced using satellite imagery.

For local and survey-level maps and analysis, all source data was transformed and projected to Universal Transverse Mercator projection (UTM; zone 19 South), using the WGS1984 datum. For macro-regional scale applications that encompassed more than one UTM zone, data was projected to Albers Equal Conic projection. Survey data was collected using Universal Transverse Mercator projection with the WGS1984 datum.

CHAPTER 5

A LANDSCAPE OF WAR

Introduction

During the Late Intermediate Period, the landscape of the Colca Valley was significantly shaped by war. In this chapter, I present the survey data that demonstrates that valley residents not only sought out strategic site locations, but also made significant architectural investments in defending those locations—patterns that reflect the important challenges facing local communities. The chapter begins by reviewing the specific types of investments in defense observed. A classificatory scheme of defensive sites in the valley is then presented, based on both size categories and the presence or absence of domestic structures. I argue that observed differences between classes of fortifications reflect both differences in the size and number of communities that used the defensive site, and differences in how the sites were used. Finally, I discuss the overall spatial patterning of fortifications across the survey area. Pukaras were found across the central and upper valley and in all major ecological zones. Fortifications were closely articulated large LIP settlements in the valley, as well as many important pasturage areas surrounding the valley margin. I argue that the distribution and form of fortifications in the valley suggest that they were the result of coordination across multiple settlements, but does not reflect centralized defenses.

Defensibility

Several studies of defensive sites have presented ways of systematizing indexes of defensiveness in order to provide a measure comparing the defensibility of sites (Arkush 2010;

Martindale and Supernant 2009), a means for systematically identifying defensive sites (Bocinsky 2014; Borgstede and Mathieu 2007; Keeley, et al. 2007) or providing a measure of the threat of conflict (Sakaguchi, et al. 2010). Researchers define and measure the variables which contribute to a site's defensibility differently; however, two broad categories of components can be identified across studies—*intrinsic defenses* and *constructed defenses*.

Intrinsic defenses refer to those attributes of the physical landscape which can or did contribute to defensibility of a particular site, and would have likely been sought out as site locations during times of actual or perceived conflict. Some features, such as visibility and slope, provide defensive assets that would otherwise be difficult to construct. The defensibility of other features, such as rock outcrops and cliffs, could reduce labor and resource costs needed to prtect the permiter of the site. Intrinsic defenses can include the following types of features:

1. Landscape barriers: Water bodies, cliffs, ravines or other features which prevent or significantly slow approach to the site. Also, steep slopes, promontories, and any other feature that limits the overall accessibility or the number of viable approaches to the site location.
2. Visibility: Large areas of visible terrain from the site location, to facilitate monitoring for potential threats.

Of course, there are a number of factors which effect decisions about site placement, which can make it difficult to determine whether site locations were selected specifically for their defensibility. Furthermore, some regions may naturally exhibit more defensiveness. In the Colca Valley, for example, the mountainous terrain affords more defensible locations than an open plain. Thus, it is important to consider both site location, and specific architectural investments when identifying sites as fortifications.

Constructed defenses, consist broadly of built features intended to increase the defensibility of a particular location. In general, constructed defenses are designed to create barriers, limit accessibility, and to facilitate projectile fire. Constructed defenses include built features intended to:

1. Create barriers: Can include of walls, palisades, stockades, ditches and moats.
2. Limit access: Can include limiting the number of entrances to the interior of the site, defended or baffled gates, and offset accesses.
3. Facilitate projectile fire: This can include parapets, towers, and bastions.

While some types of constructed defenses—such as protected gates and bastions—have been argued to be unequivocally defensive (Keeley, et al. 2007:55), they are also not always present at all defensive sites. Other features, such as perimeter walls, are more common in fortifications, but are also more difficult to interpret. Poorly preserved walls may not appear to have offered much protection, or the absence of additional defensive features—such as parapets—can leave open the possibility of multiple interpretations. Thus, it is important to examine the co-presence of multiple features when considering the defensibility of sites in archaeological contexts. Furthermore, even when features such as perimeter walls and hilltops were used defensively, it is important to consider the diversity of relationships and meaning that emerge through these spaces.

Intrinsic Defenses

All sites recorded during our survey were located on hilltops or promontories. Site locations were prominent features on the landscape relative to the surrounding area (Figure 5.3). These locations had several advantages for defensibility, including limited or difficult access, and increased visibility of the landscape. Many were also associated with natural barriers, such as rivers, quebradas, and cliffs.

The elevations within the study area rise as you move up-valley and thus absolute measures of site elevation do not adequately reflect the elevation advantages of the site locations. However, a comparison of the median elevation of the 1 km area surrounding the site and the site elevation provides a measure of the elevation advantage of fortified sites relative to the surrounding terrain. Defensive sites were on average located 72 meters above the surrounding landscape (Figure 5.3). Elevation provides certain defensive advantages; particularly increased visibility and more difficult accessibility by forcing approaching threats to move uphill.

Many sites incorporated physical landscape features that provided effective barriers along one or more sides of the site. In particular, cliffs and escarpments commonly formed a partial perimeter around the sites (Figure 5.1). In many cases, access from one or more directions around the site was entirely impossible because of cliff faces and rock outcrops. The site of Auquimarka (TU-188), for example, access to the site is limited to 110 meters along the northern side, with the remaining 375 meters of site perimeter made entirely inaccessible by dramatic cliff faces (Figure 5.2). The sites of Choque Mamani (CO-187), CA-203, and Paraq'ra (SI-199) were placed adjacent to rivers, which would have made access from those sides more difficult. A third type of landscape barrier found at many of the sites were rock outcrops. Some were large enough to have entirely prevented access from a direction, while others were incorporated into the large perimeter walls of the site (Figure 5.4). Perhaps most commonly, sites were located in areas with steep slopes that wouldn't necessarily have prevented access, but would have made access more difficult and costly. Given that sites were located on hilltops, ridge tops and promontories, steep slopes were a universal feature of the sites recorded.

Figure 5.1. View of Pukara (CO-189) from the north. Note the cliff that forms the eastern perimeter of the site (indicated with arrow).

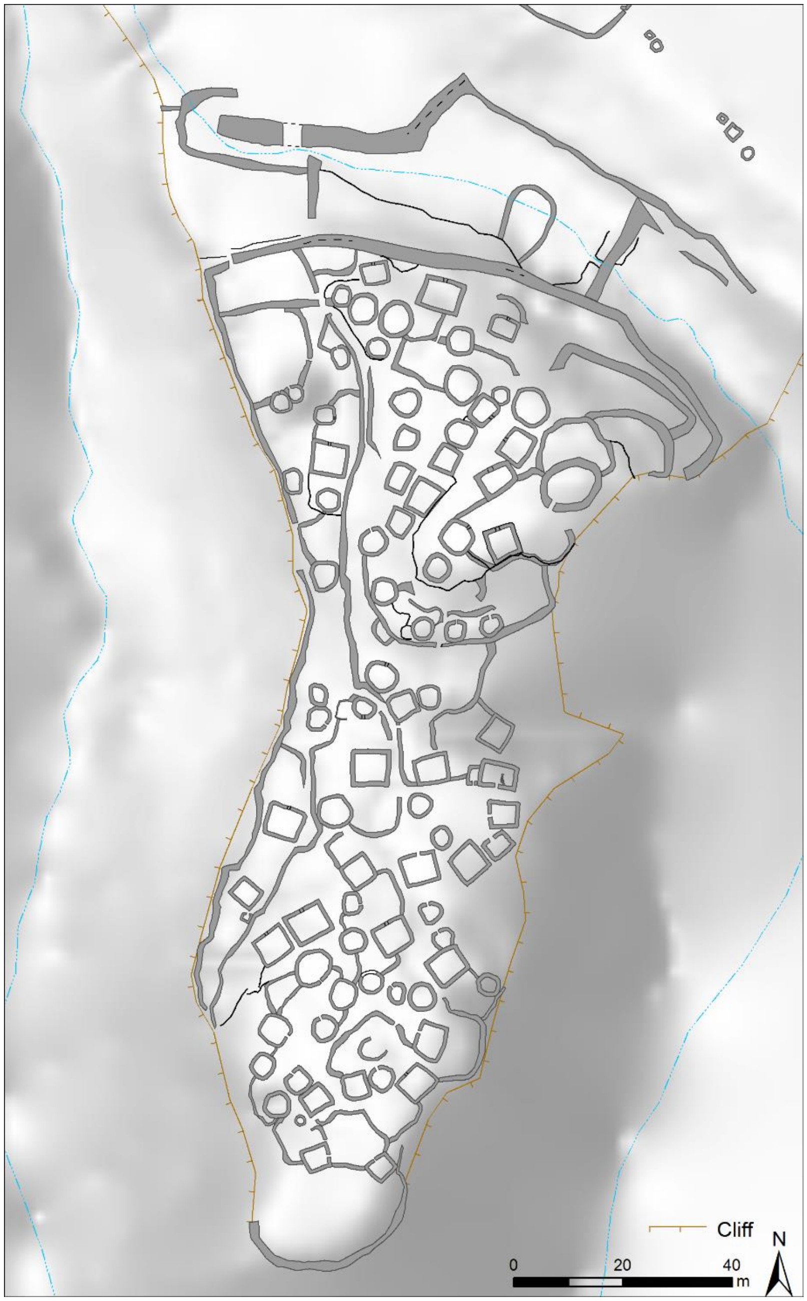


Figure 5.2. Plan map of Auquimarka (TU-188) showing the promontory location, with cliff faces along three sides.

The surveyed sites also had extensive views of the surrounding landscape. Visibility can both facilitate monitoring of the landscape for potential threats, and can enable long-distance communication. Computer-aided viewshed provides one way of measuring the visible area around the site, by delimiting the terrain that is visible from a particular point on the landscape based on topographic intrusions. To assess the visible area around the fortifications, visibility analysis was run at two distances: near distances (3400 m) which would have allowed for identification of individuals, and far distances (40 km) which would have allowed for long-distance communication using smoke or fire signals. The total visible area from site centroids was summed and compared to those from site centroids of non-fortified LIP settlements drawn from published surveys of Lari (Doutriaux 2004), and Yanque, and Coporaque (Wernke 2013). This comparison was designed to assess whether hilltop sites were situated to increase visibility of the landscape.

Comparisons between these two site classes found that fortified sites had significantly larger visible areas at near distances (Welch Two Sample t-test t=1.556, df=65.419, p=0.125). This difference suggests that fortified sites were situated to increase the visible area surrounding the site that could be effectively monitored. Fortified sites also had larger visible areas at greater distances on averages, but these differences were not significant (Welch Two Sample t-test t=0.6383, df=56.987, p=0.526). This suggests that LIP sites in the valley had roughly equal visibility at greater distances. This may reflect the overall high landscape visibility afforded by the incised valley, where both high elevation sites, and valley-bottom sites had relatively high viewsheds. But it could also reflect the broadly shared threat of conflict during this period that resulted in an overall shift to more defensive settlement locations. Many non-fortified settlements were located in elevated, defensible locations (Chapter 3), which likely minimized the relative differences in visibility between defensive sites and settlements during the LIP.

Limited accessibility, physical barriers and impressive viewsheds were common to all sites surveyed. The builders of these sites took advantage of strategic aspects of the landscape—

natural rises, mountain tops and promontories—which provided the sites with natural defensive advantages.

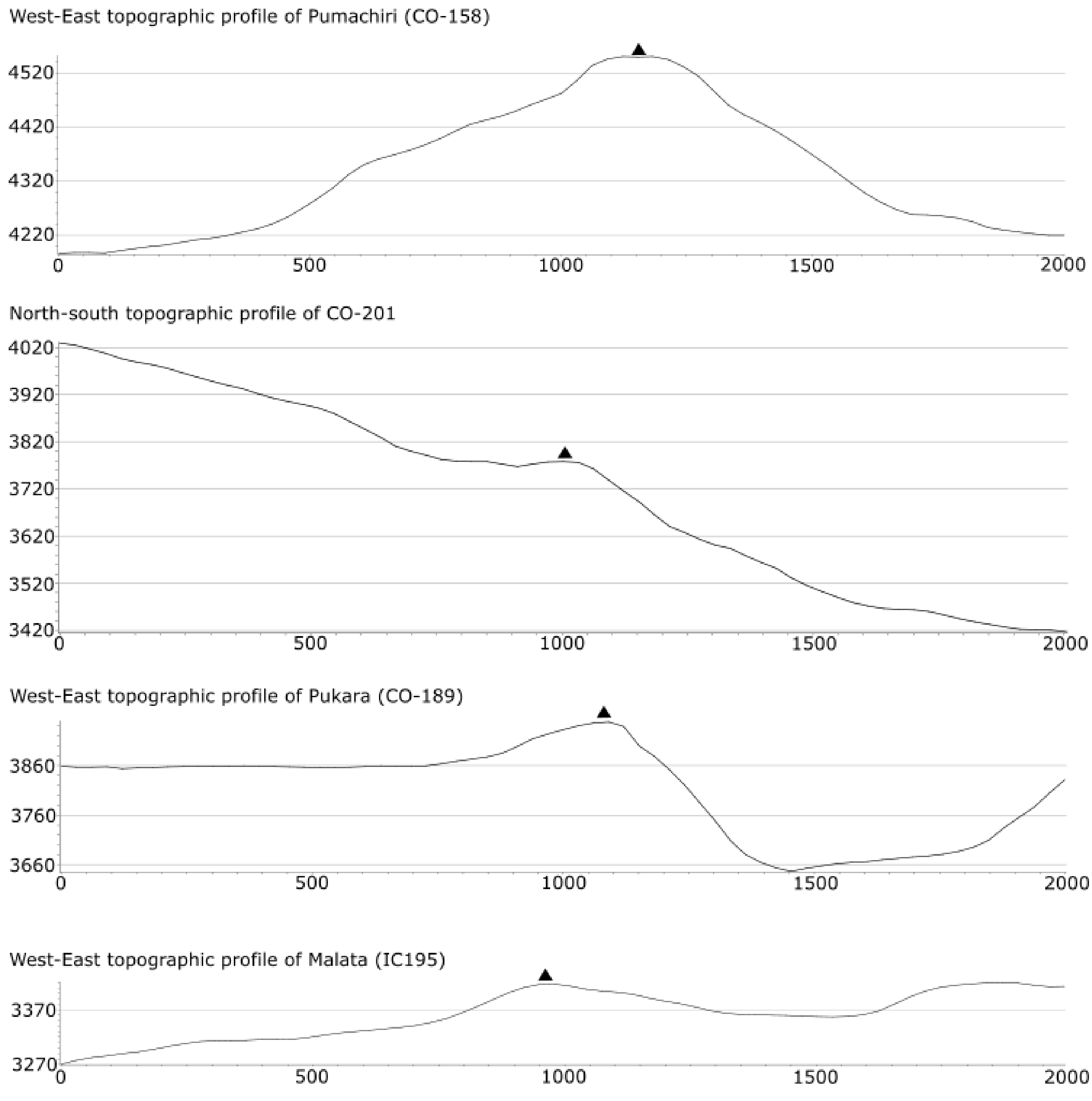


Figure 5.3. Topographic cross-sections of several fortifications, showing the prominence of the site location relative to the surrounding terrain.

Figure 5.4. Defensive wall at Chaillita (TU-186). Note the incorporation of natural outcrop in the wall perimeter (indicated with arrow.

Constructed Defenses

Sites were classified as fortifications only if there was evidence of architectural investment in site defenses. We recorded a variety of defensive features. By far, perimeter walls were the most common defensive feature recorded and were present at all sites recorded during survey. Many perimeter walls incorporated additional defensive features, including parapets, bastions, and ditches. Access through perimeter walls was also highly restricted and a number of defensive gates were identitified. Taken together, the architecture present at the sites presented here reflect an orientation toward defense.

Walls

All sites recoded during our survey had at least one perimeter wall, designed to enclose all or part of a site. Many perimeter walls were not fully continuous, but were built in conjunction with rock outcrops, cliffs, or escarpments in a way that effectively created an enclosure.

Defensive walls were massive and durable constructions, exemplified by their exceptional preservation at remote fortifications where stones have not been robbed for more recent constructions. In all cases, walls were constructed of two faces with a fill of small to medium-sized rocks, dirt, and less frequently mortar, in between (Figure 5.6). The vast majority non-structure walls recorded during our survey were dry-laid without mortar; and this was especially true at non-residential sites. At residential sites, defensive walls were far more likely to have been constructed with mortar. Defensive walls were constructed primarily of unworked fieldstone, with larger stones forming the base, and smaller ones towards the top. Lightly to moderately dressed stones were occasionally used, and were more commonly found at gates or entrances.

Figure 5.5. Exterior defensive walls at Auquimarka.

Figure 5.6. Examples of defensive walls. Left shows wall with mortar, right shows wall without.

Fortification walls were on average 1.08 m thick, and most were between 0.5 and 2 m thick. The thickest wall recorded was just shy of 5 meters at the thickest point. Wall height is more difficult to determine given that few retain their original height. The tallest wall—a reconstructed defensive wall from Fortaleza de Chimpa (MD-190)—measured 7 meters on the exterior side. The greatest height for a non-reconstructed wall was 6 m, and there were several well-preserved examples measuring more than 4 meters in height. Defensive walls were frequently built into the hillside, with their maximal height on the exterior, amplifying the natural height advantage of the slope. The interior height of walls without parapets rarely exceeded 1.5 m, which would have allowed defenders to see and fire projectiles over them.

Defensive walls were the largest and most durable investments in defense at fortified sites. In some cases, this required the construction of a fully encircling wall, but most often, walls were limited to the most accessible portions of the site and instead took advantage of natural cliff faces, steep slopes and rocky outcrops to produce the enclosure. Sites contained anywhere from one to ten perimeter walls, with most having two (Figure 5.8). Multiple perimeter walls provided additional protection in the case that an exterior wall was breached. Walls were placed anywhere from four to 112 meters apart, averaging 22 meters apart.

In addition to the perimeter defensive walls, some larger sites had additional transverse or ancillary walls which, which may have supported the overall defense of the site by funneling access to certain areas, or limiting possible escape routes, but did not serve to enclose a specific area (Figure 5.7).

Figure 5.7. Pachamarka (MA-183) viewed from the south. Transverse defensive walls indicated with arrows.

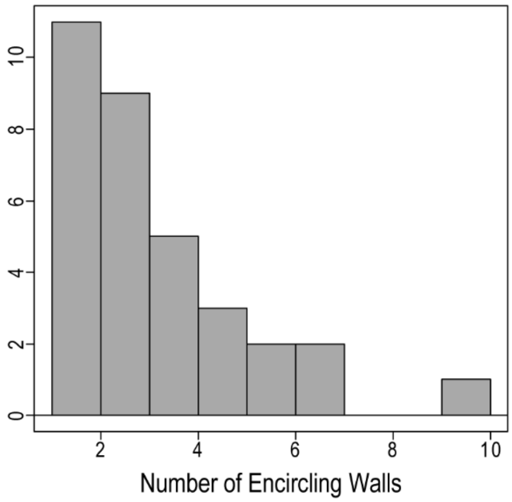


Figure 5.8. Number of perimeter walls found at fortifications.

Parapets

Wall parapets are a common feature of defensive walls. Parapets form protected interior walkways by creating a raised exterior face, which protects a flat interior platform (Figure 5.9). This provides a protected ledge along the wall for firing projectiles. Parapets are particularly useful in very tall walls, which otherwise would have been difficult or impossible to see or fire over from the interior. Parapets were identified at five sites with another possible one at a sixth site, and were found at both fortified settlements and non-residential fortifications. Where multiple walls were present, parapets were always placed along the most exterior encircling wall, with the exception of Auquimarka (TU-188) which had parapets along the two most exterior walls. Parapets were frequently located adjacent to entrances or access points in the walls, likely designed to provide additional protection at these crucial vulnerabilities in the perimeter defenses (Figure 5.10).

Figure 5.9. Wall parapet at the site of Choque Mamani (CO-187).

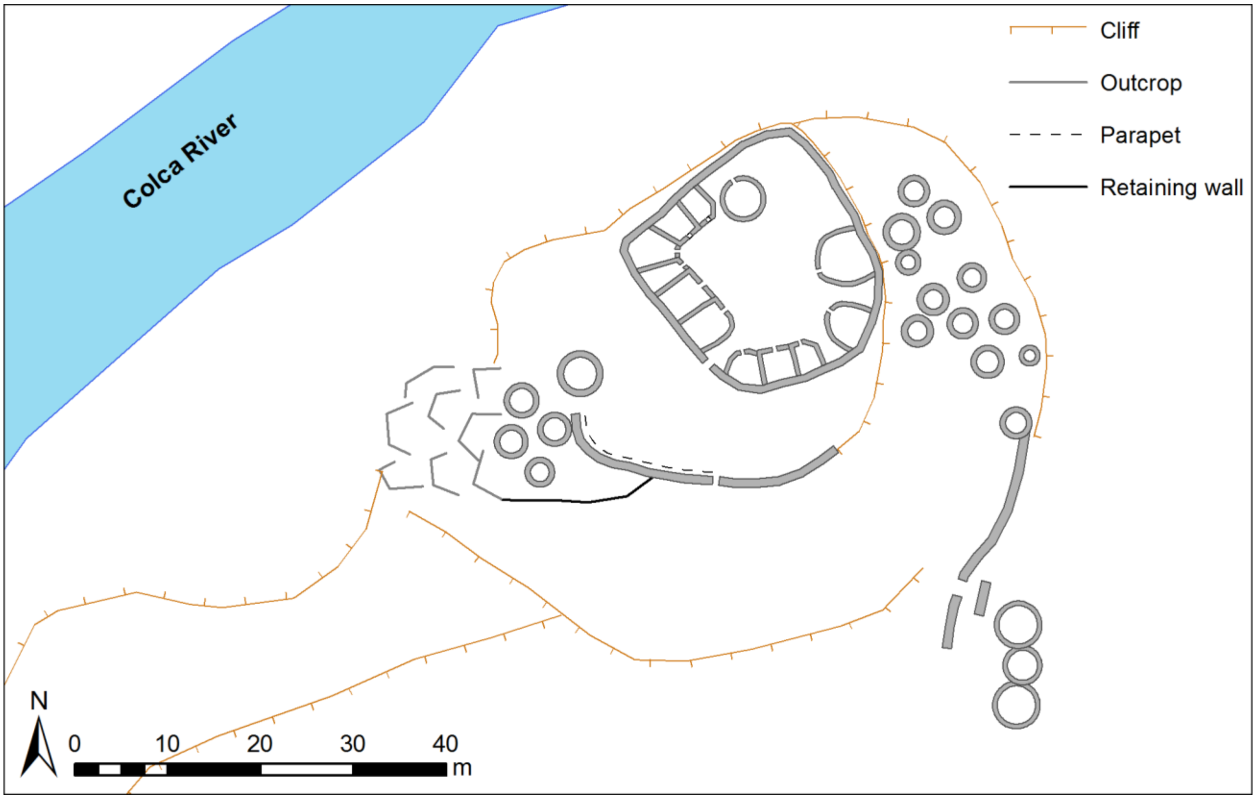


Figure 5.10. Plan view of defensive sector at Choque Mamani (CO-187) showing the location of the parapet adjacent to the wall access.

Limited Access

Entrances are necessary weak points in site defenses (Arkush and Stanish 2005; Keeley, et al. 2007:62). Doorsways and gates must be sufficiently large and accessible to allow residents to engage in their daily activities around the site and to travel out to their fields and pastures. At the same time, the larger and more accessible the entrances, the more vulnerable the site was during attack. Thus, fortifications necessarily reflect a balance between accessibility for daily activities, and protection. The builders of fortifications used several strategies for protecting access to the site, including limiting the number of gates, forcing single-file entry, and obscuring access to the site. Thus, restricted and defended accesses are common features of defensive sites.

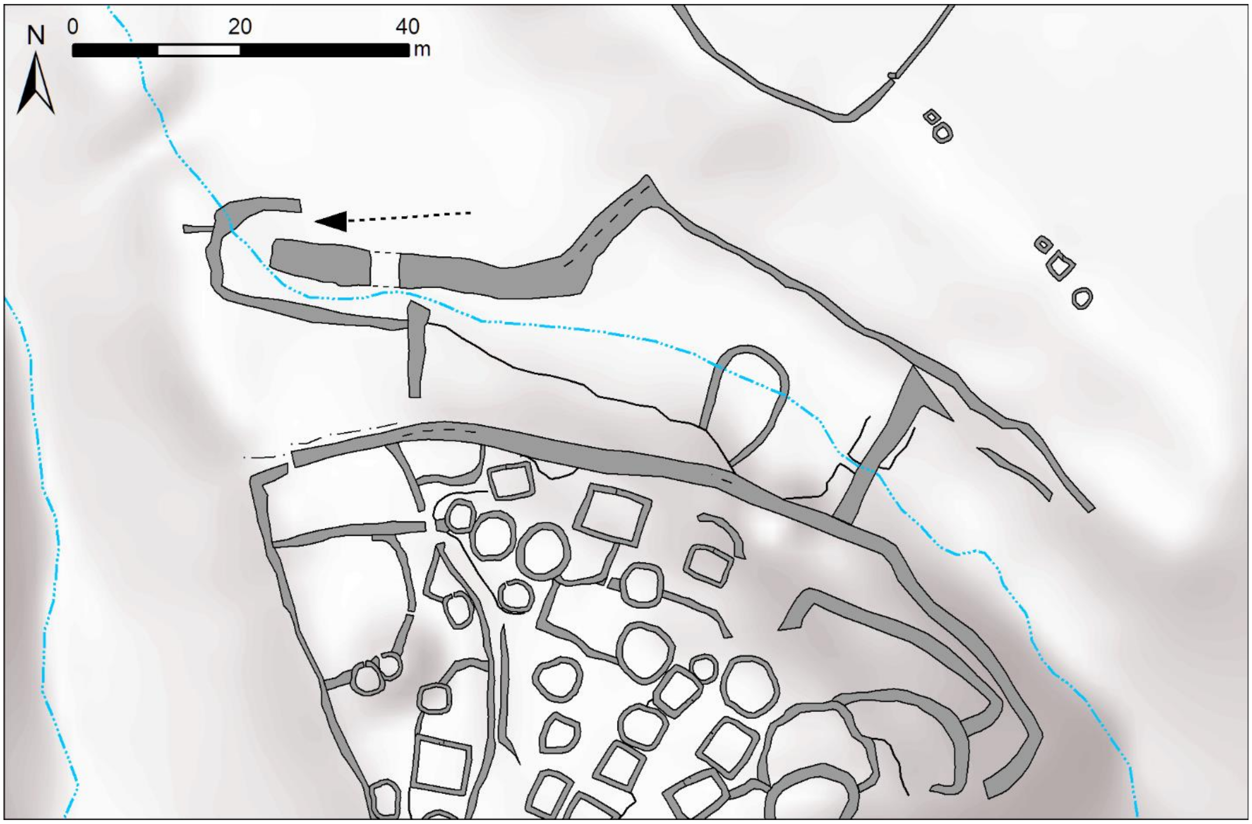


Figure 5.11. Defended access at Auquimarka. Note the offset accesses which could have trapped attackers between the outer defensive walls

Within sites in the survey, access to interior walled spaces was highly restricted, and most walls had only a single access. Only six examples of walls with two entrances were identified in the survey, and no wall had more than two accesses. Where two access points were present, these entrances were located between 40 and 150 m apart; frequently on the extreme ends of the wall. In some cases, these accesses may have served a “divide and conquer” strategy, splitting the attacking group into two smaller ones. In other cases, entrances led to separate portions of the site, at times leaving one intentionally obscured or hidden to someone unfamiliar with the site.

At sites with more than one perimeter wall, entrances in concentric walls were often, but not always, off-set from one another. This arrangement is consistent with defensive strategies designed to slow access to the interior of the site. One of the clearest examples comes from

Achomani (AC-175), where each of the six wall entrances is off-set from the previous (Figure 5.12). Offset entrances would have slowed advance into the site if the exterior wall was permeated, forcing those unfamiliar with the site to see out the next entry point and possibly trapping them within the defensive walls. This can be seen at Aquimarka (TU-188), where the exterior-most defensive wall acted as a funnel, directing would-be attackers into what is effectively a killing-alley, trapping them between the two outermost defensive walls (Figure 5.11).

In only a few cases were entrances preserved well enough to take measurements, and at times, walls were so collapsed that it was not possible to identify the access point at all. Where preserved, the base width of entrances ranged from 0.4 m to 3.4 m, with most falling between 0.5 and 1.0 m (Figure 5.13). Given the shoulder breadth of an average male is 0.5 m, most gates would have necessarily forced single-file entry. Where entrances were well enough preserved, most were widest at the base and narrowed slightly towards the top. Entrances included open gates consisting of breaks in the length of the wall, and more door-like entries topped with lintels (Figure 5.14). Gate-like entrances appeared to more common, however, complete wall heights were rarely preserved making it impossible to ascertain in most cases. While wall lengths were constructed of un-worked stone, entrances were often constructed of lightly dressed stone, or selected tall and narrow boulders.

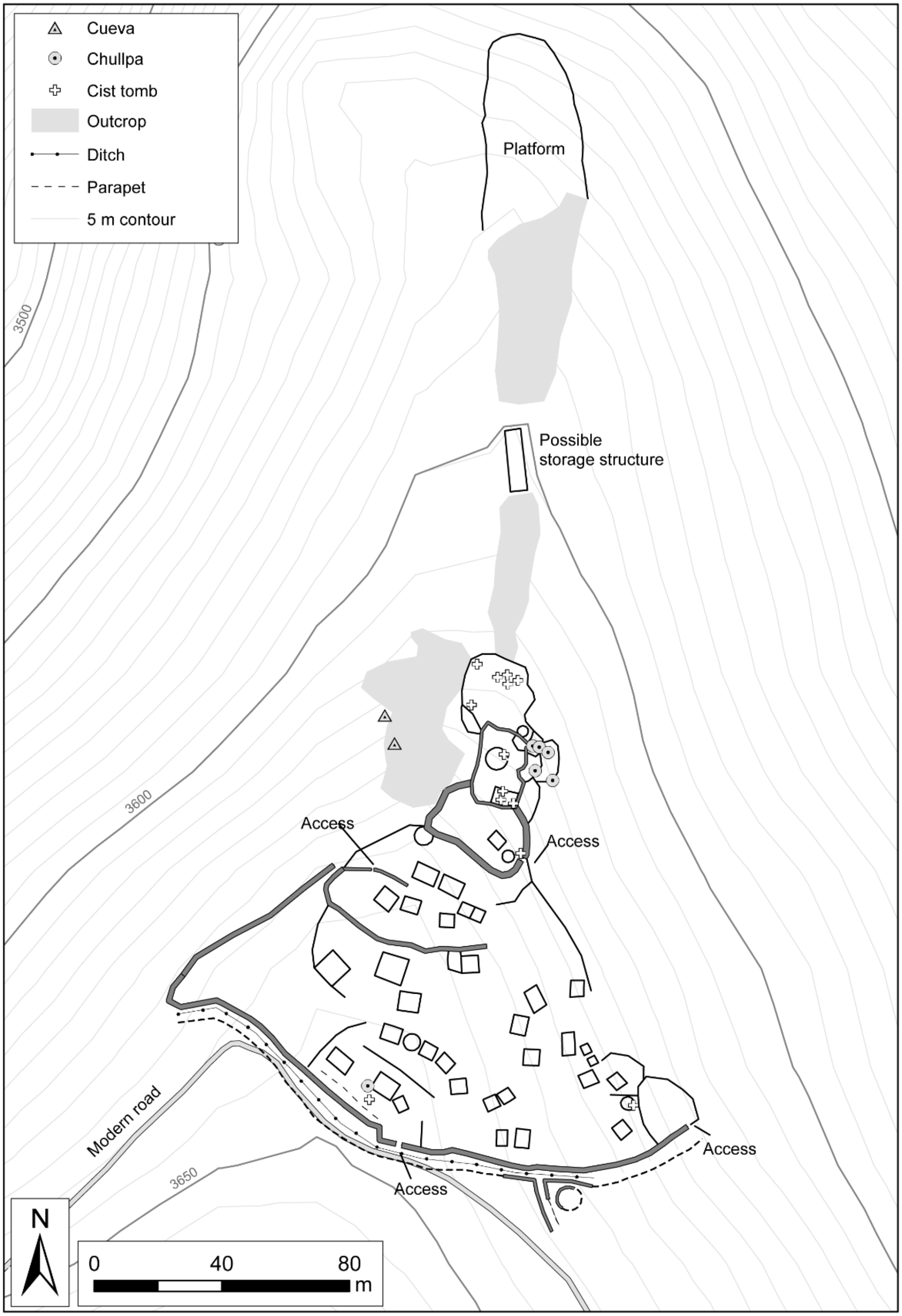


Figure 5.12. Site of Achomani (AC-175). Note the multiple offset entrances.

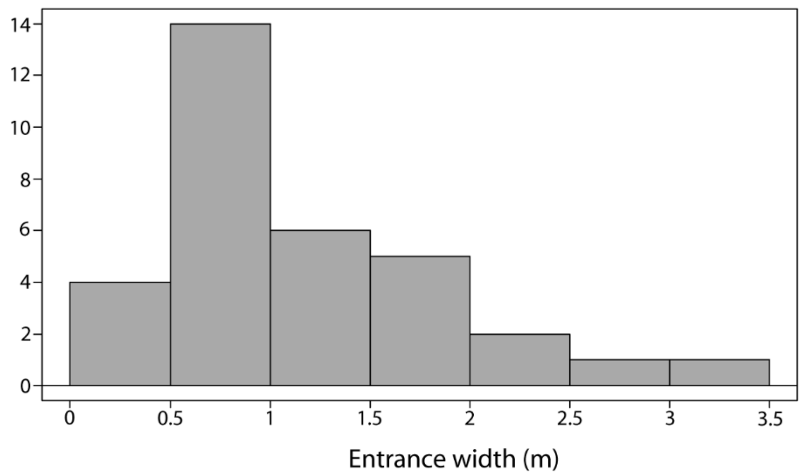


Figure 5.13. Histogram of the base width of defensive wall entrances.

Figure 5.14. Examples of wall entrances. At left, a door with lintel at the site of Pachamarka (MA-183). At right, an example of an open gate from Auquimarka (TU-188).

Two sites appear to have been constructed in a way to intentionally deceive or divert approaching individuals not familiar with the site. At Pachamarka (MA-183), the gates to the primary fortified mountaintop are oriented south toward the broad expanse of puna. When approaching from the south, however, one is led across a precipitous and narrow rocky outcrop, requiring quite a bit of bouldering to cross (Figure 5.16). These south-facing gates are also extremely narrow and short, making them difficult to pass through. A second set of accesses located further west are nearly imperceptible, except from within the fortified hilltop and likely served as the primary access to the site for local residents. A similar example comes from the site of Choque Mamani (CO-187). Located deep within the Colca river ravine at nearly the same elevation as the river, the site occupies a natural rise which is connected to the river bank by a narrow rocky outcrop to the west (Figure 5.15). The gates in the primary fortification walls similarly face west towards this narrow landbridge, however, access from this direction is impossible due to the sheer cliff faces of the hilltop along this side. Instead, the primary access to the site is around the southern side, through a narrow path flanked by several small circular structures which likely served as control points.

This type of constructed deception is reminiscent of descriptions of New Guinea defensive settlements, which Roscoe (2008), argues were designed to intentionally divert, divide and disorient attackers who manage to pass through the main perimeter wall. By providing several (apparently) possible access points, the attacking warriors will tend to attempt multiple pathways, thus making the attacking group smaller and disorienting them enough to possibly give the resident group the element of surprise. Similar tactics were likely at work in these two sites.

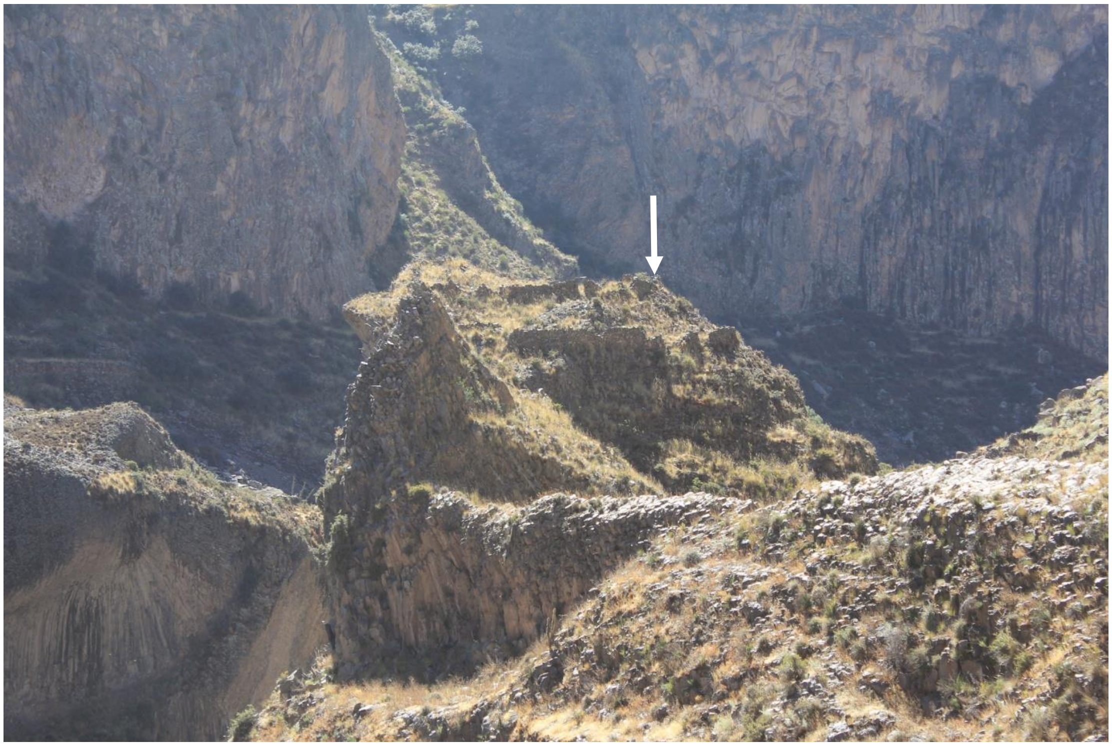


Figure 5.15. Approach to Choque Mamani (CO-187). The narrow land bridge in the center of the frame is interrupted by a large rocky outcrop preventing access. Actual access is hidden to the south (right side of frame).

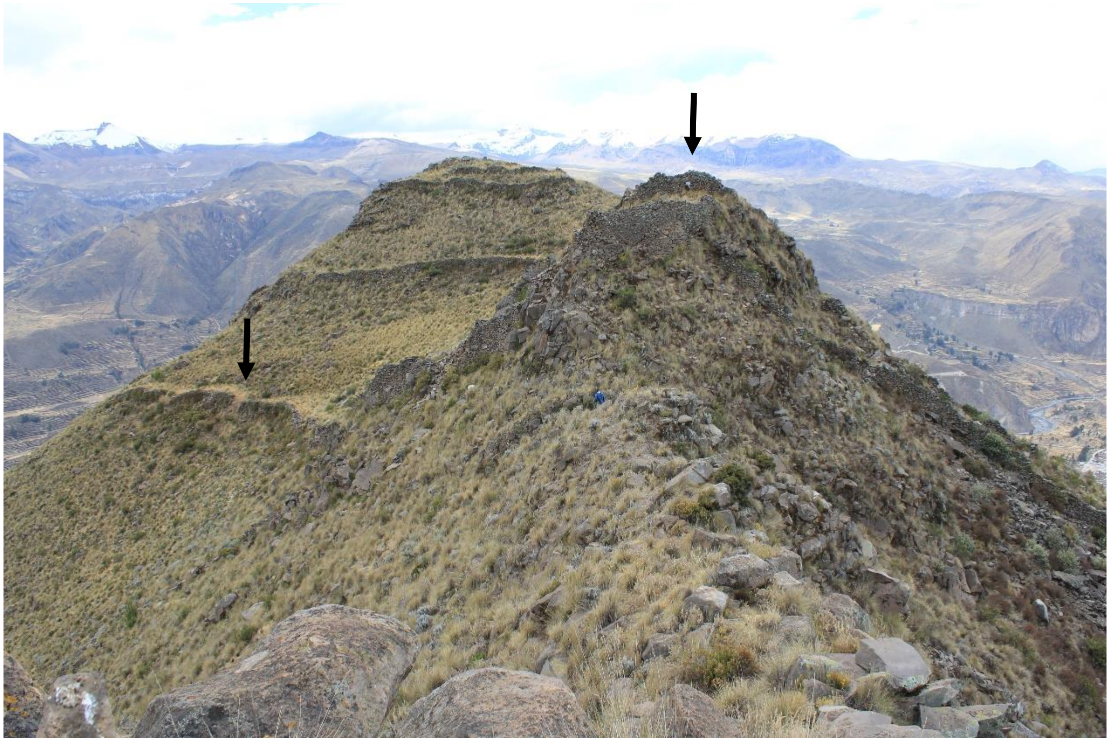


Figure 5.16. Approact to Pachamarka (MA-183). Two prominent gates are indicated with an arrow near the center of the frame. Alternative access is located in the left of the frame.

Defended Gates

In addition to limiting the number of access points in defensive walls, inhabitants utilized a variety of methods for protecting entrances through the walls. Keeley provides a detailed treatment and classification of defensive gates and describes how they were used to subject an entering attacker to as much fire from as many directions as possible (Keeley, et al. 2007:63; Lawrence 1979:304). Defended gates were identified at six sites and represented three primary types of defended gates: baffled, screened, and flanked (Figure 5.17). Baffled gates, such as those found at Auquimarka (TU-188) and Pukara (CO-189) were designed to force attackers to expose their flanks and backsides while entering through the wall by partially overlapping the defensive walls (Keeley, et al. 2007:62-64). Screened gates, like that found at Pukarilla (SI-197), have a barrier covering the gate and forces entering attackers to expose their side while entering.

Finally, two sites had flanked or bastion gates. At Pukara Ocra (SI-200) both entrances had walls which curved inward providing a platform flanking each entrance. Similarly, Achomani (AC-175) had the remains of a flanked gate, and the eastern side had the remains of a circular structure on top. Additionally, when present, parapets were almost always located adjacent to a wall entrance, clearly situated to help protect this weak point in the defenses.

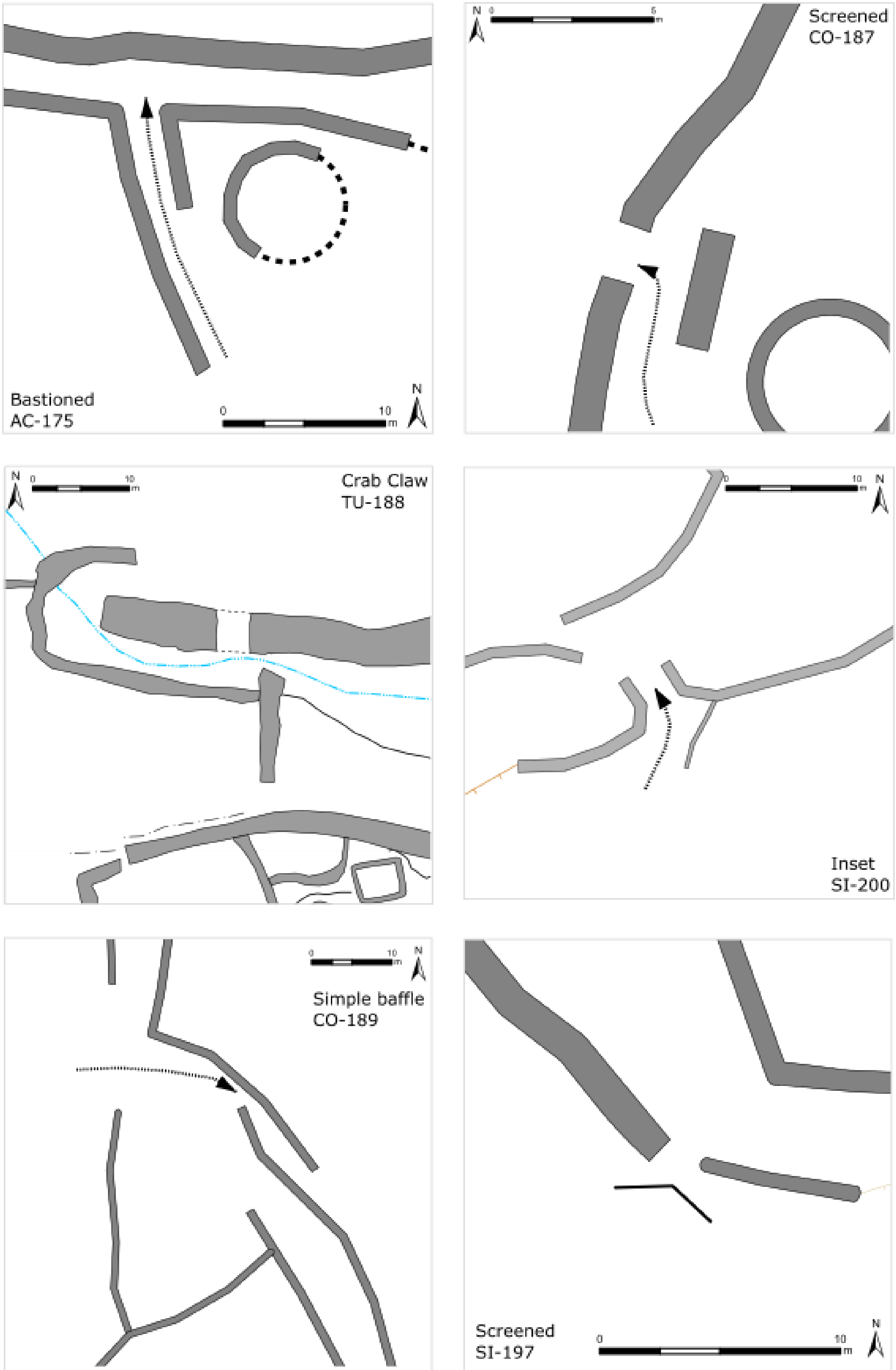


Figure 5.17. Examples of defended gates at Colca Valley hillforts.

Other Defensive Features

A variety of other defensive features were identified during survey. A ditch was identified at the site of Achomani (AC-175), located between what appears to have been the first and second defensive walls and would have served to amplify the height of the second wall.

In several cases, defensive walls were thick enough that an individual could easily traverse the top of it. It is likely these walls were intended to serve as lookout or monitoring spots. At the site of Aukunikita (AC-176), the southern segments of the defensive walls were 2.2 m thick compared to an average 1.6 m thick for the rest of the wall (Figure 5.18). The interior of the wall also had a line of stones protruding out, forming rustic steps—a feature often seen in tall terrace walls—located along the interior which would have allowed an individual to easily scale the wall. The location of the thickened wall segments would have provided expansive views of the puna to the south.

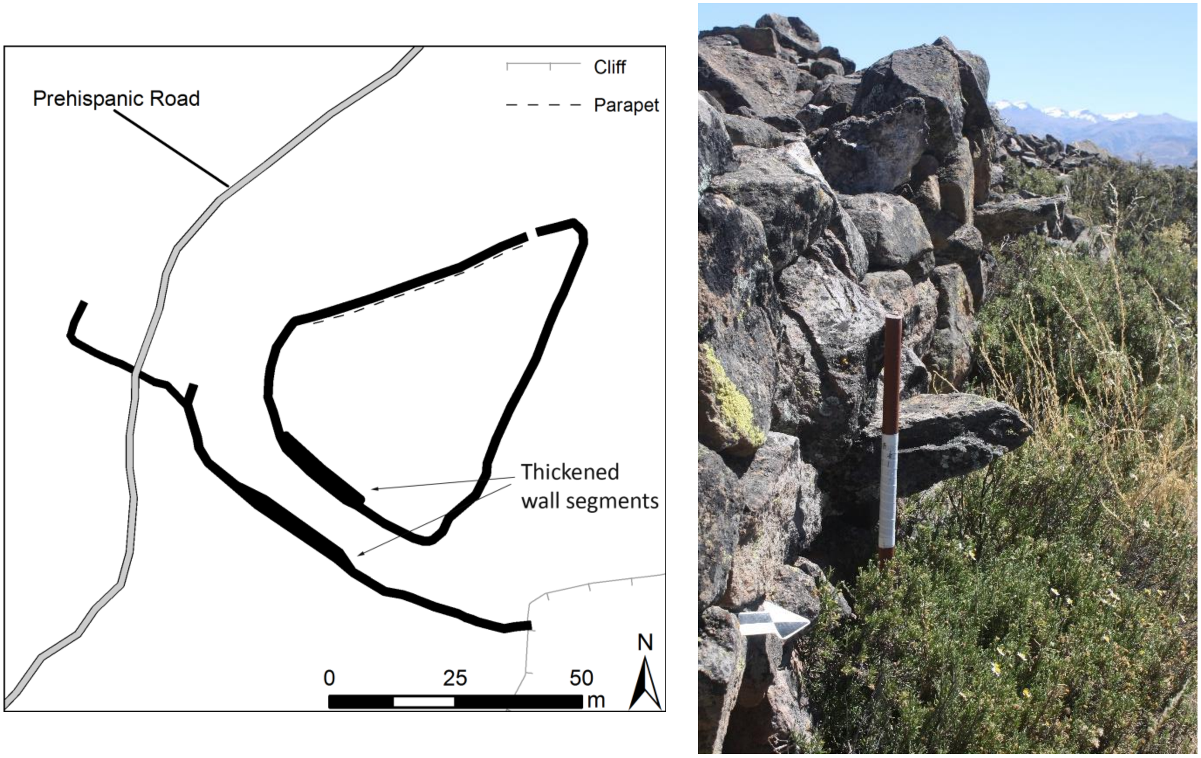


Figure 5.18. Plan map of Aukunikita (AC-176) with thickened wall segments noted (left); steps visible on the interior of the innermost wall (right).

Weapons

Few clear examples of weapons were recovered during survey. One complete and two partial projectile points were recovered from two separate sites in the upper valley. More commonly, however, within the fortifications we found small rounded stones which had either been lightly worked or selected for, which were likely used as sling stones or other projectiles during conflict (Figure 5.19). Thus, weapons appear to have been primarily expediently collected from the surrounding area, with limited manufacture of war implements.


Figure 5.19. Possible sling-stone cache at Cabeza de León (CA-191).

Hilltop Sites and Defense

Overall, we did not encounter many clear examples of weapons, such as caches of sling stones or mace heads. While we did find examples of small rounded stones that could have been used as sling stones, most of these appeared to have been selected from the general area, rather than clearly worked. Despite limited examples of clear weaponry, I argue that these sites were designed to provide defense. It is clear from the survey data, that the sites recorded were uniquely defensive in location and design. Sites were situated in a variety of strategic locations, drawing on the natural height advantage of various hilltops, ridge tops and promontories. Such locations offered unobstructed views of valley and highland areas, and were difficult and costly to access. Other location features, such as water bodies, cliffs, escarpments, and rock outcrops were often present, preventing or limiting access to the site from one or more sides.

While site locations were strategic and highly defensible, architectural investments show the intentional transformation of these hilltops into defensive and highly protected spaces. Sites contained walled enclosures, with highly restricted access. These walls often appear in multiple, providing layers of protection to the innermost area. Access to interior spaces was made more difficult by defended gates, obscured or hidden access points, and offset gates. Other features often considered to be clear features of defense, such as parapets, bastions, and ditches were found at several sites. However, the sites recorded during survey not only included a number of defensive features, but the architecture at most of these sites consisted entirely of defensive constructions, suggesting that defense was a very real concern that led people seek out and construct protection in and on the landscape.

Scholars have offered several other possible explanations of walled hilltop sites in the Andes. In the Andahuaylas region, Bauer and Kellett (2010; 2010) have argued that while hilltop sites may have provided some defense, they more strongly reflect a change in local domestic economy away from the large-scale agriculture of the Middle Horizon, towards a greater dependence on camelid pastoralism. However, the sites in their study were only lightly defended, generally situated in defensible locations, with minimal investment in perimeter walls, defended gates, or other defensive constructions. This stands in contrast to the sites presented here, all of which include large-scale perimeter walls, often in multiple, and which almost always include additional defenses such as baffled gates, parapets, and bastions. Furthermore, the location of the sites here shows close articulation with both grazing areas and agricultural fields. While evidence for intensification of pastoralism cannot be ignored, the location of these sites and the architectural investments cannot be explained solely by changing economic practices.

It has been suggested that hilltop locations and walled enclosures were largely symbolic, rather than defensive. Dean (2005), for example, highlights the important role of prominent hilltops as mytho-historical origin points and materialized deities (*apus* or *huacas*) venerated by local communities, and suggests communities may have relocated to hilltops in order to draw closer to these places of power and protection. A related argument is that large enclosing walls may have served to demarcate ritual spaces and materialize community identities vis-a-vis outsiders (Hastorf 1993; Parsons, et al. 2000). These explanations draw parallels with monumental ritual enclosures found in other periods.

In the Colca Valley, the colonial documents tell us that the local ethnic groups each traced their origins to distinct volcanoes—the Cabanas to the local volcano of Hualca Hualca, and the Collaguas to the more distant Collaguata located north in what is now the department of Cuzco (Ulloa Mogollón 1965 [1586]). More locally, the site of Pumachiri (CO-158) is today a local *apu* for the community of Coporaque. The significance of these hilltop sites is today reflected in the frequent presence of local shrines, many which include overtly Christian symbols such as crosses that are maintained on their summits.

While hilltops often play an important role in Andean cosmology and remain significant spaces of ongoing ritual and veneration, the architectural investments presented above highlight the need to move beyond simple dichotomies of ritual and functional (defensive) spaces. The significance of hilltop sites clearly persisted beyond the period of conflict for which they were constructed. Furthermore, I argue that consideration of the defensiveness of these sites, along with examination of the ways in which war impelled local communities to collaborate in the construction of common defenses, allows us to more fully consider the ways in which war shaped practices of community affiliation that were materialized in the very walls we study.

Site Classes

Fortifications form a distinct category of sites, defined by the presence of overtly defensive architecture, and in particular, large, overbuilt perimeter walls. The size and elaboration of fortified sites vary in significant ways, and provide insight into the populations which lived in and used the sites. Contained within this category are small outposts consisting of one or two defensive wall, large settlements with nearly 200 structures, and everything in between. At the highest level, two broad classes of fortifications can be distinguished: fortifications with domestic structures (residential fortifications) and those without (non-residential fortifications). Non-residential fortifications accounted for 70% of the sites recorded during survey (23 of 33). While some of the sites classified as non-residential contained structures, the limited surface artifacts indicted that these structures were not used as permanent, long-term residences. Within each broad class, several types were distinguished based on the site area and/or the number of structures present (Table 5.1).

Table 5.1. Fortification classification

Category	Class	Size	Description	Number
1	Non-residential	Small	Absence of domestic architecture. Site area less than 2 ha	13
2	Non-residential	Large	Absence of domestic architecture. Site area greater than 2 ha	10
3	Residential	Small	Fewer than 10 domestic structures or less than 10 ha	3
4	Residential	Medium	10.1 – 20 ha or 11-50 structures	4
5	Residential	Large	Greater than 20 ha or more than 50 structures	3

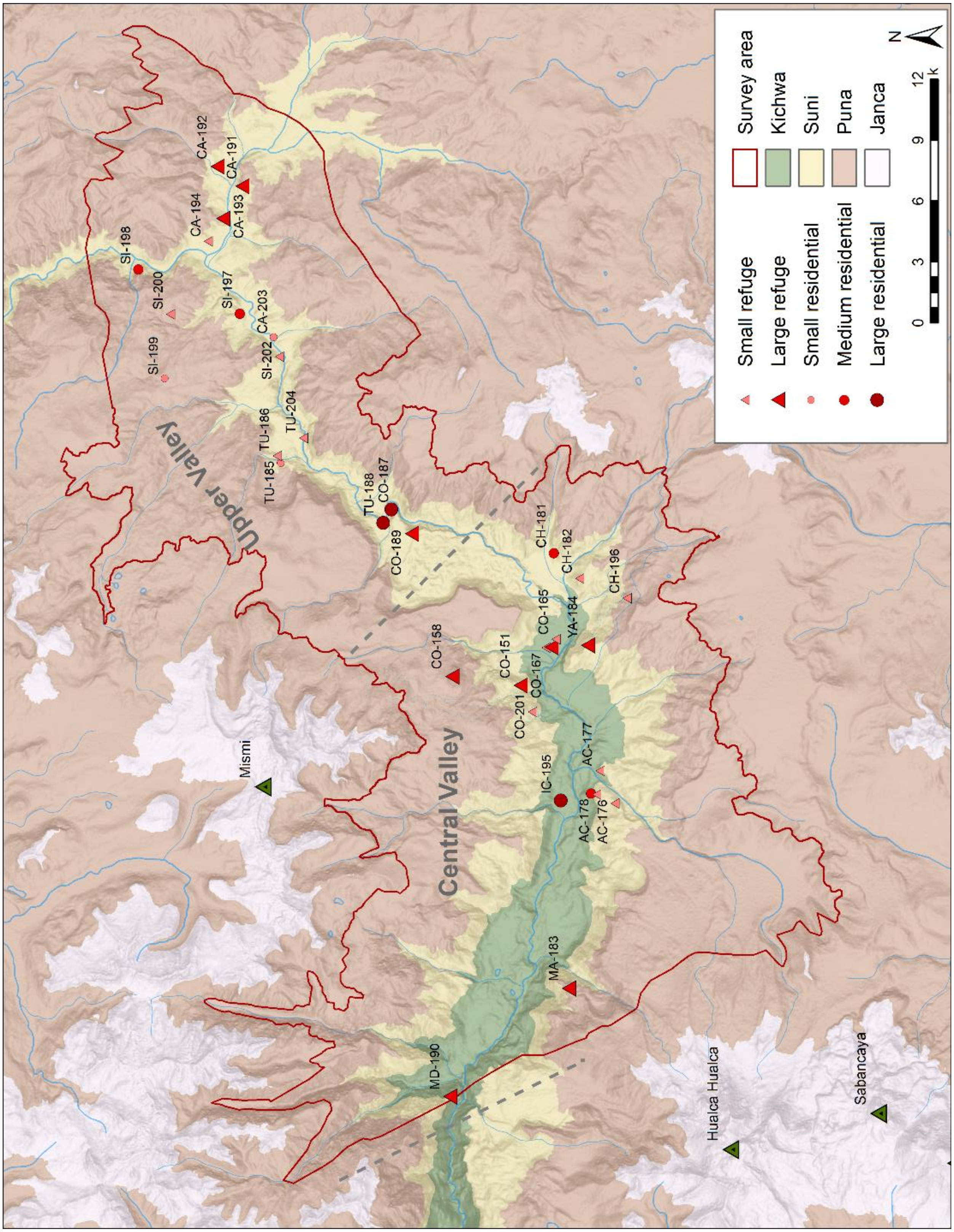


Figure 5.20. Map of the survey areas showing valley division, ecological zones, and all registered fortifications.

For non-residential fortifications, size divisions were determined using the total area contained within fortification walls. The total site area for non-residential fortifications varied widely—from less than a hundredth of a hectare to just under 20 ha. A natural break in site size around 2 ha was used to distinguish between small and large non-residential forts (Figure 5.21b).

Residential forts were classified using both site size and the number of structures. In general, fortifications in the valley were well-preserved, allowing for relatively accurate structure counts. House counts were used where relatively complete counts could be made with confidence; otherwise, total site area was used. A further complication came from sites that were clearly used across multiple time periods. Thus, we must assume that structure counts provide only a rough approximation of the size of the LIP occupation of the sites. At settlements occupied across both the LIP and LH, structures counts may overestimate the size of LIP populations. However, as I discuss below, site classes correlate with the amount of investment in defenses, suggesting broad correspondence between site size and residential population.

At settlements where structure counts could be made, it is clear that the density of occupation at residential sites varied substantially. Structure density within residential sectors of the sites ranged from 0.5 structures per hectare (San Andres [CH-181]), to 28.8 structures per hectare (Achomani [AC-175] and Malata [IC-195]), with an overall average of 9.5 structures per hectare (Figure 5.22). This variation is likely due in part to the topographical constraints of the particular site locations. In more restricted hilltop or promontory settings, the overall structure density is higher, likely due to the limited area that could be used for habitation.

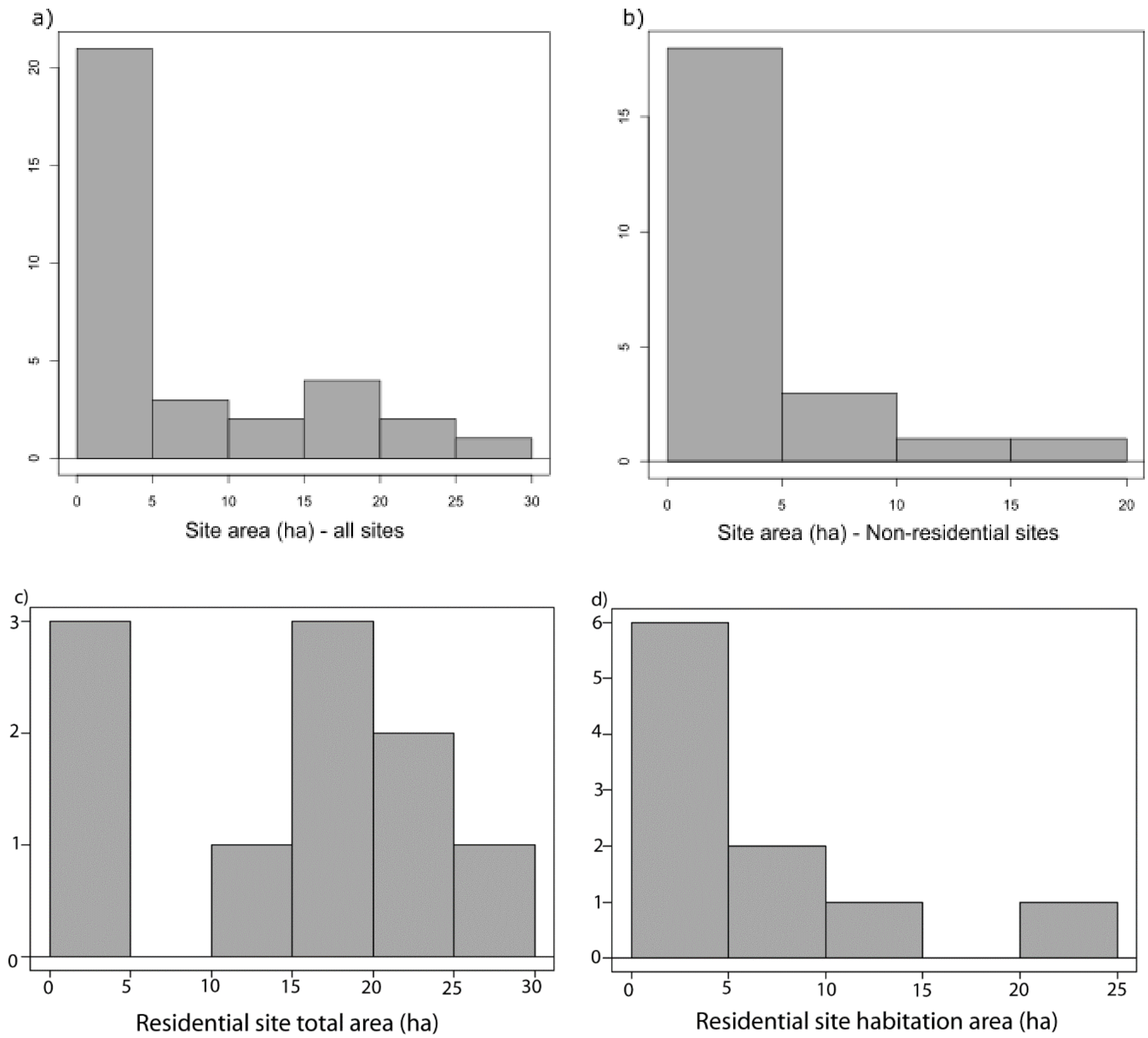


Figure 5.21. Histograms showing the range of site sized. A) total site area of all sites; b) site areas of all non-residential forts; c) total area of residential sites; c) habitation area of residential fortifications.

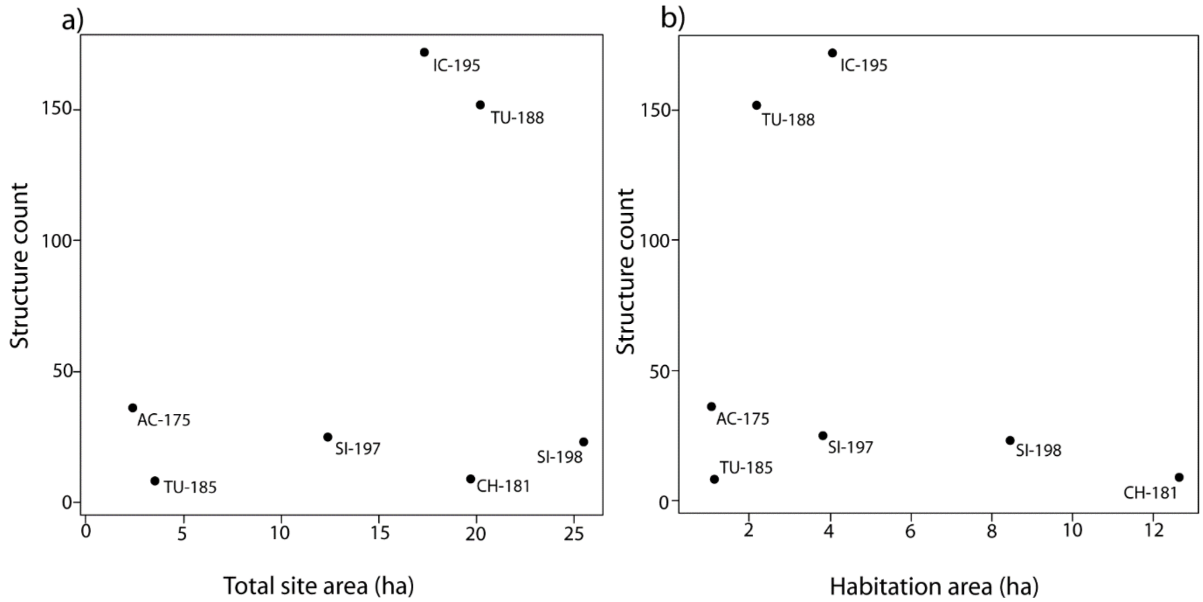


Figure 5.22. The relationship between structure count and a) total site area, and b) habitation area[2] for residential fortifications

The two largest fortified settlements—Auquimarka (TU-188) and Malata (IC-195)—are larger, both in terms of area and house count, than the largest LIP settlements previously recorded in the valley. We counted 152 structures at Auquimarka and 161 at Malata. The next largest LIP settlement for which house counts are available is the site of Uyu Uyu in Yanque, which had 139 houses (Table 5.2). Thus, it is safe to say that the largest fortified settlements were comparable to the largest LIP settlements measured both in terms of settlement size and occupational density.

[2] The sites of Choque Mamani (CO-187), Markarani (SI-199), and CA-203 were excluded because accurate structure counts could not be determined.

Table 5.2. Major LIP settlements in the central and upper valley.

Site Name	District	Area (ha)	House count	Source
Juscallacta	Chivay	6	90-95	Brooks 1998
Uyu Uyu	Yanque	4.26	139	Wernke 2003
San Antonio/Chijra	Coporaque	12	136	Wernke 2003
Llactapampa/Tunsa	Coporaque	5.75	90	Wernke 2003
Auquimarka (TU-188)	Tuti	20.19	152	Present work
Malata (IC-195)	Ichupampa	17.31	161	Present work

Comparisons of Site Classes[8]

Fortifications in the valley varied in terms of both their intrinsic defenses and constructed defenses. Differences between site classes, show that residential and non-residential fortifications varied in terms of how difficult they were to access, their visibility of the landscape and the visual prominence, suggesting they were used in different ways. Additionally, sites of all classes and types demonstrated a range of investment in defensive architecture, which was likely related to the size of the population that used the site.

To examine intrinsic defenses, I focused on the ease of access and visibility of the surrounding landscape. The ease of access of each site was calculated using a cost distance analysis and hiking model within ArcMap to derive an anisotropic measurement of the time to reach the site. The use of cost distance analysis with Tobler's (1993) hiking model creates a raster image in which each cell represents the cost estimate (in time) to reach the site using the most efficient route based on the slope. In this case, I used a one kilometer buffer around the site to find the median cost estimate from a standard aerial distance from the site centroid. The median value provides a cost estimate to reach the site from a kilometer away, and allows for comparison of a relative ease of access to the site.

[8] The data used in this section can be found in Appendix A

To assess the visible area around each site, I calculated the viewshed at two distances. A proximate viewshed was calculated within a 3.4 km buffer around the site to assess the area which could be effectively monitored for threats (see chapter 7 for further discussion of how this distance was selected). A second viewshed with a 40 km buffer was used to assess the overall visibility of the landscape. All viewsheds were created from polylines of the site defensive walls, rather than a single site centroid point. I chose this method because I found that the precise location of the viewshed point had a marked impact of the visible area around the site. Viewshed analysis calculates visible area based on the presence or absence of intervening topography. Thus, if the site centroid happened to be located in a low elevation area, or adjacent to a topographic rise, the viewshed would be artificially truncated, despite the fact that that land is otherwise visible from a different vantage point at the site. Using the polylines of the site defensive walls provides a more realistic approximation of the area that was intended to be monitored. In all cases, the viewshed was calculated using an observer offset of 1.5 meters, approximating the height of the eye in an average human individual.

Ascent time for the sites ranged from 14 to 66 minutes, with most falling around 30 minutes. In general, larger fortifications were more remote than smaller ones across both site classes (

Figure 5.23a). However, ascent time and distance to the nearest pukara were strongly correlated. The more remote the pukara from the others, the longer the ascent time to the site. Measures of visibility were similarly varied, but not systematically across site classes. Large non-residential fortifications were able to see the greatest area, but all residential fortifications had roughly the same visible area regardless of the site size or population (

Figure 5.23b).

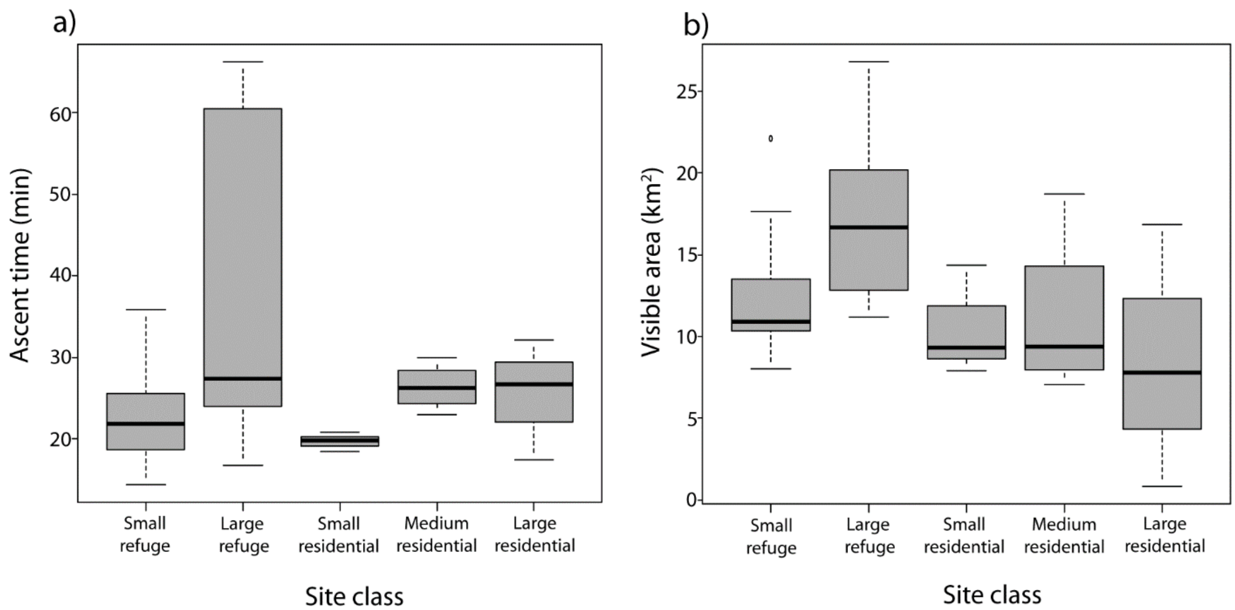


Figure 5.23. Measures of intrinsic defensibility; a) ascent time from a 1 km distance; b) total proximate visible area.

The number of defensive walls, their thickness, and the presence of other defensive features—such as parapets and ditches—all impact the defensibility of the site. In addition to comparisons of the number of defensive walls and the presence of additional defensive features, I calculated the total constructed wall area (see also Arkush 2010:148). Wall height was not used, due to significant variation in wall preservation across sites in the survey. This measure provides a rough approximation of the difficulty of penetrating the site's defenses.

There was no relationship between wall investment (m^2) and either ascent time (Spearman's rho=0.099, p=0.584) or overall visible area from the site (Spearman's rho=0.225, p=0.207). However, there was a moderate positive relationship between wall area and proximate (within 3400 m) visibility (Spearman's rho=0.453, p=0.009), indicating that sites with more wall construction actually had *greater* visibility of the area immediately surrounding the site. The significance of this relationship, however, appears to be driven by a few very large fortifications.

Thus, there is no indication that sites located in more accessible locations or with limited visibility of the landscape compensated for ease of access or more limited visibility by building more or thicker defensive walls (Figure 5.24). By all measures, the extent and elaboration of defensive constructions appears to reflect the size of the population that occupied or used the site (Figure 5.24d). There was a moderate positive correlation between the amount of wall construction and site size (Spearman's rho=0.363, p=0.038). Larger fortifications had more and thicker walls than smaller fortifications, and this pattern was true for both non-residential and residential sites. This parallels patterns found in Lake Titicaca Basin hillforts (Arkush 2010:149), and suggests that investment in defensive constructions was constrained by the number of individuals who could contribute to their construction. Among residential sites, this resulted in the construction of both more and thicker walls (Figure 5.25c, d). By contrast, the average wall thickness was nearly the same across both small and large non-residential forts; instead, investment was directed toward constructing more walls (Figure 5.25d).

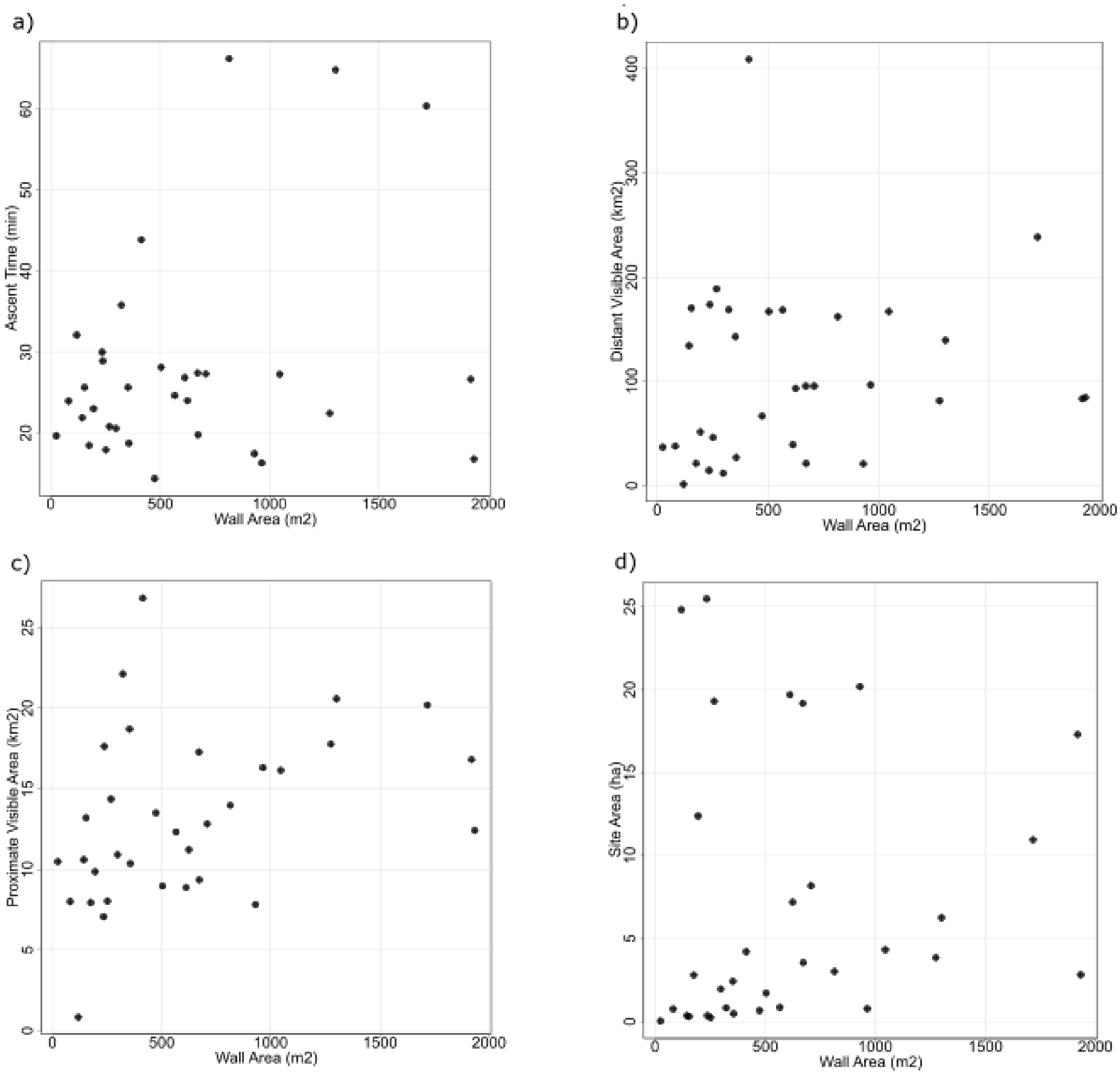


Figure 5.24. Wall area is not correlated with (a) ascent time (Spearman's rho=0.099, p=0.584) or (b) overall visible area (Spearman's rho=0.225, p=0.207). There was a positive correlation between c) proximate visible areas (Spearman's rho=0.453, p=0.009) and wall area and d) wall area was overall correlated with site area (Spearman's rho=0.363, p=0.038).

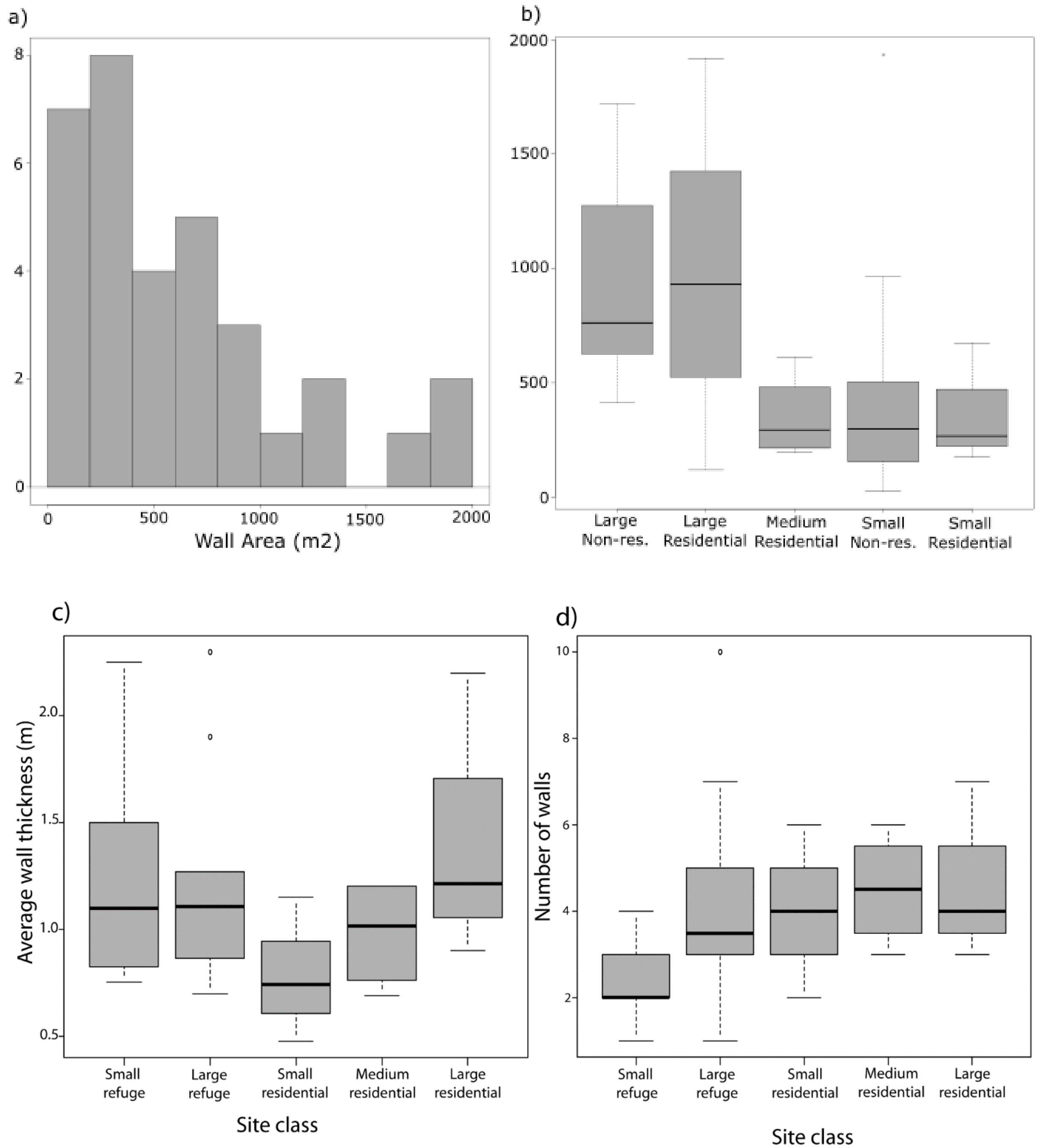


Figure 5.25. Measures of constructed defenses; a) range of measured wall area across all sites; b) wall area by site class; c) average wall thickness by site class; d) total number of perimeter walls by site class.

At fortified settlements, the labor was almost certainly drawn from the resident population. However, non-residential fortifications, which made up 70% of fortifications in the valley, did not have a resident population and were clearly constructed and maintained by individuals living in surrounding settlements or dispersed homesteads. If we consider investment in defensive constructions as a rough proxy for the size of the population that used the site, many large non-residential fortifications were used by populations that approximated those of the largest residential settlements. In fact, six non-residential fortifications had architectural investments equal to the two largest and most elaborate residential forts of Auquimarka (TU-188) and Malata (IC-195).

Compared to residential forts, non-residential forts were more visually prominent, had larger viewsheds, and were located in areas which were more naturally defensible. By all measures, non-residential fortifications were more visually prominent on the landscape than fortified settlements. Non-residential fortifications were located in more prominent locations compared to residential fortifications, situated an average of 77 meters higher relative to the surrounding terrain (Figure 5.27a). Additionally, non-residential fortifications also had larger viewsheds, both of the immediate area surrounding the site, and total landscape visibility. Larger viewshed would have not only fascilitated monitoring of the surrounding landscape, but also indicate that the sites themselves were also more visible from areas outside the site (Figure 5.26). Non-residential fortified sites had 50% more visible terrain at proximate distances and three times as much total visible area (Figure 5.27c, d). All of these measures were significant within a 95% confidence interval. When broken out further, large residential sites appear to have the smallest visible area. Perhaps this is because they could compensate with large populations, unlike the medium residential sites and the small residential sites.

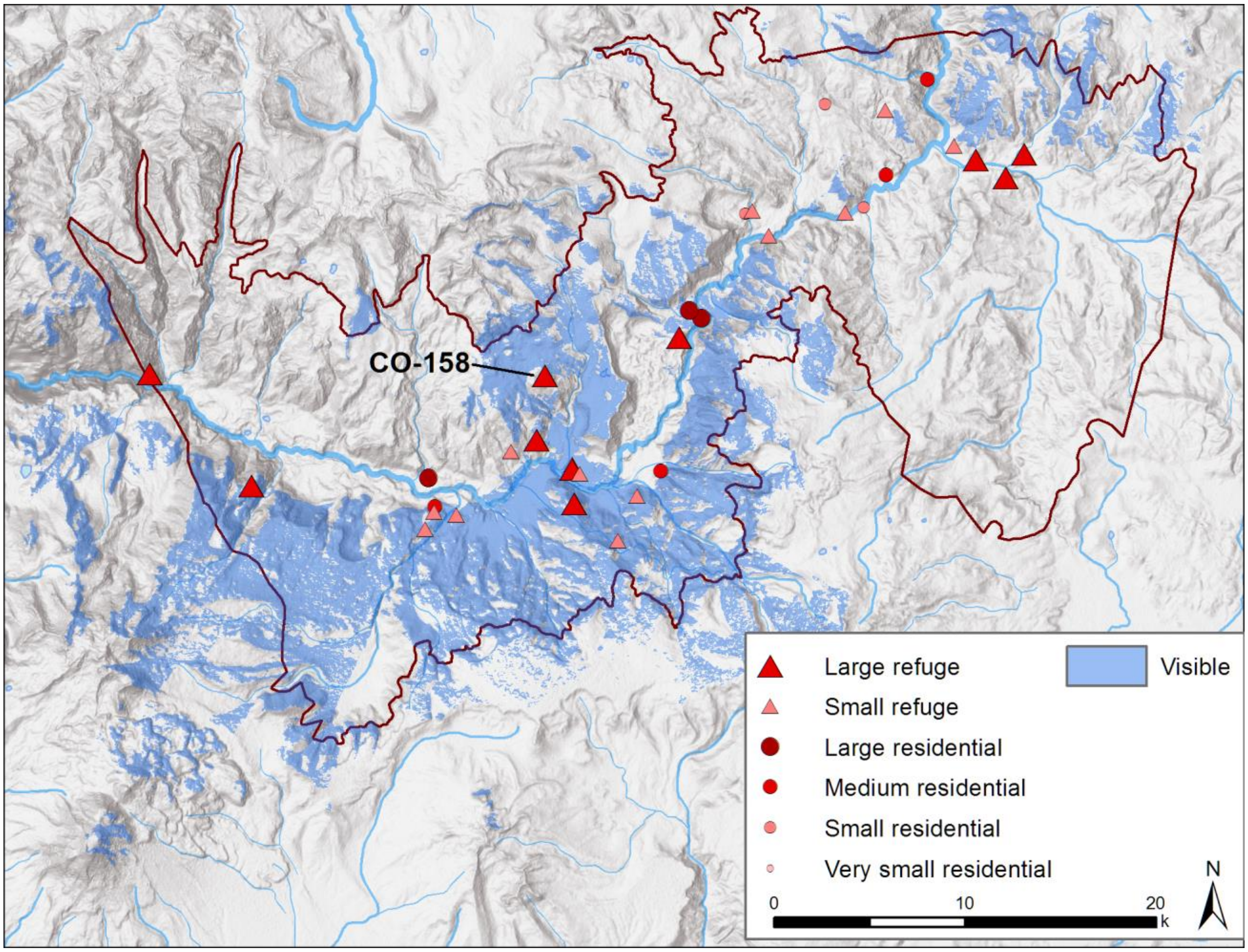


Figure 5.26. Viewshed results from Pumachiri (CO-158), which had the largest visible areas at both near and far distances.

While measures of visibility and prominence varied significantly across site classes, there are many measures of defensiveness that were the same across both non-residential and residential sites. There were no significant differences in ascent time, the number or thickness of walls, or the distance to the nearest fortification. There is no significant difference in ascent time between non-residential (mean=0.49 hours) and residential (mean=0.41 hours) fortifications. Ascent time among large non-residential fortifications showed the greatest variability of all classes, ranging from less than a half an hour, to more than an hour (Figure 5.27b).

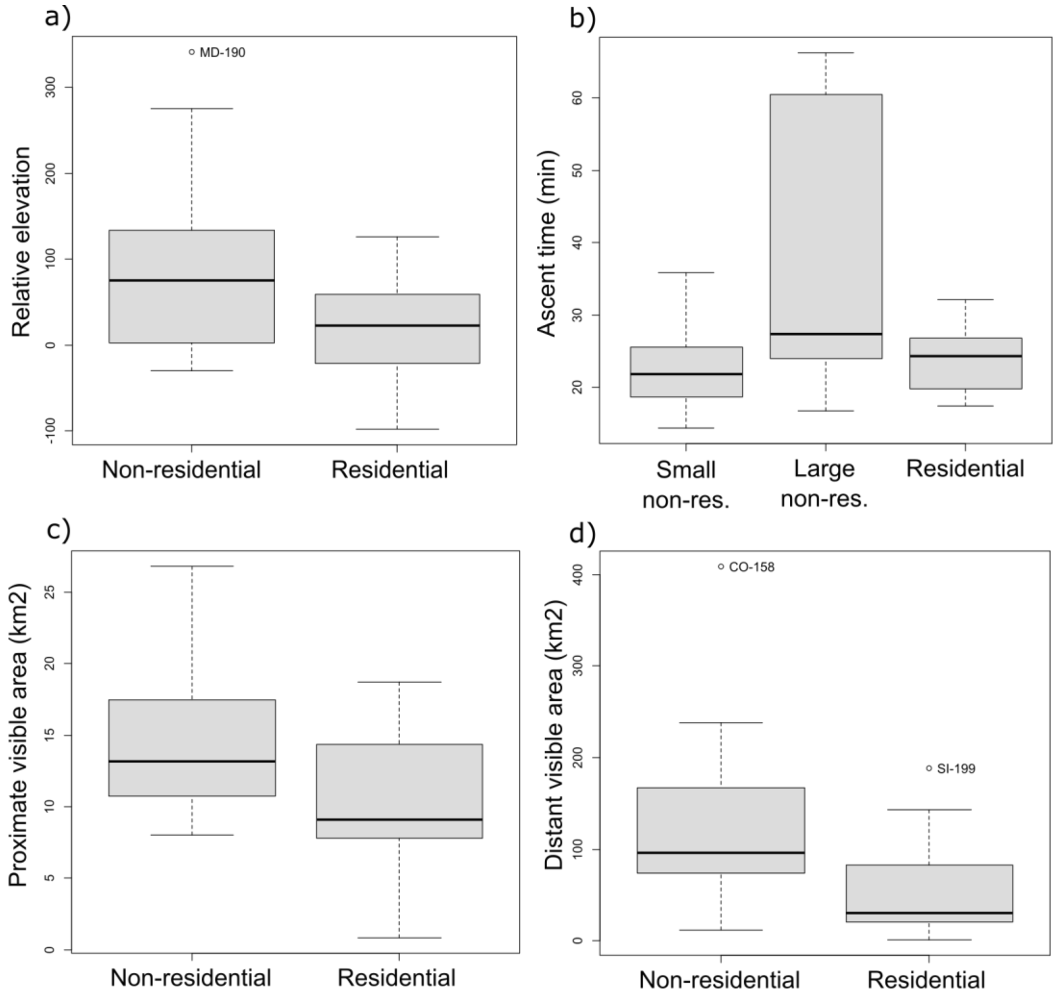


Figure 5.27. Differences between non-residential and residential fortifications; a) relative elevation compared to surrounding terrain; b) ascent time in minutes; c) proximate landscape visibility in km^2; d) total visible area in km^2.

Diverse Defensive Strategies

Variation in the elaboration of site defenses and site location suggest that fortifications reflect a diversity of uses in defense. While fortified settlements were clearly designed to provide protection for the local residents, the number of non-residential fortifications highlights the importance of defense in the valley as a whole. Fortified sites which lack evidence of sustained domestic occupation have frequently been termed refuges, suggesting they may have served as temporary defense from intermittent conflict or as places of last resort when other defenses failed. However, I argue that non-residential fortifications in the valley served a variety of other defensive functions. Several non-residential forts were located in close proximity to important non-fortified LIP settlements and likely served as the primary defenses for these groups. The sites of CO-201, Llanquipiña (CH-196), and Pallaqlle (YA-184), were all closely associated with major unfortified LIP settlements, and very likely served as the primary defenses for the residents of those nearby settlements (Table 5.3).

Table 5.3. Distances between prominent unfortified settlements and registered pukaras

Fortification	**Settlement**	**Distance (km)**
Fortaleza de Chimpa (MD-190)	Malata	1.8
Ch'ilaqota (CO-151)	San Antonio	0.4
CO-201	Uyu Uyu	0.6
Pallaqlle (YA-184)	Yanque	0.9
Llanquipiña (CH-196)	Juscallacta	1.0
CO-165, CO-167, CO-168	Llactapampa/Tunsa	0.4-0.5

However, several non-residential fortified sites, including some especially large ones, were quite remote from LIP settlements. The site of Pumachiri (CO-158), for example is at minimum a 2 hour walk from the hamlets and villages below in Coporaque, making it an unlikely refuge for those groups, especially if they had to react quickly to an attack. However, the site is less than an hours walk from two larger pastoralist settlements. Given that most fortifications were located in the suni, and to a lesser extent, the puna zones, many of these sites could have provided refuge for pastoralists and their herds. The remains of likely prehispanic corrals were found associated with at least three fortifications, all of which were located in the suni and puna areas at the edges of the valley. Key examples can be seen at Chiloq'ota (CO-151) and Akunikita (AC-176). At Chiloq'ota, a series of walled enclosures were located to the north of the defensive walls may have served as corrals[9]. Within the defensive walls of the site, several circular enclosures could have also served as corrals (Figure 5.28). Several corral areas were associated with Akunikita, including a small grouping to the south, and a much larger one to the north, located between the Akunikita and Koricancha (AC-178) (Figure 5.29). Furthermore, defensive walls themselves could have offered protection to herds pasturing on the puna. Thus, several fortifications were likely used in part as refuges for pastoralist groups.

[9] Prior survey by Martin (1986) as part of the Colca Valley terrace project interpreted these walled enclosures as unirrigated terraces, or field-wall terraces. However, several features suggest they were not agricultural terraces. Many of the walls are very thick (more than 2 m in some areas), unusual for most field walls. Additionally, the standing height of the walls was over 2 m in height, which would also be unusual for terrace walls. Finally, the interior ground surface of the enclosures was basin-like, with low points in the center.

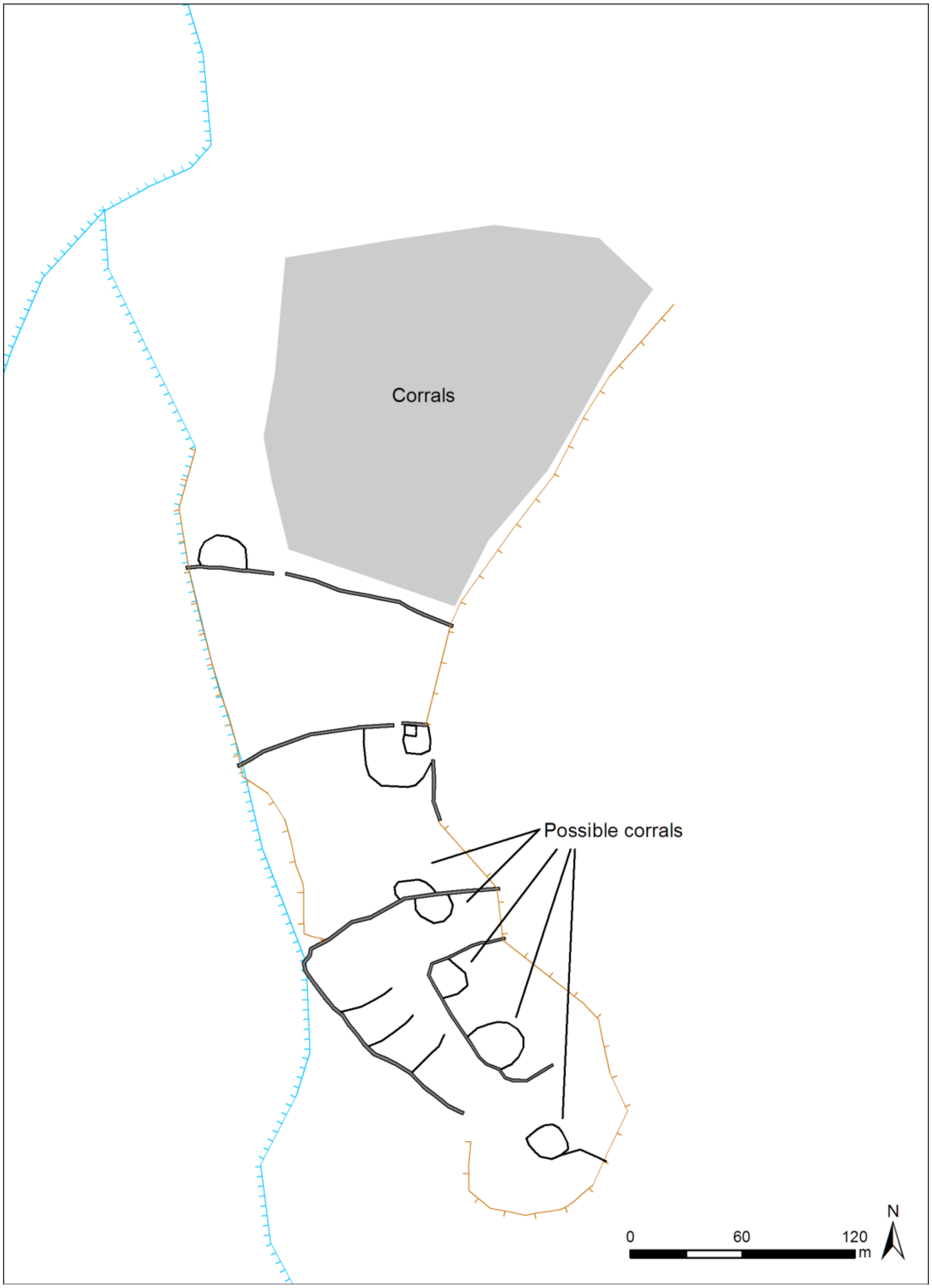


Figure 5.28. Plan map of Chilaq’ota (CO-151) indicating possible corrals.

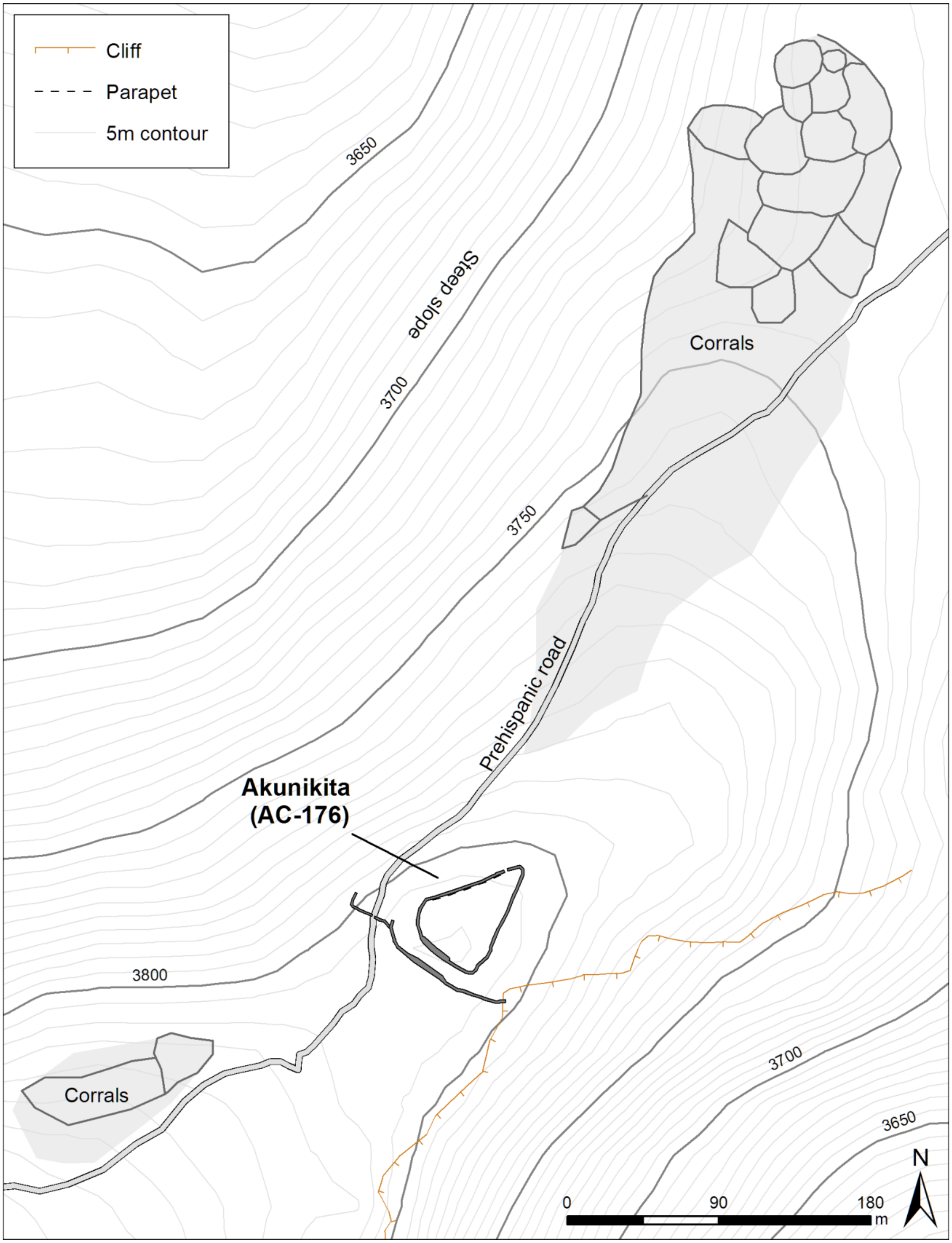


Figure 5.29. Site of Akunikita (AC-176) showing location of near-by corrals.

While many non-residential forts may have provided defenses for undefended agriculturalist and pastoralist communities, there is little evidence to support the idea that these sites would have acted as refuges of last resort. Even sites like Aukunikita (AC-176), which were close enough to other fortified settlements to have been reached as a space of last resort, seem unlikely to have been used in that way. Given that the constructed defenses of fortified settlements and non-fortified sites were nearly the same, and the fact that retreat from a fortified settlement was likely a risky prospect (especially given the very limited wall entrances), it seems unlikely that they would have been particularly useful in that way during active conflict.

The defensive role of non-residential fortifications likely extended far beyond defense for undefended communities. These sites were made to see and be seen. Non-residential fortified sites were significantly more visible on the landscape and afforded greater visibility of the landscape. The higher viewsheds of the non-residential sites would have been advantageous for monitoring the landscape for threats. At the same time, the increased visibility of the sites within the valley region would have made them important markers on the landscape. I suggest that in addition to serving as refuges for the residents of non-fortified settlements, these sites also served as monitoring outposts. Given the visual prominence of these sites, they also may have been used to relay messages to near-by sites, using visual signals (such as smoke or fire signals) or auditory signals. There is some evidence indicating the use of smoke or fire signals in the Andes in both pre-hispanic and historic contexts. Garcilaso (Garcilaso de la Vega 1966 [1609]) reported that the Inka used smoke or fire signal relays were used relay information on military uprisings. There are also several historical sources which indicate Aymara use of smoke and fire signals around the turn of the 20th century in the Lake Titicaca Basin (Bandelier, et al. 1978:89; Chervin 1913:69).

There also evidence these sites served a sentry role—monitoring access into and out of the valley. The clearest support for this comes from the site of Aukunikita (AC-176). The site is located along a well-preserved ancient path which extends roughly north-south. The path crosses through a gate in the exterior defensive wall at the site, clearly indicating a sentry role for the site. Additionally, a regional mobility analysis (detailed in Chapter 7) demonstrates that fortifications were located to monitor key access points into the valley.

Fortifications in the valley were clearly designed to defend the residents who built and used them. A third of the sites recorded were likely designed as protection for the residents who lived within and adjacent to the defensive walls. Others, were likely intended as refuges for groups living in settlements and perhaps dispersed households in nearby areas, and likely reflect cooperation between multiple settlements who collaborated for mutual defense (Chapter 6). The location of several non-residential fortifications in the puna regions surrounding the valley and higher slopes indicate that residents of the valley were equally concerned with protecting pastoralists and their animals that would have grazed in those areas, particularly during the dry season.

However, many of these sites also served to monitor the surrounding landscape, control access into and out of the valley, and perhaps to facilitate local and long distant communication. As discussed in Chapter 7, many non-residential fortifications were located to control key access point into and out of the valley. Additionally, non-residential sites were highly visible features on the landscape that also maintained extensive views of the surrounding landscape; key features which would have facilitated long-distance communication between sites.

Distribution of Sites Across the Valley

Pukaras were located across the central and upper valley, on both margins of the river, and in all three major ecological zones present in the survey area. However, site classes were differentially distributed, suggesting that they reflected local defensive needs.

Fortifications were present in roughly equal number in both the central and upper valley (17 in the central valley, 16 in the upper valley). However, the distribution of site classes varied significantly across these two portions of the valley (Table 5.4). The central valley was dominated by non-residential fortifications—82% (14 of 17) are non-residential fortifications. By contrast, the upper valley contains a mix of non-residential and residential fortifications (56% non-residential, 44% residential), and had a greater diversity in the size of residential fortifications (Figure 5.30).

Table 5.4. Site class distributions across the central and upper valley

Site Class	Central	Upper
1. Small non-residential	8 (62%)	5 (38%)
2. Large non-residential	6 (60%)	4 (40%)
3. Small residential	-	3 (100%)
4. Medium residential	2 (50%)	2 (50%)
5. Large residential	1 (33%)	2 (66%)
Total (percent of total)	17 (51.5%)	16 (48.5%)

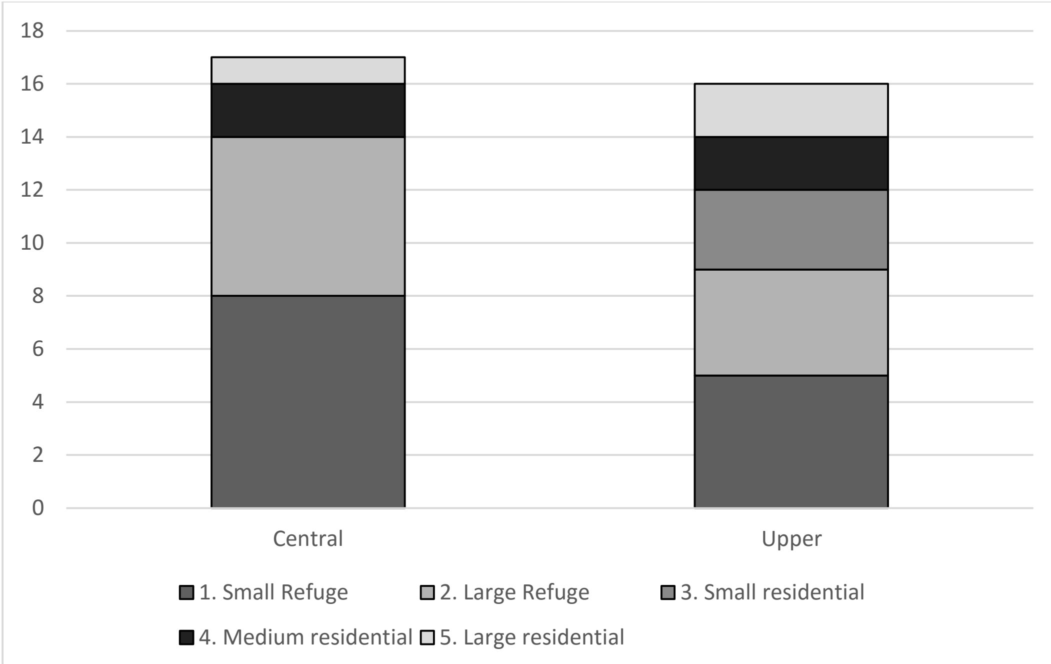


Figure 5.30. Site class counts for the central and upper valley.

Fortifications were found in all ecological present in the survey area, although not all site types were present in equal proportions. Given that the sites all occupy elevated areas, it is not surprising that fortified sites are concentrated in the valley slopes and margins of the puna. Only six (18.2%) were located in the *kichwa*, while more than half of the sites recorded (18, 54.5%) were located in the *suni* zone, and the remaining nine (27.3%) in the *puna* (Table 5.5). Both non-residential and residential sites were present in all ecological zones, although not residential fortifications in the puna area were smaller (Figure 5.31).

Table 5.5. Distribution of site types across ecological zones.

Site Type	Kichwa	Suni	Puna
1. Small non-residential	3 (23%)	8 (62%)	2 (15%)
2. Large non-residential	2 (20%)	3 (30%)	5 (50%)
3. Small residential	-	2 (67%)	1 (33%)
4. Medium residential	-	3 (75%)	1 (25%)
5. Large residential	1 (33%)	2 (67%)	-
Total (Percent of Total)	*6 (18%)*	*18 (55%)*	*9 (27%)*

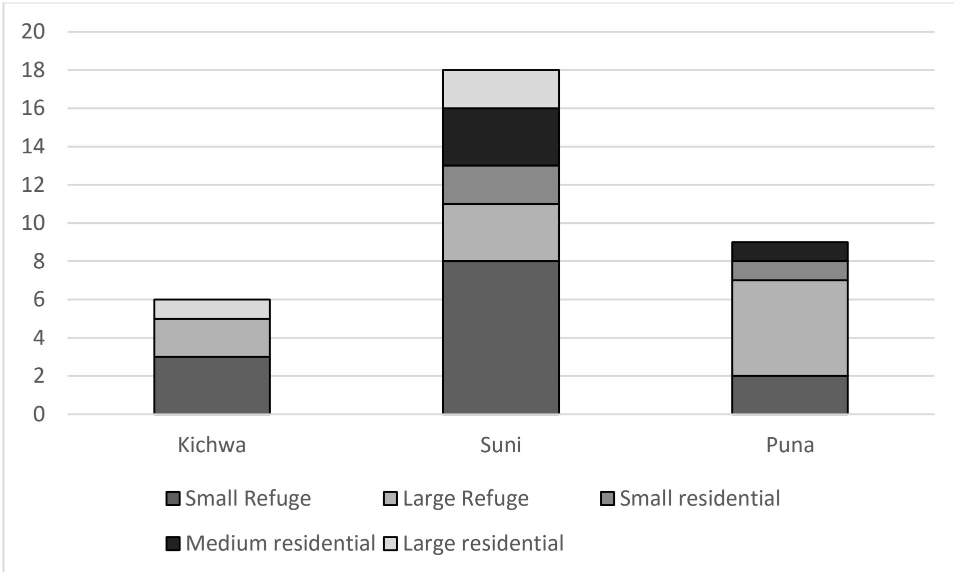


Figure 5.31. Distribution of site classes by ecological zone.

In part, the fact that relatively few fortifications are located in the kichwa zone can be explained by the fact that lower ecozone makes up the smallest proportion of terrain within the survey area (roughly 11.5%) (Figure 5.32). Additionally, pukaras were located in topographically strategic locations, including natural rises, and thus it is expected that the elevation of these sites would skew higher than non-fortified settlements. However, the predominance of fortifications in the suni ecozone when compared to the puna cannot be explained in the same way. Suni terrain makes up approximately a quarter of the survey area, but more than half of all fortifications are located within this elevation range. Thus, there appears to have been a preference toward placing sites within this transitional ecozone; perhaps because it would have provided more ready access to both agricultural areas and pasturage.

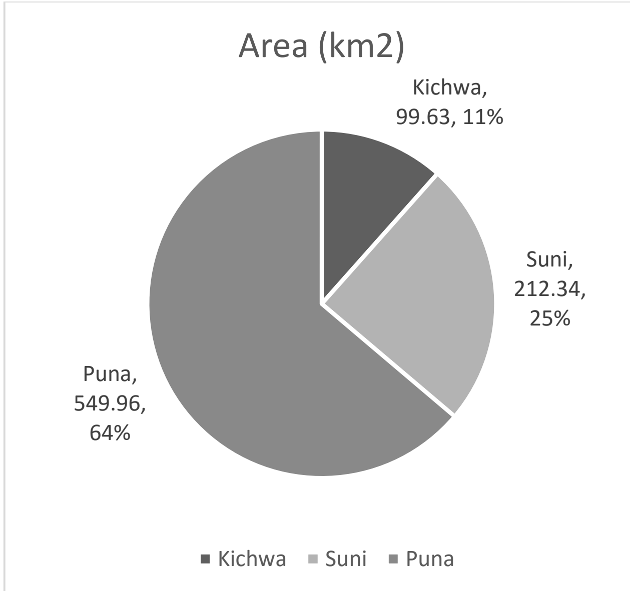


Figure 5.32. Proportion of survey area occupied by each ecozone.

The distribution of sites across the valley and in distinct ecological zones suggests that while defense was a concern in the agricultural core of the survey area, there was a greater investment in protecting areas adjacent to key pasturage areas, and the spaces in between. In part, this likely reflects both the diversified domestic economy of the Colca Valley during the LIP, which included both agricultural production and camelid pastoralism. Sites located in the suni slope would have provided protection for individuals and communities active in both domains. Even in the upper valley where agriculturally-productive areas are more restricted due to elevation, fortified sites are often located adjacent to agricultural terraces that also offered access to pasturage.

Additionally, the differential location of sites in the suni and puna areas, rather than the core agricultural areas, suggests that pastoralists, and more specifically, camelids, may have been particularly vulnerable. This likely indicates that raiding for animals, rather than agricultural stores, was a common pattern of conflict in the area. Notably, defenses are less frequent in the lower reaches of the survey area which would have offered more extensive areas for cultivation. Fortifications are notably absent in the district of Lari and much of Maca and Madrigal, despite known LIP settlement in those areas (Doutriaux 2004). To the west of the survey area, prior work in Cabanaconde (Doutriaux 2004), an area known for its extensive maize cultivation in the LH and colonial periods, did not find LIP-period defensive sites. Raiding for herd animals is common in ethnographic accounts globally (Gray, et al. 2003; Salzman 2002; Sweet 1965). Raiding for agricultural products would require greater logistical considerations for moving products, that would have involved transporting large and heavy ceramic vessels, herd animals, if captured, could quite literally move themselves. However, targeting of agricultural fields is also a known practice, although more typically related to destruction of stores and fields, rather than acquisition (Meggitt 1977; Andrew Peter Vayda 1960).

Site Chronology and Use

A majority of hilltop forts were constructed during the Late Intermediate Period. Only a handful of Middle Horizon ceramics, and no Formative ceramics, were found at the fortified sites, and most of the Middle Horizon ceramics were found at a single site. Fully half of the sites also had Late Horizon period ceramics present, although often in much lower frequency. Surface collections of ceramics from the surveyed sites provide a relative chronology of use for fortifications in the valley. Ceramics were classified using the ceramic sequence developed by Wernke (2003), which built upon earlier work by Malpass and de la Vera Cruz (de la Vera Cruz Chávez 1987, 1989; Malpass and de la Vera Cruz Chávez 1986, 1990).

The late prehispanic ceramic sequence is divided into four stylistic categories which provisionally correspond to two broad time periods. In his chronology, Wenke suggested that

Collagua I and II broadly correspond to the LIP, and Collagua III and Collagua Inka correspond to the LH, with Collagua III representing either a transitional form or a local LH style, and the Collagua Inka style representing a local expression of Inka-style ceramics. Based on my systematic surface collections and excavation data, I place Collagua I, II and III as Late Intermediate Period styles, and Collagua Inka as a Late Horizon style. The evidence for this is presented in greater detail in Appendix C, but I will briefly lay out the two primary lines of evidence for this classification. First, at Malata (IC-195), where we carried out systematic surface collection, distributions of Collagua III ceramics follow similar distribution patterns to Collagua I and II, and differ substantially from the distribution of Collagua Inka ceramics. Importantly, only Collagua Inka ceramic distributions correspond to the standing architecture at the site, which likely represents the Late Horizon/Early Colonial settlement patterns of the site. Second, in well-stratified contexts at Auquimarka (TU-188), Collagua I, II and III ceramics are all found associated with the earliest floor levels. By contrast, Collagua Inka ceramics first appear in small quantities in the subsequent thick fill layer associated with a major reconstruction phase, and then in substantial quantities in the subsequent occupation layers (Chapter 8). Excavation data was unable to resolve whether Collagua I, II, and III styles represent chronological differences (i.e. whether Collagua I, II, and III styles represent chronological phases from early to late LIP). Very few Collagua I ceramics were found in excavation, and none were found in clear LIP contexts. However, the increasing frequency of each style in surface collections does tentatively support a chronological component to the stylistic changes. If Collagua I ceramics represent an earlier LIP form, their overall paucity at fortifications could indication that the hillforts were constructed primarily in the mid and late LIP. However, this remains speculative.

Table 5.6. Stylistic attributes of Collagua ceramics.

<table>
<tr><th>Style</th><th>Collagua I</th><th>Collagua II</th><th>Collagua III</th><th>Collagua Inka</th></tr>
<tr><td>Code</td><td>CO1</td><td>CO2</td><td>CO3</td><td>COI</td></tr>
<tr><td>Period</td><td>LIP (Early-Mid?)</td><td>LIP</td><td>LIP (Late?)</td><td>LH</td></tr>
<tr><td>Paste</td><td colspan="4">Semi-compact to compact, with sparse to abundant very fine to fine sand temper, with occasional feldspar inclusions.</td></tr>
<tr><td>Firing</td><td colspan="3">Variable, but mostly reduced core</td><td>Oxidized</td></tr>
<tr><td>Finish</td><td colspan="3">Well burnished</td><td>Finely polished</td></tr>
<tr><td>Slip</td><td colspan="3">Dark cherry red, some orange-red, expediently applied</td><td>Bright red, orange-red; evenly applied.</td></tr>
<tr><td>Vessel form</td><td>Closed, deep, straight-sided or flaring bowls</td><td>Like CO1, plus rounded bowls, cantaros</td><td>Flat-bottom bowls with flaring, straight or rounded sides</td><td>Shallow open plates, large aryballoids, cups, beakers, pitchers</td></tr>
</table>

Collagua I, II and III ceramics are all similar in terms of surface treatment, paste and firing. In general, Collagua I-III ceramics are covered with a dark or cherry red slip, applied expediently to the all or part of the interior and exterior surfaces, which were then well-burnished. Pastes ranged from semi-compact to compact with various sand, volcanic or feldspar inclusions, and vessels were fired in a reduced environment producing a dark reduced core. Stylistic categories were distinguished based on differences in vessel form and, to a lesser extent, surface decoration. Collagua I vessels consisted primarily of slightly constricted, straight-sided or slightly flaring bowls. When present, surface decoration was located on the exterior surface, typically just below the rim of the vessel, and consisted of a range of curvilinear, geometric and zoomorphic designs executed in black, and occasionally white paint, on the red slipped surface. Collagua II vessels were more included many of the same Collagua I forms, but were generally more open and also included cantaros. Decorated Collagua II vessels typically consisted of thick curvilinear designs executed in black paint just below the exterior rim, and occasionally located below the interior rim of more open flaring vessels. The most common design consisted of thick draping arcs hanging from the rim. Collagua III ceramics consist of more open flaring bowl forms decorated with thick black concentric straight or wavy lines below the interior rim.

Collagua Inka ceramics differ from Collagua I, II, and III ceramics in form, decoration, and slip. While all Collagua ceramics shared similar pastes, Collagua Inka vessels tended to be completely oxidized. Collagua Inka vessels were more open, consisting primarily of shallow open plates, but also including aryballoids, cups, beakers and ollas. The distinctive slip of Collagua Inka ceramics is perhaps their most distinguishing feature—ranging from bright red to orangish-red, and occasionally orange. Overall, these vessels were more finely polished and decorations were more finely executed than Collagua I-III. Decoration consisted primarily of fine concentric lines around the rim, frequently in conjunction with other geometric, curvilinear or representational designs on the interior surface. Decorative elements were primarily done in black paint, but a number of polychromatic designs were also found.

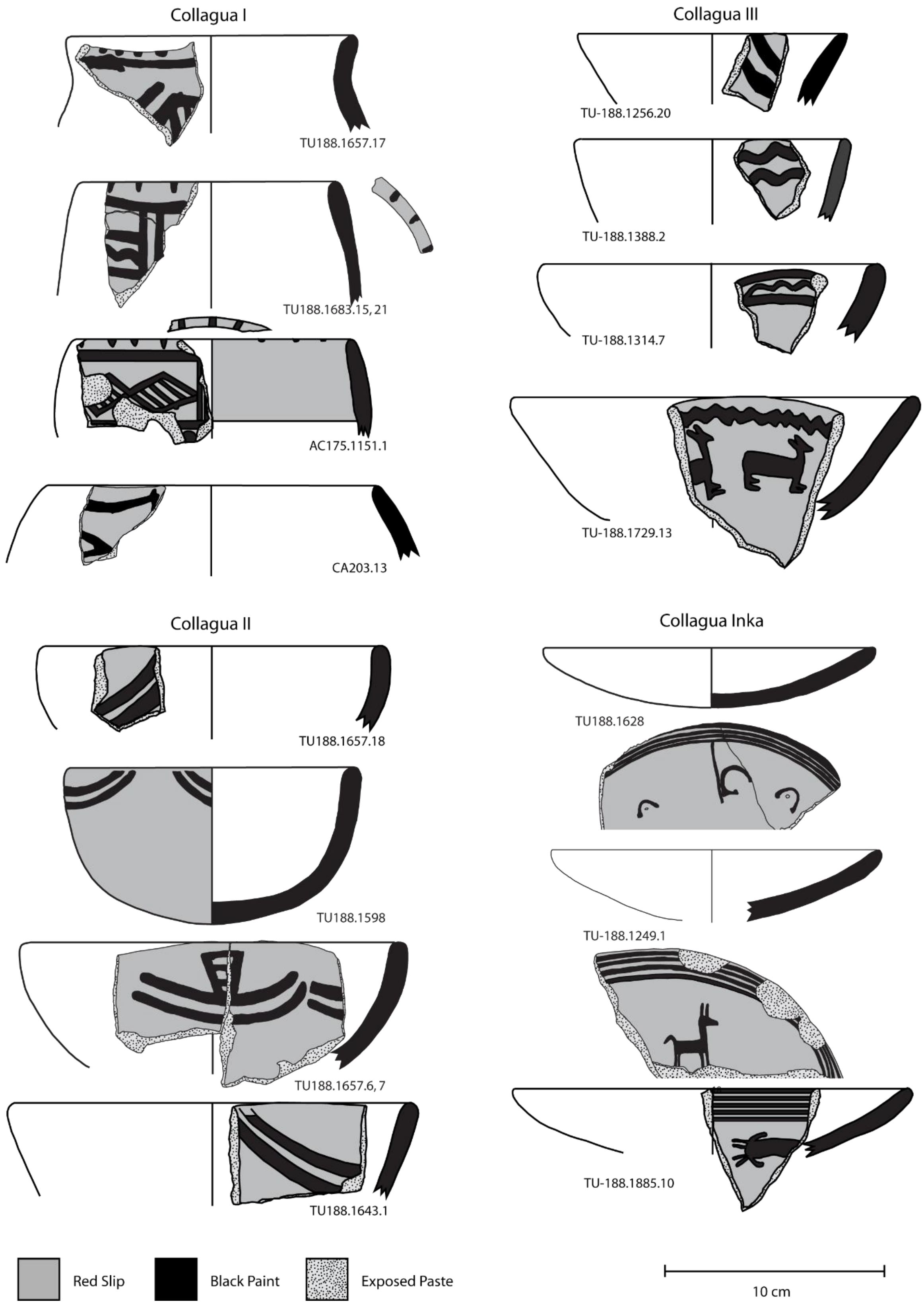


Figure 5.33. Overview of vessel forms and decoration by style.

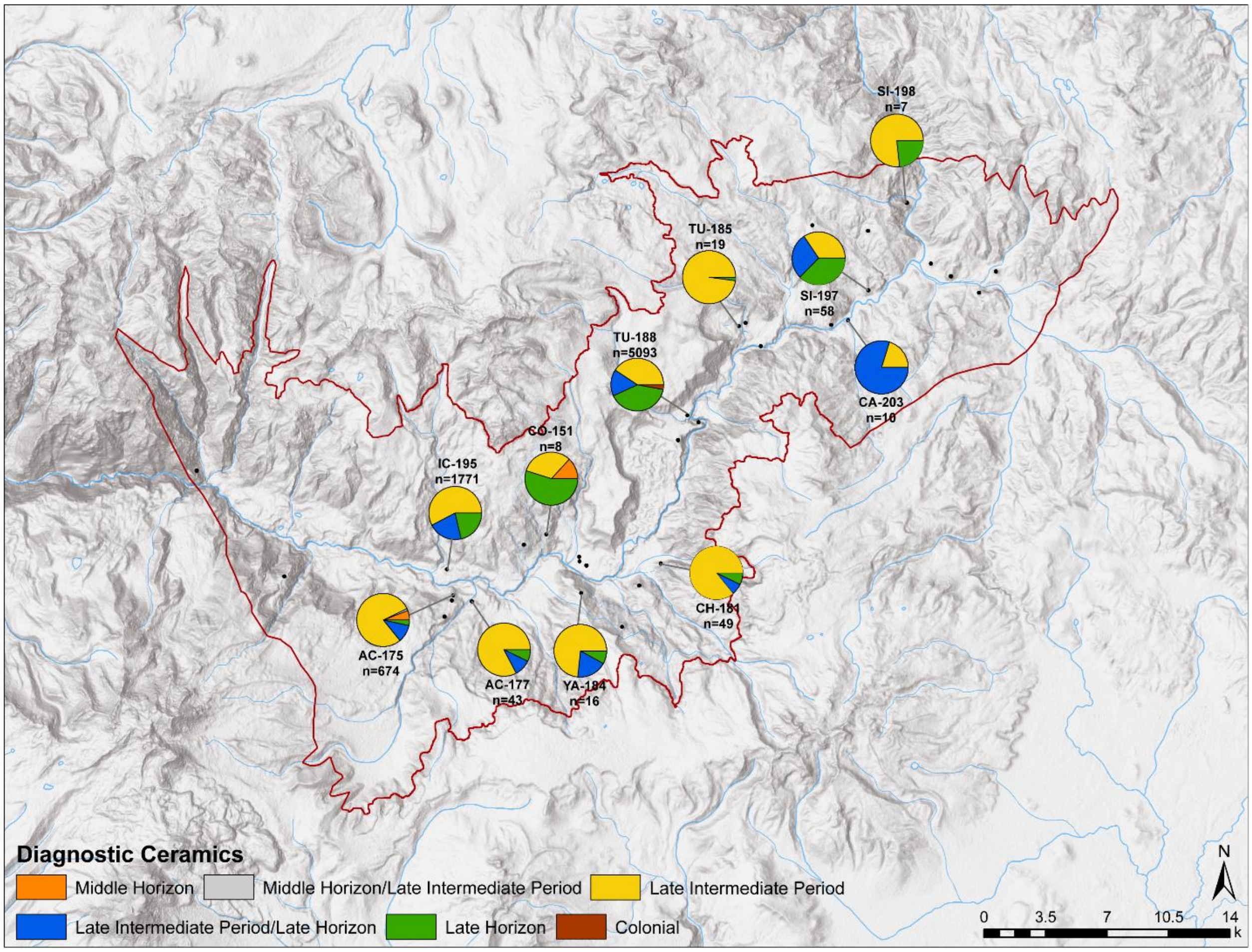


Figure 5.34. Proportions of diagnostic ceramics by period. Only sites with five or more diagnostic ceramics are depicted in the figure.

Late Intermediate Period Ceramics were found at all fortified sites where surface ceramics were present (Figure 5.34). Late Horizon ceramics were also found at nearly all sites (10 of 12) with significant surface ceramics (more than 5 diagnostic sherds). Only four sites (AC-175, TU-188, MD-190, and CO-151) had evidence (though small—at most a handful of sherds) for MH occupation or use. Pending the results of radiocarbon dates, it appears that fortifications in the valley were primarily constructed during the LIP, with a few perhaps showing continuity with some type of MH occupation. Only five of the sites with large enough sample sizes (TU-188, IC-190, CO-151, SI-197, and SI-198) had enough diagnostic LH ceramics to indicate that they continued to be used in any substantial capacity after incorporation into the Inka state. Of these five, four were settlements. Overall, four of the nine fortified settlements appear to have had continuous occupation from the LIP through the LH. This type of continuous occupation across the LIP and LH has been noted in previous studies in the valley (Doutriaux 2004; Wernke 2013), and speaks in part to the significance of fortified sites within the valley. Previous research in the valley found much higher rates of continuous occupation, with nearly all LIP settlements occupied into the LH. With more than half of the fortified settlements deoccupied in the LH, this represents a marked change from other settlement patterns in the valley——a topic that will be explored in greater depth in Chapter 8.

Discussion and Conclusions

The Late Intermediate Period landscape of the Colca Valley was significantly shaped by war. The 33 sites registered during our survey demonstrated a significant orientation towards defense, both in terms of strategic site location and the elaboration of defensive architecture. Defensive sites were found across the central and upper valley and in all ecological zones. The construction of hilltop fortifications in the Late Intermediate Period represents a significant shift from earlier settlement patterns. Only a handful of Middle Horizon ceramics were found during survey and most were recovered from a single site. Thus, the location of these sites was not an outgrowth of prior settlement patterns, but instead deliberately sought out for their intrinsic defensibility.

The extent to which walled hilltop sites reflect defensive concerns in response to warfare—versus serving a symbolic function or a response to changing ecological factors—has been strongly debated (for an in-depth treatment, see Arkush and Stanish 2005). Some scholars have suggested that the walls at hilltop sites may have instead served to delimit ritual space or community boundaries (Dean 2005:167-168; Hastorf 1993:65; Parsons, et al. 1997; Parsons, et al. 2000), pointing out that walls frequently do not fully enclose the area, or appear to be too small to have provided adequate defenses. Others have suggested changing production strategies in response to climate change may better explain the shift to higher-elevation and hilltop sites than warfare or frequent conflict (Bauer and Kellett 2010; Kellett 2010). Still others have suggested the possibility that conflict may have been more akin to *tinku*, a ritual form of fighting, than warfare (Browne, et al. 1993:276; Hastorf 1993; Morris 1998; Parsons, et al. 2000:171-172; Silverman 1993:221, 224). I maintain, however, that a concern for defense is the most parsimonious explanation for the features seen here. Walls recorded in this survey are massive constructions and contain other diagnostically defensive features, such as wall-and-ditch features, limited access points, parapets, and observation posts. Additionally, a shift to more intentensive economic focus on pastoralism, like that argued for the Andahuaylas region (Bauer and Kellett 2010), cannot fully explain the proliferation of wall hilltop sites in the valley. Several hilltop sites appear on natural rises within prime agricultural lands that are otherwise spatially disconnected from the high slopes and puna areas that are necessary for grazing domesticated camelids and clearly indicate they were not positioned to take advantage of pasturage. The sites of Malata (IC-195), San Andres (CH-181), CO-165, CO-167, CO-168, and Choque Mamani (CO-187), are key examples of this.

Finally, a there is bioarchaeological evidence of conflict from the valley. Bioarchaeological analysis of human remains from two chullpas in the upper valley, between the fortifications of Aquimarka (TU-188), Choque Mamani (CO-187) and Pukara (CO-189) documented high rates of cranial trauma (9/18, 50%) (Arkush and Tung 2013; Tung, et al.

2008)(Figure 5.35). Ceramics from the tomb included both LIP and LH styles, however, providing only rough chronological controls for the burials. Additionally, recent bioarchaoelogical analysis of human remains excavated from two chullpa cemeteries in Coporaque found cranial trauma rates of greater than 50% (Velasco 2016b). One of the cemeteries (Yuraq Qaqa) is located along the base of the cliff line just below and to the east of the non-residential fortification of Chilaq'ota (CO-151), and were undoubtedly part of the broader archaeological complex that included the cemetery, the fortification, and the large residential settlement of San Antonio/Chijra (Figure 5.35). Radiocarbon dates from both bone and wall mortar place the tombs squarly in the Late Intermediate Period (Velasco 2016a).

Both the archaeological data presented here, and emerging bioarchaeological evidence clearly indicate that warfare was an important part of the lived experiences of residents in the valley during the Late Intermediate Period. Defensive sites in the valley included both fortified settlements and non-residential fortifications. Non-residential fortifications served several roles in the defenses of the valley. Some likely served as the primary defenses for undefended settlements and pastoralist communities. These sites, however, were also highly visible and provided vast vistas of the surrounding landscape, making them strategic observation points and possible points of inter-site communication. Finally, the location of many of the sites adjacent to prehispanic roads or other points of regional accessibility suggest they were also strategic for monitoring access into and out of the valley, a point that is explored in greater detail in Chapter 7.

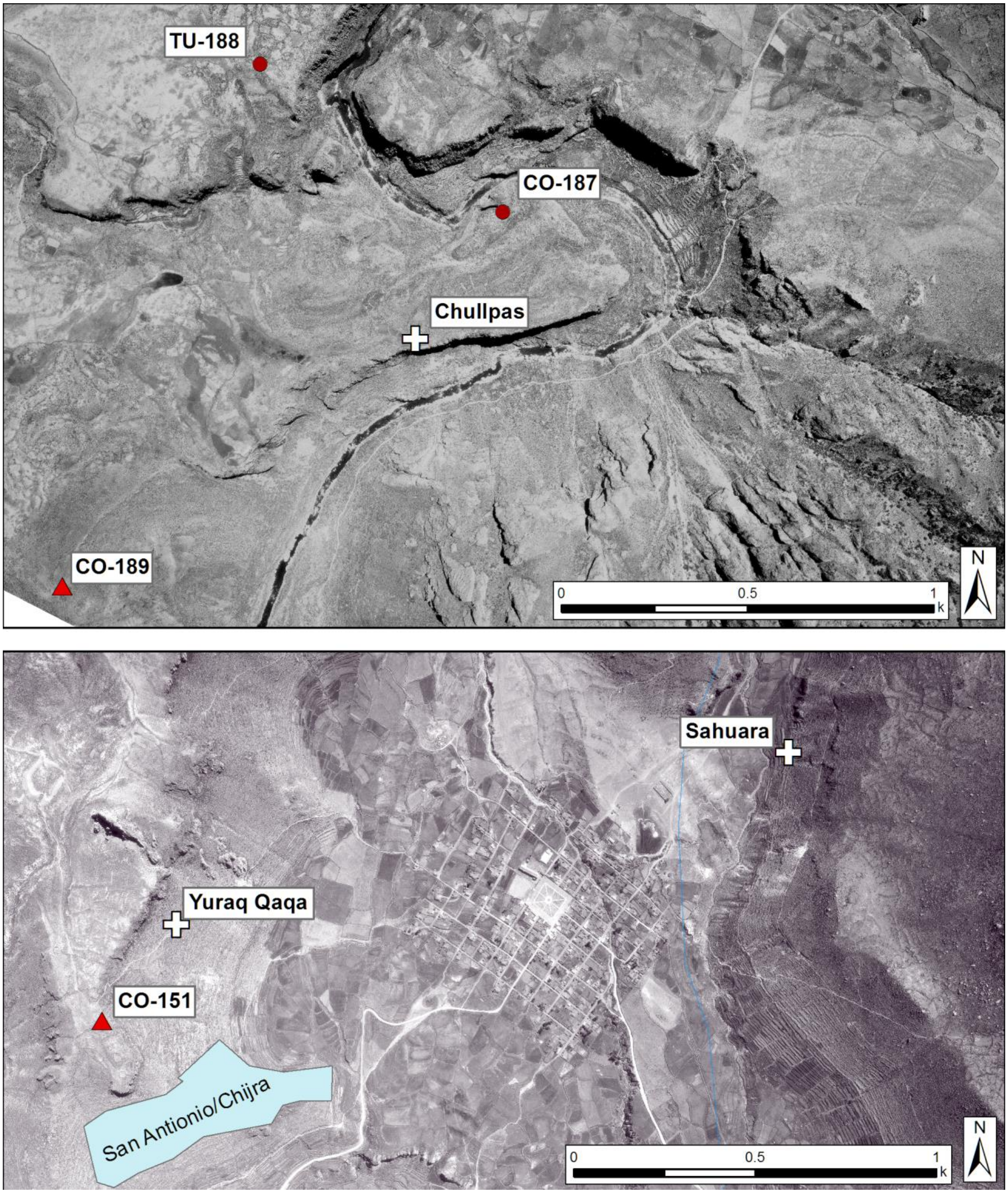


Figure 5.35. Location of burial contexts mentioned, showing relationship to fortifications.

The elaboration of defenses was directly related to the size of the population that built and used the sites. Furthermore, defenses appear to be oriented around the local domestic economy of the local residents and their particular defensive concerns. This suggests that the defensive patterns in the valley reflect decentralized efforts to construct defenses, rather than the centralized execution of a regional defensive strategy. However, sites were also not entirely atomistic. All defensive sites were corporate constructions which required the coordination of labor for their construction, maintenance and use. While some may have drawn from the residential communities that lived in and adjacent to the walls, the majority served groups whose permanent residences were elsewhere. These sites likely required coordination across multiple communities who were drawn together for mutual defense.

Furthermore, many sites were key for monitoring the landscape and supporting local and long-distance communication between sites. Others were situated to control access into and out of the valley. This diversification of defense suggests that while valley defenses were not a centralized defensive apparatus, they were relational; responding to local defensive needs, while also constructed in relation to other settlements and defensive sites, forming an emergent network of defense that linked both local and more distant communities. These topics are taken up in the next two chapters.

CHAPTER 6

LIFE AMONG THE WALLS

Introduction

Scholars have long noted the binding and repelling effects of warfare. Conflict and entrenched antagonisms can drive a wedge between communities, while fortifications, and the broader settlement patterns that result from pervasive conflict, can further reify group differences, by separating communities in both physical and social space. Such durable antagonisms can provide an effective barrier to the formation of broader regional polities, by reinforcing autonomy, limiting exchange, and otherwise preventing the development of the type of cross-cutting ties that are necessary for the development of political centralization and territorial control (Allen 2008; Arkush 2010). However, within these broader divisions, war can also intensify community affiliations.

This chapter examines how war shaped community interaction both within residential communities situated within or near the fortification walls, and those that lived outside them. In this chapter I present data from the detailed architectural mapping and data collection at all sites. I examine the patterns of settlement within the fortified settlements, the organization of household and community-storage, and evidence for stylistic variation and differentiation. Examined together, I argue that fortifications reflect an overall pattern of political decentralized, but one that nonetheless indicates growing status differentiation both within and between sites. The chapter then turns to the question of non-residential fortifications, which comprise two thirds of the sites recorded during survey. These sites were clearly built and used by individuals who lived elsewhere, likely in nearby settlements and dispersed residences. I argue that such non-residential fortifications reflect the important role of defense in generating inter-settlement ties of mutual obligation and support, and also highlight how war shaped the lives of those living within and outside of the fortification walls.

I then describe how fortifications materialized community relationships through corporate projects, individual and collective mortuary architecture, and public gathering space. I argue that corporate projects such as defensive architecture and irrigation infrastructure were themselves monumental and public architectural investments that emerged through self-organization in the absence of political centralization. I further suggest that mortuary practices and public gathering spaces were central to deepening and naturalizing ties within the communities that who relied on each other for defense, engendering a sense of community identity and affiliation that was tied to relationships of kinship and reciprocity. Overall, these defensive spaces reflect how the context of war brought communities together in novel ways.

Residential Fortifications

Many fortifications were not only defensive, but were also places of long-term permanent residence for several or dozens of households. A total of 10 out of 33 fortifications in the valley were classified as residential. These sites ranged from small hamlets with fewer than 10 domestic structures, to very large villages. To a great extent, residential fortifications reflect the broader valley-wide changes in settlement patterns during the Late Intermediate Period—greater nucleation and growing status differentiation (Chapter 3). Settlement nucleation during this period was likely driven at least in part through the increased concern with defense; a concern most directly reflected in the construction of defensive settlements.

Concern for defense motivated residents to seek out strategic locations, resulting in a significant break from the settlement patterns of the preceding Middle Horizon period (Chapter 5). By all indications, most fortified settlements were constructed in previously unoccupied areas. Only a handful of Middle Horizon ceramics were found at fortified settlements and most of these came from a single site (Achomani [AC-175]). Fortified settlements also created a context which facilitated greater interaction and interdependence between households. The largest fortified settlements contained more than 150 domestic structures each and were very densely settled. These nucleated settlements put households in close contact with one another, and the site defenses typically required residents to enter and leave the site through a single entrance. Additionally, defense required the coordination of labor for the construction, maintenance, and protection of the defensive architecture.

Living and Producing

Domestic Architecture

Collagua domestic architecture has been well studied in the region (Brooks 1998:429-430; Guerra Santander and Aquize Cáceres 1996; Malpass 1987; Neira Avendaño 1961, 1990; Shea 1986b, 1997b; Wernke 2013). Many of the characteristics of the local architecture detailed by Wernke (2013:110-115) are reflected in the domestic architecture documented by this study. While Wernke's original documentation of Collagua architecture was based primarily on the central valley region around Yanque and Coporaque, the consistency of these characteristics across the entire surveyed areas of the valley, which includes both the central and upper valley, is noteworthy. Doutriaux's (2004) research in the lower valley also found consistency in domestic architecture, indicating a broadly shared architectural style. House form appears to be the only significant attribute which varies, a point which is discussed in greater detail below.

Collagua houses were single-room structures constructed of selected or worked local fieldstone. The buildings were constructed of double-faced stone walls laid with mortar and a gravel and dirt fill. These structures were typically free-standing, although occasionally two or more abutted. Most structures were either rectilinear or circular in form, although some instances of ovoide structures were found. Rectilinear houses had high gabled roofs, with gables located along the shorter axis of the structure (Figure 6.2). Circular houses, on the other hand, had hip roofs. Some well-preserved rectilinear houses had interior stone supports located high along the gabeled sides, which likely supported a secondary storage area (Figure 6.3). Some structures contained additional features, such as windows or niches. House doorways were tall and narrow, a diagnostic feature of Collagua domestic architecture (Figure 6.1). When preserved, they were slightly trapezoidal in form, with a wider base and narrower top. Doorways ranged from 40-63 cm in width along the base. On rectilinear structures, these were always found centered along one of the long axes of the building.


Figure 6.1. Example of a circular structure with well-preserved doorway.


Figure 6.2. Example of a quadrangular structure. Note the high gable.

Figure 6.3. Rectilinear domestic structure with attic supports at gable.

Previous research has noted that variation in house form broadly corresponds with elevation. In general, quadrangular house forms are found in the lower and central valley, while circular structures predominate in the upper valley. Brook (1998:242) noted this pattern and suggested the different architectural forms might indicate ethnic differences between the two valley areas, noting that the predominance of circular forms in the altiplano and suggesting greater connections between the upper valley the altiplano to the east. In his survey of the Yanque-Coporaque area, Wernke (Wernke 2003:197-199; 2013:128-130) found that all prehispanic quadrangular house structures were only found in the agricultural core of the valley (below 3800 masl). All house structures in the *puna* portions of his survey were circular in form, and these accounted for 70% of all circular structures registered. Wernke suggests these differences are connected to differences in production——agriculturalists constructing and residing in quadrangular houses, and pastoralists in circular houses. Despite the differences in house form, both structure types have the tall and narrow doorways which are diagnostic of the local Collagua architectural tradition. Thus, Wernke suggests that the circular structures may be local variations of regional Altiplano/puna house forms, given the greater ties between the pastoralist communities to that region.

Similar spatial distributions of structure forms were observed in the present survey—quadrangular structures are overwhelmingly located in areas below 3800 masl, while circular structures are predominately located above 3800 masl. There are two notable exceptions, however. At Auqimarka, structures of both forms were found in roughly equal proportions. Here, our test excavations suggest that circular structures were used as storage and cooking structures within patio groups that also contained one or more quadrangular structures used used as primary residences (Chapter 8). However, the structures tested were almost certainly constructed in the LH, and it is possible that circular structures predominated during the LIP.

A second exception comes from the site of Choque Mamanai (CO-187). The site is located in the upper valley, in very close proximity to Auquimarka (TU-188) and Pukara (CO-186), but occupies a unique location along the edge of the Colca River. Although the site is located just over a half a kilometer from Auqimarka, it is 220 meters lower in elevation. The defensive architecture occupies a small hilltop deep in the ravine, while the domestic architecture is concentrated on the southern hillside, and domestic architecture and agricultural terraces along the north side. According to local informants, the unique geography of the ravine keeps it significantly warmer than the surrounding area, making even maize production possible. Extensive terracing along the north side of the river suggest that agriculture was particularly important to the residents. The predominance of circular structures at this site, despite its lower elevation (3683 masl) and the likely agricultural focus of its residents is a exception to the overall pattern in the valley.

During his survey of the Yanque-Coporaque area, Wernke analyzed 654 structures and developed a six-type classification of domestic architecture in the valley, drawing attention to the variation in masonry styles. While there are specific canonical features of the domestic architecture in the valley (high gables on quadrangular structures, and tall narrow doorways), variation in structure form and masonry style reflect the heterogeneity of household economic practices and status. Thus, close examination of domestic architecture at the fortified settlements provides one avenue for examining how household economies and status were materialized through the built environment.

Given the palimpsest of LIP, LH, and often colonial occupations at most settlements (both fortified and not) in the valley, it has remained difficult to isolate specific periods of occupation. The excavations presented in chapter 8, for example, clearly show major rebuilding associated with the later Inka occupation of the site. Although this example is from only one site, I suggest that at least at sites with higher Inka architectural investment, standing architecture likely reflects predominantly Late Horizon patterns, rather than the addition of new structures through time. Survey data from the few sites in the valley with occupations limited to the LIP, the same architectural canons were in use, demonstrating continuity in local building traditions through time. However, overall residential areas from these few examples are less densely occupied, indicating that population densities grew through time. Thus, the settlement densities for residential sites used through the LH and/or colonial periods likely do not provide accurate estimates for the extent or density of the earlier LIP occupations. This topic is taken up in greater detail in Chapter 8.

Masonry Style, Structure Size, and Status

As discussed above, there are many general characteristics of domestic architecture which were consistent across the valley during the late prehispanic period. However, not all houses were created equal. Houses varied both in terms of size, elaboration, and masonry—differences which point to the growing status inequalities throughout the late preshipanic periods. To understand evidence for status differentiation expressed through domestic architecture, I follow the a seven category typology of masonry style and quality, corresponding to differences in the labor input needed for the shaping of the stone and construction of the structure developed by Wernke (2013)(Table 6.1; Figure 6.4). Within this classification, Type 1 masonry consists of unworked fieldstone of various shapes and sizes, set uncoursed in mortar. Corners and wall headers consisted of undressed stone, and the structures lack header and stretcher rows. Type 2 masonry consists of more uniform fieldstone, again set uncoursed, but with dressed corners, doorways and wall heads. Type 3 masonry presents similar quality corner, doorway and wall head dressings to type 2, but with roughly coursed walls. Masonry types 1-3 all represented low to medium labor input for domestic constructions. By contrast, types 4-7 all represent higher labor inputs of three distinct styles. In all cases, these structures were comprised of carefully selected fieldstone with uniform in size and color, which were dressed and coursed with minimal mortar. Doorways, wall heads, and corners were finished with finely dressed stones. Type 4 structures had distinctive facades comprised of coursed split rolled river boulders, laid with the fractured side facing out, often with the remaining three walls constructed in a fashion similar to Type 2. Type 5 masonry was comprised of thin tabular slabs, laid in fine courses. Type 6 masonry is comprised of finely coursed rectangular or ovoid blocks which have been worked to create a uniform brick-like façade. Finally, type 7 masonry consists of fieldstone which has been selected and worked for uniform size (similar to type 3), but has been laid in fine courses of alternating color or of decorative bands of color.

Table 6.1. Masonry typology for late prehispanic domestic structures. Adapted from Wernke 2013.

Type	**Description**	**Labor input: shaping**	**Labor input: construction**
1	Unworked fieldstone of varying size, shape and color, no coursing, rough corners and heads	Low	Low
2	Some worked/selected fieldstone, no coursing, dressed corners and heads	Medium	Medium
3	Worked, coursed fieldstone, dressed corners and heads	Medium	High
4	Coursed split river boulder façade, dressed corners and heads	Medium	High
5	Coursed tabular worked slabs, finely dressed corners and heads	High	High
6	Coursed rectangular worked blocks, finely dressed corners and heads	High	High
7	Worked fieldstone with belt courses of alternating color, finely dressed corners and heads	High	High

Type 1

Type 2

Type 3

Type 5

Type 6

Figure 6.4. Examples of masonry types identified during survey.

In the present study, detailed architectural data was collected from a total of 560 structures in the survey. Of those, a total of 332 (59%) were classified as domestic structures during survey, and 275 (83%) of those were sufficiently well-preserved to classify the masonry type (Table 6.2). Five of the seven masonry types were present in sites in the survey; types 4 and 7 were not present. Wernke's original work found both of these masonry types were very rare and found almost exclusively at the site of Uyu Uyu. Type 4 made up only 1.8% of his survey and all but one example was from Uyu Uyu, while only four examples of type 7 were found and all were at Uyu Uyu. Additionally, Doutriaux (2004:239) found no examples of type 4 or 7 masonry in her survey of Cabanaconde and Lari, which suggests that these types may have been a particularly localized style.

Table 6.2. Structure counts by site

Site	Domestic structure count	Masonry type determined
Achomani (AC-175)	33	29
San Andres (CH-181)	9	9
Pukara Killa (TU-185)	6	0
Choque Mamani (CO-187)	24[3]	24
Auquimarka (TU-188)	79	69
Malata (IC-195)	161	141
Pukarilla (SI-197)	16	1
Paraq'ra (SI-198)	22	0
Markarani (SI-199)	2	2
CA-203	1	0

[3]The structure count for Choque Mamani (CO-187) only includes those located in the fortified sector.

Table 6.3. Masonry type by site.

Site		Masonry Type					Total	Median	Mean
		1	2	3	5	6			
Achomani (AC-175)	Count %	5 17.2%	3 10.3%	5 17.2%	2 6.9%	14 48.3%	29 100%	5	4.1
San Andres (CH-181)	Count %	9 100%					9 100%	1	1.0
Choque Mamani (CO-187)	Count %	24 100%					24 100%	1	1.0
Malata IC-195	Count %	65 46.1%	43 30.5%	10 7.1%	15 10.6%	8 5.7%	141 100%	2	2.2
Pukarilla (SI-197)	Count %	1 100%					1 100%	1	1.0
Markarani (SI-199)	Count %	2 100%					2 100%	1	1.0
Auquimarka (TU-188)	Count %	28 40.6%	17 24.6%	2 2.9%	21 30.4%	1 1.5%	69 100%	2	2.6
Total	Count %	134 48.7%	63 22.9%	17 6.2%	38 13.8%	23 8.4%	275 100%	1	2.1

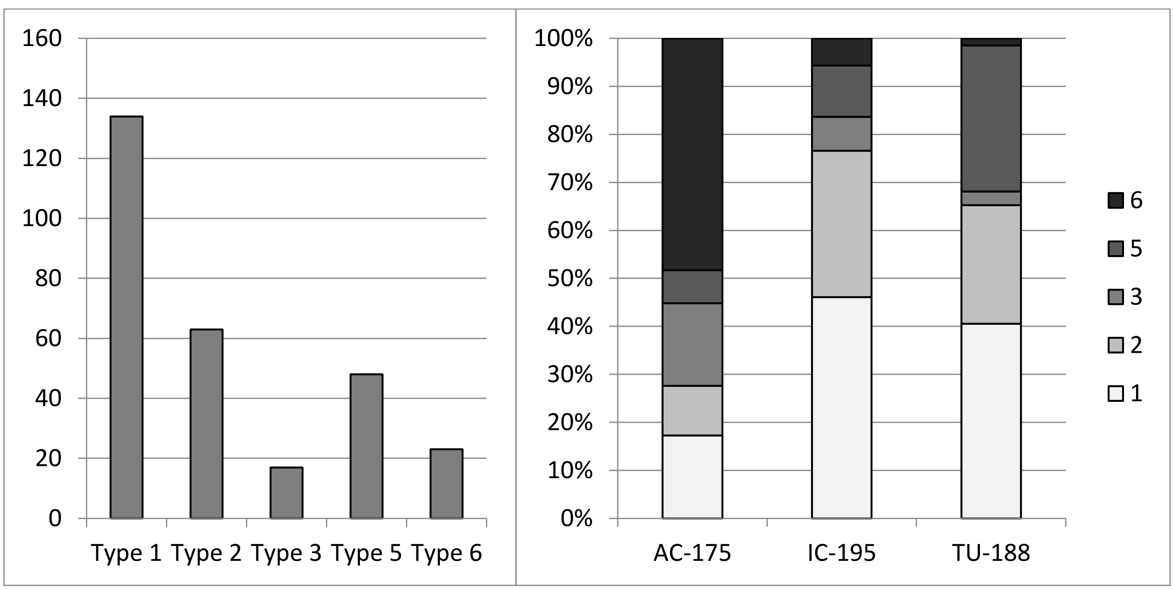


Figure 6.5. Left: Masonry type frequency across all settlements; right: proportion of each masonry type at the three largest settlements: Achomani (AC-175), Malata (IC-195) and Auquimarka (TU-188).

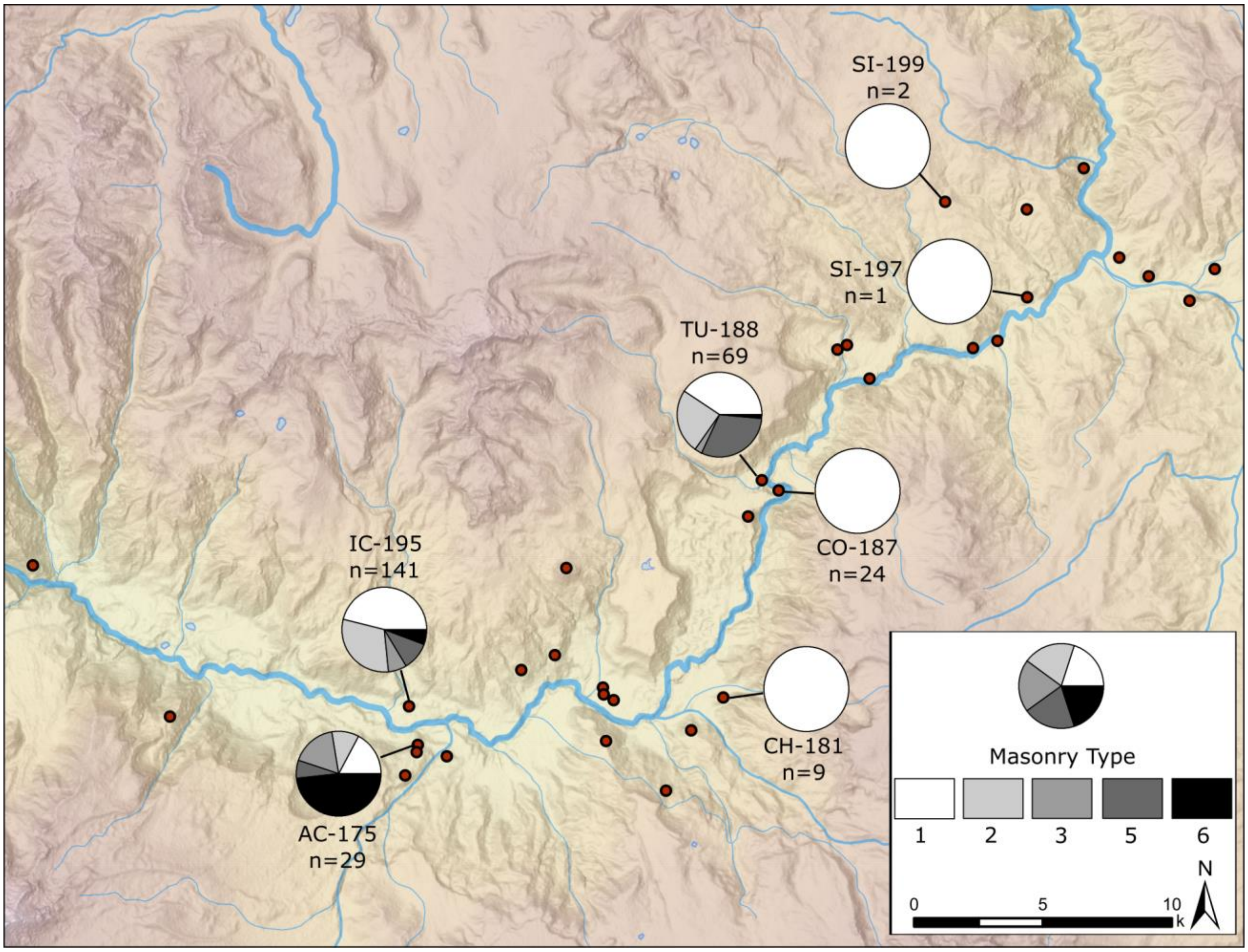


Figure 6.6. Proportion of masonry type by site.

Nearly half of all structures (48.73%) were of type 1 masonry, while the fine masonry styles (types 5 and 6) comprised one quarter of the sample (24.9%). Most of the residential fortifications (4 of 7) contained only Type 1 masonry. Only the sites of Achomani (AC-175), Malata (IC-195) and Auquimarka (TU-188) had any variation in masonry type (Figure 6.5). Among the three, the site of Achomani stands out in terms of the ratio of high-status structures to low-status structures. More than half (55.2%) of the domestic architecture was classified as either type 5 or 6, indicating higher investment in shaping and construction.

While both the thin tabular type 5 masonry, and the blocky type 6 masonry are more labor intensive styles, they also appear to reflect stylistic and material choices which varied across sites (Figure 6.7). At Auquimarka, 30% of structures were classified as type 5, but these structures accounted for more than half (55.3%) of all type 5 architecture registered during survey. Similarly, the type 6 structures at Achomani accounted for 61% of all type 6 masonry in the survey.

A total of 332 domestic structures were sufficiently well preserved to take measurements. All measurements were taken from the interior of the structure to capture the total living space. The average structure size was 19.1 m^2, and most structures were less than 30 m^2 in area (**Error! Reference source not found.**). Interior house area varied significantly with house form. The average interior area for circular houses was 9.74 m^2, while the average for rectangular houses was 22.37 m^2, a significant difference (Welch two sample t-test t=-13.1761, df=321.952, p<2.2e-16).

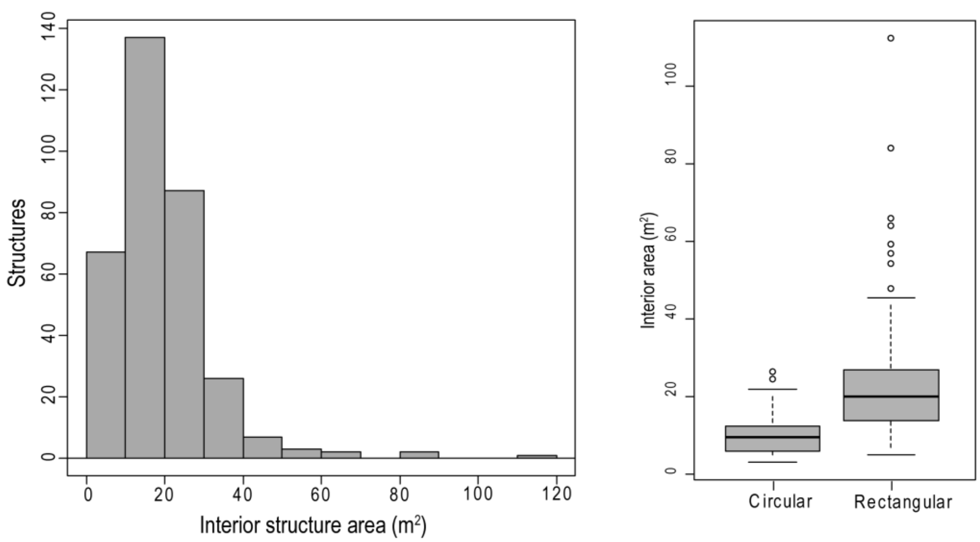


Figure 6.7. Interior structure area for all structures (left), and by structure plant (right).

Masonry type and interior house size were correlated—with the average house size significantly larger the finer the masonry type (Spearman's rank correlation, S=2212667, p=2.333e-15, rho 0.4442299). In his survey, Wernke found a similar pattern, with the exception of masonry type 6. This led him to suggest that this tabular style may have been a later type, expediently built using corner stones from earlier buildings—thus giving the illusion of effort in shaping. In our survey, type 6 masonry was found primarily at the site of Achomani (AC-175), and to a lesser extent at the site of Auquimarka (TU-188). In both cases, the masonry type correlates with larger structure footprints. Notably, at Achomani, we found a burial cave located at the base of the hilltop, which also had evidence of quarrying and likely provided stones for many of the finer structures. While the largest structures were classified as having type one masonry, the correlation between house size and masonry type held true within house form categories, suggesting that masonry type and house size do provide a relevant measure of household status (Figure 6.8). Variation in masonry type and structure size reflet overall patterns of growing status differentiation across the valley during the late prehispanic period. Domestic architecture reflects differences both between and within settlements. There was little variation between domestic structures at most small and medium sized fortified settlements, with smaller and less finely worked masonry overall. At larger settlements, domestic architecture was more heterogeneous, reflecting differentiation within the settlements. Additionally, the presence of larger, finely executed structures suggests the presence of a growing elite segment.

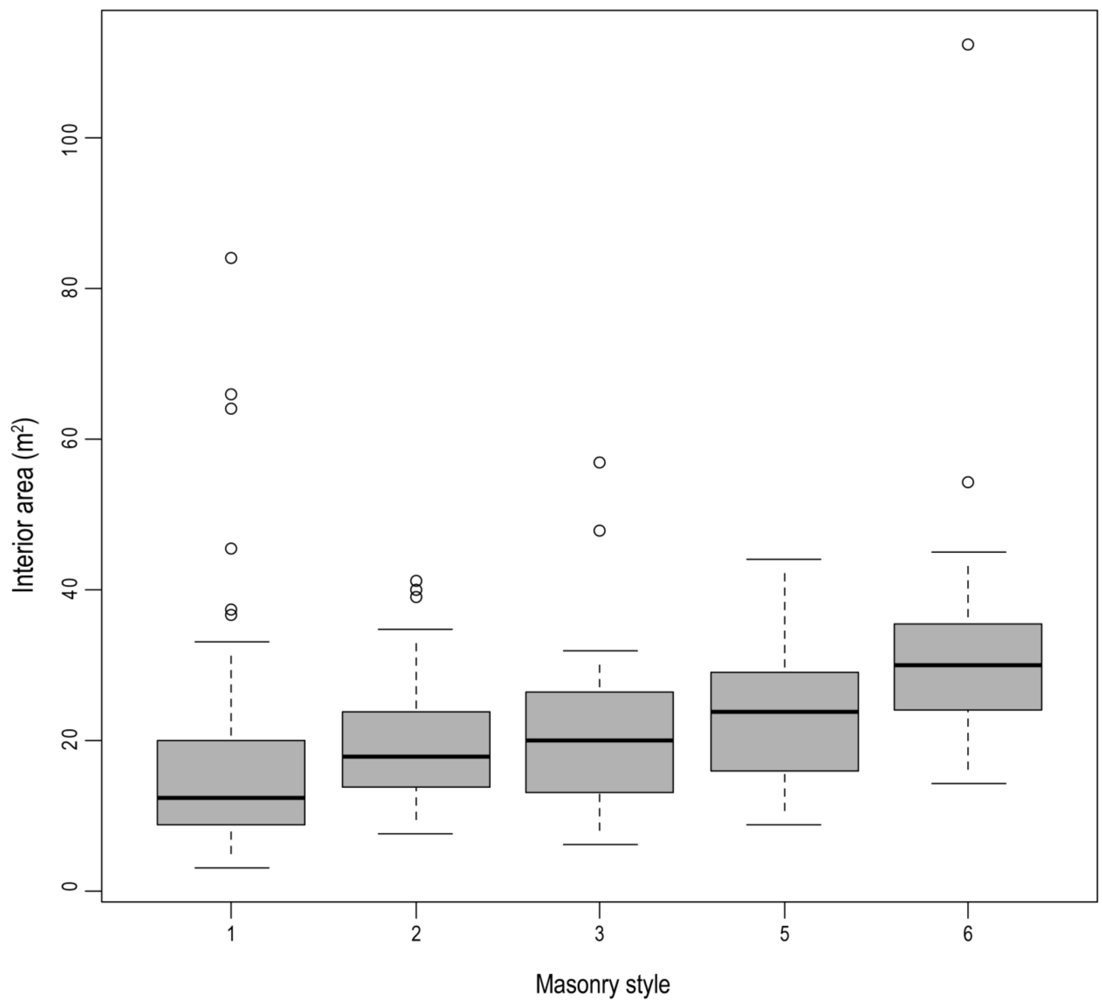


Figure 6.8. Interior structure size by masonry style. Includes only the 275 structures for which both structure size and masonry style were observable.

Site Organization and Planning

There is no evidence of centralized planning in the organization of households within residential fortifications. The major defensive architecture at each site was built idiosyncratically, following the local topography of each site. Houses were situated either singularly or in small grouping of 2-5 structures, often delimited by small patio walls. Overall, domestic structures were placed to accommodate the site's topography, taking advantage open or relatively level areas, or constructing small residential terraces to provide a level building surface. As elaborated in Chapter 5, all hillforts took advantage of natural rises, cliff faces and steep slopes, and defensive walls were built to enhance the inherent defensibility of the site. The topography of the site also impacted the placement of residential areas relative to the defensive architecture. Residential areas were more frequently found outside of the defensive walls (6 of 10); at only two sites was all domestic architecture located within the defensive walls, and the remaining two had architecture both within and outside of the defensive walls. The specific configuration appears to have been dependent on the topography of the site area. In two of the four contexts where the structures were located within the defensive walls, the sites were located on promontories (AC-175, TU-188). In these cases, walls were only required along one edge of the site, while the natural slopes and cliff faces provided protection for the remaining site perimeter. In the case of Pukara Killa, the domestic architecture is encircled by a circular perimeter wall, but here the hilltop appears to have been sufficiently large to contain the small number of structures at the site.

In most contexts, particularly where domestic architecture was placed outside of the defensive walls, houses and patio groups were arranged in a way which would have allowed for movement throughout the site, but apparently without the need for more formalized roads or pathways. In cases where residences were placed within fortification walls, the placement of wall entrances and the placement of residences created a more limited set of pathways, particularly if one intended to access the most interior parts of the site. At Achomani, for example, with the exception of the outermost defensive wall, all walls had only one access point. As one moves toward the interior of the site, each wall is successively closer to the subsequent wall, creating a increasingly more prescribed path through the site. The only formalized pathways were found at Auquimarka, where a narrow north-south pathway was clearly delimited by retaining walls to the east and west (Figure 6.9). But even here, the formalized pathway only extended to the middle of the fortified sector. Beyond that, individuals would have had to move through the patio spaces and house clusters to access other portions of the site.

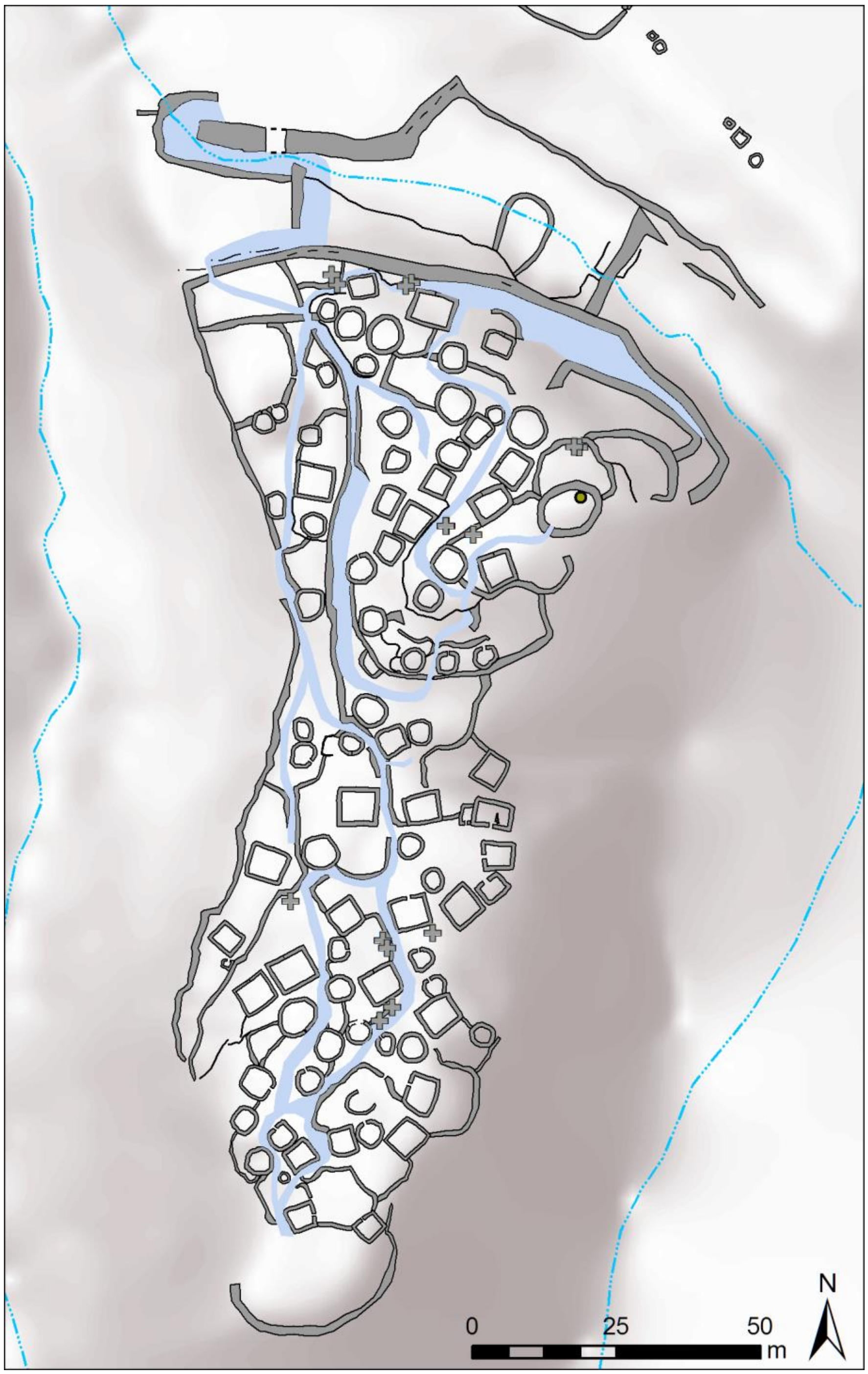


Figure 6.9. Map of pathways through the site of Auquimarka (TU-188).

Storage

At fortified settlements, storage was typically maintained at a household level, however, two examples of settlement-level storage were found. Analysis of building diameters for circular structures in the survey reveals a natural break in the interior structure diameter, such that structures with up to 10 m^2 interior area were classified as storage structures, and the remaining as domestic structures. Excavations at Auquimarka generally support this classification. Excavated contexts within structures of this size found no evidence for hearths or other features that would suggest that they were used for cooking or as sleeping quarters. Storage structures consisted of quadrangular or circular structures either abutting the short end of a domestic structure, or free-standing.

Identification of storage structures during survey was based on size and provides only a preliminary means for classification. However, it does provide an initial avenue for examining how storage was organized within domestic groups and settlements. In general, probable storage structures were found dispersed throughout the residential areas at fortified settlements. Likely storage structures were often found within defined patio groups, suggesting that resources were primarily managed at a household level, rather than a site level (Figure 6.10).

Figure 6.10. Map of sector I residential area at Auquimarka (TU-188) with likely storage structures indicated in black.

Two examples of probable community-level storage were found at the site of Achomani (AC-175) and Choque Mamani (CO-187). At Achomani, a large rectangular platform is located along a narrow ridge, to the north of the core residential portion of the site (Figure 6.11). The platform is massive—5.3 m wide, 19.2 m long, and up to 18 m tall—with a stepped access in the approximate center of the eastern side. On the surface of the platform, we identified six sub-surface deposits; one rectangular in form and the remaining circular in form. The deposits are lined with coursed stone. They were three meters in diameter on average and anywhere from 0.7 to 1.3 m deep. A small niche was observed on the interior of one. Prior reconnaissance in Achoma by Shea (1986a) noted the presence of this structure at Achomani, and a similar one at the near-by site of Potosina, a non-defensive LIP-period site, and suggested they could have served as either deposits or burial structures. Our reconnaissance of the structure found neither human remains nor fragments of serving vessels, which are typically found in and around looted mortuary contexts, providing support that the structure likely served as a deposit.

The second example comes from the site of Choque Mamani (CO-189) which occupies a rocky hilltop situated at the banks of the Colca River un the upper valley. Here the valley, the river cuts a particularly deep ravine—approximately 200 m deep—and has limited accessibility from the surrounding upland terrain. The unique location of this site, with an elevation of approximately 3700 masl, and its close proximity to the river produces a unique microclimate where more extensive and diversified cultivation is possible, Terraces flank the slopes of both sides of the river gorge, and many of them continue to be cultivated (Figure 6.13).

The defensive site itself occupies a small rocky hilltop circled by three defensive walls. At total of 29 structures were identified within the defensive walls of the site, with another three just outside the walls and adjacent to the primary entrance to the sector (Figure 6.12). With the exception of 11 structures within the innermost defensive wall, these are free-standing circular structures, primarily located along the eastern side of the site. At the apex of the site, the innermost defensive wall is lined with eleven irregularly-shaped structures. The structures abut the defensive wall, most forming groups with doorways that open to the interior of the space.

The interior areas of the structures within the defensive sector range from 1.3 to 23.8 m^2, with an average of 7.8 m^2. The structures within the highest defensive wall are larger, averaging 12.1 m^2, while the free-standing circular structures average only 5.5 m^2. The small size of the structures, their close configuration, and the absence of patio walls indicates they were not domestic in nature. Additionally, the absence of human remains or concentrations of finely decorated ceramics in or around these structures, suggests they were not mortuary structures. Thus, they are tentatively believed to be storage structures. The distinct forms (circular vs. and mostly abutted and roughly rectilinear), may indicate distinct functions that were not identifiable through surface survey. However, the small size of these structures (average diameter 2.6 m) still indicates they were not living structures.

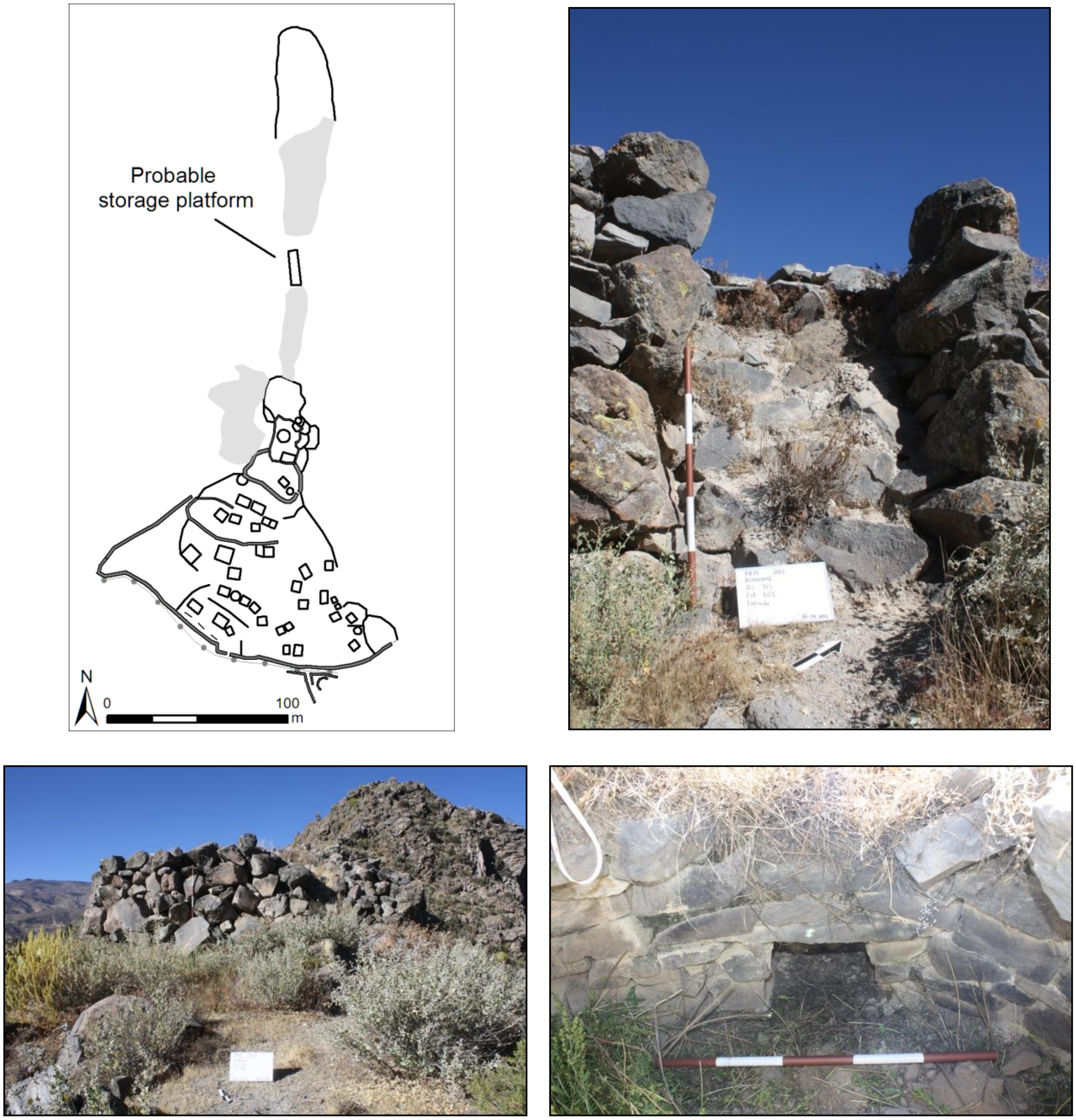


Figure 6.11. Probable collective storage structure at Achomani (AC-175). Clockwise from top left: plan map of Achomani with location of platform indicated; access to platform from the east; view of platform from the north; interior view of one of the cists.

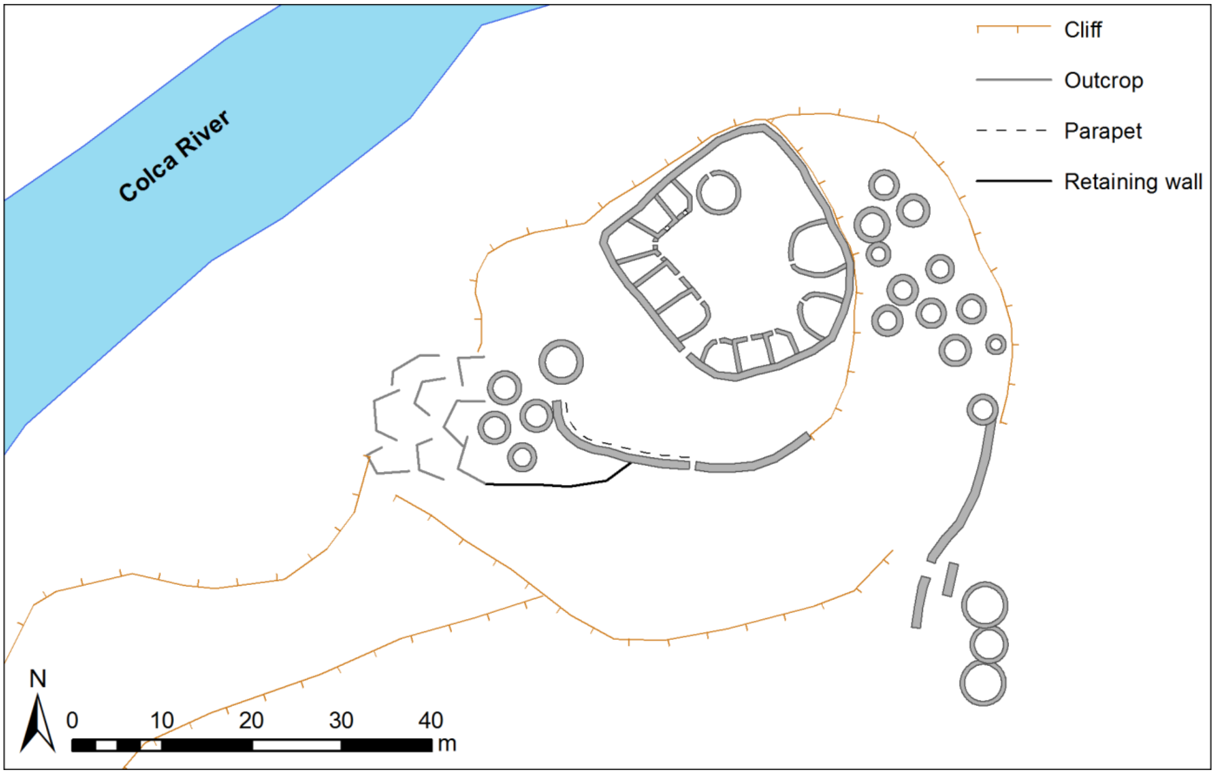


Figure 6.12. Defensive sector at Choque Mamani (CO-187).


Figure 6.13. View of the location of Choque Mamani (CO-187, indicated with arrow). Note the agricultural terraces on the slopes in the left side of the frame.

Producing

Fortifications were found in all the major ecological zones within the survey area and were nearly equally distributed across the central and upper valley, indicating they were important for both agriculturalist and pastoralist communities. However, the upper valley had more than twice as many residential fortifications (7 compared to 3 in the central valley), suggesting the need for permanent, full time fortification was even more important in the upper valley. Residential fortifications were also far more likely to be located in the suni, and to a lesser extent puna, ecological zones, suggesting that they may have been especially important for pastoralist communities. This complicates some interpretations of LIP warfare, which has frequently emphasized raiding for stored agricultural goods. The importance of fortification, especially residential fortification, in higher elevations suggests that if raiding was a frequent mode of conflict during the LIP it may have been directed toward animal resources, rather than agricultural resources. This makes sense—agricultural products, such as grains, would have been stored in large sacks and ceramic vessels, making them very difficult to transport. Successful raiders would have needed to bring their own pack animals to transport any booty from the raid. Livestock on the other hand, would literally transport themselves once captured.

This is not to say that protection of agricultural resources wasn't a concern. The largest residential fortifications were located around core agricultural areas. Malata (IC-195), the largest residential fortification, is the only fortified settlements located in the kichwa ecozone (Figure 6.14). The two next largest residential fortifications—Auquimarka (TU-188) and Choque Mamani (CO-187) are both located in and around a unique upper valley agricultural micro climate which provided conditions which were able to support the production of maize and other traditionally lower valley crops. Finally, Achomani (AC-175), a medium sized residential fortification, was located just above the juncture between the kichwa and suni ecozones. In general, agriculturalist settlements are larger and more sedentary, whereas pastoralist communities tend to be smaller and more mobile, which would explain why there were fewer and larger residential fortifications in key agricultural areas, and more and smaller residential fortifications in pastoralist areas. Thus, the variation in the location of residential fortifications appears to have more to do with the relationship between economic focus and population size, rather than differences in risk.


Figure 6.14. Location of Malata (IC-195), viewed from the south. Note the extensive agricultural terracing surrounding the site.

Non-Residential Fortifications

Fully two-thirds of the fortifications recorded had no year-round, permanent residential population. As discussed in Chapter 5, nonn-residential fortifications served a number of uses, including temporary defensive refuge, monitoring outposts, and inter-site communication (Chapter 7). Compared to residential forts, non-residential forts were more visually prominent, had larger viewsheds, and were located in areas which were more naturally defensible. Structures were present at several of these sites, however, most were very small, and the lack of cultural materials indicates they were not used for an extended period of time. The site of Pumachiri (CO-158), for example, contains approximately 100 small circular or ovoid structures (Figure 6.15). These, however, appear to be windbreaks or temporary shelters, rather than permanent residence. Several sites had one or two isolated structures (typically circular), which may have been used as temporary housing for individuals on active watch in the area. Thus, it is clear that if the sites were intended to protect a population, it did not house a permanent population. The predominance of non-residential fortifications speaks to how war shaped settlement across the valley, not just in fortified settlements. While residential fortifications were likely constructed and supported by their resident groups, non-residential fortifications almost certainly served multiple small settlements and isolated households. Their construction thus relied on coordination across multiple, dispersed households and communities thus extending relationships of mutual dependence.


Figure 6.15. Windbreak at Pumachiri (CO-158).

Building and Using Non-Residential Fortifications

If non-residential fortifications did not have a permanent resident population, then who built and used these sites? And were they intended to support a single community, or did several settlements coordinate labor and share the defensive space? Some non-residential sites were clearly associated with large unfortified LIP settlements (Chapter 5), and may have been used primarily by residents of the near-by settlement. Other non-residential sites, however, were likely built, used, and maintained by households from several near-by settlements.

Drawing on Wernke's (2003, 2013) full coverage survey from the Yanque-Coporaque portion of the central valley, provides one way for approximating the groups who may have used the fortifications. Path distance analysis was used to determine the walking time from each non-fortified site to the nearest fortification. The results show that within this portion of the valley, all sites were located within about a one hour walk from a non-residential fortification, and most were reachable in fewer than 40 minutes (Figure 6.16).

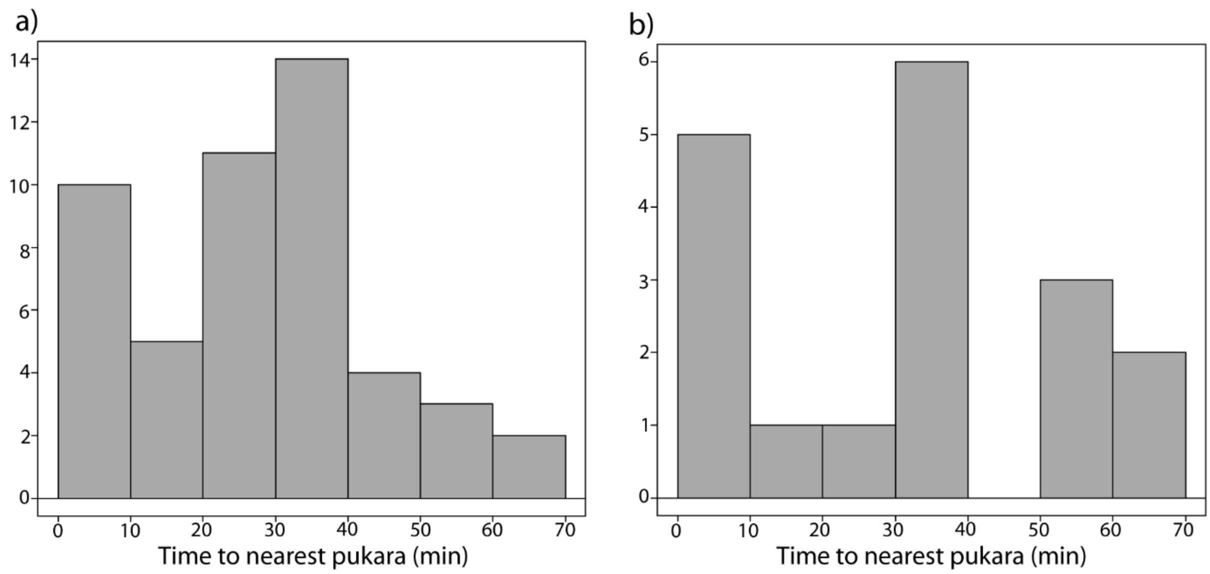


Figure 6.16. Time to nearest pukara from a) all unfortified sites (n=49); b) non-fortified settlements (n=18). Data for non-fortified sites drawn from Wernke 2013.

In Figure 6.17, the results of this site catchement approach are modeled spatially, showing the non-fortified sites in relation to its nearest pukara. This provides a general sense of the populations who likely built, maintained and used the fortifications. Overall, it indicates that fortifications, especially non-residential fortifications, were not the result of efforts by autonomous villages, each in conflict with one another. Rather, these were corporate efforts, likely coordinated across multiple villages and serving the defensive needs of those villages.

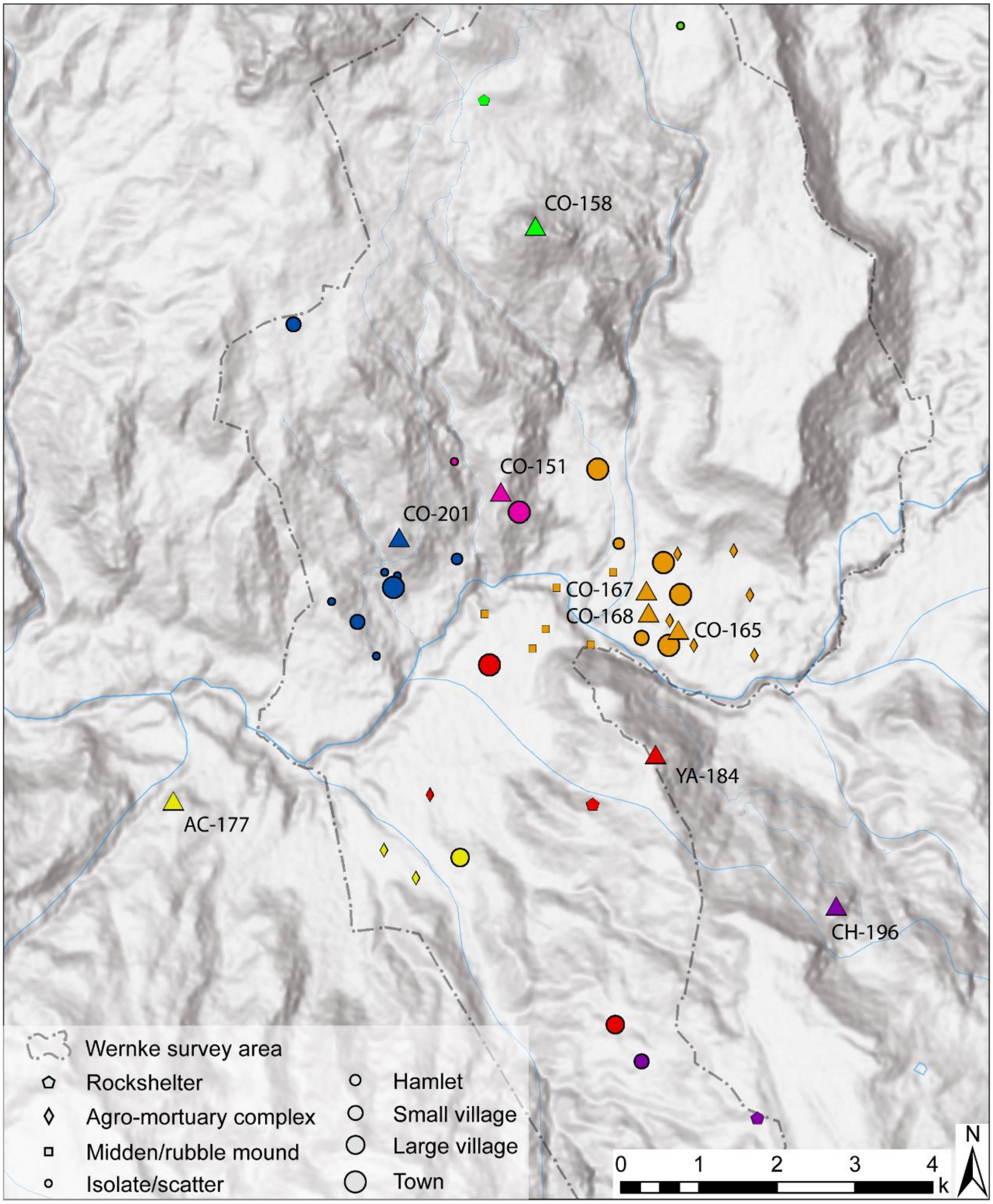


Figure 6.17. Map of the Yanque-Coporaque portion of the central valley. Fortifications are indicated with triangles. Unfortified sites are color coded to correspond to that of the nearest fortification based on walking time. Data for non-fortified sites from Wernke 2013.

Corporate Projects, Gathering Spaces, and Ritual Places

Scholars have frequently noted a general absence of LIP-period public or monumental architecture across the highland Andes (Covey 2008; Parsons and Hastings 1988), especially when compared with the preceding Middle Horizon states of Wari and Tiwanaku, and the subsequent Inka state. The lack of public architecture is generally interpreted as a reflection of the flattened social hierarchies and weak political centralization. However, an emphasis on ritual or administrative centers—or lack thereof—ignores the perhaps subtler and idiosyncratic spaces and practices which defined public life during the LIP. Furthermore, the dichotomization of public/private and integration/fragmentation has limited our ability to understand the ways in which people were brought together during the LIP. In the Colca Valley, I suggest that the practices and spaces which brought together LIP communities in the valley were in many cases intimately tied to defensiveness.

Corporate Projects

Defensive Architecture

Defensive architecture represents one of the largest and costliest (both in terms of materials and labor) corporate projects undertaken in the region during the LIP. Defensive walls in particular, were massive constructions—up to 5 meters thick and often reaching more than 3 meters in height. The investments in defensive architecture were coordinated at a supra-household, and at times a supra-settlement scale. At fortified settlements, defensive construction would have likely drawn primarily from the residential population. By contrast, non-residential fortifications likely drew labor from multiple nearby settlements. By all indications, this coordinated labor was not mandated or executed by political authorities, given that political institutions were neither centralized nor hierarchical (Chapter 3).

At fortified settlements, defensive architecture was likely constructed by the residents of the site, and perhaps drawing upon labor from near-by isolated households as well. Non-residential fortifications were clearly constructed by communities who lived elsewhere. While some of these sites appear to have been directly linked to major unfortified LIP settlements, they also likely served several communities. In fact, drawing on survey data from Wernke (2013), non-residential fortifications had 4 nearest neighbor settlements, and these settlements were all within approximately one-hour walking time. The labor required for the construction and maintenance of fortifications, not to mention the manning and defense of those walls, would have provided a context for regular and sustained interaction between households living in fortified settlements, and those living in various non-fortified settlements. Particularly in the context of non-fortified settlements, the construction and maintenance of the defensive outposts would have provided an important space for sustained interaction across settlements.

Irrigation Infrastructure

Agricultural infrastructure in the valley expanded significantly during the LIP (Brooks 1998; Denevan 1988; Treacy 1989; Wernke 2013). The expansion of irrigation agriculture required significant investments in infrastructure, including the construction of terraced fields and importantly irrigation canals to capture and transfer snow melt and spring water from higher elevations. Irrigation networks in the region rely on long feder canals to carry water from the springs, revines and claciers above the valley (Chapter 3; Figure 6.18). While irrigated terrace fields were likely constructed and maintained by the households who worked the fields, the irrigation canals were corporate constructions which were built and maintained through the collective labor of the various households and communities who relied on the water to sustain their fields. Today in the valley, the maintenance of irrigation canals is a major *faena* (collective work festival), requiring all households who use the canal to send an individual from the family to participate in the annual cleaning of the canal, along with additional support in the form of food and other provisions, usually provided by female members of the household (Gelles 1990; Guillet 1987, 1992; Treacy 1994; Wernke 2013). The annual canal cleaning culminates in a festival, which includes food, music and alcoholic beverages.

The extensive canal system not only required cooperation in their construction and maintenance, but also would have required significant negotiation between households and communities to manage access to the water. Households with fields located lower in the network were dependent upon their upstream neighbors for water. Additionally, the canal systems often changed the natural course of the rivers and streams. Wernke (2013) provides a clear example of this for the central valley, where one of the primary canals took water away from fields above the modern village of Coporaque and diverted to the western fields above the prehispanic settlement of Uyu Uyu. This was true of all the major canal systems that have been mapped. Also on the north side of the rver, the Qachulle canal, which irrigates fiels around Pampa Finaya in Coporaque, draws water from a tributary that otherwise flows east toward the fortified settlements of Auquimarka (TU-188) and Choque Mamani (CO-187) (Figure 6.18). On the south side of the river, the Huarancante canal, a significant source of water for the fields around the village of Yanque crosses severa major quebradas providing irrigation water to fields around Chivay, including San Andres (CH-181), and Juscallacta (Figure 6.19). This reengineering of the water systems in the valley certainly necessitated negotiation between all parties situated within the same watershed.

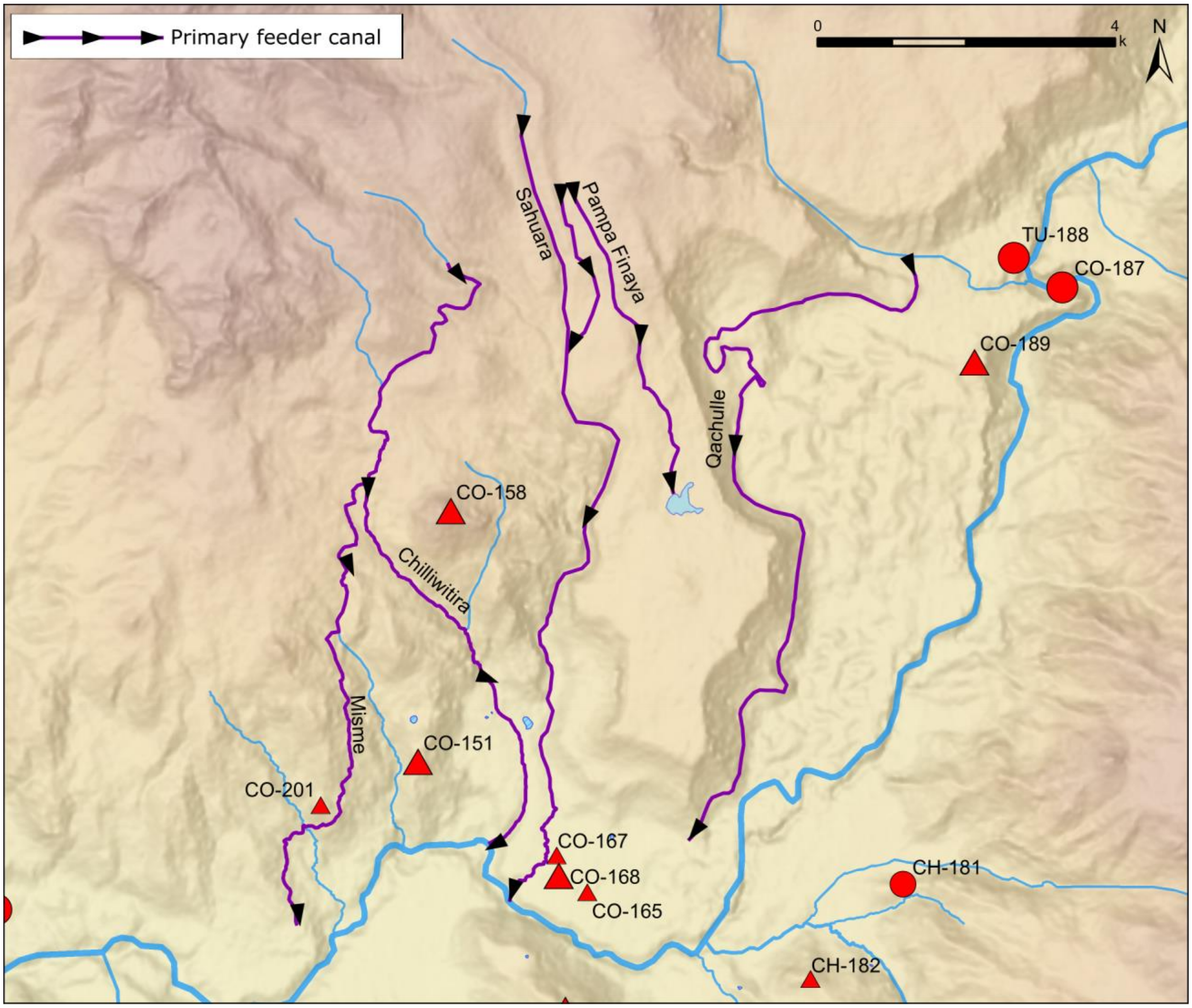


Figure 6.18. Primary feeder canals on the north side of the river around Coporaque. Redrawn from Wernke 2013:122.

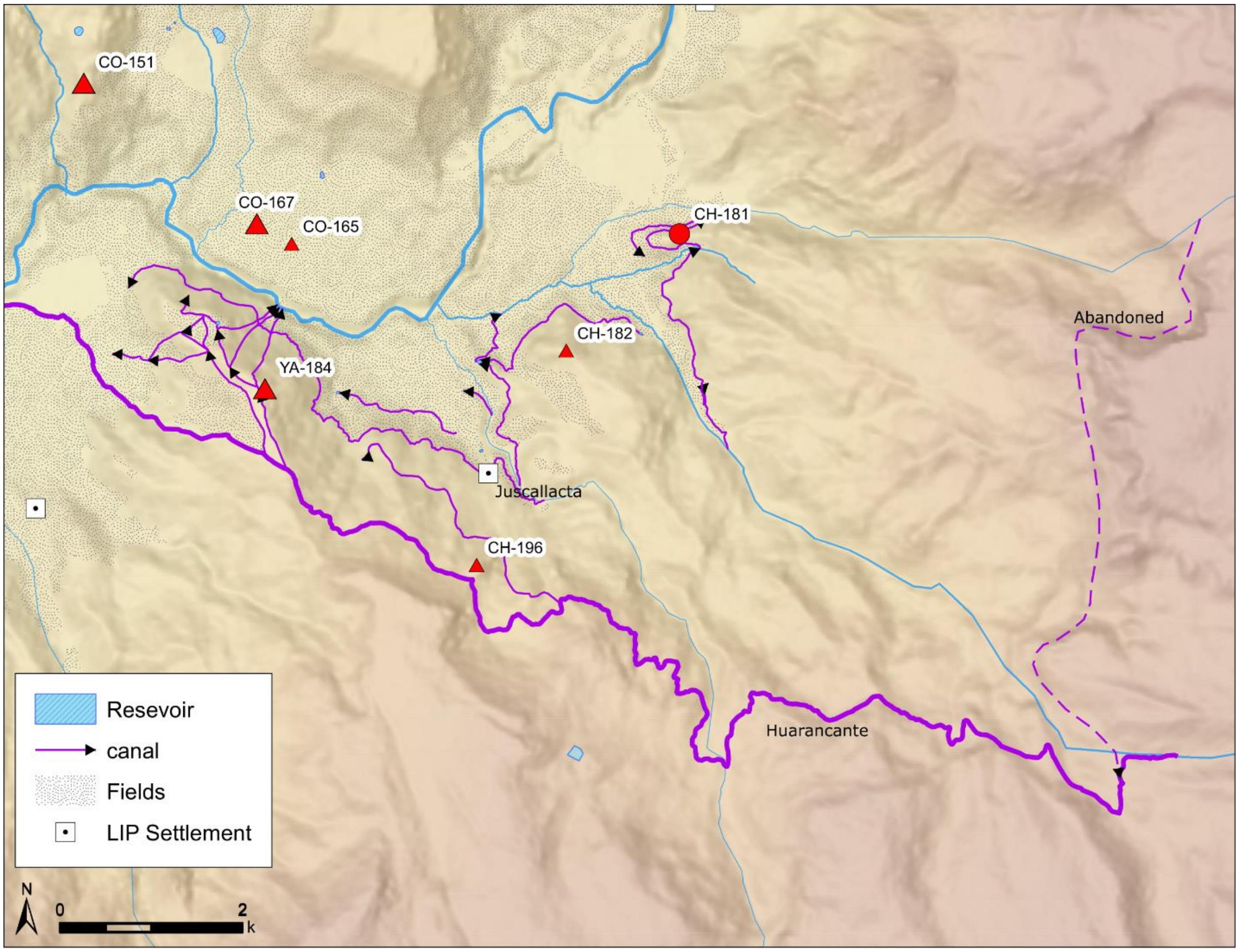


Figure 6.19. Route of the Huarancante canal on the south side of the river.

The significance of water management was materialized in the form of stone megaliths called *maquetas*, which appear to have been carved to model the various fields and canals of the valley. These stone carvings show horizontal terrace fields which are transected by vertical canals, and sometimes include reservoirs. The maquetas appear to have been designed to model the flow of water, allowing one to pour liquid from reservoirs or water sources at the top and watch the liquid pass through the various canals. Maquetas were found at or near several fortified sites, primarily in the central valley where most of the agricultural fields in the survey area are concentrated. At the site of Pallaqlle (YA-184), a large maqueta sits on the road from the Yanque to the site (Figure 6.20). A second maqueta sits within one of the defensive walls. The association between agriculture and fortifications is especially clear at the site of Fortaleza de Chimpa, where dozens of maquetas are located in and around the fortified site (Figure 6.22). The maquetas at the site vary in both size and elaboration. It is unclear why so many maquetas were located around this specific site.

While canal networks, particularly in the central valley, created systems of interdependences between settlement, it was also likely a source of tension. Water access continues to be a crucial source of tension between neighboring communities. In 1971, tensions over water access between the neighboring communities of Yanque and Coporaque led to a battle between the two communities fought at the contested juncture in the canal system, and ultimately resulted in a death by slingstone (Benavides 1997). The frequent association between maquetas and fortifications in the central valley could suggest that water access was a key motivation for conflict. However, as I discuss in Chapter 9, while local conflict over resources, such as water, may have erupted into violent confrontations, it does not appear to have been the primary motivation for fortification contruction. As shown above, many field areas surrounding fortifications shared water sources, or were linked along the same long feeder canal. Intractible conflict over water access would have likely resulted in greater territorial divisions throughout the canal network.

Figure 6.20. Large maqueta on the path outside Pallallqlli. Photo by Enmanuel Choque.

Figure 6.21. Maqueta from Malata (IC-195), which appears to represent the quebrada which can be seen behind it to the north.

Figure 6.22. Large grouping of maquetas outside of Fortaleza de Chimpa (MD-190). Photo by Enmanuel Choque

Burials

The defensive walls not only linked households and settlements through mutual defensive need, they also connected the living inhabitants to the past through the close association between defensive walls and burials. Burial architecture was found in and around many of the fortified sites in the valley, including both residential and non-residential forts. Several types of mortuary architecture were present in the valley during the LIP, including above-ground burial structures (commonly referred to as *chullpas*), subterranean stone-lined tombs, and cave burials. All three forms were found at defensive sites in the valley and appear to be roughly contemporaneous. Chullpas in the valley have been dated to at least as early as the early Late Intermediate Period (roughly 1100-1300 CE) (Velasco 2016a), and LIP Collagua ceramics were found associated with both subterranean tombs and cave burial contexts during surface collections. Looting of mortuary contexts is common across the valley, and all burials found during survey were looted contexts. The lack of clear association between interred individuals, mortuary treatment, and burial goods makes it impossible to directly address the significance of burial architecture. Additionally, both subterranean cists and above-ground structures (such as *chullpas*) were known to be used for both burials and for storage of grains and other goods. While concentrations of decorated serving vessel fragments were found in association with them in some cases, human remains were not always present. Thus, it is impossible to conclusively say whether these structures were used for storage or burial. However, as Neilsen (2008) points out, such functional dichotomies are largely artificial, and these architectural forms were used for both burial and storage.

Subterranean Tombs

Subterranean cists were found throughout the valley. In general, these structures consisted of stone-lined subterranean cists, typically around 1.5-2 m in diameter, and approximately 1-1.5 m deep. Most appeared to be only one layer deep, however a couple of examples of multi-level tombs were found at Malata (IC-195) (Figure 6.23). In this case, the lower tomb had been capped with a stone slab creating a floor for the subsequent burial. These tombs likely contained only a single burial, consisting of an individual in a flexed position, wrapped in cloths and basket materials.

Subterranean tombs were found associated with defensive walls, within residential areas, and in distinct cemetery groupings. Cist tombs associated with defensive walls were located along the interior of the wall. In these locations, the tombs were found either singly or in close pairs, as in the cases at Auquimarka (TU-188). Tombs were also found clustered in moderately-sized cemeteries set apart from the primary domestic areas. Three examples of cemeteries were found; two at Malata (IC-195), and one at AC-175. In all cases, cemeteries were located in prominent locations. At Malata, the cemeteries were located on natural rises, and at Achomani, a small cemetery was located on the artificial platform at the apex of the site within the most interior defensive walls. A smaller number of cists were found within the domestic areas, often adjacent to domestic structures or along patio walls. No burials were found inside of house structures during our limited excavation.

Figure 6.23. Cist tomb from Malata (IC-195).

Chullpas

Chullpas refers to a broad class of above-ground burial structures. In the valley area, chullpas are constructed of local fieldstone, and mortar with double-faced walls. Though not observed in this survey, remains of plaster and red pigment have been found on the interior surfaces of some well-preserved examples (Wernke 2003:228), and many were likely covered in plater and paint on the exterior walls.

Figure 6.24. Two well-preserved chullpa with cornices at Auquimarka (TU-188).

Figure 6.25. A circular chullpa from Auquimarka (TU-188).


Figure 6.26. Abutting chullpas beneath a rock overhang at Pukarilla (SI-197).

Chullpas can be free-standing structures, but were also often constructed in groups which shared walls, creating separate chambers, often developed through time over the course of several building phases (Velasco 2016a). A majority of chullpas found during survey were free-standing structures. Examples of abutting chullpas were found at Pukarilla (SI-197) and Fortaleza de Chimpa (MD-190) (Figure 6.26). Circular chullpas were more common within the survey area, but both rectilinear and circular chullpas were found and there were no discernable differences in their spatial distribution (Figure 6.24 and Figure 6.25). At sites with both circular and rectangular style, chullpas of each form appeared in roughly equal numbers. At the site of Auquimarka (TU-188), for example, pairs of chullpas—one rectilinear and one circular—were located next to one another (Chapter 8). Within this survey, chullpas were frequently found either on natural rises, or adjacent to cliffs, using the face as a posterior wall. Overall, chullpas were designed to be visually-prominent. Unlike cist tombs, chullpas were collective burial chambers which would have held many individuals.

At some sites, such as Achomani (AC-175) and Malata (IC-195), chullpas were located near the defensive walls of the site, marking the spaces as both defensive and mortuary. At other sites, chullpas were more dispersed, occupying more peripheral areas of the site.


Figure 6.27. Burial cave at Achomani (AC-175).

Caves

Several cave burials were found in association with defensive sites in the valley. These caves were naturally occurring spaces, often modified to some degree, either opened through quarrying of stone, or sometimes with the addition of small fieldstone walls to further enclose the space. At Achomani (AC-175), a large burial cave sits along the western base of the large rocky promontory upon which the core residential and defensive architecture was constructed. The cave, which also likely served as a quarry for the stones used to construct the residential architecture at the site, contained numerous individuals, along with fragments of textiles and ceramics. Other burial caves, such as those associated with Fortaleza de Chimpa (MD-190) and Pachamarka (MA-183) were also located near the bases of the rocky hilltop promontories occupied by the defensive architecture, but were located at a greater distance from the sites.

Discussion of Burial Architecture

Within fortifications in the valley, there was important variation in both burial type (chullpa vs. cist vs. cave), but also the location of those burial places. We did not collect the type of data that would provide detailed information on the relative chronological or status differences between burial contexts within the sites, however, some broad observations and suggestions can be made.

It is possible that burial variation in burial architecture is related to changes through time. The limited data does suggest that burial styles changed from the LIP to the LH, however, all three burial styles were almost undoubtedly used contemporaneously in the LIP. In the southern highlands and altiplano, chullpa burial structures likely date to sometime in the Late Intermediate Period (Sillar 2012). The only radiocarbon dates for chullpas in the valley come from Matt Velasco's work on a complex of chullpas in Coporaque, which are located in an escarpment only 140 m from the site of Chila'qota (CO-151). Dates from burial architecture and human remains date their construction to somewhere between 1100 and 1300 CE, which places this burial architecture firmly in the LIP (Velasco 2016a). By contrast, cist burials likely have greater antiquity, having been widespread throughout the MH. Systemic surface collections at Malata (IC-195) found high concentrations of LIP serving wares in the two cist tomb cemeteries at the site, and almost no Late Horizon ceramics in these areas. While it seems possible that cist tombs fell out of favor in the LH, both cist and chullpa burials coexisted in the LIP. Our reconnaissance of the cave contexts revealed a mix of LIP and LH ceramic styles, suggesting they were used across both periods. A second possible chronological component to burial styles was also suggested by our data. While chullpa burials undoubtedly date to the LIP, the distribution of circular and rectilinear forms of freestanding chullpas varies. The only examples of rectilinear chullpas were found in site that had LH components, which could suggest they were a later expression of burial architecture developed after Inka arrival in the valley.

Given the contemporaneity of all three burial styles, it is possible that they represented either status differences or referenced particular kinship structures. Cist tombs, chullpas, and cave burials represent successively more collective forms of burial. Within the Colca Valley, cist tombs are often found interspersed within the residential core of the sites, while chullpas are more spatially isolated from the domestic core (Wernke 2003:225-234). Additionally, chullpas were designed to be visually prominent, occupying natural rises and often painted bright red providing a stark contrast with the surrounding landscape. By contrast, cist tombs were only marked on the surface by the stone slabs which covered them. In part, the visual prominence of chullpas has led some scholars to suggest that these structures served as visual boundary markers, broadcasting the inclusivity of the deceased residents in contrast to an external other (Mantha 2009). In this sense, it is argued that chullpas are a manifestation of a group identity through the placement of key ancestors within the structure. The suggestion here is that chullpas may have housed the key apical ancestors of a kin group. In nearly all cases, chullpas appeared in multiples; only at the site of CA-191, a large non-residential fortification, was only a single chullpa found at the site. Thus, separate kin groups may have maintained separate chullpas.

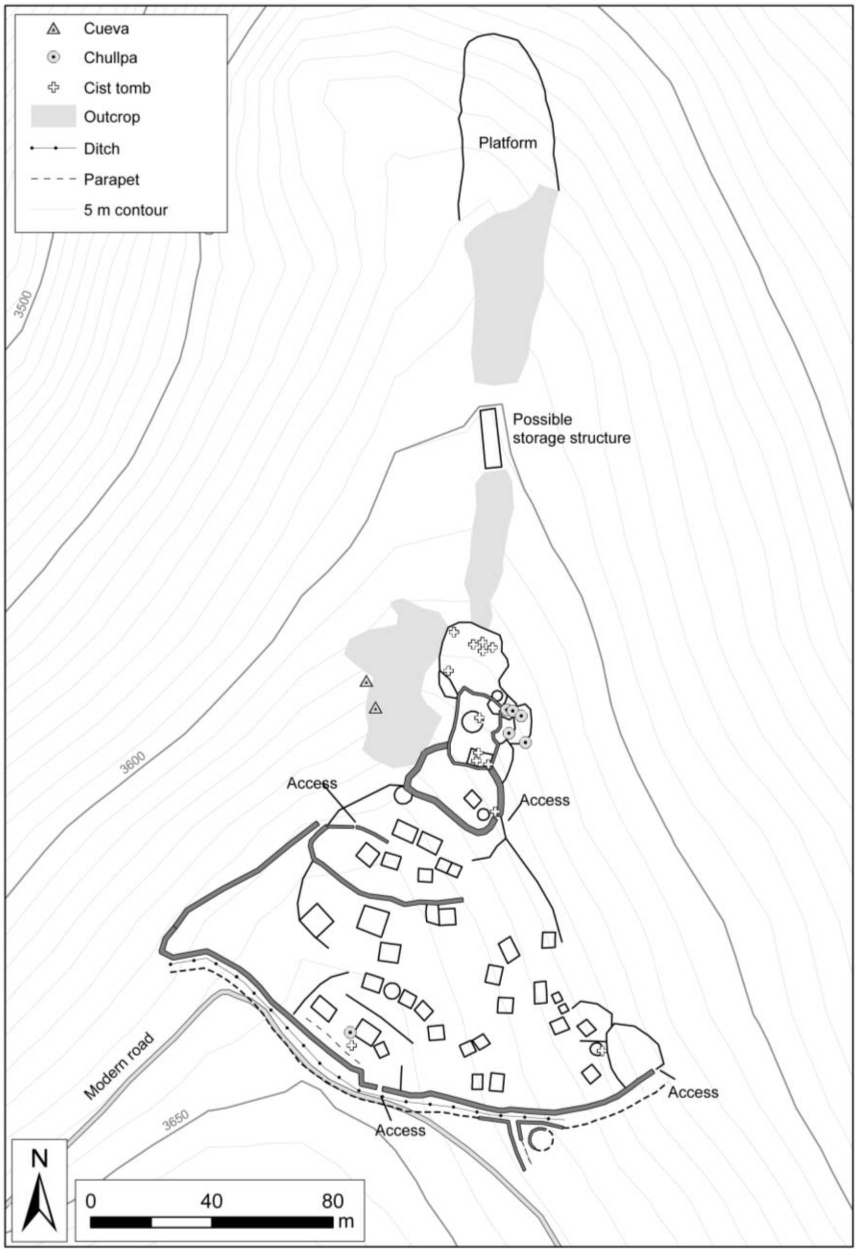


Figure 6.28. Plan map of Achomani (AC-175) showing the distribution of the three forms of mortuary architecture at the site.

At the same time, burial space was not the only factor. While cist tombs were the only burial type found in and around the household context, they were also found in clusters forming cemetery spaces, and in significant places such as along the defensive walls of the site. Thus, it appears that not only were certain burial spaces reserved for specific classes of individuals, but certain burial places were also reserved for significant individuals. Given the coexistence of burials located in different architectural contexts within the same site, it is clear that individuals who were buried in association with the defensive walls represented a distinct class of individuals. The close association between mortuary architecture and defensive walls has been noted in other areas across the Andes (Buikstra 1995, Moseley 1990, Nielsen 2009). It is possible that those spaces were reserved for military individuals, perhaps ones who had a special leadership role, or had performed especially valiantly during a battle. It is also possible that these were spaces reserved for more distant or apical ancestors. In either case, the individuals buried along the defensive walls represent individuals who had broader significance for the community who used the fortification.

In addition to the cist tombs along the defensive walls, cave burials and chullpas were also intimately tied to the defenses of the site. The burial cave at Achomani, for example, was constructed into the western base of the rocky promontory which protected the site's living residents, while a series of chullpas flank the eastern side of the same promontory. I argue that these spaces of veneration and commemoration represent the ways in which local communities actively sought to inculcate and naturalize defensive communities through kin relationships and practices of commemoration, thus reflecting more explicit practices of community affiliation.

Gathering Spaces

While it is true that when compared with the LH, there is limited evidence for constructed spaces for public ritual, these types of spaces were not entirely absent from LIP fortifications. At most sites, the defensive walls not only provided protection from threats, but they also helped to define open spaces which could have been used as gathering areas for commensal and public events. While the production of these spaces may have been more incidental than intentional, the fact that these spaces were left open, even as similar spaces were filled in with houses to accommodate growing populations, suggests they were purposefully left open. At both Auquimarka (TU-188) and Pukarilla (SI-198), the broad, flat, open spaces just exterior to the fortification walls, may have provided an important gathering space when there was no conflict (Figure 6.29).

In addition to these accommodated spaces, a few specific examples of intentionally-constructed spaces were identified. At Achomani (AC-175), a large, artificially-leveled platform was located to the north of the primary residential and defensive core. The platform was encircled by a small double-coursed wall, further defining the space and delimiting access to it.

The defended hilltop spaces of the fortifications appear to have held special significance. Aside from the defensive walls which encircled the space, these peaks were typically devoid of any standing architecture. The frequent presence of cist tombs within these spaces speaks to their importance to the resident populations. However, perhaps the clearest indication of their role in the public or ritual lives of the population is the frequent placement of rectilinear platforms within these spaces. There are four examples of rectilinear platforms located at the apex of the hilltop—Achomani (AC-175), San Andres (CH-181), Malata (IC-195), and Markarani (SI-199) (Figure 6.30). The platforms are typically defined by a single course of stone, worked into fine blocks (approximately 50-80 cm thick) (Figure 6.30). While none of these structures were excavated, the interiors of the platforms were likely filled and leveled, perhaps given a prepared floor. It is possible these structures were likely later additions to the site, probably added following Inka colonization of the region; possibly a local nod to *ushnu* platforms. Even so, their placement within these heavily defended spaces speaks to their broader ritual significance, which was likely tied to, but was not limited to the defensibility of that space.

Figure 6.29. View of the defensive sector at Pukarilla (SI-197). Note the open area outside the defensive walls.

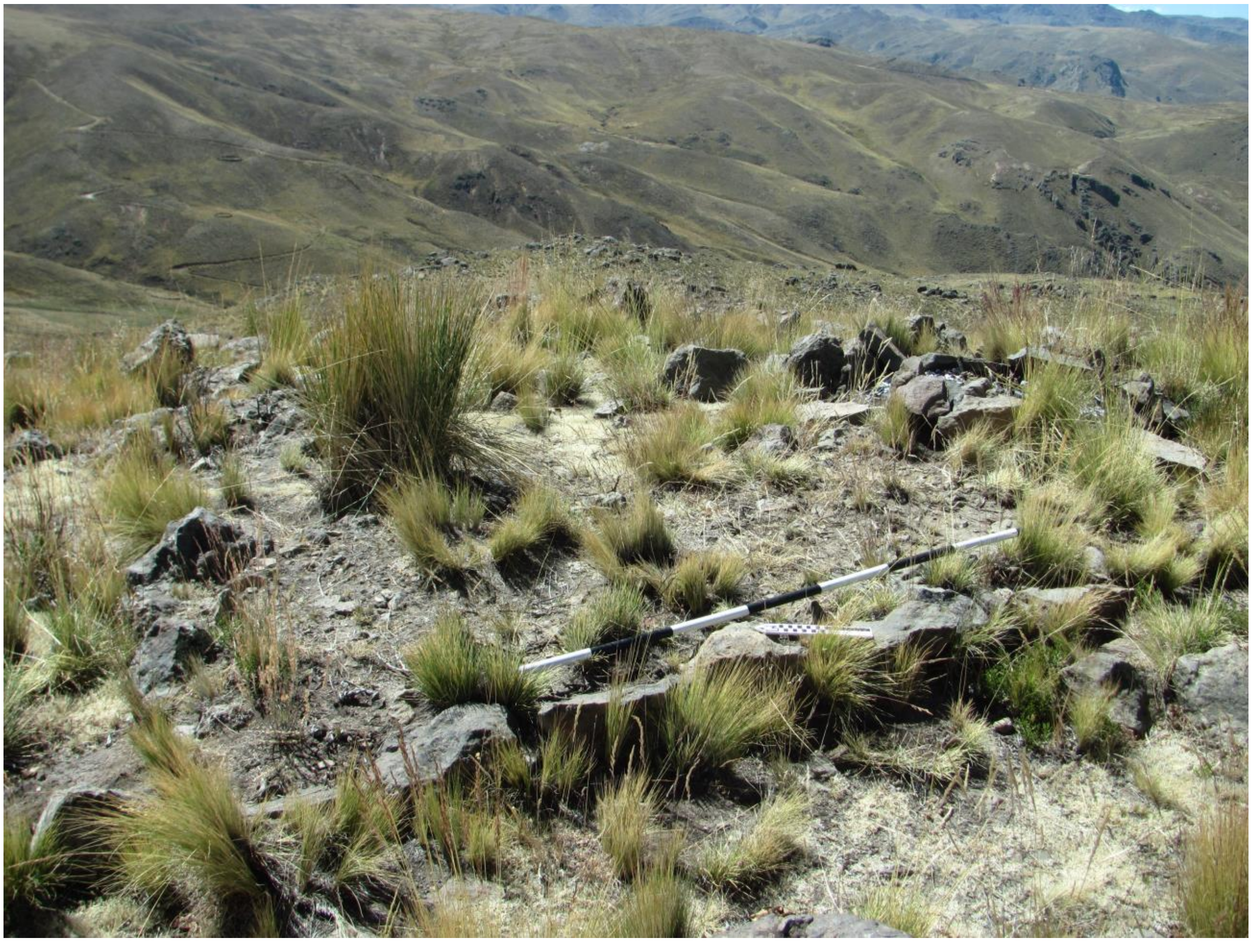


Figure 6.30. Rectangular platform on the summit of Markarani (SI-199).

The ritual significance of the peaks is clear even today, where shrines of various levels of formality are frequently found on the defended peaks of the fortifications in the valley. This is not surprising given the long Andean tradition of venerating elevated places, such as mountaintops or peaks. One of the fortifications—Pumachiri (CO-189)—is the apu for the near-by village of Coporaque.

Overall, public spaces during the LIP appear to have been more informal and accommodated, rather than following a formal cannon of construction. Thus, while public ritual displays and commensalism were not absent from the lives of LIP populations, their expression was highly variable, reflecting the absence of a centralized polity in the valley during that time.

Discussion and Conclusions

The expansion of fortifications in the valley brought people together in new ways. Fortified settlements linked households together not only through the construction and maintenance of the defenses, but also through sheer proximity. Several settlements were densely settled, and residential areas were frequently tightly circumscribed either within the defensive walls or the surrounding topography. The absence of formal planning and internal organization of fortified settlements suggests they likely grew organically through time.

Distributions of masonry types within sites and across the valley suggest the presence of status differences between households and between sites in the valley. However, growing status differentiation does not appear to have been tied specifically to political centralization. Previous research in the central valley has noted that elites were present at multiple settlements, a pattern that does not suggest the emergence of a single center of political authority (Wernke 2013). While many settlements in the valley, including those in the present work, exhibit a complicated palimpsest of LIP and LH use, the site of Achomani (AC-175) was only occupied during the LIP. The site exhibits a high proportion of elite structures. This pattern is also seen at the LIP site of Juscallacta (Brooks 1998; Guerra Santander and Aquize Cáceres 1996), and lkely reflects growing status differences between settlements.

Variation in structure form and masonry style also reflects subtle differences between domestic architecture in the central and upper valleys. Domestic architecture in the central valley was dominated by rectilinear structures, and higher status houses were more likely to be constructed of blocky (type 6) masonry, while upper valley houses were predominately circular in form and high status houses tended to use thin tabular (type 5) masonry. However, both masonry styles were found across the survey area, and other features, such as tall, narrow doorways were common to all domestic architecture in the valley, indicating shared stylistic cannons.

But while fortified settlements likely primarily served households in the settlement, non-residential fortifications likely drew on more extensive social ties. Most non-residential sites were not directly associated with a single settlement, but instead served several villages and hamlets from the surrounding area. Additionally, those located high on the puna likely provided temporary refuge for pastoralist communities and their herds. This pattern highlights how defensive concerns extended well beyond the households who lived directly within fortified settlements. But it also demonstrates how defensive concerns provided a context for supra-settlement cooperation, linking households through shated defensive interests.

The defensive constructions at LIP fortifications were large corporate projects that were often monumental in scale. Additionally, much of the irrigation and agricultural infrastructure in the valley was developed during the LIP. Carved boulders known as *maquetas*, appear to represent systems of reservoirs, canals and agricultural fields and many examples were found in association with defensive sites. While it is not possible to date these carvings, their close association with defensive sites suggest their contemporaneity. The development of these large-scale agricultural systems likely reflect a parallel context for cooperation which extended beyond individual sites. Irrigation systems create relationships of up-system and down-system dependencies, and their construction often changed the natural course of water runoff. I argue that defense and water provided parallel and likely intertwined contexts for local negotiation and cooperation which linked politically independent communities through corporate labor and mutual obligation. However, cooperation and conflict were likely intimately tied. As discussed above, access to water is also often highly contentious, and tensions may have been exacerbated by periods of drought and cooling recorded for this period.

While these sites were clearly defensive, they were not *simply* defensive. Nearly a third of the fortifications were home to permanent communities and were loci for a variety of activities as people went about their daily lives. However, debates centered on distinguishing between ritual or defensive use of these sites, creates a false dichotomy that impoverishes our ability to understand the ways in which defense was integrated into the lives of communities in the valley. As I have shown in this chapter, mortuary architecture and public gathering spaces were intimately tied to the defensibility of the sites. Burials were placed in and along defensive walls, and large cave burials sit at the base of many of the hilltops. While highly formalized plazas were generally absent in the LIP, many fortifications accommodated large open spaces that may have served as areas for public gatherings. This suggests that while the pragmatics of defensive need drew communities in the valley together in new ways, such relationships of mutual obligation were also actively inculcated through commemoration and commensalism.

CHAPTER 7

WARFARE, ALLIANCE AND THE POLITICAL LANDSCAPE

Introduction

A fundamental question guiding this project concerns the scale of war in the Colca Valley. Cross-cultural studies of warfare in societies with various forms of political organization can help to illuminate the relationship between spatial patterns of settlement and fortification, and the nature and scale of conflict (Arkush 2010:60-66). Understanding how communities organized around defense provides one way of understanding the nature of conflict, the role of centralized leadership, and the ways in which social boundaries were challenged and maintained through war.

This chapter uses spatial modeling to build a more complete picture, not only of the nature and scale of conflict in the valley, but perhaps more importantly, the nature and scale of the relationships between settlements and their role in building community affiliation. To do this, I focus specifically on defensive alliances and regional movement patterns. I begin the chapter by reviewing the literature on alliances in order to build a spatial model of alliances. I then apply that model to the fortification dataset examine the evidence for alliances across the valley. Finally, I look at regional mobility patterns and their relationship to the location of fortifications, to examine whether fortifications were placed to guard against an external threat.

I argue that war provided a context for the development of defensive alliances that likely operated at both local and regional scales. Secondly, defensive settlements were located in and around key access points for regional movement into and out of the valley. Taken together, I argue that patterns of fortification in the valley reflect nested alliance relationships that were primarily constructed in response to threats coming from outside of the valley. The fact that fortifications were oriented towards an external threat does not suggest the absence of local conflict between neighboring communities. However, as I discuss in the conclusion of the chapter, local-scale conflict does not appear to have been the primary motivation for the construction of fortifications.

Models and Analysis

Models are a central facet of archaeological research. They may operate in the mental background of the researcher, guiding research questions, methodological strategies, and interpretations. Alternatively, they may be formally operationalized, making explicit assumptions about the interaction between various factors, processes, and expected outcomes. Models serve various roles in archaeological research—organizational schema, comparative devices, hypothesis testing, explanatory mechanisms, theory building (Clarke 2014; Lake 2014). Clarke describes models as "pieces of machinery that relate observations to theoretical ideas" (2014:2).

Scholars have constructed various classificatory systems for describing the use and implementation of models. Perhaps the most seminal work comes from Clarke (2014 [1972]). In his book, Clarke divided models into two classes—models which rely on abstraction and those which draw on real-world examples—each with two primary subclasses, and a dizzying array of subdivisions (Table 7.1).

Table 7.1. Classification of models based on Clarke (2014 [1972]).

Type	Description	Example
Artificial		
- Hardware		
○ Direct	Direct models of archaeological sites and artifacts	Artifact replicas; site reconstructions; experimental archaeology
○ Indirect	Tangible replica of relationships derived from direct analysis	Outputs from correlation analysis, cluster analysis
- Abstract		
○ Iconic	Iconic representations of observed properties.	Maps; graphs
○ Mathematical	Mathematical representations of relationships between observations or factors.	Statistical relationships; probabilities; random walk models
○ System	Abstract representation of the flow of consequences between interlinked components	Flow chart; model of inputs and outputs

While Clark's typology of archaeological models is useful for breaking down at a very granular level the possible types of models used in archaeological research, the relevance of this level of specificity increasingly looses relevance in their application. In practice, most archaeological models draw multiple types of models into a more synthetic whole. This has been increasingly the case as computers have come to aid in modeling archaeological scenarios. For instance, one of the models presented below uses maps (abstract-iconic), to derive models of movement and visibility (abstract-mathematical), to understand patterns of clustering and dispersion (hardware-indirect), to address the potential of alliance relationships between defensive settlements. Thus, following Clarke's typology, it would be difficult to determine the type of model being utilized.

A second line of classification focuses on the intended uses of the models and their results [Mithen 1994, O'Sullivan and Unwin 2010:355). This has been especially true of spatially-integrated and/or computer models. Geographic Information Systems are at their core modeling software. At a basic level, a GIS is a model in that it is used to visually represent the relationships between a selected set of observed or hypothetical phenomena. However, most often when we think of spatial modeling, we are thinking of measuring or manipulating spatial data to understand processes in the real world. Mithen (1994), for example, identified three classes of models, based on their intended purpose:

- Hypothesis Testing: models used to determine what actually happened in the past by comparing the results of the model to actual archaeological distributions.
- Theory Building/Heuristic Modeling[10]: using GIS to understand the potential dynamics of processes.
- Methodology Development: modeling interactions between multiple factors in an attempt to predict relationships or observations in the real world and to develop or test methodological approaches.

Models, and in particular computational/spatial models have frequently been criticized for taking a "rational actor" approach to human action, for being overly simplistic and reductionistic, or for being environmentally deterministic. This criticism is not unfounded. Models necessarily rely on the systematic representation of the observed phenomena, and thus frequently rely on optimizing human behaviors in their representation (i.e. least-cost path analysis, predictive modeling). Additionally, many early geospatial models—particularly site locational/predictive models—focused heavily on environmental factors (land cover, slope,

[10] The term "heuristic" is used in various ways with varying levels of specificity. Within computer sciences, for example, heuristic is used to indicate a computational model which works well, but is not necessarily ideal. Here, heuristic models are typically understood as a form of efficiency, used in instances where the time/cost involved with determining the *ideal* model is deemed too high, and a good-fit model is sufficient. At the other extreme, the term heuristic is used to mean "rule-of-thumb" (similar to the more specific example above), or a researcher-informed model (Kintigh and Ammerman 1982), or more generally a theoretical model.

water sources). This was in part because as a tool, GIS was borrowed from the fields of land management, geography and biology and was thus better equipped to deal with environmental factors than human ones (Church, Bandon and Burgett 2003:145). Furthermore, this application of GIS grew out of a processual framework, which often reinforced behavioralist approaches to human/environment interaction and priviledging of materialist explanations (Kvamme 2006).

Current applications of geospatial modeling have extended far beyond predictive modeling, and its application is not limited by particular theoretical paradigms. In particular, GIS has increasingly been used to examine the more human factors. Scholars have used GIS technologies to examine visual perception of the landscape by modeling the visibility of particular places or the extent of visual fields (e.g. Ayala and Fitzjohn 2002; Briault 2007; Gaffney et al. 1996; Llobera 1996, 2006, 2007; Maschner 1996; Nair 2007; Wheatley 1995; Wheatley and Gillings 2000). Arkush (2010), for example, uses line-of-sight analysis between fortifications to identify ethno-political boundaries. She demonstrates how these boundaries were constructed through conflict and antagonism within the specific landscape of the Lake Titicaca Basin, and how those boundaries, in turn, reinforced perceptions of difference and enabled continuing conflict. Others have addressed questions of movement using least-cost paths, spatial network analysis or other means (e.g. Covey et al. 2013; Harrower and D'Andrea 2014; Howey 2007, 2011; Llobera 2000; Wernke 2012; Wernke and Kohut i.p.). While these approaches are not without criticism (Lake and Woodman 2003; Llobera 2007; Tschan et al. 2000; Wheatley and Gillings 2000), they represent an important move toward developing analytic methods that consider how experience of the landscape shapes the political processes (Covey et al. 2013; Kosiba and Bauer 2013). Models are central to archaeological analysis, and provide a context for greater transparency in the assumptions, factors and techniques being used to explore cultural practices and processes in the past.

Fortification and Alliance

Warfare and Alliance

At a general level, alliances can be understood as cooperative relationships between communities for the purposes of defense (Helbling 2006; Roscoe 2009; Simon and Gosser 2001; Simon and Jacobs 2000). However, alliance relationships were both politically charged and deeply embedded in the local landscape. Forging alliances was inherently risky and potentially costly (Bossen 2006; Helbling 2006; Wiessner 2006). Allies could renege or change affiliation at crucial moments (Bossen 2006; Chagnon 2012; Andrew P. Vayda 1976). Additionally, allies might expect compensation for battle losses and consideration in the distribution of booty after a successful attack (Helbling 2006; Wiessner 2006). These relationships thus required ongoing negotiation and affirmation of trust and commitment (Ferguson 1984b:272; Helbling 2006; Junker 2001; Knight 2001; Perodie 2001; Wiessner 2001, 2006). The distribution of resources gained in conflict among allies also provided a possible avenue for leaders to enhance and extend their political power by demonstrating generosity and inculcating expectations of reciprocity (S. A. LeBlanc 2006:446; Liston and Tuggle 2006:158-159, 172).

The nature of alliance relationships is dependent on the specific local context. The size and force of surrounding communities, the specific threats they faced, and the availability of alternative alliance options all shaped the relative ability of groups to negotiate specific relationships (Helbling 2006:125). In areas where conflict was frequent, the construction of alliances shaped perceptions of risk and safety of their surroundings and thus the ways people moved through the landscape. Roscoe, for example, describes how Yangoru clans changed their subsistence activities during periods of conflict, including clearing group (rather than household) gardens and traveling in large groups to the gardens so that some could monitor for threats while others attended to garden activities (Roscoe 2009:85-88). Additionally, Chagnon describes how village fissioning and selection of new village locations among the Yanomamö required consideration of the particular alliances and conflicts between the other villages in the region (Chagnon 2012:88-91).

While predicated on the need for defense, the formation of alliances provided important contexts for economic exchange, social interaction and political negotiation. However, alliances are only effective if both parties can trust the other will come to their aid—trust that depends both on a sense of mutual obligation and, at a pragmatic level, confidence that support is possible. I argue identification of defensive alliances in the archaeological record requires greater attention to how local landscapes shape perceptions and experiences of proximity. The model presented here demonstrates the potential of GIS to model these factors at a human scale, to better understand how alliances, predicated on defense, constituted a political landscape of affinity and difference.

Modeling Defensive Allies

Alliance relationships took many forms, each entailing different sets of expectations. However, the nature of these common relationships can be broken into three broad categories of alliances: 1) *Offensive alliances*, where a group might seek out allies to launch an attack with or to side with them in a pitched battle (Helbling 2006; S. A. LeBlanc 2014; Wiessner 2006). 2) *Defensive alliances*, alliances which served primarily a defensive need, where two or more groups provide mutual defensive support during an attack (S. A. LeBlanc 2014; Roscoe 2009). 3) *Passive alliances,* where two or more communities agree not to fight with one another, with no expectations of support in combat against other enemies. This final arrangement might serve to expand the safe territory surrounding the community (Roscoe 2009; Simon and Gosser 2001), ensure safe passage through another group's territory (Helbling 2006; S. A. LeBlanc 2014), or to facilitate the sharing of information about common enemies (S. A. LeBlanc 2014).

Defensive alliances play a greater role in choices of settlement location, and thus tend to be the most archaeologically-visible (Arkush 2010:156-161; E. E. Jones 2006; S. A. LeBlanc 2000, 2001; Wilcox, et al. 2001b:153). Defensive alliance models have two basic spatial requirements: first, sites must be *intervisible* in order to be able to signal for support when needed; second, sites must be *proximal* enough that support can arrive in time to help during an attack. These requirements can be modeled spatially, and a number of scholars have sought to operationalize them in their research.

In general, intervisibility has been documented either in the field or using viewshed functions in GIS software (Schaepe 2006). GIS viewshed analysis uses point features on a digital elevation model (DEM) to determine sightlines based on the intrusion of topographic features. While viewshed analysis is straight-forward, it does not take into account vegetation cover, nor does it address atmospheric extinction or physiological limits of human visual perception (Fisher 1994; Dennis E. Ogburn 2006; Wheatley 1995); problems which will be addressed in greater detail below. Despite these limitations, viewshed analysis provides a useful measure of site intervisibility, particularly for relatively proximate sites and in areas with little vegetation cover.

Proximity is the second spatial requirement for alliances, yet this factor has proved difficult to operationalize. Distance has been discussed in two ways—relevant distances between allied sites and relevant distances between antagonistic groups (buffer zones). Alliances and buffer zones have been defined either impressionistically—in the form of descriptive observations of settlement patterns—or analytically through Euclidean site catchment measures. When employed analytically, the maximum distance between allied sites has typically been 10 to 15 km (Arkush 2010:157; S. A. LeBlanc 2001, 2006; Wilcox, et al. 2001b:152). Measures of buffer zones, or unoccupied areas between fortified areas are also varied and impressionistic, with minimum unoccupied straight line distances of 10 to 32 km used to define a buffer zone (Arkush 2010; Haas and Creamer 1993:85; S. A. LeBlanc 2000; Wallace and Doelle 2001:281; Wilcox, et al. 2001a). Additionally, many factors influence landscape permeability, and thus proximity in travel time, between sites. Euclidean distance is therefore only a very rough approximation of real world geographies and does not account for the affordances of the landscape (Chemero 2010; Gillings 2012; Llobera 1996). Along with distance, terrain is a first order factor in landscape permeability, especially so in areas of high topographic relief, such as the highland Andes. Given that fortifications are frequently located on natural rises, Euclidean distance almost certainly overestimates the proximity of sites (Figure 7.1).

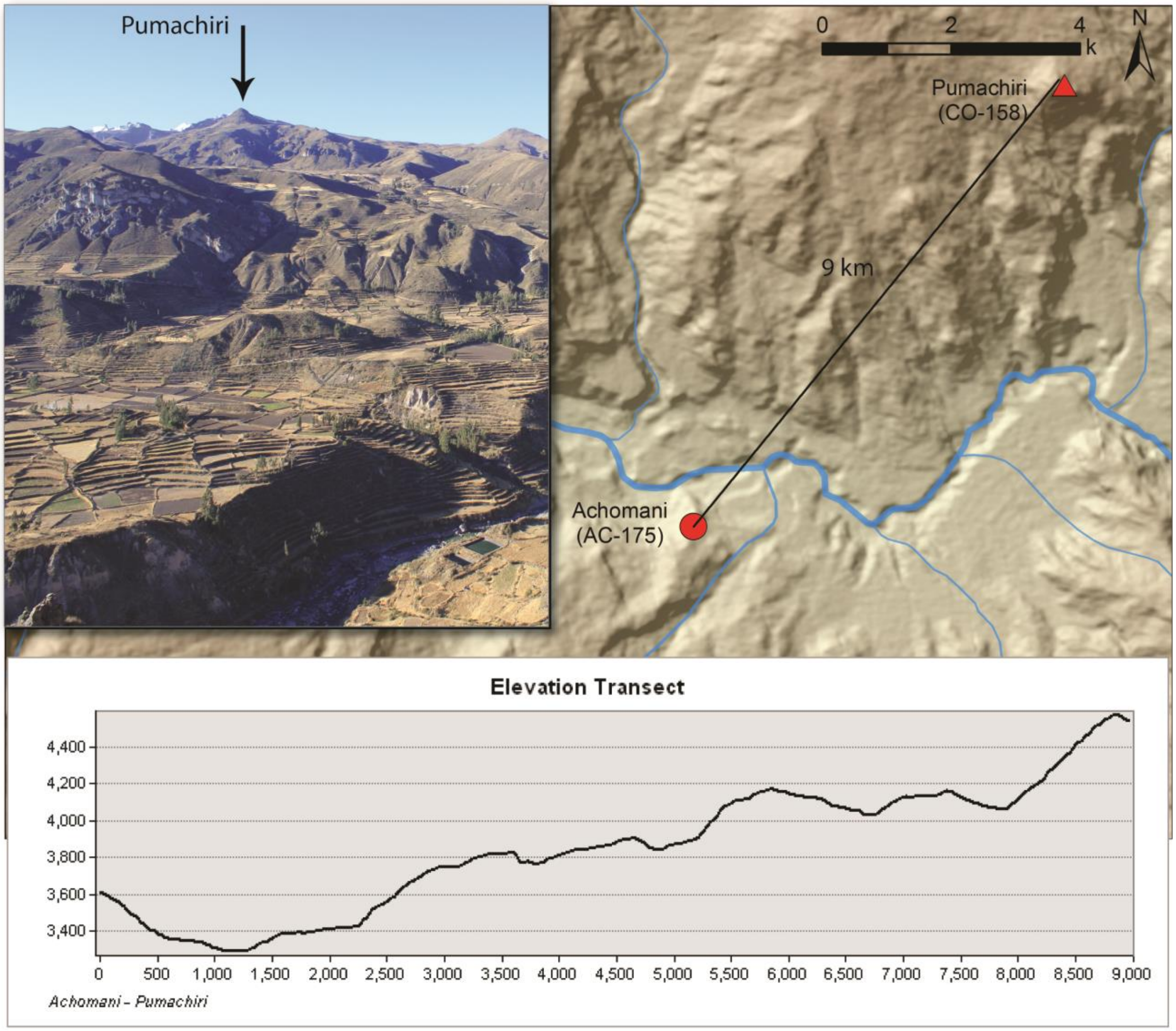


Figure 7.1. Example of the impact of terrain on travel costs. Estimated travel time assuming level terrain: 1.8 h (108 minutes). Estimated travel time using hiking model: 4.0 h (242 minutes).

The model presented here was developed to address the ways in which defensive aid was constrained by the local landscape, by modeling the potential for monitoring for threat and the relative cost of moving through the local mountainous terrain. For this purpose of this model, possible alliance relationships are identified as sites that are near enough to be signaled for and respond to an attack. This definition has two key components that need to be identified:

1. Lead time: how much time does a community have to prepare for an attack? The lead time is determined by both the point at which a threat would become visible to a site, and how long it would take for that threat to reach the site once identified.
2. Response area: what near-by sites can respond in time to help? The response area is determined by the surrounding terrain that is visible and from which the site could be accessed within the lead time.

The first step is to determine the point at which the threat becomes visible. Standard viewshed analysis uses elevation data to produce a Boolean raster indicating visible and non-visible areas based only on the intrusion of topography into a viewer's line of sight. This analysis does not account for the natural degradation of human sight as distance increases, nor does it account for the size of the object being viewed. A modified fuzzy viewshed equation, developed by Denis Ogburn (2006) was used to estimate the area around the site that an individual would be visible. Ogburn's equation combines a distance decay function developed by Fisher (1994) with the trigonometric relationship between object size and distance from viewer to determine object visibility. The modified fuzzy viewshed identifies the area around each site that a lookout could perceive an individual traversing the landscape. The time it would take an individual to reach the site once detected is determined using a surface raster which uses a hiking function developed by Waldo Tobler to calculate the amount of time it would take to travel from any raster cell to the site centroid (Tobler 1993, table provided by Nico Tripcevich). This time cost thus provides an approximate amount of time a single site has to prepare their defenses.

Using the same path distance raster, it is possible to identify neighboring sites that could reach the site within the lead time. This is combined with a viewshed raster to determine sites that are both intervisible and near enough to respond.

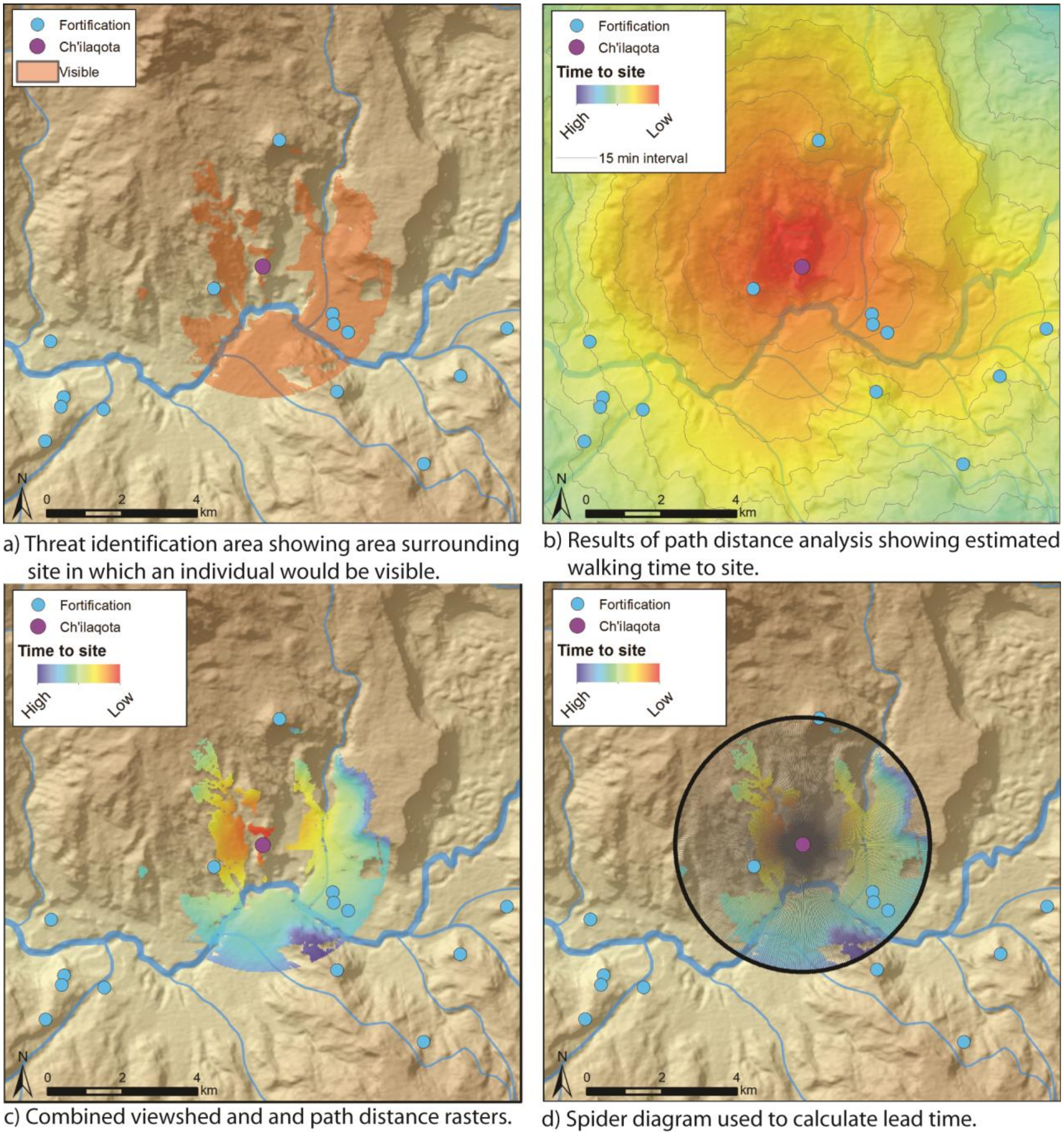
The steps used for this model are explained below using a single site (Ch'ilaqota, CO-151) and the results for all sites in the valley are discussed in the results section. I use polyline features of defensive walls overlaid on an ASTER gDEM with 30 m resolution as the basis for the viewshed components of the analysis and the site centroid as the destination for measures of travel time. All analyses were run in ESRI ArcGIS 10.1 and 10.2. This model incorporates multiple analyses which must be run from each site, making it computationally intensive. However, the use of ArcMap's model builder allows for rapid iterative runs once the parameters of the analyses are defined.

Threat identification

The first step in the analysis is to determine the area around the site that could be effectively monitored. Ogburn's equation provides a distance multiplier (a) for a given arc (β) which can be applied to the width of a particular object to yield the distance that object subtends the given visual arc. The equation is as follows:

$$a = \frac{1}{2\tan(\beta/2)}$$

Using this equation, the distance multiplier for a visual arc of 30" is 6875.49 meters. When multiplied by the width of an average individual (0.5m), it yields a distance of 3437.75 meters at which an individual would be visible under ideal conditions. For the purposes of this analysis, the distance was rounded down to 3400 meters. A viewshed from polylines of the site defensive walls was run using a 3,400 m limit, a viewer offset of 1.5 m (to approximate human eye level) and an object offset of 1.6 m (to approximate the height of an average individual). Polylines of defensive walls were used instead a point feature to more accurately reflect the practice of monitoring the landscape, which would have likely involved either multiple individuals posted along the wall or a single observer traversing the walled perimeter. The resulting raster displays the total area around the site in which an individual would be visible (Figure 7.2a).



a) Threat identification area showing area surrounding site in which an individual would be visible.

b) Results of path distance analysis showing estimated walking time to site.

c) Combined viewshed and and path distance rasters.

d) Spider diagram used to calculate lead time.

Figure 7.2. Analysis steps for calculating lead time.

Lead Time

The second step was to calculate how long it would take an individual to reach the site once they became visible to the observer (the lead time). First, an anisotropic walking model was used to estimate walking times based on the slope of the local terrain. A raster surface was produced with time values using the path distance tool in ArcGIS with a vertical factor table derived from Tobler's walking model. Tobler calculates walking velocity using slope through the following function:

$$W = 6e^{-3.5|S + 0.05|}$$

Where *W* is the walking velocity and *S* is the slope of the terrain. The resulting path distance provided a raster with values representing the cost in time to travel from each cell to the site centroid (Figure 7.2b). The path distance and viewshed rasters were combined to produce a single raster containing the time of approach to the site from each raster cell in the visible area (Figure 7.2c). In the resulting raster, each visible cell has a value equal to the time (in hours) to reach the site and each non-visible cell has a value of zero.

To find the lead time value for each site, a spider diagram was generated from 410 points, which were evenly distributed around the circumference of the 3,400 m site buffer. The resulting lines were then used to find the time to reach the site (from the path distance analysis) for each line at the point it intersected with the combined path distance and viewshed raster (Figure 7.2d). The resulting table provided 410 values indicating the time to approach the site at the point of visibility from all directions around the site. The resulting approach times for each site were not normally distributed, so the median value (here 1.066078) was used as the lead time (rather than the mean) to minimize the impact of (probable outlier) extreme values (Figure 7.3).

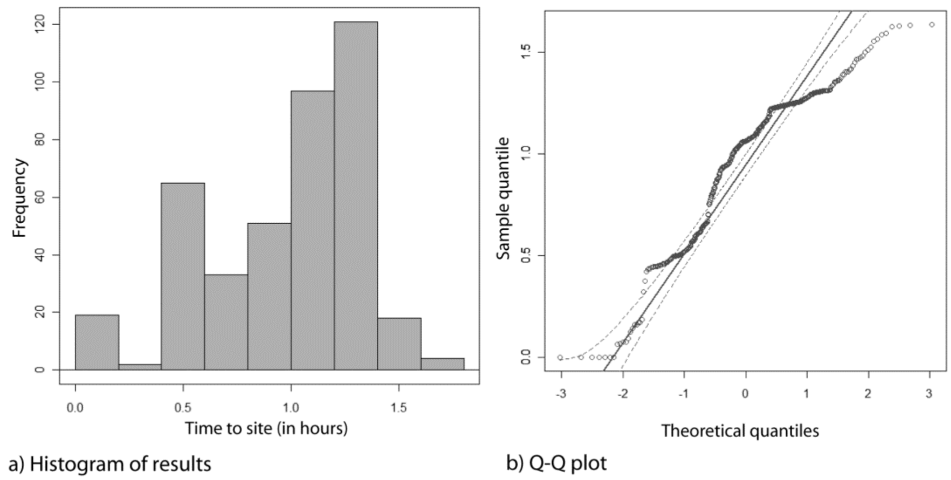


Figure 7.3. Histogram and Q-Q plot of the time to reach the site from the point of visibility along each of the 410 spider lines. Q-Q plot shows skewed distribution. Shapiro-Wilk Normality test rejects normal distribution: W=0.9297, p=5.081e-13.

Response Area

The results from the previous step provided a lead time value for each site which was used to define the possible response area. The path distance raster was reclassified to show only the area with time values equal to or less than the lead time value. A second viewshed was generated using a viewer height of 1.5 m and an unlimited radius. The visibility radius was expanded with the understanding that defensive sites would be visible at greater distances both because of the larger scale of the architecture and because sites participating in an alliance relationship would presumably know the location of allied sites.

The resulting rasters were combined to produce a single raster displaying the total visible area near enough to respond within the lead time for the site. Sites falling within this area were identified as potential allies (Figure 7.4). The model was run for each site in the survey area.

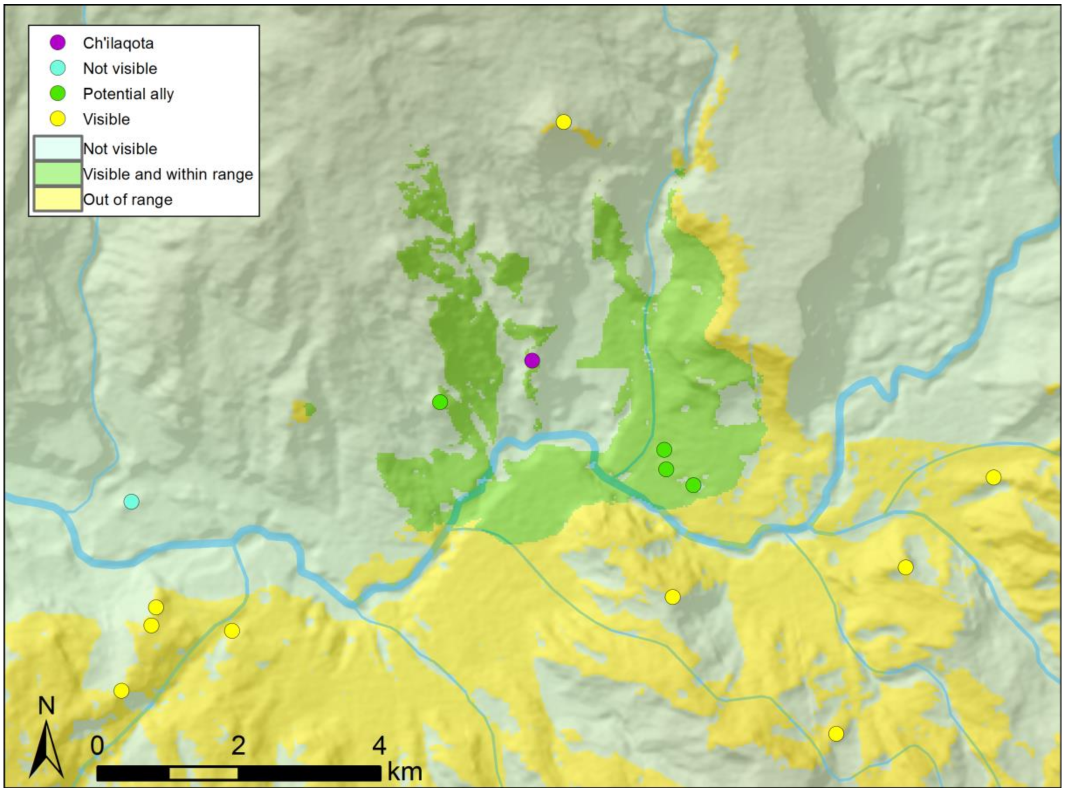


Figure 7.4. Results for CO-151 showing sites meeting the criteria for proximate allies.

Applying the Model

I applied the model presented above to each of the 33 fortifications recorded in the Colca Valley survey. Sites that met the criteria for intervisibility and proximity were marked as potential proximate allies. The lead time calculated for each site ranged from 16.8 – 98 minutes. More than half the sites (n=20) had lead times of between 45 minutes and 1 hour. Based on this calculated lead time, each site had between 0 and 4 sites near enough to respond within the specified time. Sites identified as potential allies were located in close proximity, with a maximum of 2.9 km (aerial distance) between any two potentially-allied sites. Most sites were even closer—between one and two kilometers from each other (Figure 7.5). This suggests that the Euclidean site catchment measures would tend to substantially overestimate the effective distances between communities that could have served as proximate allies.

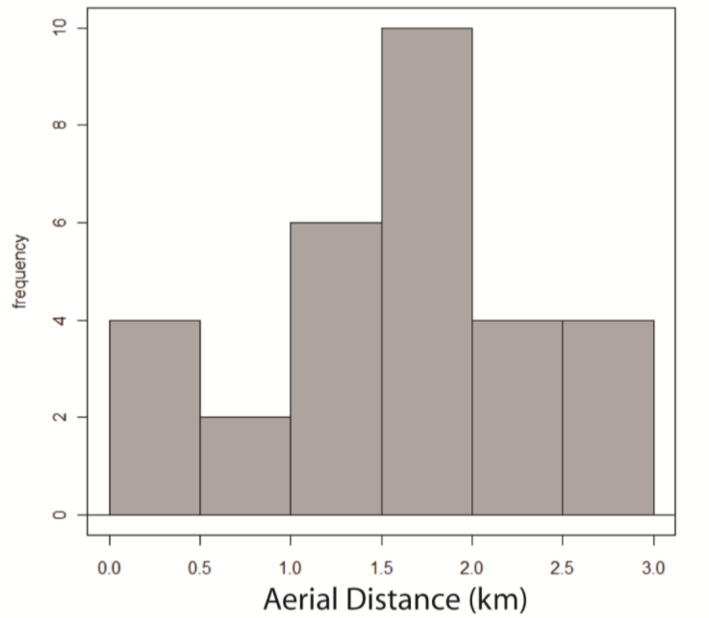


Figure 7.5. Histogram showing the aerial distance between modeled proximate allies.

By mapping out all the potential allies, it is possible to distinguish seven clusters of defensive sites distributed across the valley (Figure 7.6). In the example here, clusters were defined somewhat liberally, including all sites identified as a potential proximate ally of any other site in the cluster; meaning a site did not need to meet the criteria of proximate ally for all other sites in the cluster. Each cluster contains between three and six sites, and nearly all sites within the surveyed area (81%, n=27) fall within a cluster. These clusters tend to be located within the lower-lying portions of the valley, which are also the more agriculturally-productive. This is not surprising given the mixed agro-pastoral economy of the central and upper valley. The high elevation puna was the focus of pastoralist communities, which were far more mobile than those in the agriculturally-productive valley-bottom areas. Agricultural villages, with their more permanent settlements and larger populations, were likely more obvious targets for raiding and provided the labor needed to invest in large corporate projects, such as fortifications.

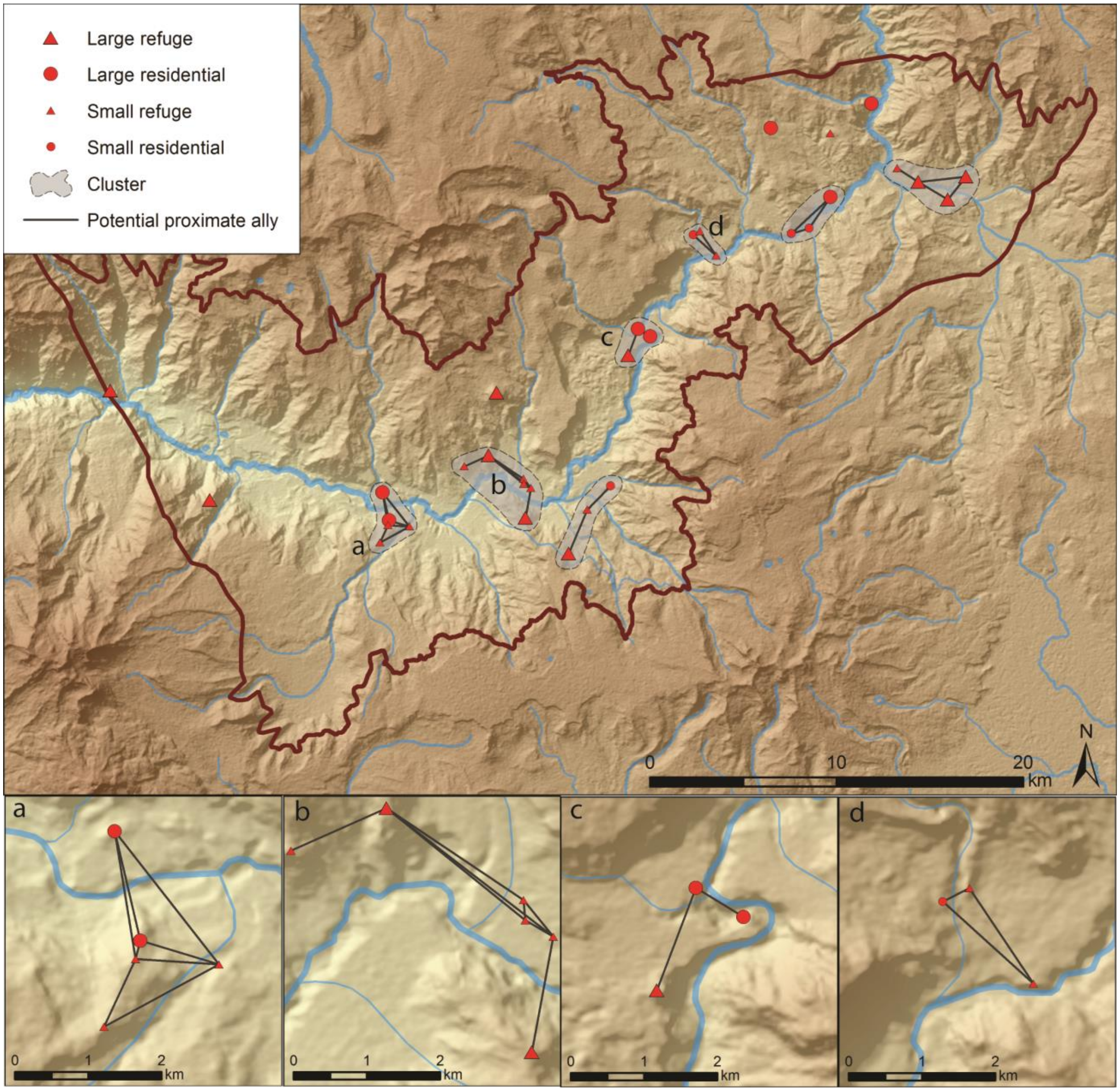


Figure 7.6. Results of analysis with clusters identified.

Table 7.2. Results showing median lead time, number of defensive allies, and total visible fortifications by site.

Code	Name	Median Lead Time	Type	Defensive Allies	Total Visible Fortifications
AC-175	Achomani	1.06	Large Residential	3	12
AC-176	Akunikita	1.11	Small Refuge	2	10
AC-177	Pilluni	0.94	Small Refuge	4	10
AC-178	Korikancha	1.19	Small Refuge	4	7
CA-191	Cabeza de Leon	0.94	Large Refuge	2	4
CA-192	Ankasuyo	0.84	Large Refuge	2	3
CA-193	Aukinamayo	0.94	Large Refuge	3	4
CA-194	Confluencia	0.82	Small Refuge	1	3
CA-203		0.58	Small Residential	2	3
CH-181	San Andres	0.80	Small Residential	1	8
CH-182	Mollepuku	1.24	Small Refuge	1	11
CH-196	Llanquipina	0.66	Large Refuge	1	7
CO-151	Ch'ilaqota	1.07	Large Refuge	4	12
CO-158	Pumachiri	1.19	Large Refuge	0	14
CO-165		0.87	Small Refuge	4	9
CO-167		0.87	Small Refuge	3	11
CO-168		0.85	Small Refuge	3	10
CO-187	Choque Mamani	0.28	Large Residential	1	2
CO-189	Pukara	0.97	Large Refuge	1	7
CO-201		0.79	Small Refuge	1	14
IC-195	Malata	0.91	Large Residential	3	6
MA-183	Pachamarka	1.15	Large Refuge	0	11
MD-190	Fortaleza de Chimpa	1.64	Large Refuge	0	4
SI-197	Pukarilla	0.77	Large Residential	2	7
SI-198	Paraq'ra	0.79	Large Residential	0	0
SI-199	Markarani	0.83	Large Refuge	0	6
SI-200	Pukara Ocre	0.85	Small Refuge	0	3
SI-202		0.84	Small Residential	2	5
TU-185	Pukara	0.77	Small Residential	2	3
TU-186	Chaillita	0.77	Small Refuge	2	3
TU-188	Auquimarka	0.62	Large Residential	2	3
TU-204	Pukara	0.81	Small Refuge	2	3
YA-184	Pallaqlli	1.27	Large Refuge	1	15

The model provides additional data which can be used to clarify the strategic role of different classes of fortifications within the valley. For example, there were significant differences in the amount of lead time between refuges and residential fortifications. The average lead time for refuges (0.98 hours or 58.8 minutes) was significantly higher than the median response time for residential fortifications (0.74 hours or 44.4 minutes; Welch Two Sample t-test, $t=2.9602$, $df=17.846$, $p=0.008436$) (Figure 7.7a). However, the average number of potential proximate allies was nearly the same across both groups (refuge mean = 1.78; residential mean = 1.80) (Figure 7.7b). One possible explanation is that refuges were strategically placed in locations which were particularly advantageous for monitoring the surrounding landscape. While residential fortifications were clearly placed to take advantage of natural defenses, there were likely a number of additional competing factors—such as access to water, agricultural fields, and pasturage—which were also considered in their placement.

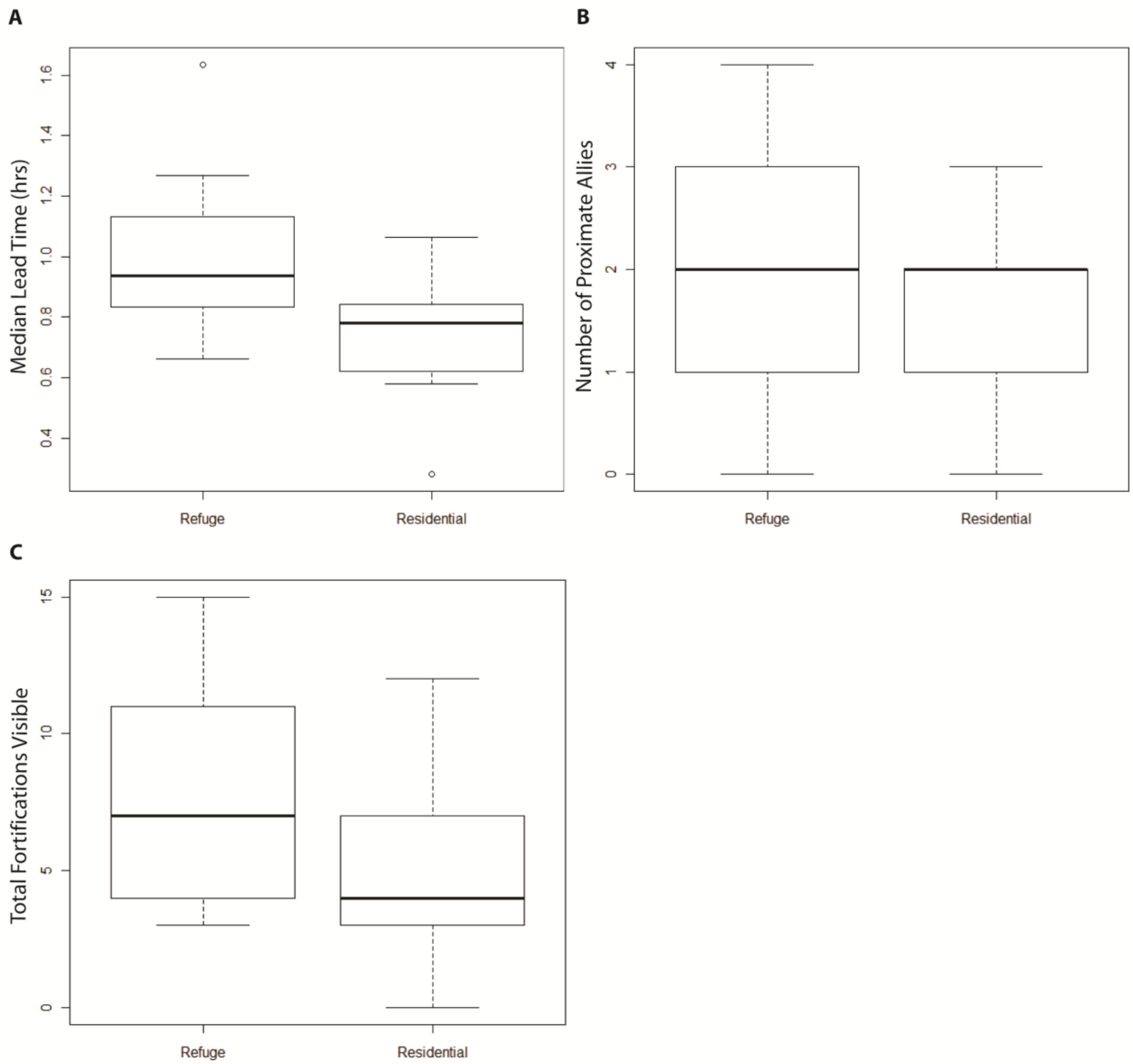


Figure 7.7. a) Box plot of median lead time by site type. b) Box plot of proximate allies by site type. c) Box plot of total visible fortifications by site type. Welch Two Sample t-test t=2.146, df=19.794, p=0.04446

All but six sites form part of a cluster. Four of the six outliers are fortified refuges with no evidence of permanent long-term habitation. With the exception of one, all are located along the perimeter of the valley, near the edges of the high altitude grasslands (puna) that surround the valley. Additionally, these sites occupy the highest elevations and, by design or consequence, are extremely intervisible with other defensive sites in the valley. It is possible that these sites functioned as monitoring outposts, which may have served as an early warning system for arriving threats. There are some references to the use of smoke and/or fire signals in the Andean literature (Stanish 2003), and it is possible a similar system was in use here. Examining lines of sight at a distance of 40 km—a conservative estimate of the visibility of smoke and fire signals (Di Peso, et al. 1974; Ellis 1991) the extent of these long-distance visual connections is apparent.

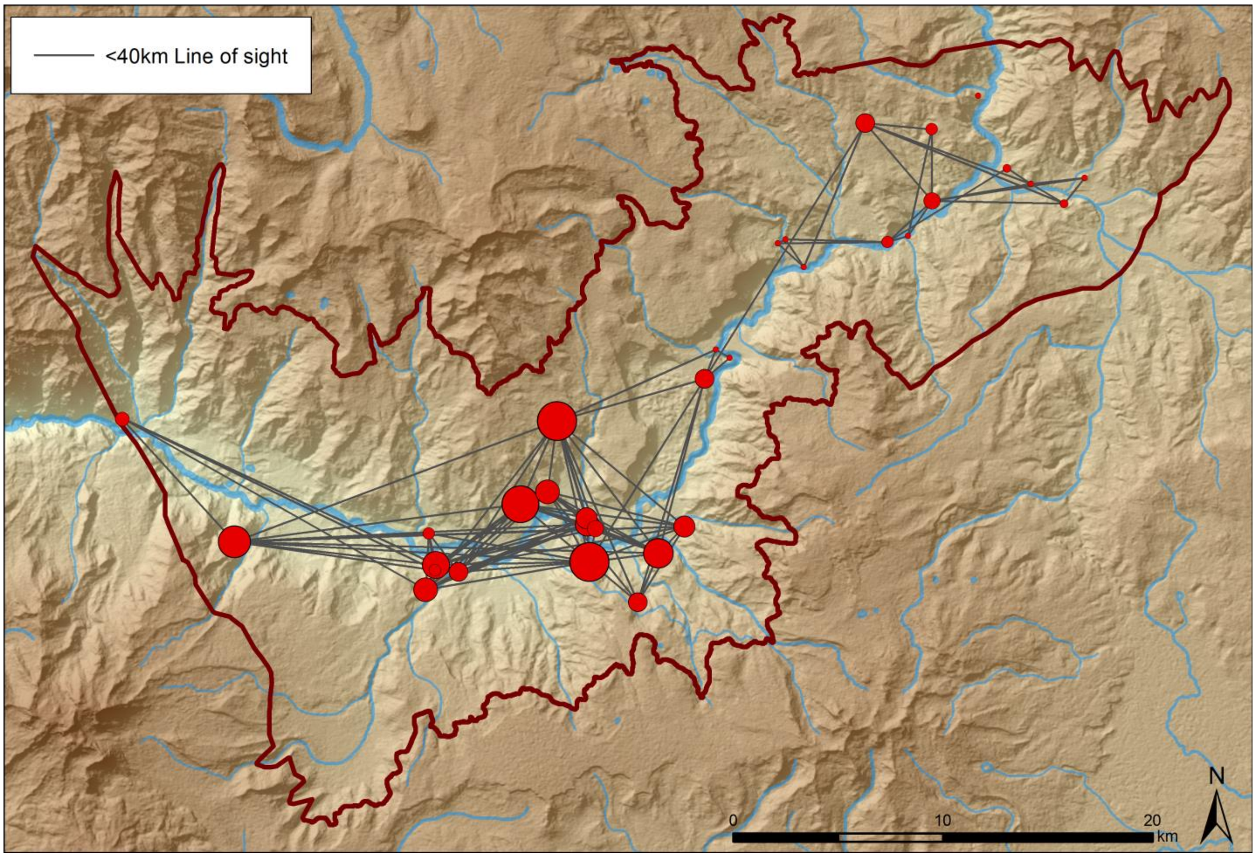


Figure 7.8. Lines of sight within 40km. The size of the site point is proportional to the number of sight lines.

The presence of multiple distinct clusters of fortifications may suggest local coalitions of allied pukaras, potentially in conflict with one another. However, examination of long-distance visual connections reveals dense connections between fortification clusters, which suggests the presence of a broader alliance network across the valley. Non-residential fortifications were intervisible with more sites, and thus may have served a key role in maintaining such cross-valley connections (Figure 7.7c). This hypothesis is preliminarily supported by the presence what appear to be fortified outposts along the perimeter of the valley which may have served to monitor access into and out of the valley (discussed below). The clearest example of this type of monitoring comes from the site of Akunikita (AC-176). Here, a well-preserved prehispanic path passes through a gate in the outer defensive wall of the site (Figure 7.9). The importance of monitoring mobility routes and its implications for understanding relationships between communities will be discussed in greater detail below.

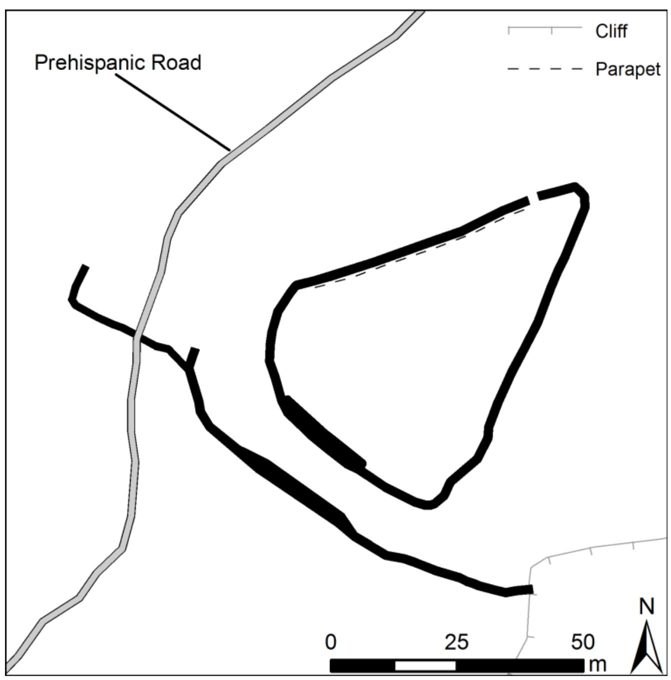


Figure 7.9. Plan map of Akunikita (AC-176) showing orientation of prehispanic road in relation to the defensive architecture.

Figure 7.10. Prehispanic path passing through the gate in the outer defensive wall at Akunikita (AC-176).

Monitoring Mobility

The second model addresses regional mobility patterns and attempts to simulate how individuals or groups may have traveled into and out of the valley. A valley-wide defensive network would suggest concern with a threat external to the valley. By contrast, local small-scale coalitions would instead indicate intra-valley conflict. As mentioned previously, at least one fort in the survey was explicitly situated to monitor a major prehispanic road. The question is whether this example is reflective of a more general concern with access points. In this section, I address this question by modeling mobility patterns at a regional level to assess whether fortifications were preferentially located in areas of high accessibility.

Approaches to Modeling Movement

Attempts to understand movement patterns in archaeological contexts have frequently used Least Cost Path (LCP) analysis to reconstruct movement patterns (e.g. Carballo and Pluckhahn 2007; Siart, et al. 2008; Taliaferro, et al. 2010; Whitley and Hicks 2003). This method uses a cost surface raster—a digital representation of the landscape in which each pixel is assigned a value that reflects the cost of moving across it. Cost surface rasters are typically derived from slope, although it is possible to construct multi-criteria cost surfaces which include additional factors such as ground cover, or water features (Howey 2007). LCP analysis then uses the cost surface raster to calculate the most efficient route between two points. This analysis also allows for the inclusion of additional parameters which can be used to model travel costs in time, and to model anisotropic travel costs (i.e. the cost of traveling downstream versus upstream).

Scholars have lobbied several criticisms of using LCP methods to model prehistoric movement patterns, raising questions about how accurately they reflect human movement across the landscape. At a basic level, LCP analysis poses empirical questions about the most accurate way to parameterize human movement, such as how best to model the impact of slope on travel time (Kantner 2004), whether to use a "Queen's case" or a "Knight's case" to simulate movement across raster cells (Wheatley and Gillings 2002), or whether to calculate cost in terms of time or effort (Kantner 2004). Additionally, LCP analyses raise questions about the cognitive aspects of how humans interact with the landscape. Scholars have pointed out that the least cost paths assume complete knowledge of the landscape (McRae, et al., 2008) and are willing and able to select the most efficient route (Howey 2011). A related critique highlights the dynamic social and cultural variables which can guide movement. Political boundaries and cultural norms of accessible and prohibited areas (cultivated fields, graveyards, airport tarmacs), are often key factors in how individuals chose to move through the landscape (Kantner 2004). Additionally, monuments, sacred places, water sources, and simply personal preferences can lead individuals to select less optimal or efficient routes (Howey 2011).

Spatial network analysis (SNA) has been used as an alternative method for modeling movement and connectivity (Livarda and Orengo 2015; Wernke 2012; Wernke and Kohut i.p.). Like LCP analysis, spatial network analysis finds the most optimal route, and can integrate various parameters to model travel cost. Rather than constructing optimal paths, however, SNA uses a user-defined network of paths and seeks the optimal route using the established path structure. Because the analysis requires the user to define the path network, this analysis works best for contexts where archaeological paths are still visible or can be reasonably assumed (in densely settled sites with standing architecture, for example). However, SNA grapples with similar questions of how well human interaction with the landscape followed optimized models of efficiency.

The strengths of least cost path and spatial network analysis lie in their ability to define likely travel routes between fixed and culturally significant locations. Despite their limitations, these analyses can be usefully applied to situations where it would be expected that movement paths would trend towards efficiency. For example, trade or procurement routes between fixed locations which were routinely traveled over long temporal scales, or movement to public locations within settlements. Llobera (2011), for example has demonstrated how a similar method, which draws on hydraulic models can be used to understand how ordered movement patterns can emerge, particularly as individuals get nearer to their intended destination. However, these methods are dependent upon identifying specific fixed origin and/or destination points on the landscape. This dependence limits the ability to study broader movement patterns where specific origins and destination are not clear or cannot be assumed.

While origins and destinations are key parameters to any analysis of movement, scholars have attempted to circumvent these limitations in various ways. In cases where either an origin or destination point is known, path distance raster—accumulative cost rasters can be used to create catchment regions which represent the areas that can be reached within a set cost limit (e.g. areas which can be reached within two hours) (Seitsonen, et al. 2014). However, this strategy only eliminates the need to set *both* and origin and destination, and is still not applicable to questions where neither can be reasonably assumed. Scholars have also used graph-based methods to construct broader networks of probable paths. For example, White and Barber's (2012) "from-everywhere-to-everywhere" method uses a grid of origin/destination points as inputs to an iterative processes which constructs LCPs between all grid points, and uses the frequency of overlapping paths to construct a network of most-likely paths and their probability of use.

Graph-based approaches provide a complementary method for modeling movement, and have gained traction archaeological analyses (e.g. Howey 2011; White and Barber 2012). The circuit model used here combine graph theory, network theory, and circuit theory to develop potential movement surfaces which consider both cost and the availability of alternate pathways (see McRae 2006). This method was originally employed in landscape ecology as a way to simulate animal migration and mobility patterns as ecologists responded to similar issues with LCP-based methods. Like LCP analysis, circuit analysis relies on raster-based representations of effort to traverse a cell, but this method transforms the inputs into a scale of relative—rather than absolute—effort. Areas of low effort are more conductive, and have the potential for greater mobility. Areas of high effort offer greater resistance and have les potential for mobility.

Additionally, in larger more conductive areas, there is greater potential for alternate paths, and this is reflected in more diffuse conductivity, compared to areas which offer only a small area of low resistance surrounded by large areas of high resistance (pinch points, or bottlenecks). The resulting raster reflects a range from low-probability to high-probability of movement which overcomes many of the criticisms that have been raised regarding the use of LCPs to model mobility. Howey (2011) previously applied this method to an archaeological context, using it to better understand regional movement patterns between Late Prehistoric period sites in Michigan.

The use of computational methods, and in particular GIS, as tools for understanding human-landscape interaction have been intensely scrutinized for their positivistic orientation. Scholars with more humanistic and interpretive orientations in particular have criticized the use of GIS to address questions of human experience of the landscape, arguing that GIS analyses focus too heavily on absolute measures of space which are then used to interpret human experience. While these criticisms are not entirely unfounded, they also largely ignore the substantial and growing theoretically-informed approaches which have systematically addressed the cognitive, social and physiological aspects of human experience using GIS-based methodologies (Kosiba and Bauer 2013; M. Llobera, et al. 2011; Marcos Llobera 2001; Ogburn 2006). Recent publications regarding the state of GISc within archaeology have articulated a more explicitly theoretical approach the application of GIS to address interpretive questions. In particular, recent articles by Llobera (2012) and Gillings (2012) have argued for approaches which move away from absolutist or positivistic uses of GIS, to theoretically-informed methods which provide more nuanced examinations of human experience of the landscape.

Rather than approaching these models as representations of mobility patterns, I instead consider the results in terms of affordances for mobility. The term, borrowed from Gibson [1979] who developed the term through his work on visual perception, has been adapted by Llobera (1996) and Gillings (2012), as way to bridge the gap between GIS-based research and experiential theories in archaeology. As Gillings elaborated in a recent article, “rather than using spatial technologies to model or somehow represent aspects of human perception and experience (or claim that such technologies are capable of doing so), we should instead use them to explore the experiential *affordances* of the landscapes, events and features we are studying” (2012:608).

Modeling Regional Mobility

The circuit analysis was run using *Circuitscape* and *Linkage Mapper* (McRae and Kavanagh 2011), two open source toolboxes containing a bundle of python scripts run through ESRI ArcMap. For the analysis, 11 regularly-spaced polygon node regions were placed around a 100 km buffer from the valley (Figure 7.11a). Combined with a polygon of the buffered region around the banks of the Colca River, these regions served as the nodal regions of the analysis. A resistance raster was created using the slope of the terrain derived from SRTM DEM (1 arc-second resolution) data. Given that the majority of the region considered in the analysis is dominated by high-elevation areas which lie above the tree-line, slope was considered to be the most significant factor impacting travel patterns, and factors such as ground cover were not considered. Slope calculated from SRTM DEM (1 arc-second resolution) in ArcMap, and recalculated logarithmically to account for the non-linear impact of slope on movement cost (see Bell and Lock 2000). The resulting slope raster was resampled[11] to a resolution of 270 m and scaled to values from 1-100 to represent relative cost of travel (see Howey 2007). The analysis

[11] Although resampling lowers the resolution of the slope raster (i.e. produces a coarser representation of the topography, it was necessary given computational limitations. Several studies, however, have shown that resampled datasets do not produce significantly different results from higher resolution ones, and are appropriate to mobility models of this scale [ADD CITATIONS].

was run in all-to-one mode—with one point serving as a destination for all other points. Through iterative runs, each node served as a destination during the analysis. The resulting surface shows relative resistance (accessibility), with low accessibility represented in cooler colors (blues, pinks), and high accessibility represented in warmer colors (yellows, white)(Figure 7.11b).

Table 7.3. Table of electrical terms and their archaeological interpretations. Adapted from Howey 2011.

Electrical term	**Archaeological interpretation**
Reistence (*R*, ohm), opposition to the flow of electrical current applied by a resistor	The opposition to human movement exerted by the local environmental contexts (friction, landscape resistance). Factors which limit movement (slope, terrain, groundcover, waterbodies, etc.) are assigned higher resistance.
Conductance (*G*, siemens), inverse of resistance, ability of a resistor to carry electrical current	Interpreted as landscape permeability. Likelihood that a walker would choose to move through a given raster cell given the alternative cell options available.
Current (*I*, ampere), flow of charge through a specific node or resistor in the circuit	The amount of current through nodes or resistors can predict the likelihood that an individual will move through the nodes or cells. Stronger currents reflect greater likelihood of movement, weaker currents reflect lesser likelihood of movement.

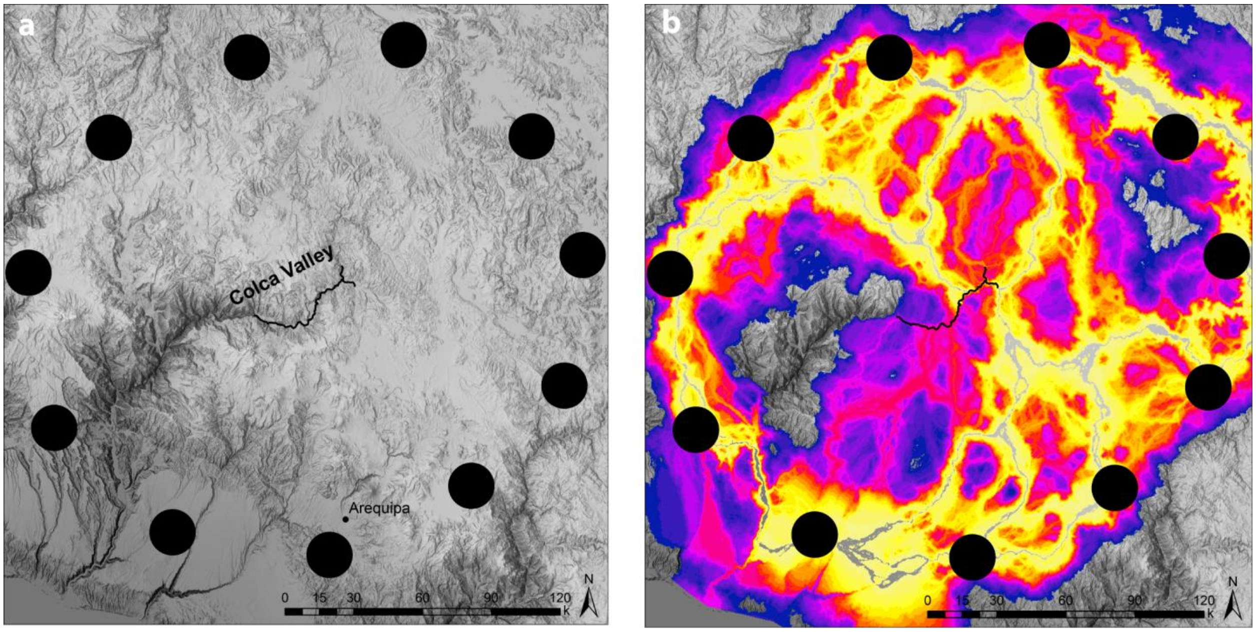


Figure 7.11. Set-up for circuit analysis. a) The regions used in the analysis. b) The resulting circuit analysis. Whites and yellows show areas of highest connectivity (lowest resistance) and blues show areas of higher resistance.

Mobility Affordance and Fortification Location

The resulting raster displays the current, or possibility of movement across all nodes given the slope resistance. Areas of higher current are interpreted as providing the greatest possibility of movement, while lower currents are interpreted as having lower possibilities of movement. It is clear from the results that the terrain of the high altitude, mountainous environment significantly impacted probabilities of movement through the network. Importantly, a cursory view of the results show that travel routes into and out of the valley converge in several key areas (Figure 7.12).

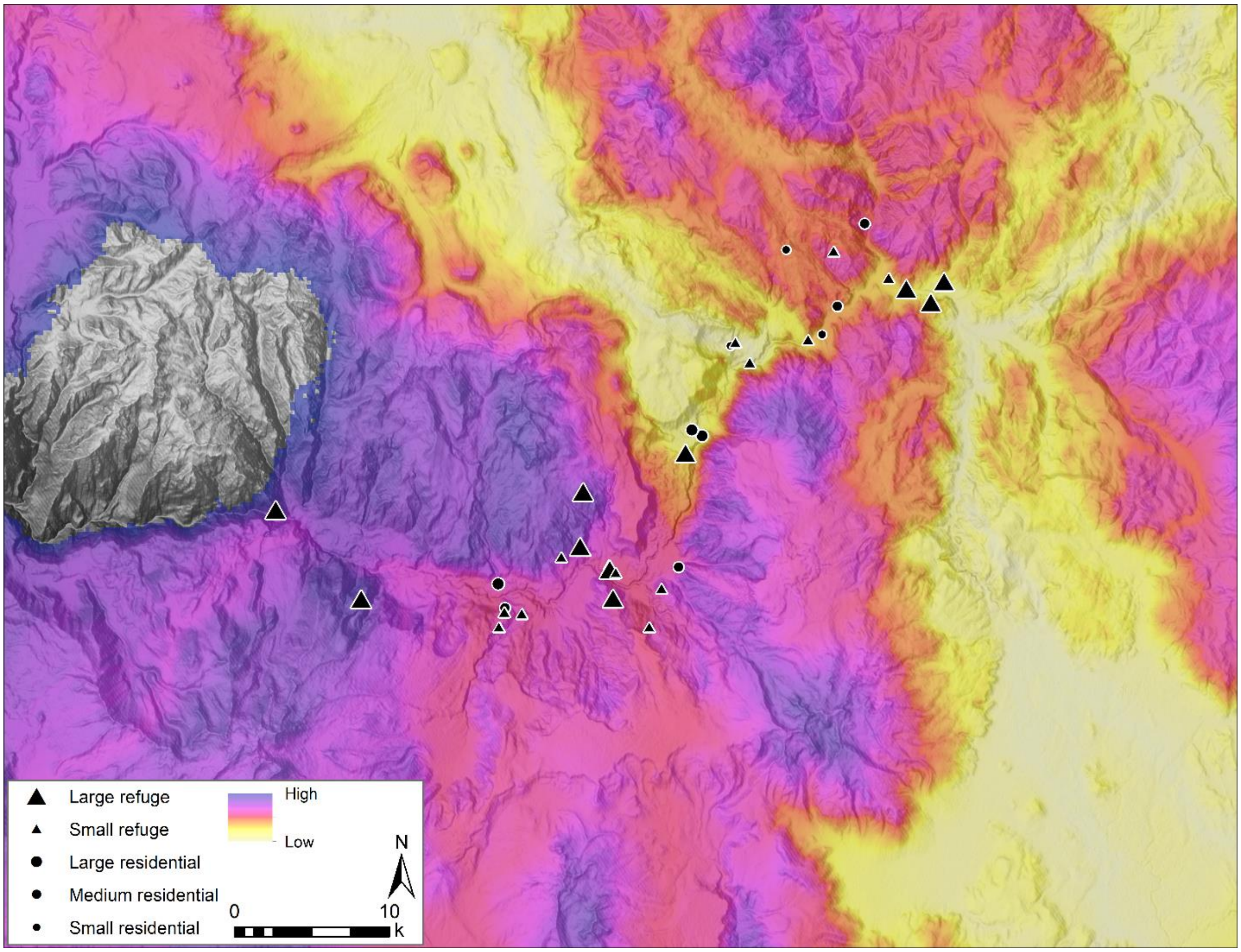


Figure 7.12. Combined LCP and circuit analysis results

It is clear from the results that the terrain of the high altitude, mountainous environment significantly impacted the difficulty, and thus probability, of movement through the region. A cursory view of the results show that the most accessible routes into and out of the valley converge in three key areas concentrated in the upper part of the valley (Figure 7.12a). A second “pinch point” analysis identified these areas as key bottlenecks in the overall mobility network, suggesting these were particularly crucial corridors for regional connectivity (Figure 7.12b). Overall, the upper valley area was far more accessible than the central valley, but access in this area was also potentially more concentrated in specific corridors—a pattern that may have been particularly relevant to local communities as they made decisions over where to place fortifications.

In the central valley, the results suggest differences between the northern and southern sides of the valley. The northern side of the central valley is the least accessible area considered in the analysis, due to the very rugged terrain. Here, fortifications are clustered to the east in the area of the central valley with the highest permeability. The site of Malata (IC-195) sits roughly in the mid-point of the central valley, and Fortaleza de Chimpa (MD-190) lies on the far western edge of the survey area. It is notable that no other fortifications were located in this area, which comprises much of the districts of Ichupampa and Madrigal, and all of the district of Lari, despite extensive Late Intermediate Period settlement in this area (Doutriaux 2004). On the southern side, by contrast, we identified almost exactly the same number of forts, but here they are more dispersed. This side of the central valley is also generally more accessible. Here we also find more fortified outposts (non-residential fortifications) situated on the puna and the transitional slopes between it and the valley bottom.

Cursory review of the results shows that fortifications, seem to be positioned in areas of high accessibility, and conversely, absent from those areas that are less accessible at a regional scale. By comparing the total affordance of the 1 km area surrounding the surveyed fortifications to a large sample of random points, fortifications were located in areas with significantly higher mobility affordance (Fig. 8). These results suggest that communities intentionally situated their fortifications in areas which would have been particularly accessible, and perhaps then particularly vulnerable. And these results hold true for both the upper and central portions of the valley (Figure 7.14).

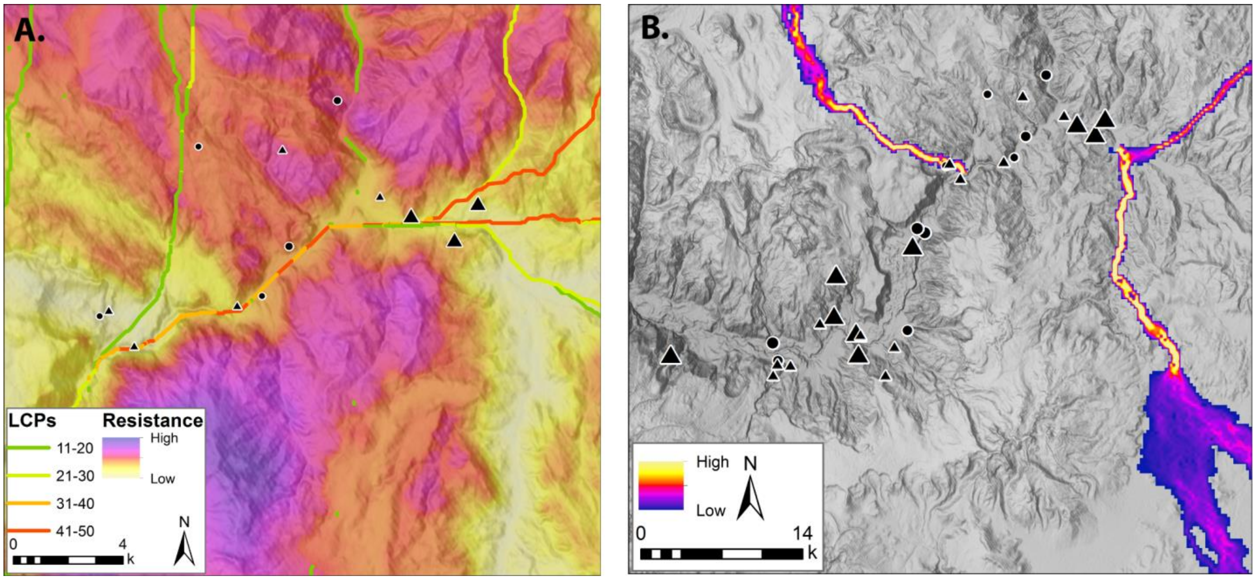


Figure 7.13. a) Detailed view of upper-valley section. b) Results of pinch point analysis for upper valley.

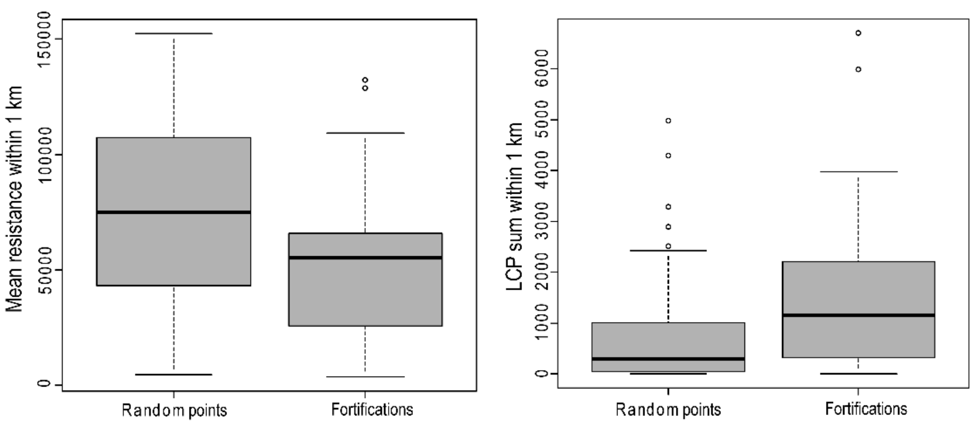


Figure 7.14. Comparison of accessibility indicators between fortifications and random points. Results show fortifications were located in areas with significantly lower resistance (left), and were near to significantly more least-cost paths (right).

Discussion and Conclusions

The ability to send or receive effective support during times of crisis is critical to building effective alliance relationships. By considering the limits of effective landscape monitoring and the travel costs associated with moving though the mountainous terrain of the valley region, the alliance model presented here provides one method for understanding how the experience of warfare shaped perceptions of proximity. For most fortifications in the valley, allies would need to be within one or two kilometers from one another to provide effective support during an attack.

The results of this model also suggest that the importance of alliances may have varied across the valley depending on local production practices. Clusters of fortifications are more frequent in lower-lying reaches of the valley where agriculture was more important, and were less frequent in the high-elevation puna regions primarily used to pasture camelids. While this could indicate that agriculturalist settlements were more vulnerable, it was more likely a result of the larger population bases of these communities allowed for the construction of more elaborate defenses (as discussed in Chapter 5). Finally, assessment of the ranges of areas which could effectively be monitored from each site indicates that non-residential fortified outposts were strategically placed in areas which provided wider views of the landscape. This suggests that residential and non-residential sites may have served distinct defensive roles within the region.

Fortifications were situated in areas that afforded greater accessibility when considered at a regional scale. Additionally, the absence of fortification in areas that were much less accessible, suggests that control over access into and out of the valley was a particular defensive concern for LIP communities. Thus, fortifications were more clearly oriented toward threats coming from outside the valley, than those from their neighbors.

However, this does not eliminate the possibility of internal conflicts between neighboring communities. Ethnographic and ethnohistoric accounts clearly show that internal and external conflict are not mutually exclusive. In the Northwest Coast of the US, for example, Angelbeck and Grier have convincingly shown that Coast Salish communities engaged in frequent conflict with their neighbors, but were nevertheless able to rally broader alliances in order to combat a common enemy. This work and others highlight the need to reframe the typical dichotomies of alliance and threat and affiliation and differentiation instead as scalar, nested, and often fluid relationships.

LIP communities likely faced a number of climate shifts which may have resulted in greater resource stress, more frequent crop failures, and more limited agricultural potential. Furthermore, drought and cooler temperatures would have posed significant threats to herd animals. Communities in the valley were often linked through water systems which would have been a likely source of conflict (Chapter 6). However, it is unlikely that local conflict was the primary motivation behind fortification construction. In areas where internal raiding and revenge conflict is pervasive, most, if not all settlements are fortified. In the LIP Colca Valley, by contrast, most people lived in *unfortified* settlements. Furthermore, fortified settlements were the minority in terms of the types of defensive sites identified in the valley. Some were clearly designed as primary defenses for local residents who either lived within the fortification or closely adjacent to it. Others were joint efforts, constructed by and providing defenses for multiple settlements. And others located higher and further removed from major population centers, were situated to maximize both their visibility of the landscape and their visibility to other sites. This diversification of defense suggests the coordinated, but not centralized, construction of a broader defensive network which would have provided direct defense for much of the population, while also facilitating monitoring of the landscape, communication between sites, and surveillance and control over access into and out of the valley.

The results presented here suggest that fortifications did not operate in isolation, but instead constituted networks of cooperative—and at times likely conflictive—relationships, that were both nested and scalar. The presence of these dense interconnections between fortified sites and the diversification of defenses suggests that local communities were enmeshed in a broader network of defense. These broader regional ties provide a possible explanation for the broad material similarities across sites in the region during the Late Intermediate Period. Within this context of war, the social, economic and ultimately political practices through which alliances were negotiated and maintained would have provided loci for interaction and the construction of relationships which crossed settlement boundaries.

CHAPTER 8

ENDURING LEGACIES: HILLTOP FORTIFICATIONS IN THE LATE HORIZON

Introduction

By the mid-13th century, the communities in the Colca Valley had been integrated into the Inka state. Inka state presence is marked by the introduction of Inka-style architecture, including several small rustic kallanka (great-hall) structures, Inka ceramics, and the emergence of a new local Inka ceramic style. Documentary sources describe a province which was centrally administered by the Inka state through the reorganization of local communities into an ideal nested administrative hierarchy. Descriptions from Ulloa in 1586 and reconstructions from several relatively complete visitas recorded between 1596 and 1667 indicate a series of bi-parte and tri-parte divisions below the broader Collaguas/Cabanas ethnic division (Wernke 2013). The Collaguas were divided into two subethnic divisions—the upper ranking Yanquecollaguas, who occupied the upper central and upper valley, and the lower ranking Laricollaguas, who occupied the lower central valley. Below this, each subdivision—Cabanaconde, Yanquecollaguas and Laricollaguas—was divided again into ranked moieties, Hanansaya and Urinsaya. Finally, within each moiety, was a series of repeating tripartite administrative division of Collana, Pahana and Cayao.

However, as Wernke (Wernke 2013:190-193) has examined, close reading of ayllu divisions recorded in the colonial visitas reveals that many of the ayllus—especially those of the higher-ranking Hanansaya—did not follow this ideal nomenclature. Many of the ayllu names within the hanansaya moieties are derived from Aymara, the pre-Inka language of the Collagua, and are organized around a right-left dualistic division—a feature common to prehispanic

Aymara polities. Overall, these documentary reconstructions suggest a political structure which emerged more through compromise than through abrupt imperial conquest—one which likely maintained some pre-Inka ayllu divisions, while reorganizing others to fit a more ideal Inka administrative structure.

Archaeological evidence in the valley does not point toward direct Inka administration in the valley either. Previous work has not identified a single primary administrative center. Instead, Inka administration appears to have been distributed between Yanquecollaguas, Laricollaguas and Cabanaconde, with a separate administrative center in each region, and all roughly equal in size (Chapter 3). The elaboration of the primary centers is difficult to ascertain because they later became reduction villages during the Colonial period, and all three lie beneath modern villages in the valley. However, the density of Inka finewares recovered at these sites attests to their importance within the Inka state, and the only examples of Inka cutstone masonry from the valley was found in two of these centers, Yanque (in the central valley) and Antisana (in the lower valley), albeit in secondary contexts.

For local communities, there was significant continuity of settlement across the valley from the LIP to the LH. The new administrative centers were built upon preexisting LIP settlements. While the extent and density of settlement expanded in the LH, previous full-coverage surveys in portions of the lower and central valley found that with the exception of one, all LIP settlements continued to be occupied into the Late Horizon (Doutriaux 2004:256-270; Wernke 2003:182). State administration extended beyond the primate centers into smaller settlements as well. Inka-style great hall and plaza complexes have been found at nine sites in the valley. These complexes vary significantly in terms of their size and elaboration, but their outline is the same. The great hall structures are long and narrow rectangular single room structures with multiple trapezoidal doorways along the long side which open onto a walled plaza. The structures range in size from roughly 10m to almost 30m along the long end, with between 2 and 7 doorways. Similar great hall structures are found at major Inka settlements in other provinces. The combined great hall/plaza area likely provided a central place for feasting and commensalism. But importantly the presence of these complexes shows how Inka administration penetrated more deeply than the primate centers to the level of local settlements.

This chapter discusses the changing role of fortifications as the area was integrated into the new state. I begin with an overview of the regional-scale changes in hillfort use, which shows that more than half of the fortified settlements fell out of use in the Late Horizon. The widespread abandonment of hilltop fortifications in the Late Horizon indicates a waning of the threat of war that predominated in the LIP. Despite an overall pattern of fort abandonment, two prominent fortified settlements—Malata (IC-195) and Auquimarka (TU-188)—not only continued to be occupied through the LH, but grew and were transformed into secondary administrative centers. The second and third parts of the chapter examine the settlement-level changes that occurred at each of these sites. As I will show, the transformation of these settlements into local Inka centers reshaped the use and significance of the durable defensive constructions.

Regional Indices of Change and Continuity

Across the Andes, incorporation into the Inka state brought about marked and important changes to how people were settled in the landscape. In the upper Mantaro Valley, for example hilltop fortresses were abandoned and residents resettled into lower valley-bottom areas (D'Altroy 1987, 1992). Similar shifts have been documented in the Lake Titicaca Basin, where there were high levels of LIP site abandonment, particularly of fortified hilltops, and many new settlements constructed, frequently near the lake margins (Stanish 1997, 2003). In many respects, the Colca Valley stands in contrast to this more general model, with extremely high levels of settlement continuity across the LIP and LH in well-surveyed parts of the valley (Doutriaux 2004; Wernke 2013).

There are both elements of change and continuity in the data from the hilltop fortifications in this survey. Late Horizon ceramics were found at 81% (13 of 16 sites with surface ceramics). However, only five sites had substantial enough LH ceramics to indicate they continued to be used in a significant way following the shift to Inka rule. The sites that continued to be used were nearly all settlements (4 of 5). The only non-residential fortification with evidence for continued use was the site of Chilaq'ota (CO-151), a large fortified refuge overlooking the large settlement of San Antonio/Chijra, a site whose occupation spans Late Intermediate Period through early Colonial period. Chilaq'ota is also less than 500 m south of an important prehispanic reservoir. Given the continuing importance of the site of San Antonio and the surrounding corrals and irrigation infrastructure, it is not surprising that this area would have remained in use, even if the use of the site no longer served a primary defensive role. Only the two largest fortified settlements—Malata (IC-195) and Auquimarka (TU-188)—had evidence of Inka-style architecture. Instead, Late Horizon occupation is primarily indicated through the presence of local Inka style ceramics. Even at these sites, however, LIP ceramics outnumber LH ceramics at a rate of nearly 2 to 1. This pattern is the inverse of previous studies in the valley, which found that LH ceramics outnumbered LIP ceramics at rates of 3-4 to one. This difference could be the result of Collagua III ceramics being classified at LH rather than LIP. But this could also indicate differences in the intensity of LIP versus LH use of defensive sites.

Of the fortified settlements with continuous occupation, all were medium to large settlements. Overall, the settlements that continued to be used were located in more accessible and relatively lower-lying areas, which may have been a factor in their continued use. The primary residential area of the site of Paraq'ra (SI-198), for example, lies along the banks of the Colca River, straddling a small tributary river. The site's location offered not only riverine resources, but also abundant water access for cultivation and pasturing animals. The site remained appealing—likely through the early colonial period—as evidenced by what appears to be a small rustic chapel in the residential area. Similarly, the site of Pukarilla (SI-197) is located along a tributary river and surrounded by extensive terracing. The site is also very close to the high puna grasslands, and would have supporting both cultivation and herding. Both sites remained relatively small, with only around 40 domestic structures each.

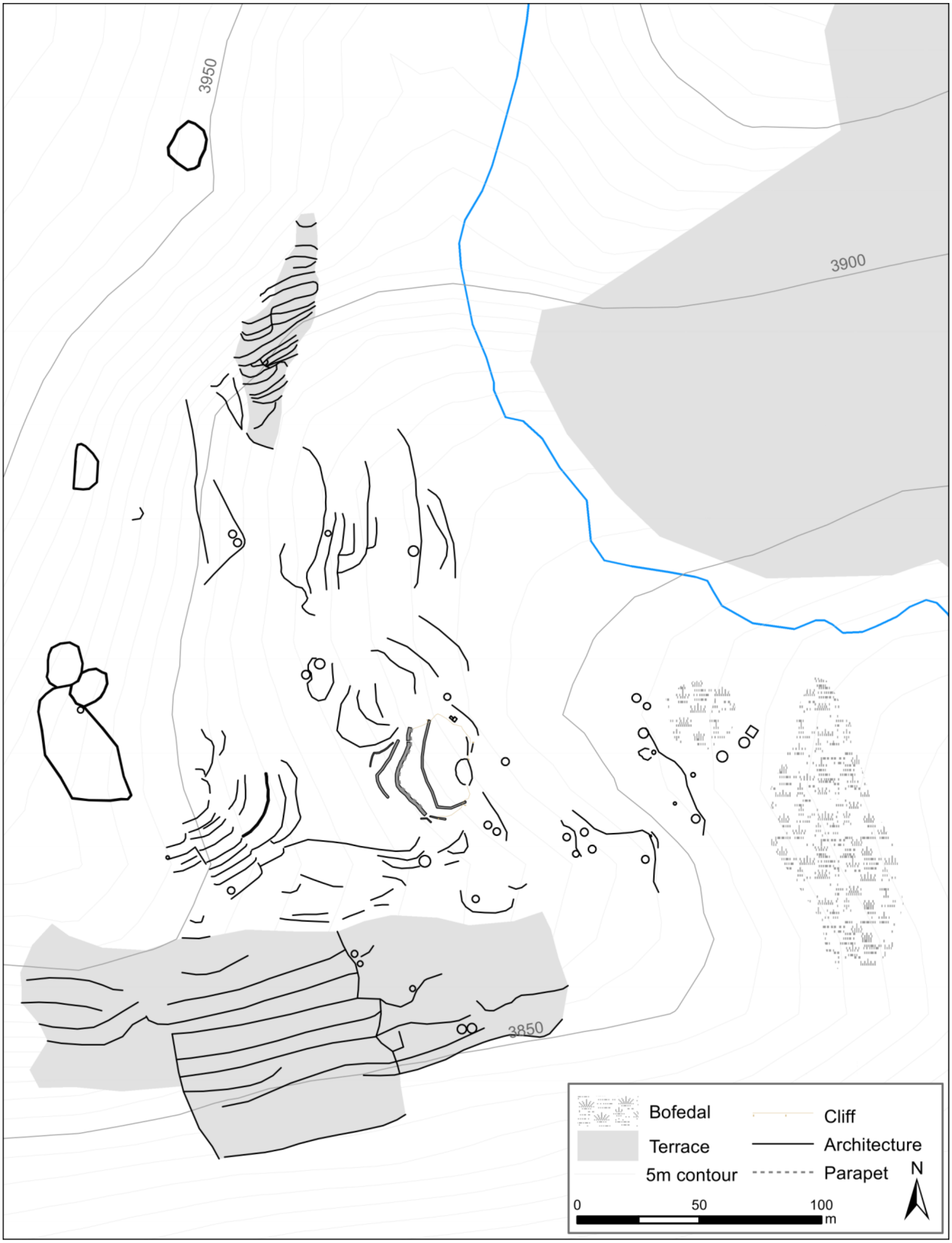


Figure 8.1. The site of Pukarilla (SI-197)

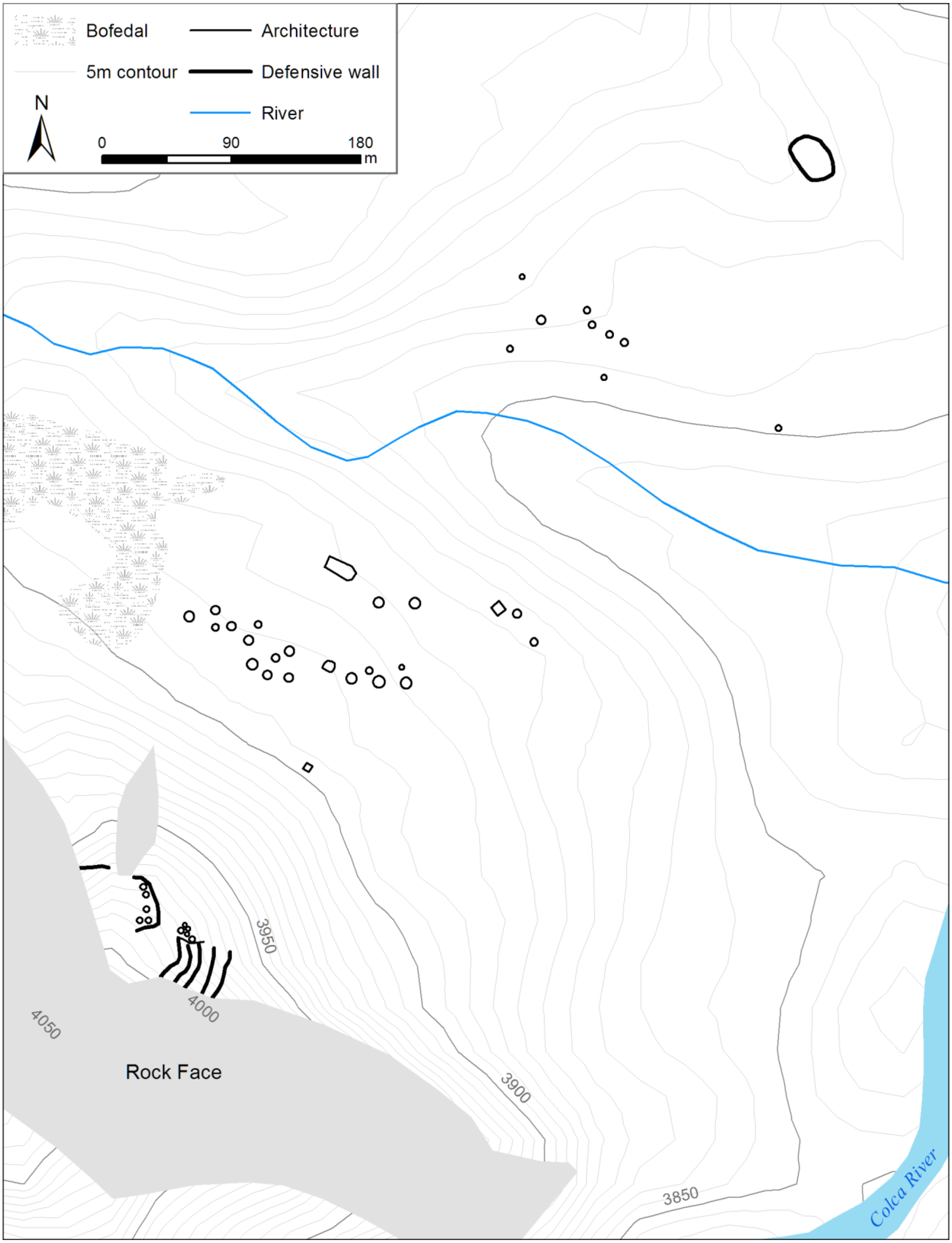


Figure 8.2. The site of Paraq'ra (SI-197).

By contrast, the sites of Malata (IC-195) and Auquimarka (TU-188) not only continued to be used, but grew substantially during the Late Horizon. At their apex, each site had over 150 domestic structures, making them comparable in size to Uyu Uyu, San Antonio/Chijra, and other large LH settlements in the valley. Inka presence at the sites was demonstrated in the construction of new residential and public spaces with Inka architectural forms, including long, multi-doored rectangular structures and well-defined, open plazas. These sites also stand out in terms of the amount of investment in defensive architecture. The residents of Auquimarka constructed 930 m^2 of wall, and at Malata a total of 1919 m^2 of wall was constructed. The median wall investment across all fortifications was just over a one quarter to half of that area (489 m^2). While wall area is only a rough approximation of building investment in defenses, it does provide a robust assessment of the ability to coordinate and execute corporate labor projects, something that was likely tied to LIP population size. Thus, the two settlements with the most intensive Inka investment likely also had the largest LIP populations.

Overall, my survey found that over 50% (6 of 10) of fortified settlements, and nearly all non-residential fortifications, fell into disuse in the Late Horizon. There is also no evidence that any new fortifications were constructed while the region was under Inka rule. Instead, there was significant growth of many of the lower-lying kichwa settlements, and new pastoralist settlements were established in the puna (WErnke, Doutriaux). Most telling, perhaps, is that the three the primary Inka administrative centers in the region were located in low-lying open plains, rather than on defensible hilltops or promontories (Wernke, Doutraiux). The establishment of state political power in decidedly non-defensive contexts indicates a shift away from the defensive concerns of the LIP.

With such a small number of fortified settlements in the study, it is impossible to identify patterns in why certain settlements were abandoned in the LH. It is likely that decisions were rather idiosyncratic and based on a number of factors. Given the inhospitable location and topographic constraints of many fortified settlements it is very possible that households chose to move to more appealing locations once the defenses were no longer necessary. Communities may have simply de-nucleated; dispersing to the immediate areas surrounding the fortifications. It is also possible that communities were drawn to the larger LH settlements and contributed to the growing settlement density and nucleation at these sites.

By all indications, the conflict which had driven the construction and use of hilltop fortifications disappeared in the Late Horizon. New and expanding settlements were concentrated in the low-lying kichwa areas and the plains of the puna. The centers of state power in the region were established in low-lying, open areas that offered no natural defensive protection. As the threat of conflict subsided, many of the features that made the fortifications so effective for defense—defensive walls, escarpments, prominent slopes, and high positions—were apparently no longer necessary or appealing to residents. Was the abandonment of hilltop fortifications a state-directed relocation plan aimed at preventing rebellion or part of a show of state control? This seems unlikely given the local variation in settlement abandonment. Two of the four settlements had both the largest LIP populations and the most elaborate defenses. Thus, it appears that with fortifications, as with nearly all settlements in the valley, the Inka came to where the people were. By the time the Inka had established their network of primary and secondary centers, they clearly felt no threat of attack either from external groups or from internal rebellion in the valley.

Table 8.1. Ceramic counts by period.

Site	MH		MHO/LIP		LIP		LIP/LH		LH		LH/COL		COL		Total
	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%	
AC-175	26	3.9	5	0.7	567	84.1	54	8.0	22	3.3	0	0	0	0	674
AC-176	1	25.0	0	0	1	25.0	0	0	2	50.0	0	0	0	0	4
AC-177	0	0	0	0	34	79.1	5	11.6	4	9.3	0	0	0	0	43
AC-178	0	0	0	0	3	100.0	0	0	0	0	0	0	0	0	3
CA-191	0	0	0	0	3	75.0	1	25.0	0	0	0	0	0	0	4
CA-203	0	0	0	0	9	90.0	1	10.0	0	0	0	0	0	0	10
CH-181	0	0	0	0	40	81.6	5	10.2	4	8.2	0	0	0	0	49
CH-196	0	0	0	0	0	0.0	1	100.0	0	0	0	0	0	0	1
CO-151	1	12.5	0	0	4	50.0	0	0	3	37.5	0	0	0	0	8
CO-187	0	0	0	0	2	50.0	1	25.0	1	25.0	0	0	0	0	4
CO-189	0	0	0	0	1	100.0	0	0	0	0	0	0	0	0	1
CO-201	0	0	0	0	1	33.3	2	66.7	0	0	0	0	0	0	3
IC-195	7	0.4	2	0.1	1104	62.3	271	15.3	379	21.4	2	0.1	4	0.2	1771
MD-190	1	33.3	0	0	2	66.7	0	0	0	0	0	0	0	0	3
SI-197	0	0	0	0	22	37.9	16	27.6	20	34.5	0	0	0	0	58
SI-198	0	0	0	0	5	71.4	0	0	2	28.6	0	0	0	0	7
SI-199	0	0	0	0	1	50.0	1	50.0	0	0	0	0	0	0	2
SI-202	0	0	0	0	1	33.3	1	33.3	1	33.3	0	0	0	0	3
TU-185	0	0	0	0	18	94.7	0	0	1	5.3	0	0	0	0	19
TU-188	2	0.04	2	0.04	2511	49.3	815	16.0	1737	34.1	0	0	21	0.4	5093
TU-204	0	0	0	0	0	0	1	100.0	0	0	0	0	0	0	1
YA-184	0	0	0	0	10	62.5	4	25.0	2	12.5	0	0	0	0	16

Local Changes: Malata (IC-195)

The site of Malata is located in the district of Ichupampa on the northern side of the Colca River. The site occupies a prominent hilltop in an otherwise level plateau divided into a mosaic of broad field bench terraces. After rising approximately 25 m above the surrounding terrain, the eastern half of the site levels off, providing a somewhat undulating surface for large residential area. On the western half of the site, the terrain continues to rise, creating a steep hilltop. This part of the hilltop is encircled by five major defensive walls. A total of 174 domestic structures were identified and are packed into residential patios defined by fieldstone walls. The site of Malata was transformed several times, first into a secondary Inka administrative center, and later into an early doctrinal settlement. Full-time residence at the site likely ceased during the Toledan reforms when residents were forcibly resettled to the *reduccion* village of Ichupampa. The long history of use of the site makes it difficult to reconstruct what the site looked like during its LIP occupation. However, systematic surface collections do provide some indication of how the use and organization of the site changed through time (discussed below).

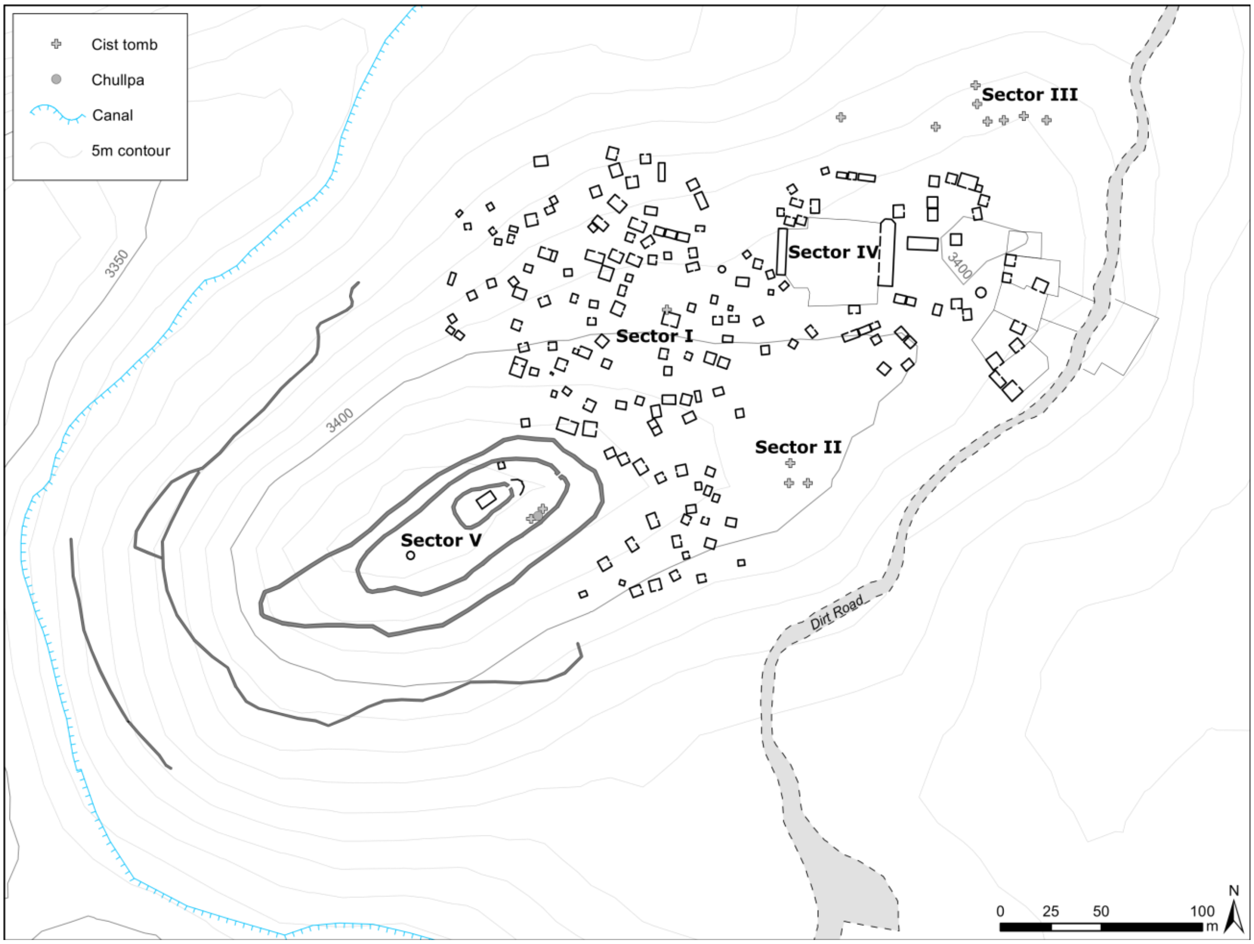


Figure 8.3. Map of Malata (IC-195) with the primary sectors identified.

The site was divided into five sectors based on architectural differences. Sector I includes the entire residential area of the site. The residential area extends along the slightly undulating terrain which extends primarily to the east of the fortified hilltop. Sectors II and III consist of mortuary areas with concentrations of looted cist tombs. Both areas are located on topographic rises, one (Sector II) along the southern extent of the site, and the other (Sector III) to the north east of the plaza area. These areas are devoid of any standing architecture, and are pocked by a number of small (less than 1 m diameter) stone lined tombs.

A large formal plaza (Sector IV) is located in the northeastern edge of the residential area. The roughly trapezoidal plaza is flanked on the eastern and western sides by two Inka long-hall structures. The eastern one shows evidence of major modifications, including the sealing of three of the four doorways and the construction of a half-hexagonal northern terminal end, during the colonial period apparently designed to retrofit the structure into a chapel.

Sector V consists of the walled hilltop. The large hilltop is encircled by 5 defensive walls, with roughly aligned accesses along the eastern side. At the apex of the hilltop is a rectangular platform measuring 8.5 by 5.1 meters, which may have been added during the Inka occupation of the site as an ushnu-like structure. The platform is modest in height—only half a meter above the surface—and was constructed of worked rectangular fieldstones supporting the level surface. A few chullpas and cist tombs were identified along the defensive walls to the eastern side of the hilltop. But otherwise, the area was devoid of any standing architecture. Notably, numerous painted stone tablets were found within this area—the highest concentration of this type of artifact found at any of the sites. These stones were primarily concentrated in the western portions of the hilltop. Painted stone tablet of this type are found across the valley and in other surrounding valleys. In the Colca Valley, they are most common in the lower and central valley. In our survey, we did not find any artifacts of this type above the village of Chivay. The tablets are often found in association with burials, and in this case may have been markers of those who died during battle or offerings for success in battle.

Spatial Practices

The distinct distributions of LIP ceramic styles and Collagua Inka ceramics suggests an important change in site organization that coincides with integration into the Inka state. Comparing the site organization of Malata to the previous examples of terminal-LIP settlements, it is clear that integration into the Inka state brought about significant changes to life at the site. While surface ceramics only provide a rough approximation of the extent of the LIP occupation, it appears that habitation during the LIP was concentrated in the southern portion of the site, and that the residential area likely expanded to further east and north during the LH.

Surfaces derived from systematic surface collections show that Collagua I, II, and III style ceramics have very similar distributions across the site. The highest concentrations of these ceramics is found in the areas peripheral to the residential sector, to the north, south, along the fortified hilltop and to the north of the Inka/Colonial plaza. Importantly, Collagua I-III ceramics only appear in very low frequencies in the most of the core residential areas of the site. By contrast, the greatest densities of Collagua Inka ceramics were found in the residential core of the site. The ceramic chronology as described by Wernke (2003) tentatively placed Collagua I and II ceramics in the LIP, and Collagua III and Collagua Inka, with Collagua III possibly representing a transitional LIP-LH style or a contemporaneous local LH style. However, the contrasting distributions of Collagua I-III ceramics with Collagua Inka ceramics suggests that Collagua III ceramics represent a (perhaps late) LIP style, rather than a Late Horizon style that was contemporaneous with Inka occupation in the valley.[1]

[1] See appendix C for an in-depth discussion of the relative ceramic chronology used here.

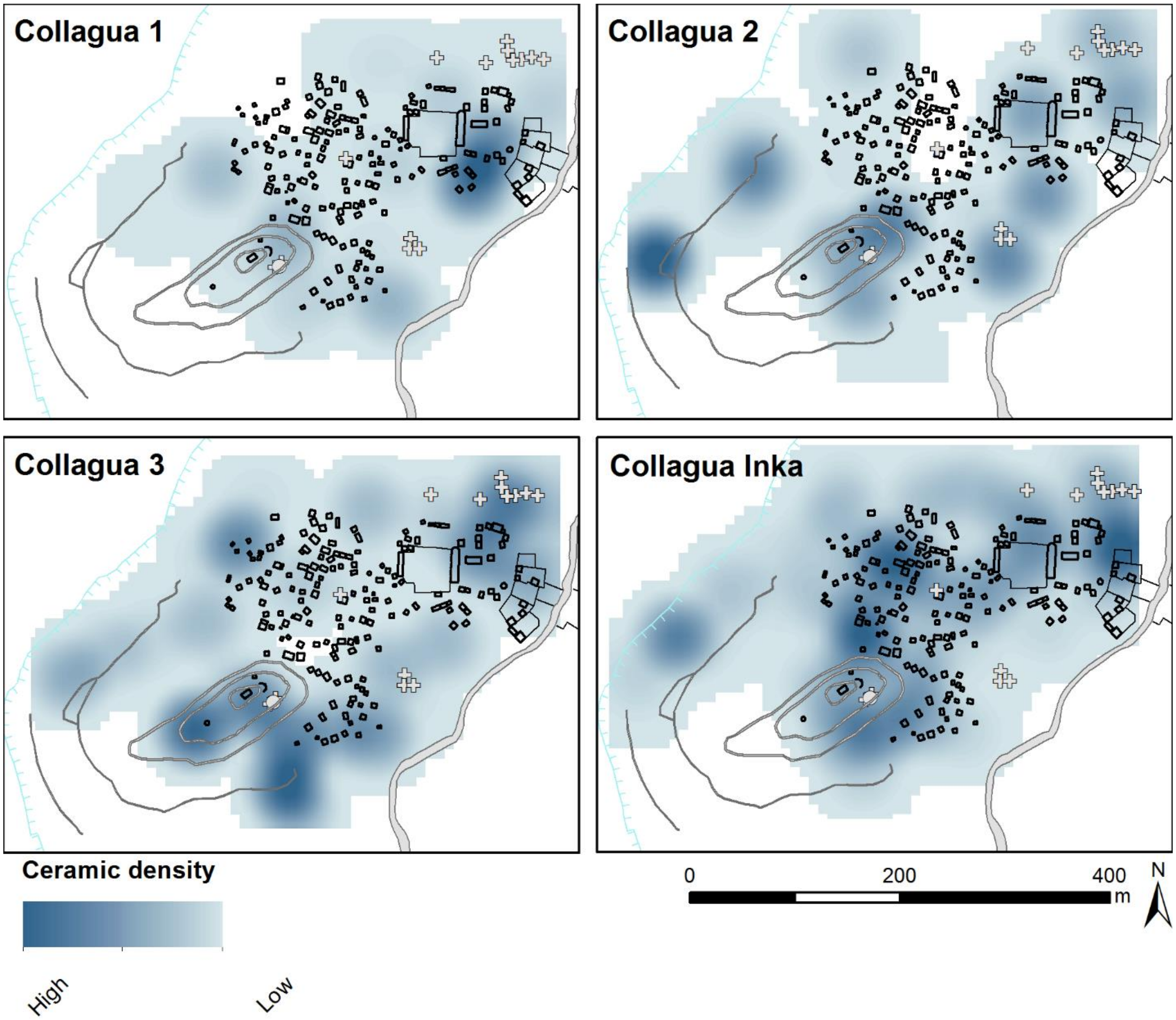


Figure 8.4. Kernal density surfaces showing patterns of period-diagnostic ceramics.

Differences in the distribution of Collagua I-III ceramics and Collagua Inka ceramics suggest changes to the residential core from the LIP to the LH. And more specifically, only the distribution of Collagua Inka ceramics coincides with the standing architecture at the site. Our excavations at Auquimarka (described below) found evidence of reconstruction with the residential areas that coincided with the appearance of Collagua Inka ceramics at the site, and it is likely that similar rebuilding took place at Malata. Thus, it is almost certain that the standing architecture reflects the Late Horizon and even Colonial uses of the site.

Analysis of the materials collected from the defensive hillfort at the site reveal that use of this area changed as well. Diagnostic ceramics recovered from the sector were overwhelmingly Late Intermediate Period styles. Only 36 of the 253 period-diagnostic sherds collected were Late Horizon styles. Activity in this area, which was unsurprisingly a central part of the site during the LIP, appears to have diminished in the LH, as activity was focused increasingly in the residential core and Inka plaza.

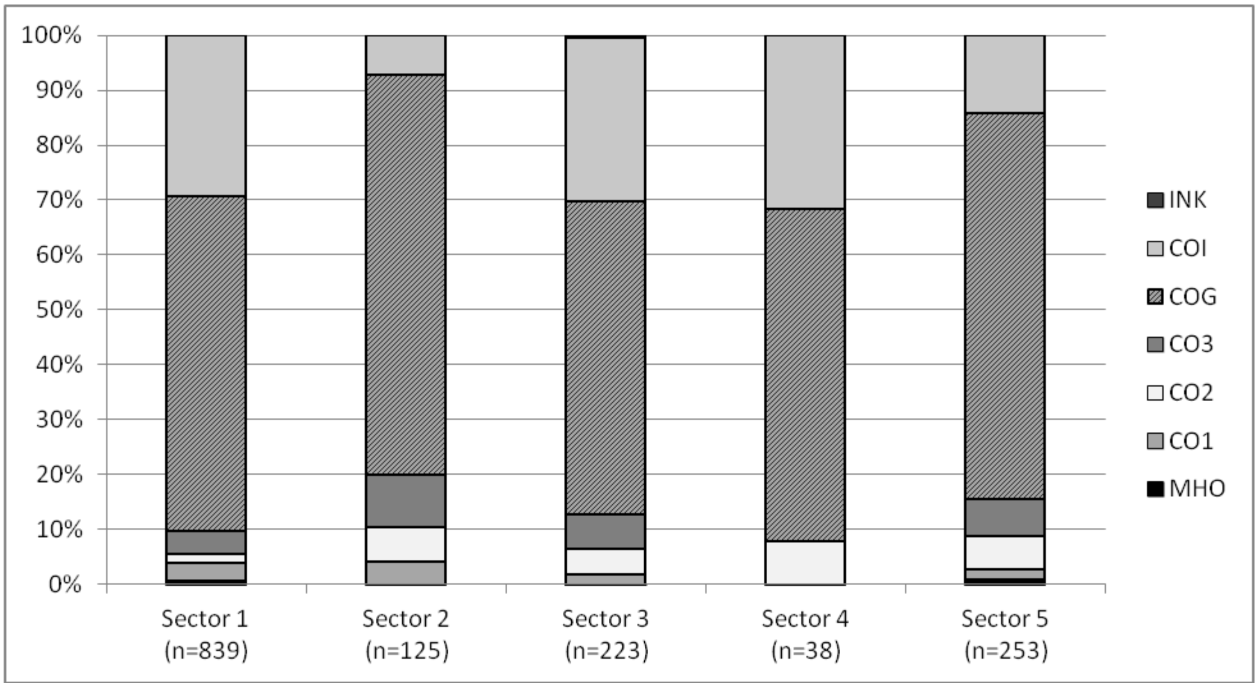


Figure 8.5. Proportion of period diagnostic ceramics by site sector.

Domestic Spaces

The residential core of Malata was very densely settled, with 161 domestic structures packed into the 6.8 ha area. Houses were arranged in domestic patio groups with between one and four structures. Houses at the site are generally freestanding, single-room rectangular structures. When two structures shared a wall, it was almost universally adjoined on the short end of the structure. In the examples found at the site, the most typical pattern was a much smaller structure joined to a larger one. The smaller structures were likley storage or perhaps cooking structures. Only a handful of circular structures were found at the site and none were associated with domestic patio groups. These structures were possibly storage or more likely burial structures. In general, residential patio walls were fitted into existing architecture and followed the irregular topography of the surrounding area.

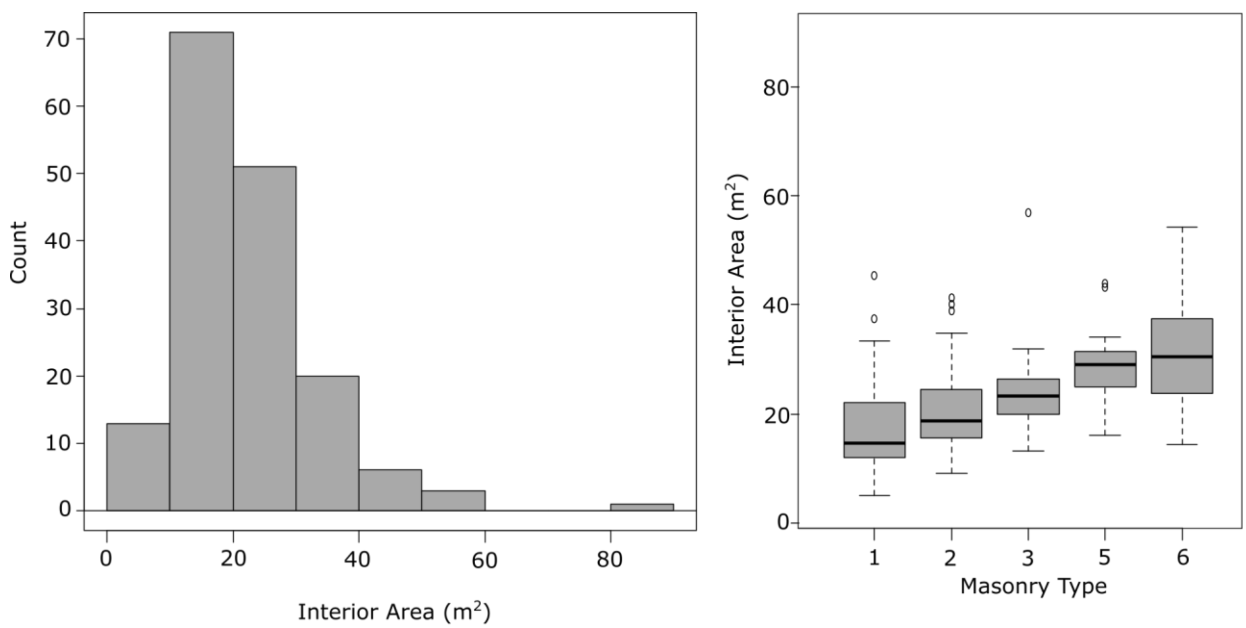


Figure 8.6. Interior area of domestic structures at Malata (IC-195); all domestic structures (left), by masonry type (right).

Most domestic structures at the site had interior areas of between 10 and 35 m^2. A smaller class of structures had areas between 40 and 60 m^2. These structures likely represent a distinct elite class of households (see also Wernke 2013:130-132). The size and elaboration of domestic structures ranges from small constructions of selected and roughly worked fieldstone, to large structures of worked stone arranged in linear courses with finely worked corners and entrances.

Overall, the larger and more finely constructed structures are found in small clusters dispersed throughout the residential area, rather than forming spatially-discrete elite and commoner domestic areas.

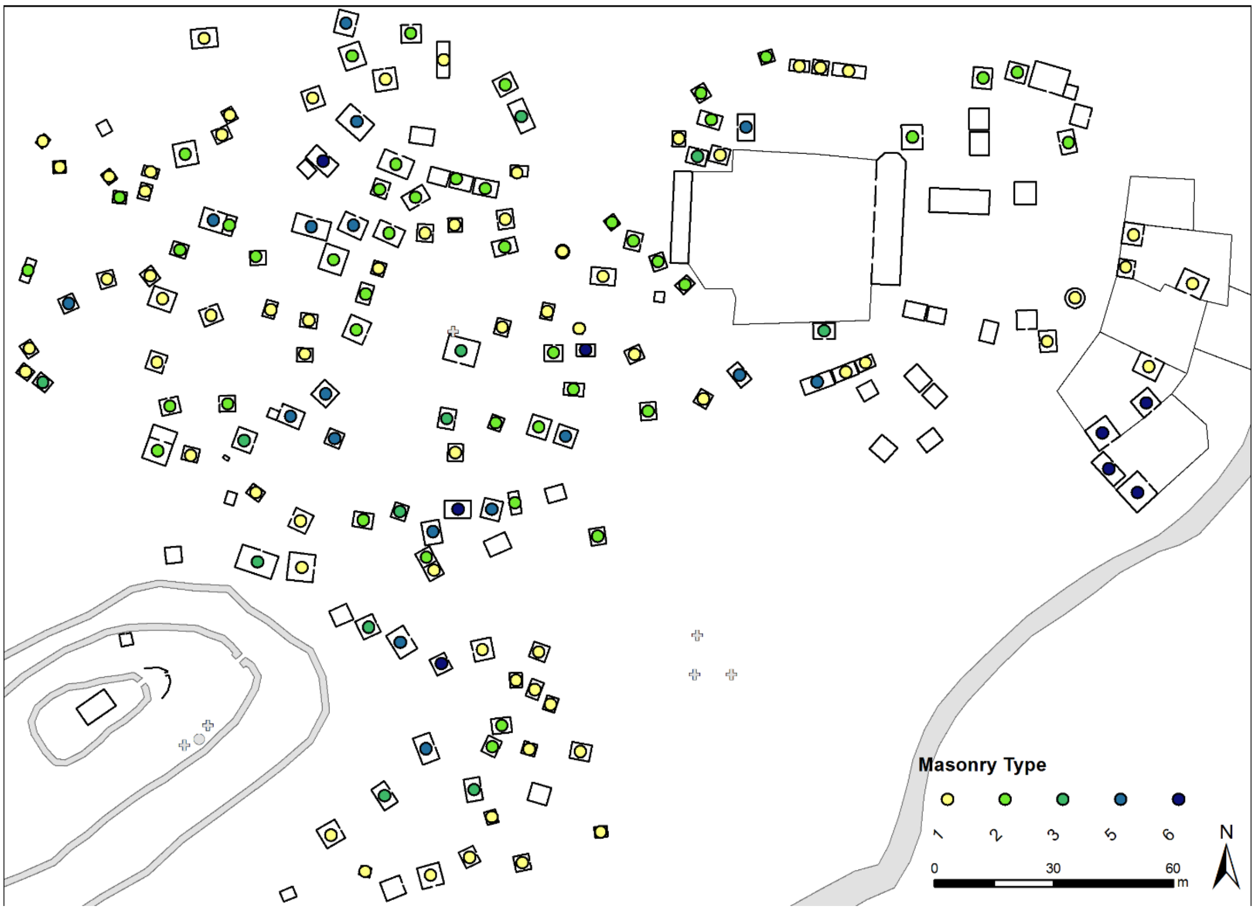


Figure 8.7. Masonry styles across the site of Malata (IC-195).

An exception to this pattern, is a cluster of high-status structures was located behind the plaza in the far eastern portion of the site. A total of eight structures were organized into three patios. Four very finely constructed houses with dressed corners and coursed worked blocky stones were arranged along the southernmost patio. Two of these structures are also among the largest at the site. The remaining structures were arranged in pairs along the two more northern patios. These structures were more modest in both size and elaboration. While the structures were constructed in the same distinct Collagua domestic style, the sharply orthogonal walled patios stand in stark contrast with the more typical irregular patio walls. This elite cluster of structures is also spatially separated from the rest of the domestic areas at the site. An additional enclosed patio area to the northeast of the more elite structures further limits both access to the interior patio, and would have obscured view of the activities here. The structures reflect a greater orientation to Inka spatial practices and may reflect either non-local administrators or local elites whose distinct domestic arrangement and physical isolation were meant to reflect their place within the broader state structure during the LH.

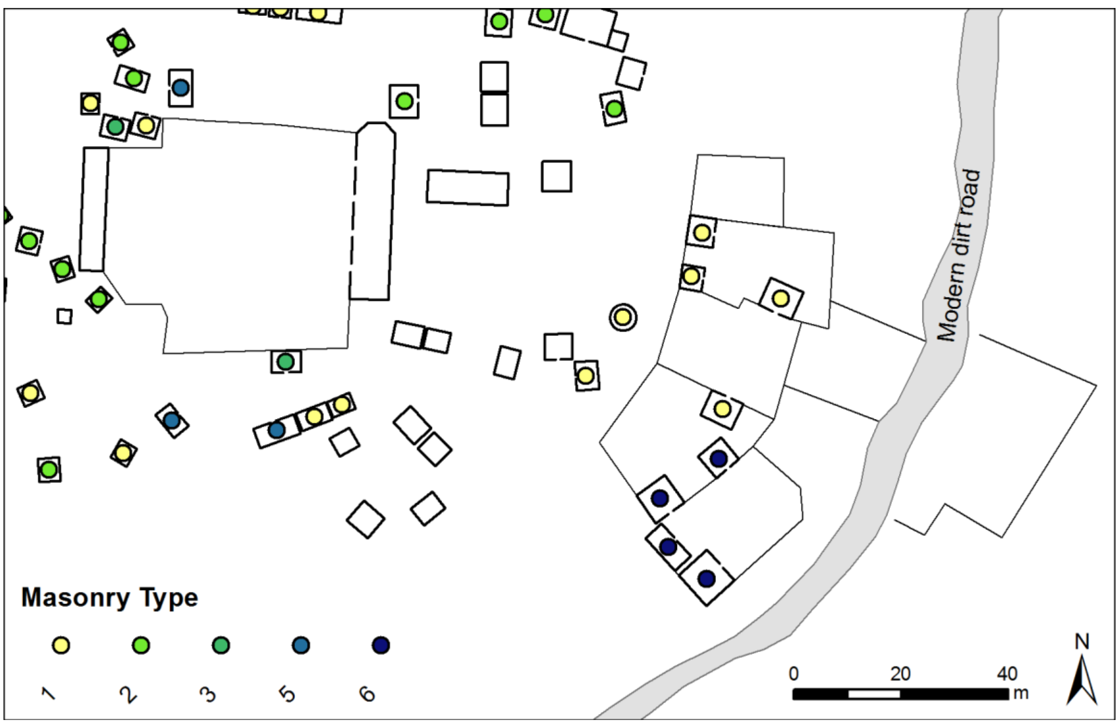


Figure 8.8. Detail of elite residential compound.

Burial Spaces

Both above-ground and subterranean burial structures were found at Malata. Two circular chullpas were found within the defensive walls on the hilltop, and another two quadrangular ones were located within the domestic sector. One was at the base of the defensive hilltop, and the other was just to the southwest of the plaza area. The predominant form of burial at the site was in subterranean cist tombs. Two discrete cemeteries were located on natural rises; one (Sector III) to the northeast of the plaza, and the second (Sector II) in the south-central portion of the site. We also found a small number of looted cists in the domestic areas. It is unlikely that these mortuary areas account for the total burial population related to the site. Local informants spoke of cave burials located outside the site area to the north, which may have been used by residents at the site.

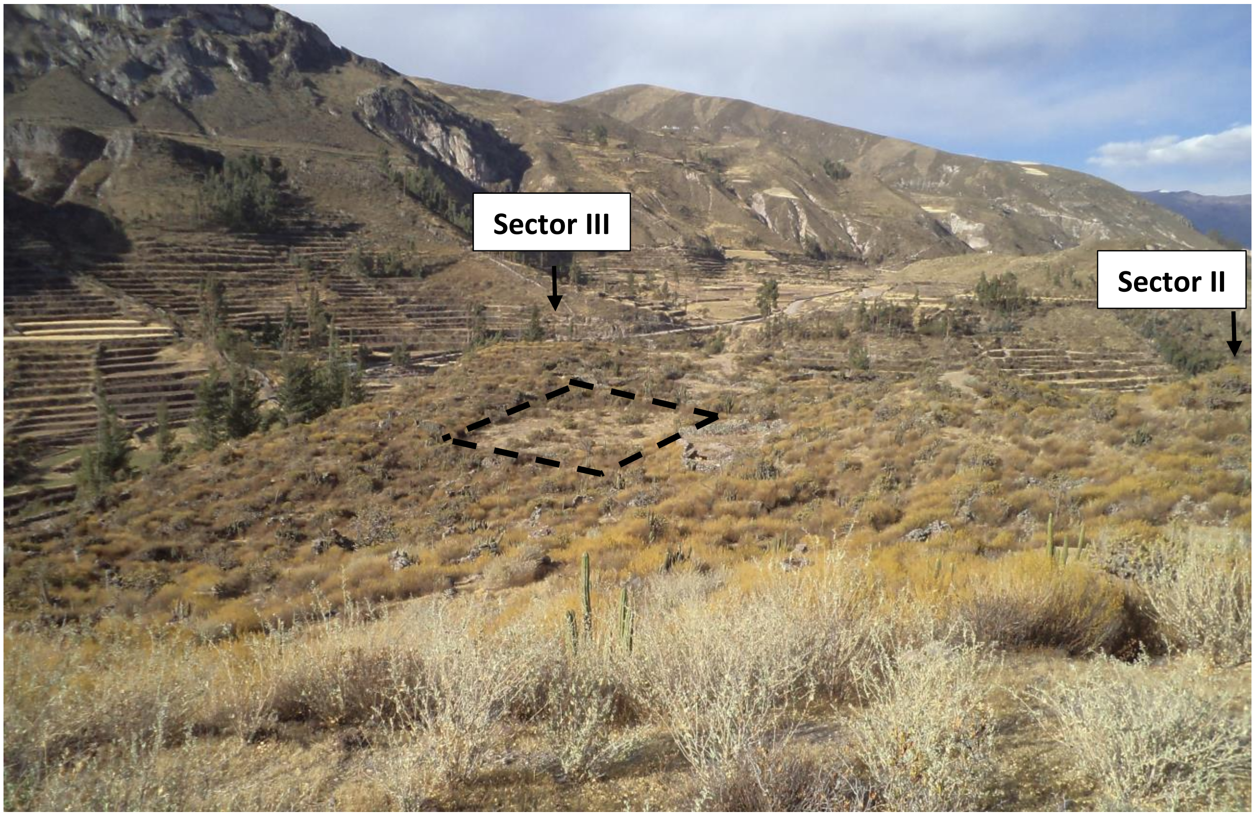


Figure 8.9. Location of Sectors II and III in relation to the plaza (outlined). Looking northeast.

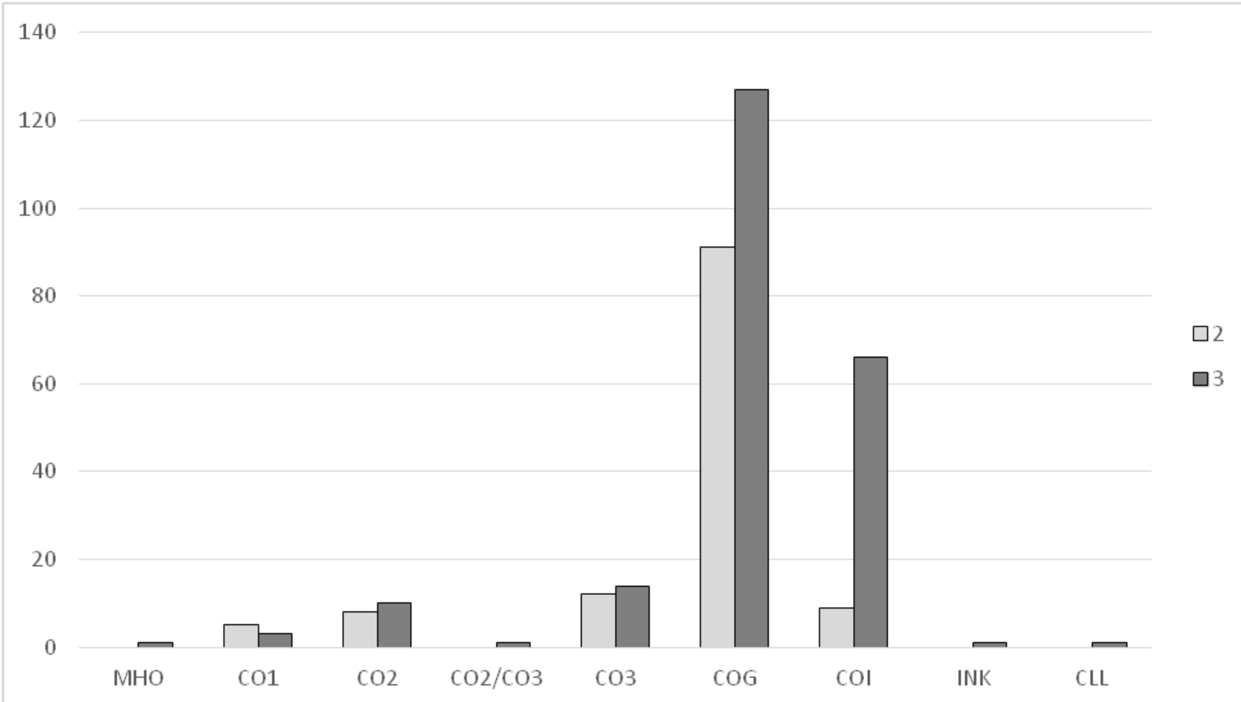


Figure 8.10. Counts of diagnostic ceramics from the two mortuary sectors.

Ceramic collections from the two cemeteries (Sectors II and III) hint at potential status differences between the two cemetery areas. High quantities of LIP ceramics were collected from the two mortuary sectors show that both were in use by the early LIP. However, only Sector III had a significant number of Collagua Inka sherds. In total, we collected 2.7 times the number of sherds from Sector III (590 vs 219), but the total number of Late Horizon sherds was more than 7 times that of Sector II (67 vs. 9). Additionally, while only four (one LIP and three LH) polychrome ceramics were recovered from the mortuary sectors, all were found in Sector III. It is clear that Sector III not only had more Late Horizon ceramics, but also had more high status ceramics overall.

It is unclear whether the quantity of LH ceramics in Sector III is related longer use of the cemetery compared to Sector II, or reflects growing status differentiation in the LH. A comparison of diagnostic LIP ceramics from both cemeteries shows nearly equal proportions of undecorated and black-on-red ceramics. The only LIP polychrome sherd recovered from either was in the Sector III cemetery, but it is impossible to draw broader conclusions from this.

The proximity of the Sector III cemetery to the later Inka plaza, suggests that the importance of this cemetery and the Inka plaza reinforced one another. The Sector III cemetery is located less than 50 m from the plaza, on a natural rise to the north east. It is possible that the plaza was intentionally situated at the foot of the cemetery as a way of reinforcing Inka claims to authority through by spatially linking administrative architecture to local ancestors. This connection in turn was affirmed through the continued use of the cemetery context.

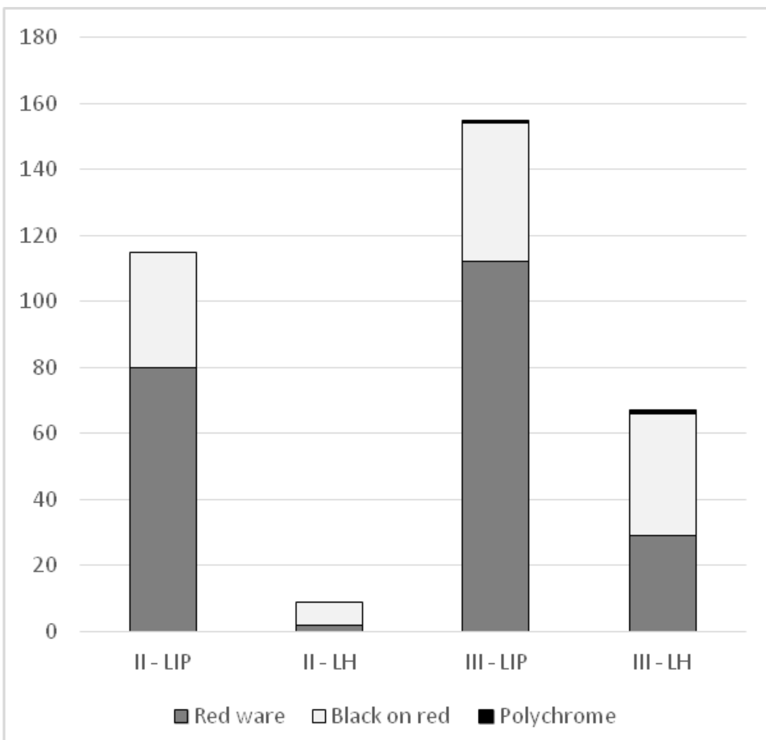


Figure 8.11. Frequencies of diagnostic ceramics by cemetery sector.

Formal Spaces of Interaction

The formal plaza is the most clearly delimited public space at the site. The plaza is roughly trapezoidal in form and flanked to the east and west by Inka great halls. The northern and southern limits of the plaza are delimited by fieldstone walls. The western structure (EST-3) measured 23 m by 4.5 m. While poorly preserved, it was clear that it had once opened onto the plaza. The eastern structure (EST-1) was even larger, measuring 31 m by 7 m. The structure appears to have been modified during the early colonial period to more closely approximate the shape of a chapel. The northern end terminates in a half hexagon and presumably served as the apse. The structure originally had four doorways which opened on to the plaza. The doorways were roughly evenly spaced along the western wall of the structure and measured approximately 1.5 meters at the base. Three of the doorways were later sealed off, leaving the southernmost door as the sole egress point. Within the structure an arched niche was identified in the western wall, a typical colonial architectural feature. The plaza itself measured approximately 46 m by 42 m. Very few materials were found in either the plaza or structure 1, suggesting these areas were kept relatively clean.

Discussion

The establishment of Malata as a secondary administrative center within the valley had important impacts on residents at the site. During the Late Horizon, there was likely a shift in the residential areas, and almost undoubtedly increasing residential growth and density. Status differences were evident at the site in variation in the size and elaboration of domestic structures. These status differences also extended into the cemetery areas of the site, which show evidence for growing status distinctions between them. An elite patio group to the southeast of the plaza also suggests the emergence of a distinct class of administrators at the site.

The addition of the central plaza and great hall structures shifted the locus of public life at the site. During the LIP, the largest public space at the site was likely the defensive hilltop. The area is free of houses or any other indicators that it would have been exclusive to any segment of the site's residents. While significant concentrations of diagnostic LIP ceramics were found within the defensive area, concentrations of LH ceramics were very low, showing a distinct turn away from the defensive architecture during the LH. Unlike the high hillfort, the plaza was situated within the core residential area, making it accessible to many as they went about their daily activities.

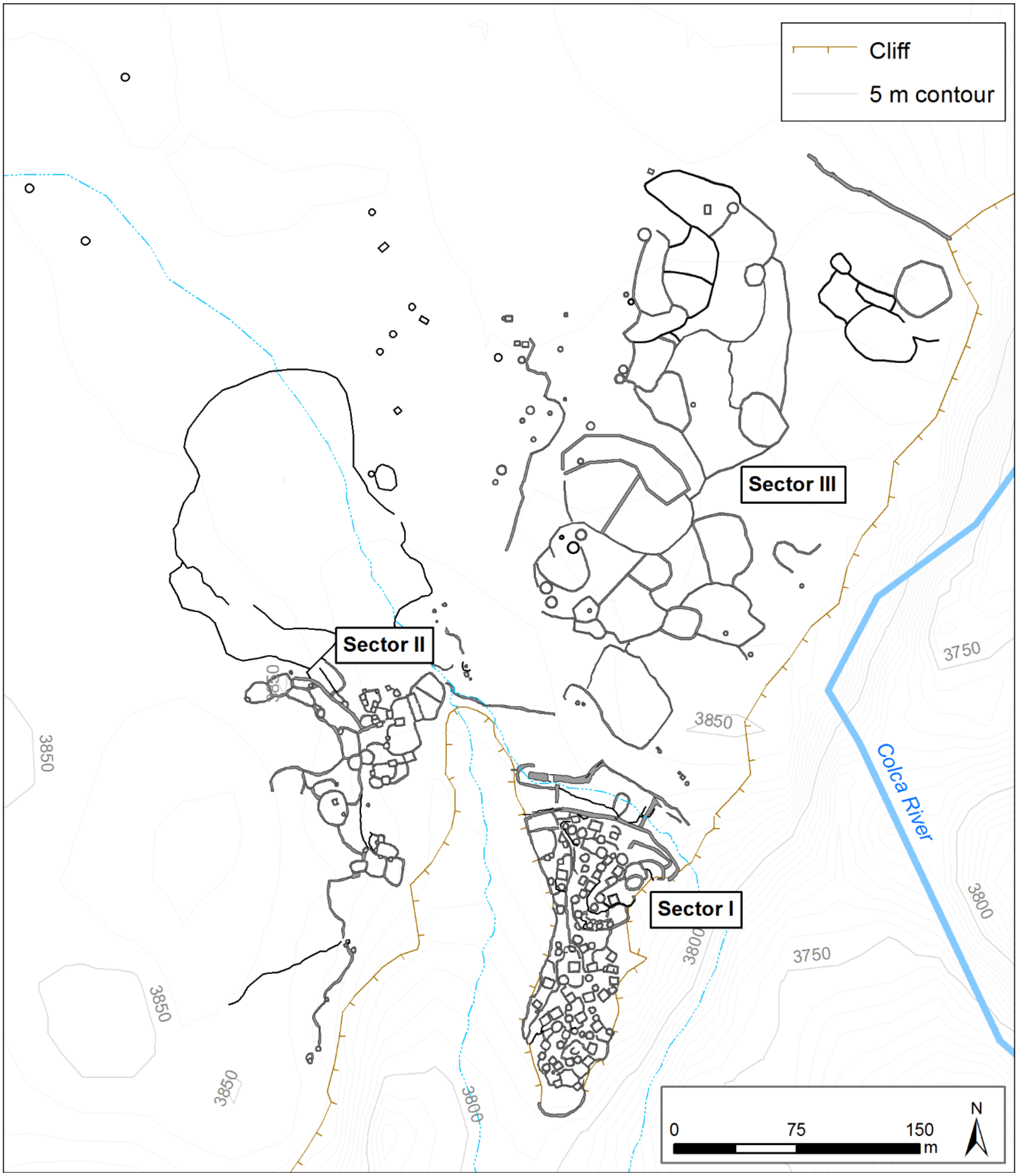


Figure 8.12. Plan map of Auquimarka (TU-188) with sectors indicated.

Local Changes: Auquimarka (TU-188)

When visiting the site of Auquimarka, one is most taken by the precipitous locale of its primary residential sector. Though the approach to the site is only slightly undulating pampa, once within the core, the defensibility of the site location is clear. Soaring cliffs surround roughly 70 percent of the site sector, dropping to the Colca river 2000 meters below and forming a peculiar finger-like promontory. The only accessible portion of the site is barricaded by a series of defensive walls which work to conceal and constrain the single labyrinthine access to the residential core. Once past the three successive gates, one is faces with a veritable maze of pathways weaving around and at times, though, dozens of small patios surrounded by anywhere from one to four domestic structures. Beyond the fortification walls, just on the other side of a prehispanic canal, is a second, smaller cluster of buildings, and a rustic great hall structure with four doors that open onto a small, walled plaza. Residential compounds and mortuary structures extend further out to the west, north, and east. These complexes are nestled on the small bits of pampa which connect the seemingly never ending series of dark, rocky, rises.

Figure 8.13. Detailed view of Sectors I and II at Auquimarka (TU-188).

The site was divided into three primary sectors based on differences in spatial patterning (Figure 8.12). Sector I consists of the walled residential sector which occupies the long finger-like promontory above the Colca River. The defenses of this sector consist of 5 defensive walls located primarily along the northernmost and most accessible side of the promontory (Figure 8.13). Access to the site is tightly restricted by a maze-like series of accesses aligned in a way to indicate a deliberate attempt to disorient one unfamiliar with the site. Within the defensive walls, domestic structures are arranged in tight patio groups, taking advantage of the limited space along the promontory. A range of structure styles are present, including both circular and rectangular plans and a diversity of masonry styles. Excavations within this sector reveal a period of significant reconstruction, during which previous structures were dismantled and the current structures were build atop a thick layer of fill. Thus, while the standing architecture in this sector undoubtedly dates to the late horizon occupation of the site, this sector was previously also a primary residential area during the LIP.

Sector II lies outside of the defensive architecture of Sector I to the north and west (Figure 8.13). A prehispanic canal and deep quebrada further delineate the two sectors. A long great hall (*kallanka*) structure opens onto an irregularly-shaped walled plaza. To the west of the kallanka are roughly 20 structures, a mix of residential structures and some that were likely tied to commensal activities that took place within the plaza. Excavations in this sector revealed that these structures date to the LH and were built in an area that had no previous occupation. I argue below that these structures represent a new locus of Inka administration and commensal activity that deliberately shifted core aspects of Inka administration outside of the defensive walls.

Sector III extends across the undulating pampa to the west of both Sectors I and II. The settlement in this part of the site is far more disperse than either of the other sectors, with clusters of domestic groups occupying the areas in and around the periodic rocky rises that punctuate the otherwise flat pampa. Situated in and amongst the domestic complexes are numerous chullpas of both quadrangular and circular form which sit atop the rocky rises. The far eastern extent of this sector and the overall site is demarcated by a large agro-mortuary wall which flanks the western side of a deep quebrada.


Figure 8.14. A view of Sector III at Auquimarka.

As I discuss in greater detail below, data from our test excavations in Sectors I and II show that the site was established sometime in the LIP, and continued to be used throughout the LH. Additionally, some fragments of colonial-era ceramics were recovered, including fragments of *botijas* were uncovered in two units—one in each sector—indicating the site was used for some period of time following Spanish conquest. It is likely that residents of the site were resettled to a small colonial doctrinal site known as Malata just across the quebrada, given the proximity of the two sites and the documented growth of the settlement over the colonial use of the site.

Domestic Spaces

A total of 152 domestic structures were recorded during our architectural survey of the site. The density of structures varied significantly between sectors, with the highest settlement density found in Sector I, with a total of 108 structures in the 1 ha area. The size and elaboration of the houses ranged from very small, rustic fieldstone structures, to large houses with fine tabular masonry. There was a much smaller range of structure size when compared with IC-195 and AC-175. Houses were arranged in domestic patio groups with between one and six other structures, which included a range of living, cooking, and storage structures. The site contained a mix of both circular and rectangular structures. The different house forms did not seem to relate to temporal differences, status differences, or to differences in household economic focus at the site (i.e. differences between pastoralists and agriculturalists). Instead, the difference in structure form appeared instead to coincide with different structure functions or uses within the domestic groups. Circular structures were both smaller in size and masonry types within this group were skewed toward the lower end of the spectrum. Masonry types 1 and 2 accounted for 63% of the circular structures, but only 44% of the rectangular structures. Additionally, our test excavations were able to determine that at least two of the smaller circular structures had served as storage structures, and one was a cooking structure associated with a nearby rectangular structure.

Finally, circular and rectangular structures were not spatially segregated within the site. Nearly all domestic patios contained both rectangular and circular structures, indicating that both types were used within discrete domestic units.

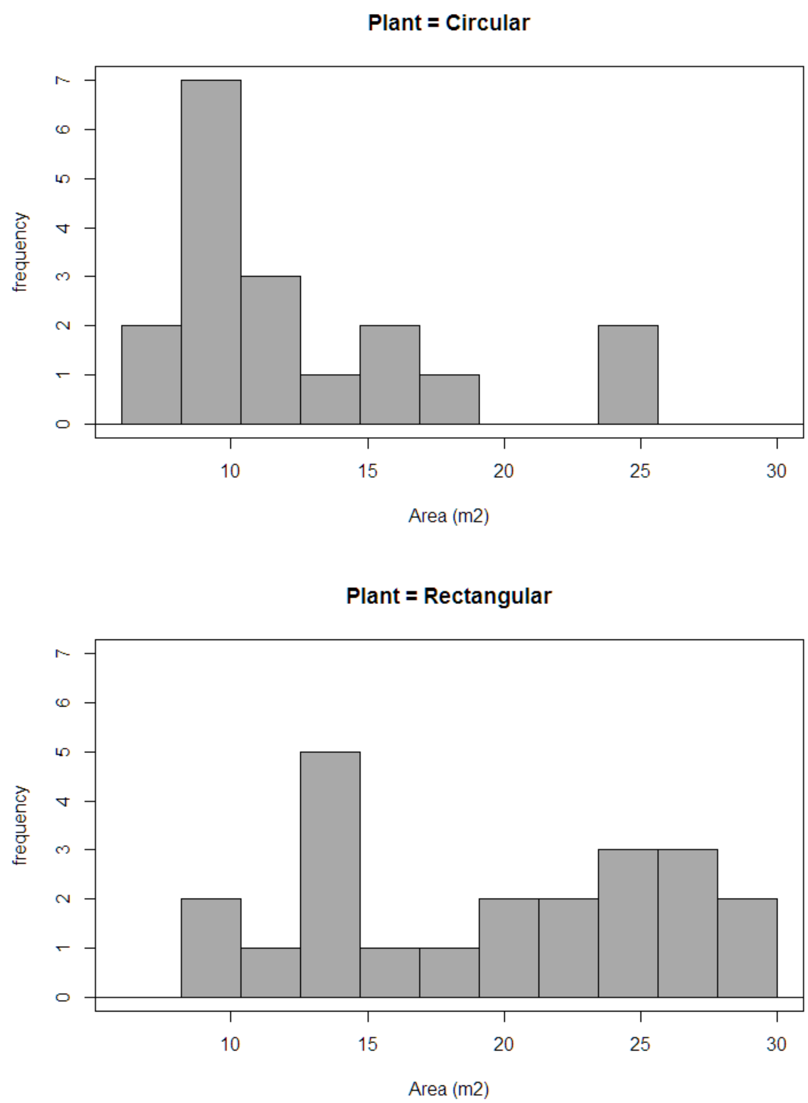


Figure 8.15. Interior areas of structures at Auquimarka by form

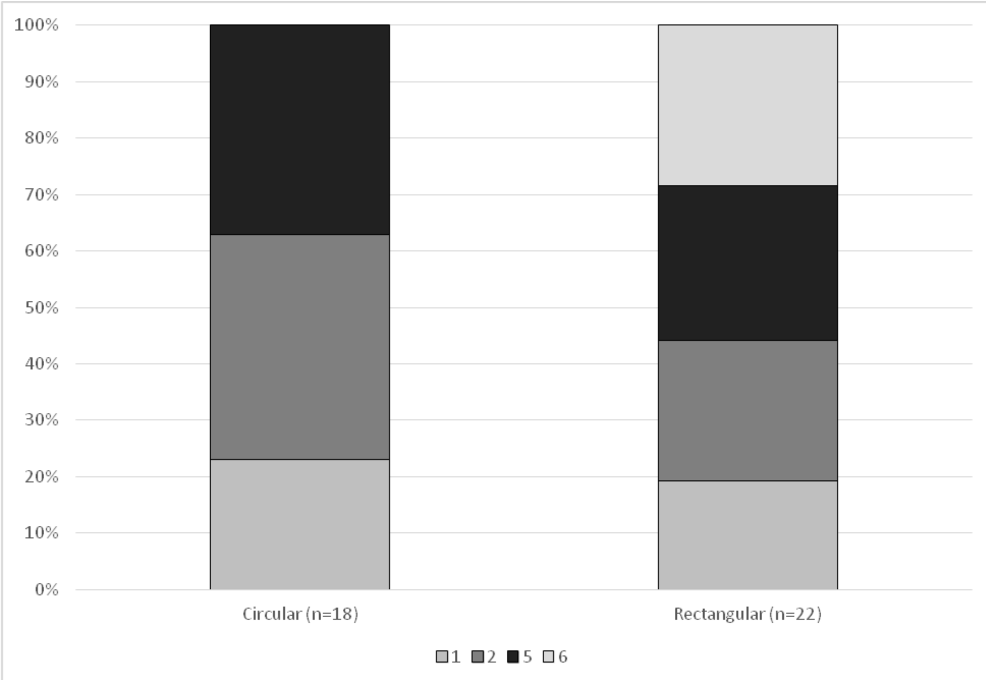


Figure 8.16. Masonry type by structure form at Auquimarka.

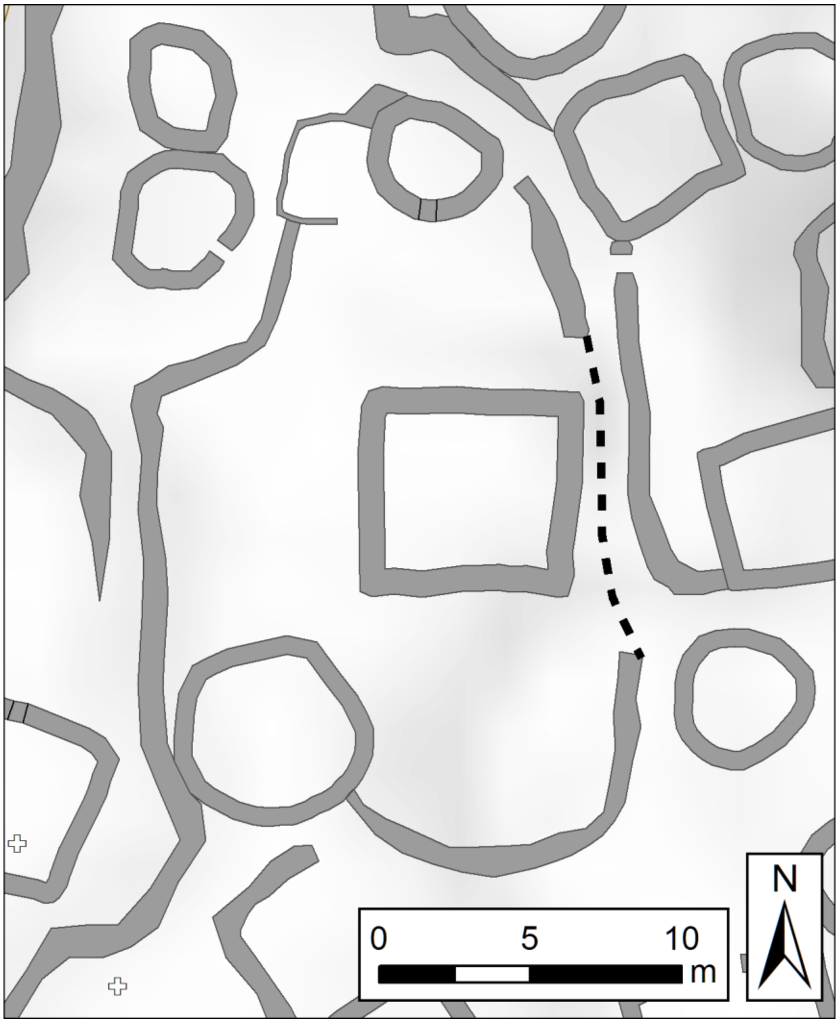


Figure 8.17. A domestic patio group in Sector I at Auquimarka.

The residential area within Sector 1 was extremely densely settled. There is little indication of central planning evident in the arrangement of domestic spaces within the fortification walls. As I describe below, the residential area appears to have grown in both extent and density during the LH. Thus, the placement of domestic structures was likely constrained by both the extreme topography of the sector, and extant architecture, such as defensive walls and terraces. Two formal pathways are still visible at the site, marked by formal gates and flanked by walls. Aside from these two path segments, movement through the site was circuitous, weaving between domestic compounds, and at times requiring movement through them to reach certain parts of the site. Thus, the extent of planning appears to have been rather limited.

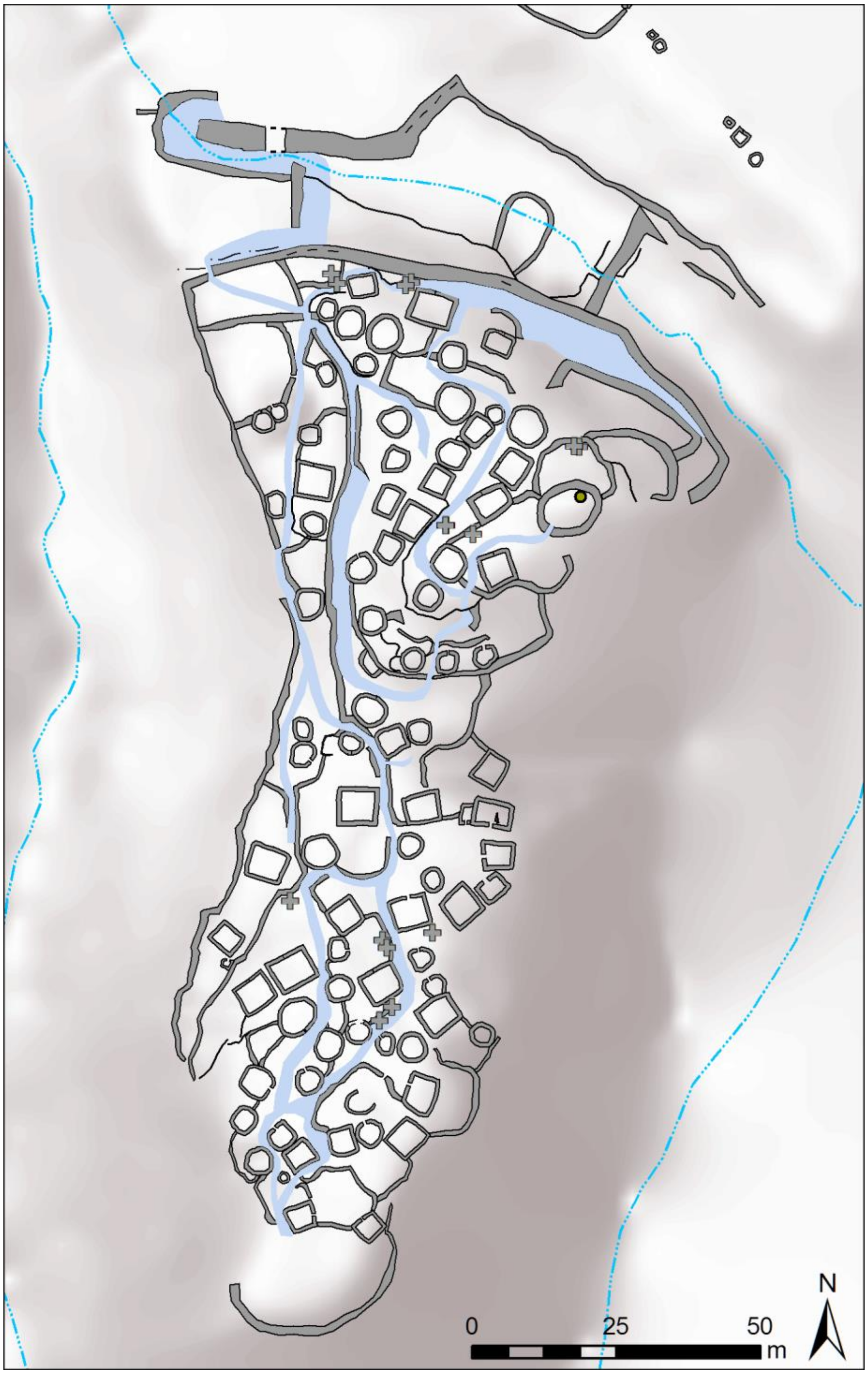


Figure 8.18. Pathways through Sector I at Auquimarka.


Figure 8.19. Gates defining major paths through Sector I at Auquimarka.

Based on our excavations, we know that the Sector II architecture—at least in the area immediately surrounding the kallanka and plaza—was constructed new in the LH. The architectural layout of Sector II diverges significantly from Sector I. The sector contains a total of 19 structures, however most appear to have been non-residential in nature. We classified only five of the structures as residences (EST-78, EST-79, EST-82, EST-83, and EST-86, Figure 8.21). The remaining structures likely served as storage or cooking structures, possibly related to commensal events that took place within the plaza.

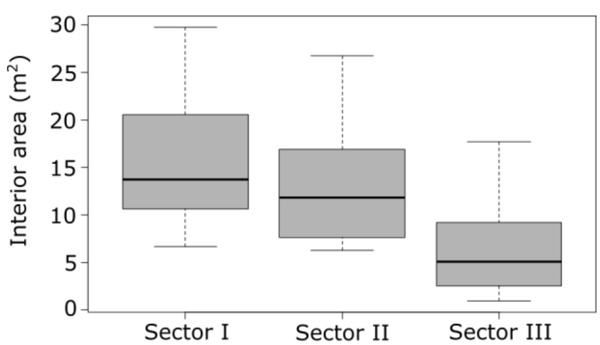


Figure 8.20. Interior structure area by sector.

The domestic structures in Sector II represent an elite residential area that was spatially separated from the larger residential areas in Sectors I and III. The residences were surrounded by walls which both highlighted their exclusivity, and sharply restricted access to the interior spaces. There was only one access point to the compound, located on the northern side. Domestic structures throughout the site were arranged into walled patio groups, however, they were also far more permeable than the spaces behind the great hall. In Sector I for example, movement through much of the site required moving through the patios of other households. The structures in this sector are not the largest or constructed of the finest masonry. The largest, structure 79 was in the largest 5% of structures at the site, and was recorded as type 3 in our masonry scale. The combination of structure size, compound size, proximity to the great hall and plaza, and the exclusivity of the compound, however, suggest that this was a space reserved for local leadership (Figure 8.22 and Figure 8.23). The structures follow many of the local canons of domestic architecture, particularly in the form of high gables and extremely narrow doorways. Our test unit did not find imported Inka ceramics or other material indicators of direct connections to Inka administration in Cuzco. Taken together, this suggests that the residents of the compound were drawn from the local community.

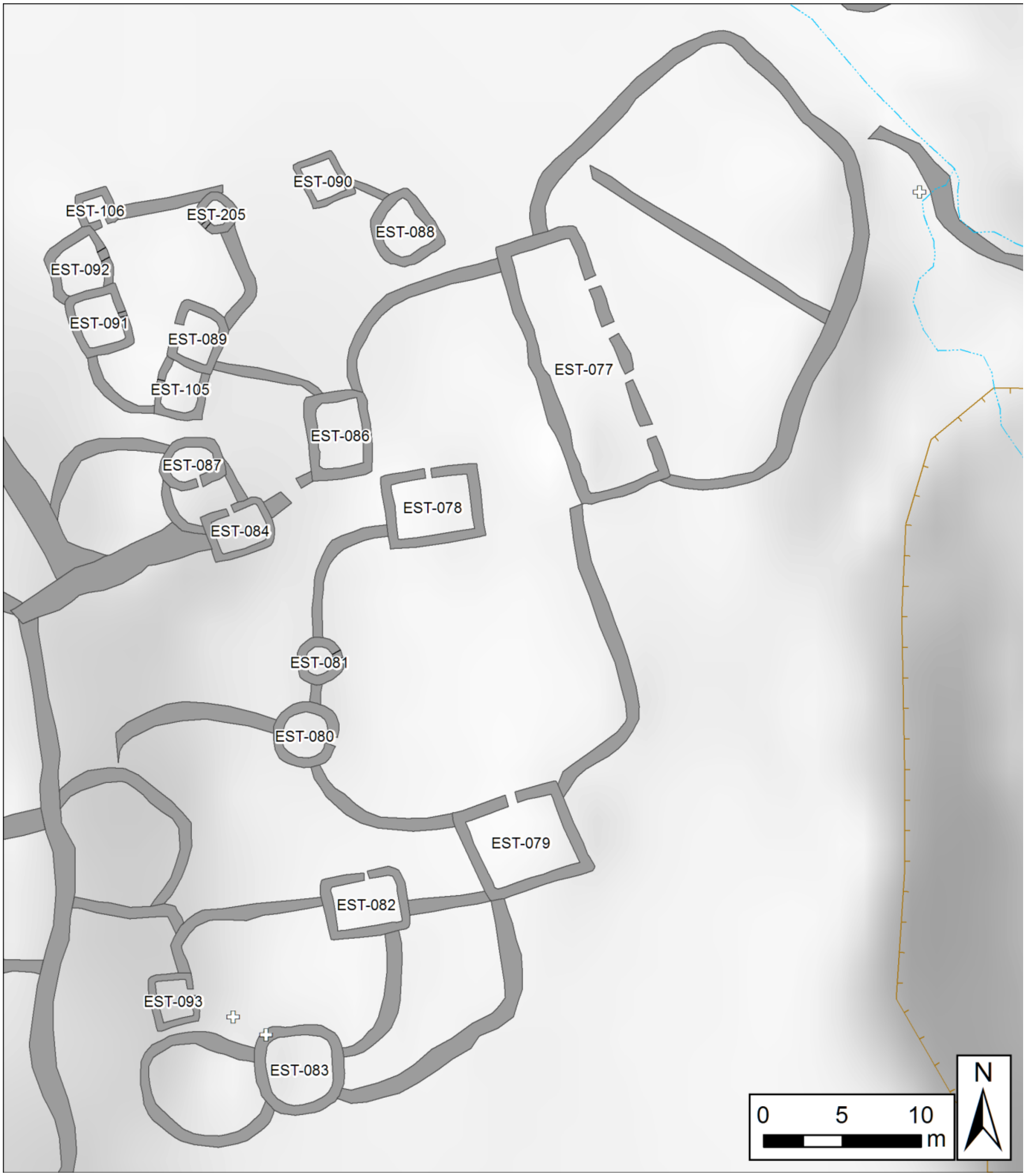


Figure 8.21. Elite residential area in Sector II at Auquimarka

Figure 8.22. Structure 79, possible residence for local administrator.

Figure 8.23. Doorway in structure 79.

Residential structures were found outside of the defensive architecture in Sector I and the plaza area of Sector II. Most of this was concentrated in the northwestern portion of the site, which we denoted as Sector III. The architecture in this part of the site was much more poorly preserved, and much of it had been leveled for modern field use. The topography of this sector undulates, with the flat planes punctuated by rises of rocky outcrops. Rustic field walls create a series of large enclosures, which likely delimited fields and/or pasturage areas. Nestled among these are domestic groups consisting of clusters of small, mostly circular structures, although rectangular structures were identified as well (Figure 8.24). Detailed masonry analysis was not possible here due to the poor preservation of most of the structures. However, measurements of interior areas of the structures show that they skewed much smaller than those in the other sectors, with the median structure size falling below the lower limit of those in Sectors I and II (Figure 8.20). Ceramics collected from this sector span the LIP and LH, thus these differences do not appear to reflect temporal changes across the site, but rather marked differences in household status between areas at the site.

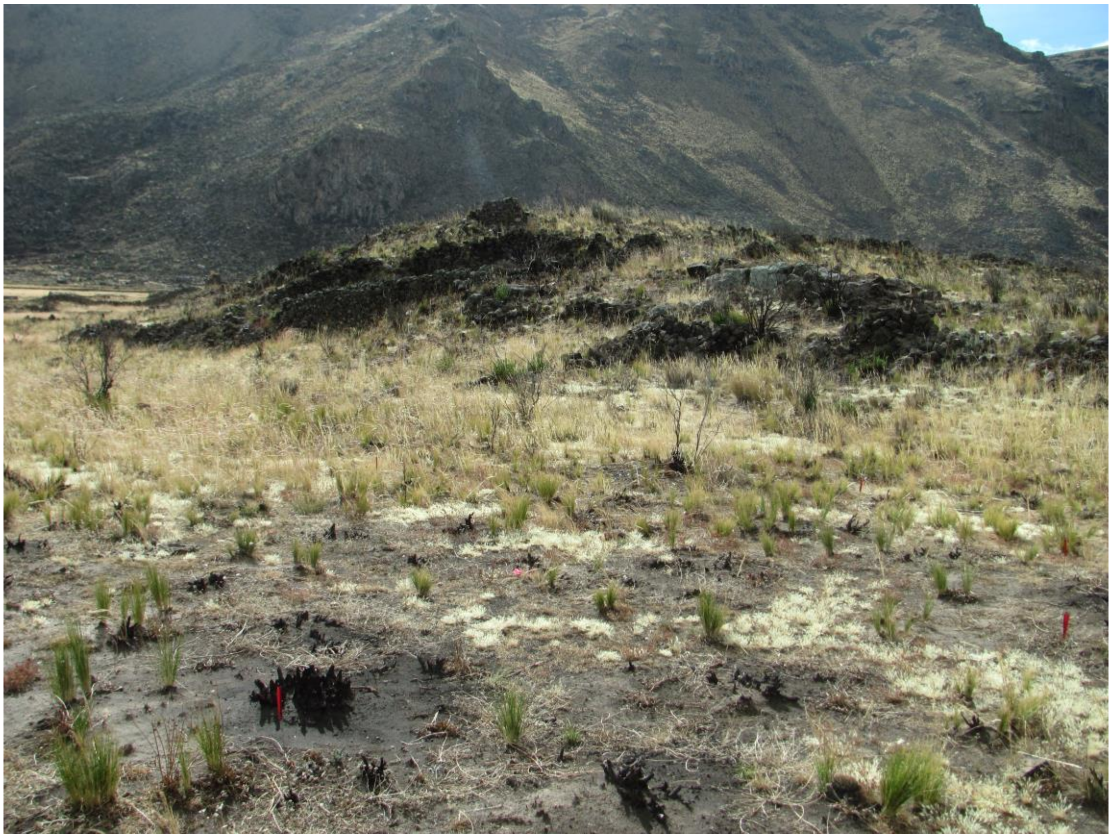


Figure 8.24. Domestic patio group in sector III.

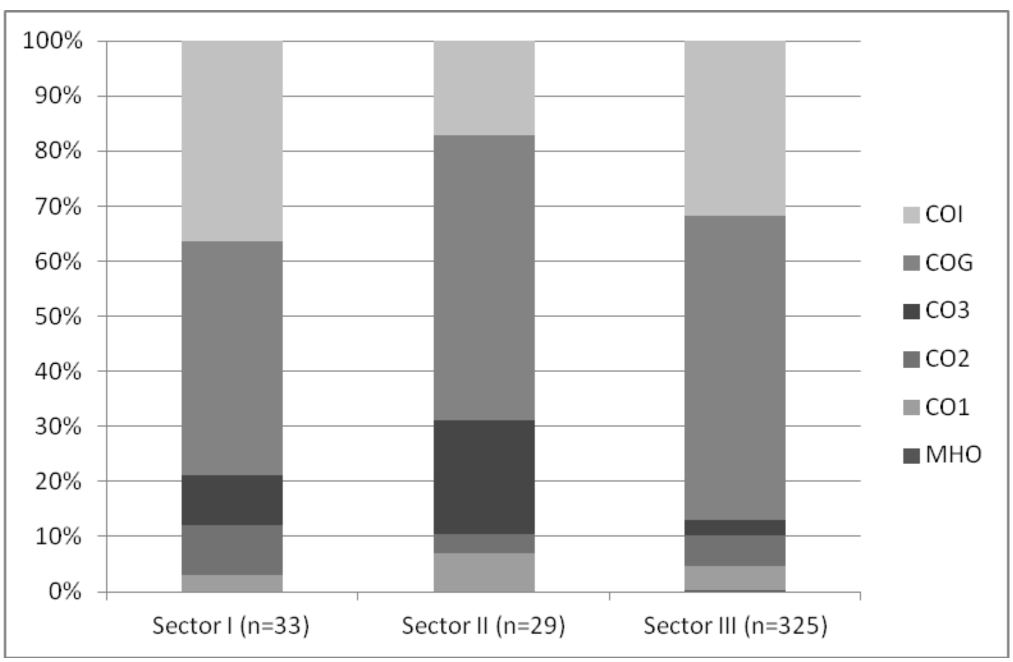


Figure 8.25. Period diagnostic ceramics by sector.

The results of our detailed architectural analysis reveal a site with marked social stratification that was spatially structured. With the exception of the area immediately adjacent to the kallanka and plaza, houses outside of the defensive walls were much more modest and were likely home to households of lower status. By contrast, the densely settled area within the defensive sector was home to a more elite segment of the site's residents. The houses here are larger and constructed of finer masonry when compared with any other part of the site. Domestic compounds contained a number of structures, including living quarters, cooking structures and storage structures. Finally, the area immediately adjacent to the great hall and plaza contained a number of special purpose structures, which were likely related to the public activities that took place there. The adjacent residential compound was likely home to local leadership that was tied into the broader Inka state administrative structure.

Burial Spaces

During our survey and excavation at Auquimarka, we identified two key forms of mortuary architecture—subterranean cist tombs and above ground chullpas. All of the examples we found were significantly disturbed. The cists were typically between 1 and 2 m in diameter and approximately 1 m deep. The tombs were lined, generally with coursed worked stone, and would have been covered with stone slabs.

Chullpas at the site were free-standing structures, either circular or nearly-square in plant. The masonry ranged from unworked and uncoursed fieldstone structures to finely coursed tabular masonry. They ranged in size from about 1.5 m to just over 3.5 m on a side for the rectangular ones, and 1.7-2.8 m in diameter for the circular ones. The structures had small access points placed roughly in the center of one of the walls. The structures were relatively poorly preserved. However, one well preserved rectangular chullpa had a cornice near the top.

Chullpas and cist tombs had distinct spatial patterning within the site. Cist tombs were found both within the domestic areas and associated with the major defensive walls. By contrast, chullpas were found on rocky rises, in areas set apart from both the defensive or residential areas. Dispersed cist tombs associated with domestic spaces were likely burials for individuals associated with the household unit. Frequently these tombs are located in the areas adjacent to the exterior of a domestic structure or near the patio walls of the domestic complexes. Given their close association with standing architecture, these burials were likely placed around the time of the rebuilding of Sector I and the establishment of Sector II, rather than reflecting extant burials from the earlier LIP period. A separate set of cist tombs were located not amongst the residential structures, but instead in close association with the defensive architecture in Sector I. The tombs were found in small clusters immediately adjacent to the interior of several of the defensive walls, including at least two which were located within wall 13 which encircles peak of the site.

Above ground mortuary architecture at the site followed a distinct pattern. With the exception of two likely chullpas found within Sector I, above ground mortuary structures were located along natural rises in the site. Both circular and square structures were found, often in pairs, with a circular and a square structure located adjacent to one another.

The contrast between the location of cist tombs and above ground mortuary structures is striking. Cist tombs are nearly invisible on the surface, and generally located in association with other forms of domestic and defensive architecture. By contrast, above ground mortuary structure are visually prominent, not only by virtue of their own height, but the height of the terrain they occupy.

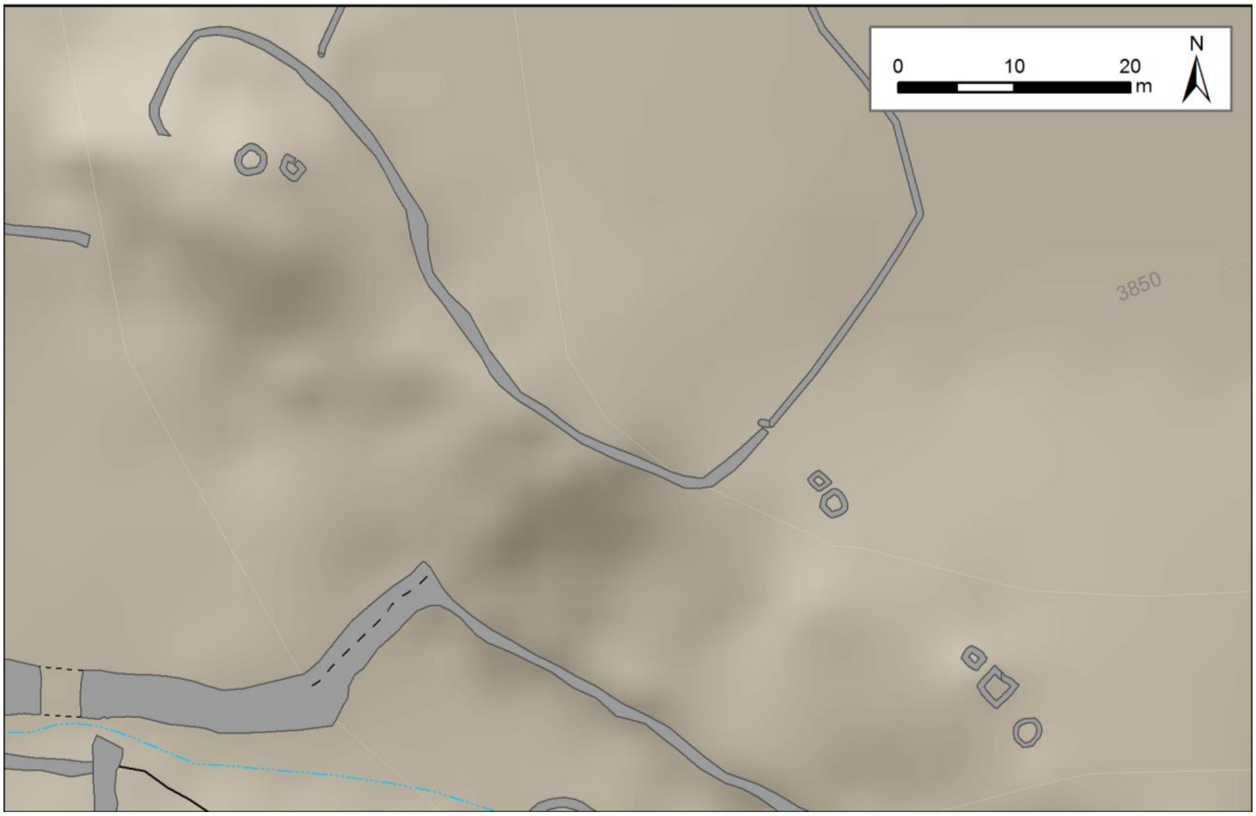


Figure 8.26. Pairs of chullpas on a natural rise to the north of sector I.

Building and Rebuilding in the Residential Core

Our excavation revealed a process of rebuilding and growth in the residential part of the defensive sector. The vast majority of the test units (13 of 16) placed in Sector I revealed no undisturbed LIP contexts. Within domestic structures, houses were typically built atop the natural matrix, with approximately 10 cm of fill used to level the living surface before the first floor level. We frequently found two living surfaces which had been separated by a moderate to thick layer of fill. However, in the vast majority of cases, Collagua Inka ceramics were associated with each of these building events, including the initial fill layers.

Outside of the domestic spaces, several other open spaces within the defensive sector appear to have been formalized during the LH. At the far southern end of the site, the walled space had been leveled loose rocky fill topped with a second more compact fill in only the most uneven places. Areas with a more level natural surface appear to have been used as-is. During the LH, however, a third layer of fill is laid to form more compacted occupation floor. It appears that the area enclosed by the upper wall of the site, M-6, had also been formalized during the LH. Although the area was more heavily disturbed, it appears the area was filled and leveled during the LH and a formal floor was prepared.

While our sixteen test units in Sector I only reveal a small picture of domestic occupation within the fortified sector, a majority (10 of 12) of the domestic structures tested had only LH occupation. If this reflects a more general pattern, it would indicate that the residential density of this sector increased substantially in the LH, with many new structures added to the area. In addition to growing residential density, non-domestic spaces within the sector were formalized during the LH.

Figure 8.27. Sector I excavation units. Units with LIP contexts identified in black.

Table 8.2. Sector 1 excavation units and their corresponding contexts.

Unit	Structure/Context
1	Structure 55 (EST-55)
2	Structure 64 (EST-64)
3	Plaza 1
4	Structure 27 (EST-27)
5	Structure 39 (EST-39)
6	Structure 45 (EST-45)
7	Structure 34 (EST-34)
8	Strucutre 29 (EST-29)
9	Plaza 1
10	Structure 21 (EST-21)
11	Structure 13 (EST-13)
12	Wall 13 (M-13)
13	Structure 10 (EST-10)
14	Structure 1 (EST-1)
15	Wall 6 (M-6)

Hints of the Past

Three of our excavation units revealed hints of the LIP occupation within this sector, along with evidence of the later changes. In this section, I discuss the three excavation units where we identified LIP contexts: Unit 6 in Structure 45, Unit 8 in structure 29, and Unit 15 to the interior of Wall 6, a major defensive wall.

Unit 6 was located in the northern edge of structure 45, a large circular structure in the southern extent of the defensive sector. Beneath the surface level and approximately 20 cm of wall collapse, we encountered a living surface. Of the diagnostic ceramics collected, 47% (49 of 104) were LH styles. The Collagua Inka style ceramics recovered from this locus was dominated by aribola and plate fragements, which made up 42% of the LH ceramics recovered from the occupation level. We also found one fragment of an Inka-style polychrome cup. Below this later floor, we found a second occupational level approximately 6 cm below. The earlier surface also contained both Collagua Inka and local LIP styles, with 32% (45 of 131) diagnostic of the Late

Horizon. More than half of these were decorated Collagua Inka serving wares such as aribolas, pitchers and plates. We also encountered an intrusive feature in the northwestern corner of the unit. The feature was .45 m deep and roughly circular. It extended approximately 48 cm into the unit. The locus contained a number of small to medium sized rocks, but few cultural materials. This may represent a possible offering related to the construction of the structure. Below the level of the floor, we encountered a thick layer of fill (approximately 20 cm) with high levels of cultural materials that included both LIP and LH styles.

Below this thick fill, we found the third and earliest living surface. In the eastern corner of the unit we were a collection of stones and concentration of ash that appeared to be the edge of a hearth features. Two additional activity areas were located in the northeastern portion of the unit. In contrast to the later occupation surfaces described above, we found only two possible Late Horizon ceramics associated with this level. Overall 93% (27 of 29) were diagnostic of the LIP and the remaining 22% were indeterminate. Beneath this occupation level was approximately 5 cm of fill used to level the initial floor surface.


Figure 8.28. Plan map of LIP living survace in Unit 6.

Our test unit in structure 45 found an earlier occupation within the unit appears to date to the LIP. We did recover two ceramics that were identified as possibly LH, though they were not highly diagnostic. This earliest occupation level was clearly not associated with the current standing architecture in that location. The surface was approximately 40 cm below the current surface. This earlier surface was likely the living floor within a domestic structure. The stones and concentration of ash in the eastern edge of the unit was likely a hearth and the areas of staining suggest domestic activity. Around the time that Inka style ceramics first appear at the site, this initial occupation surface was covered with approximately 20 cm of fill containing a mixture of soil, stone, and domestic refuse. Above this fill, the structure and its own living surface was prepared, and was possibly later refreshed with a subsequent, much thinner layer of fill and a new living surface.

Unit 8 was located in the southwestern corner of a moderately sized quadrangular structure with an adjacent storage structure. Beneath the LH occupation level, we encountered a thick stratum of approximately 20 cm of fill. Beneath the fill, we identified an earlier living surface associated with the remains of what appears to be the interior face of a structure wall. This earlier structure had been constructed directly atop the natural matrix, and approximately 5-10 cm of fill had been set down before preparing the floor. Collagua Inka ceramics first appear in small quantities in the fill above the initial floor, and then with greater frequency in stratigraphically higher contexts. Collagua Inka style ceramics were found exclusively in the fill contexts within the unit, and not associated with the upper floor level. In fact, the later floor had only four fragments of serving vessels total, and only three decorated fragments. The lower, LIP-period floor had similarly low levels of decorated ceramics; only six fragments of serving vessels, and only 7 decorated fragments.

The wall segment identified at the base of the unit consisted of a single course of large fieldstones. The stones had been laid directly atop the natural clayey matrix. The stones were laid in what appears to be a roughly curved manner, suggesting that the initial structure may have been circular in form. After the stone had been laid, a thin (appoximately 7 cm thick) layer of relatively clean fill was added, and the floor prepared above this.

Thus, it appears that at some point, the earlier structure was dismantled, with all but the first course of architectural stones removed. The area was then re-leveled and the current structure was built. There was no evidence of burning or other sort of violent destruction associated with this rebuilding episode. Additionally, no structural stones were used to fill the area in preparation for the new floor surface. This suggests that the structure was intentionally dismantled in preparing the new space. The distinctly Collagua style of the subsequent architecture suggests that rebuilding was directed by local residents of the site.

Figure 8.29. Structure 29 showing location of Unit 8 with earlier structure wall remains mapped.

Figure 8.30. Foundation stones in Unit 8.

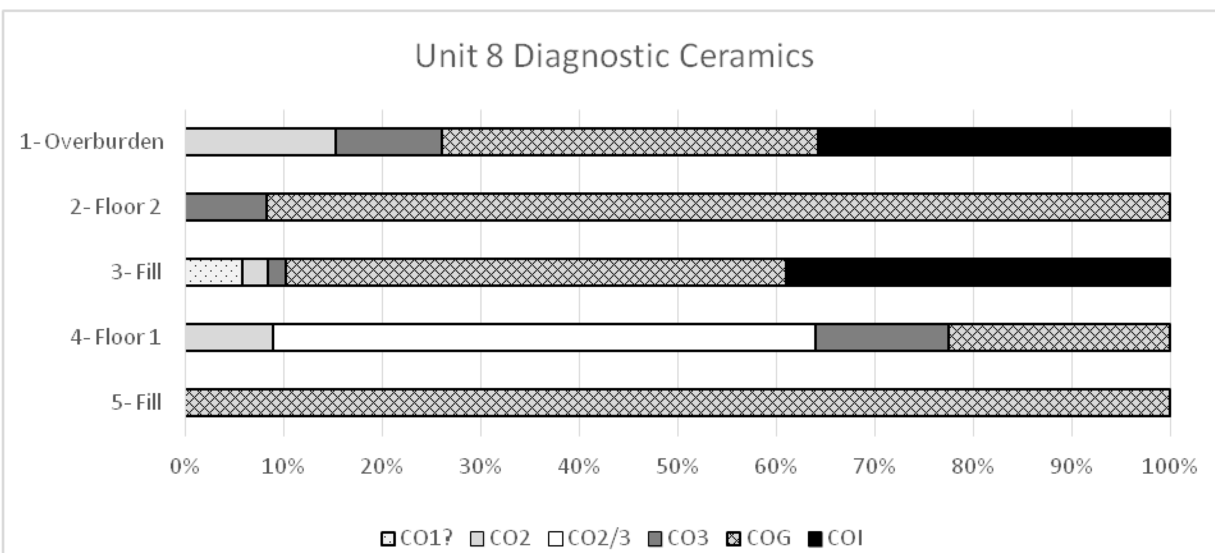


Figure 8.31. Frequency of period diagnostic ceramics recovered from Unit 8 by strata.

Unit 15 was located along the southern interior face of M-6, one of the primary defensive walls at the site. This section of the wall had an interior parapet. Beneath the initial humus and compaction wall fall, we identified two floor levels associated with LH materials. Between the two floor levels, just over half (47 of 92) of the period-diagnostic ceramics were LH styles. Many of these were decorated serving vessels, primarily plates and aribolas (18 of 47).

Beneath the two late use surfaces there was a layer of thick (approximately 40 cm) fill which covered an earlier use surface. The semi-compact and rocky fill contained large amounts of refuse (including animal bone) and other cultural materials. Period diagnostics from the fill contained both LIP and LH ceramics. Below this layer of fill, was an informal use surface situated atop the natural matrix and fill that was associated with the construction of the wall. We did identify the edge of a burned area at the eastern edge of the unit. This use surface had been formed atop a stratum of large rocks and loose fill which was used to roughly level the extremely uneven natural surface of bedrock and clay subsoil. We recovered significant quantities of materials from this stratum. Period diagnostics recovered were 29% Late Horizon and 71% LIP. Of these, a large number were decorated serving vessels, including 3 polychrome Inka ceramics and 1 polychrome Collagua ceramic.

Below this use level was the original fill associate with the construction of the wall. The fill, which was laid on the natural matrix, contained comparatively little material. All 26 of the 27 period diagnostic sherds were LIP styles, and the last was a Middle Horizon sherd. The wall itself was constructed directly atop a natural rise of bedrock and also functioned as a retaining wall to terrace the sloped terrain.

Our excavation showed that the defensive wall was almost certainly constructed in the Late Intermediate Period. The initial fill associated with its construction consisted of LIP and one

MH sherds, with very few materials in general. The subsequent use level presents a more complicated picture. The evidence for burning and the high quantities of LH ceramics hints at the possibility of a destructive event immediately adjacent to the wall. It could also point to an episode of ritual sealing of the area that was associated with the filling of the area and preparation of a new use surface. Unfortunately, our limited excavations can only hint at, rather than resolve, these possibilities.

New Construction

In the remaining 13 units we placed in Sector I uncovered no discrete LIP occupation levels. The 10 units placed within domestic structures all followed similar construction patterns. The floors were prepared with a thin (approximately 5 cm) layer of compact fill and the floor surface was prepared on top. The structures frequently had a subsequent floor surface laid atop a later thin fill level (Figure 8.32).

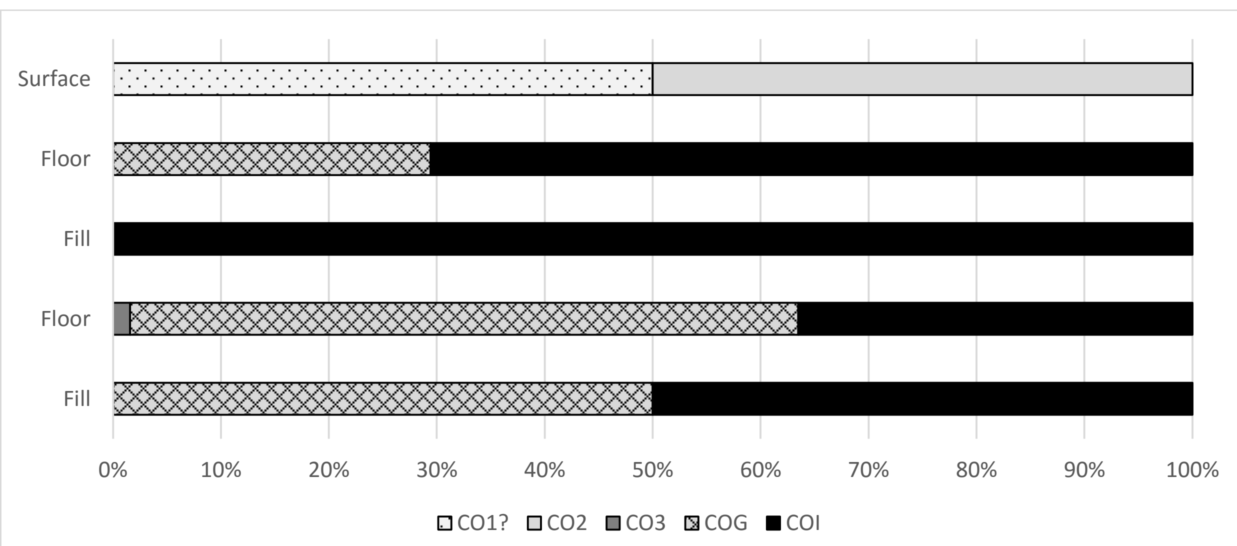


Figure 8.32. Period-diagnostic ceramics from Unit 7, showing the general stratigraphic sequence for Late Horizon structures in Sector I.

Our test excavations were able to identify different types of domestic structures within the sector. Structures 1, 10, 55 and 64 all had high proportions of cooking and storage vessels, relative to serving wares. Serving wares accounted for between 42% and 61% of the total assemblage of functional diagnostics. The presence of ash deposits and hearth features within these units further supports their use as cooking structures. These were undoubtedly part of multi-structure household patios. Structure 13 also did not appear to have served as a residence. Our unit covered nearly the entire interior area of the structure, and we found no hearths, stone features, or other features typical of residences. However, the ceramics recovered were also distinct from those of the cooking structures. We interpreted this structure as a storage structure.

The remaining six structures were likely used as primary residences. The percentage of serving wares compared with utilitarian forms associated with these structures was much higher. Serving wares accounted for between 72% and 87% of the total assemblage of functional diagnostics. In two cases, we encountered stone features related to the use of the space. In structure 21 (unit 10), a stone bench constructed of fieldstone slabs was located adjacent to the western wall of the structure and may have been used for sitting and/or sleeping. Structure 34 (unit 7) had a roughly circular stone feature made up of smaller tabular stones in the south-central portion of the unit, which may have served as a use surface of some sort (Figure 8.33).

While the households within the defensive walls likely represent an elite residential sector, individual households had different access to local Inka-style serving wares. The highest concentration was found in structure 34, which also had the highest concentration of aribolas and serving pitchers, accounting for 60% of the serving wares recovered from the unit. The structure was part of a large domestic patio group that included seven other structures and was one of the largest and finest structures at the site. This may have been home to a local elite household that held a prominent position. The high frequency of serving pitchers could suggest a local parallel form of commenalism to the official state feasting that took place in the Inka great hall and plaza.


Figure 8.33. Circular stone feature in Unit 7.

The remaining units were placed outside of domestic contexts. Two of these units were placed in a small walled plaza at the southern tip of the promontory. The area was intentionally leveled and an informal use-surface was prepared during the LH. The initial fill associated with the construction of the wall indicated that it was likely constructed during the LIP. However, there is no indication that the area was formally prepared during that time.

A third unit was placed within Wall 13, a large defensive wall which encircles the highest point at the site. The area was highly disturbed by earlier looting of cist tombs within the area. The naturally irregular and rocky surface had been intentionally filled and leveled and portions of a formal floor were identified. Very little material was recovered from the area, and only four diagnostic LH sherds were found. All four were found in association with the fill that had been used to level the area. A number of fine artifacts were recovered from the unit, including fragments of small metal adornments, and a shell pendant. It is likely that these artifacts had been associated with the looted cist tomb to the west of the unit.

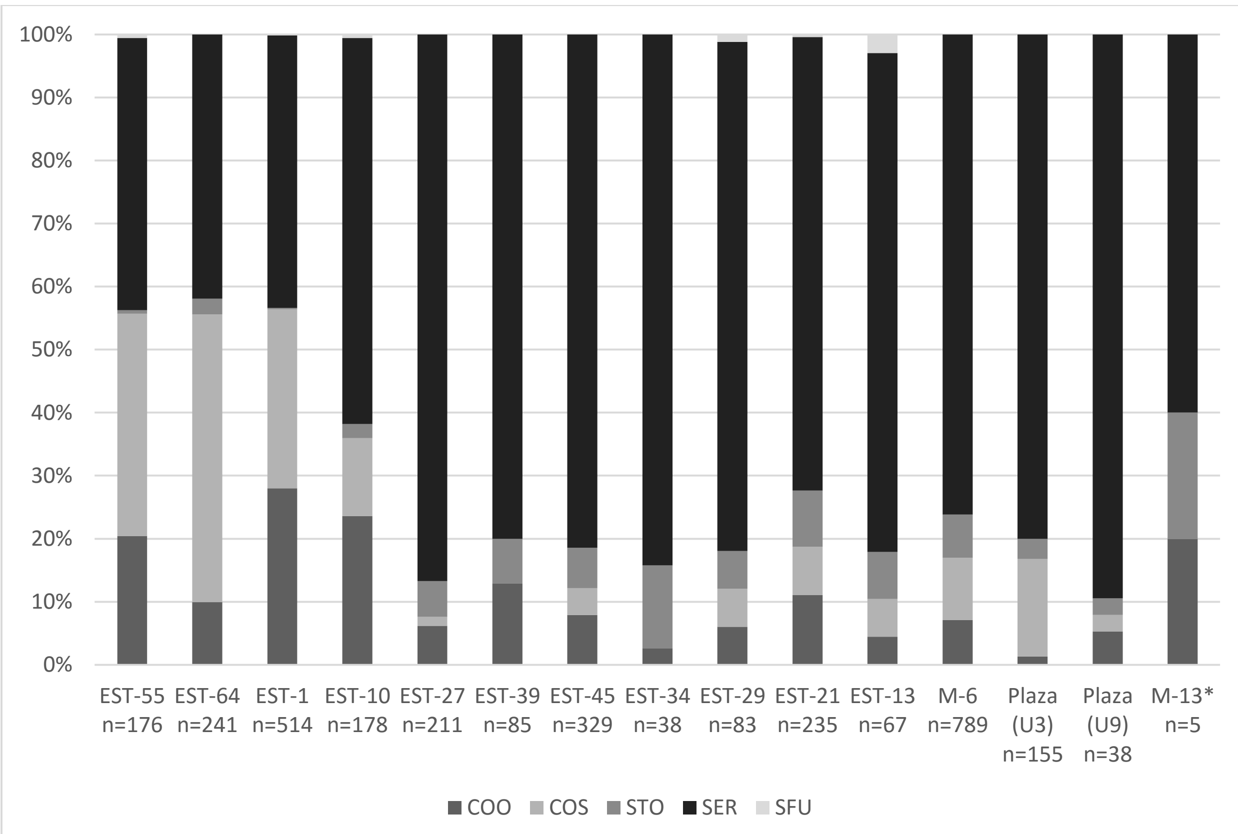


Figure 8.34. Ceramics by functional type for excavated unites in Sector I. COO=Cooking; COS=Cooking or Storage; STO=Storage; SER=Serving; SFU=Special Function.

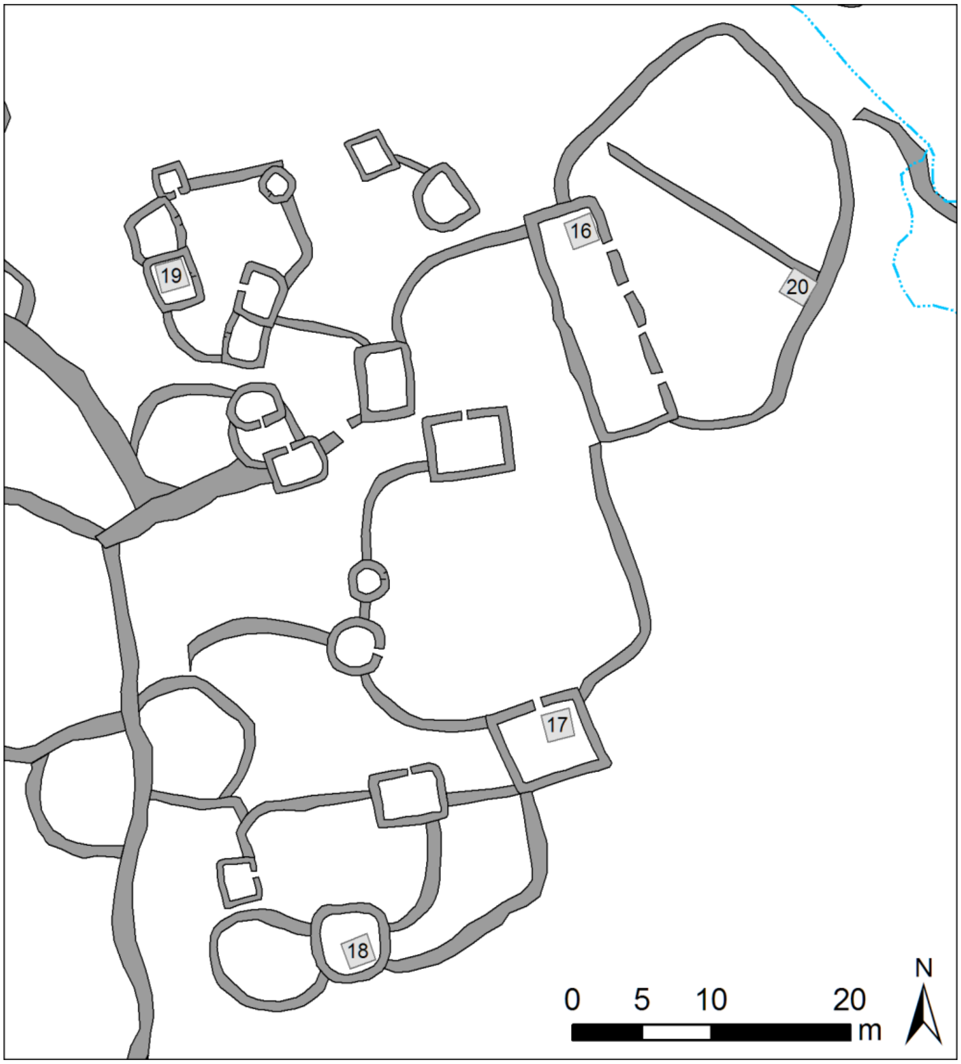


Figure 8.35. Location of excavation units in Sector II.

Table 8.3. Excavation units and their corresponding contexts in Sector II.

Unit	Structure/Context
16	Structure 77 (EST-77)
17	Structure 79 (EST-79)
18	Structure 83 (EST-83)
19	Structure 91 (EST-91)
20	Plaza 2

In contrast to the history of rebuilding in Sector I, the results of our excavation in Sector II revealed an area of entirely new construction. We placed a total of five units in Sector II; four located within structures, and one located within the Plaza. All test units revealed that structures in this sector were built directly atop the natural matrix. In most structures, we identified a single living surface. The only exception to this was Unit 16, set in the northeast corner of the Inka great hall structure. Here we found three distinct occupation surfaces, suggesting that the interior space had been refreshed multiple times. Given that most of the structure contexts in Sector II had only a single use surface, while the majority of structures in Sector I had multiple LH living surfaces, could suggest that at least some structures in Sector II were built after most of the rebuilding in Sector I. Given the limits of our test excavations, this is very tentative.

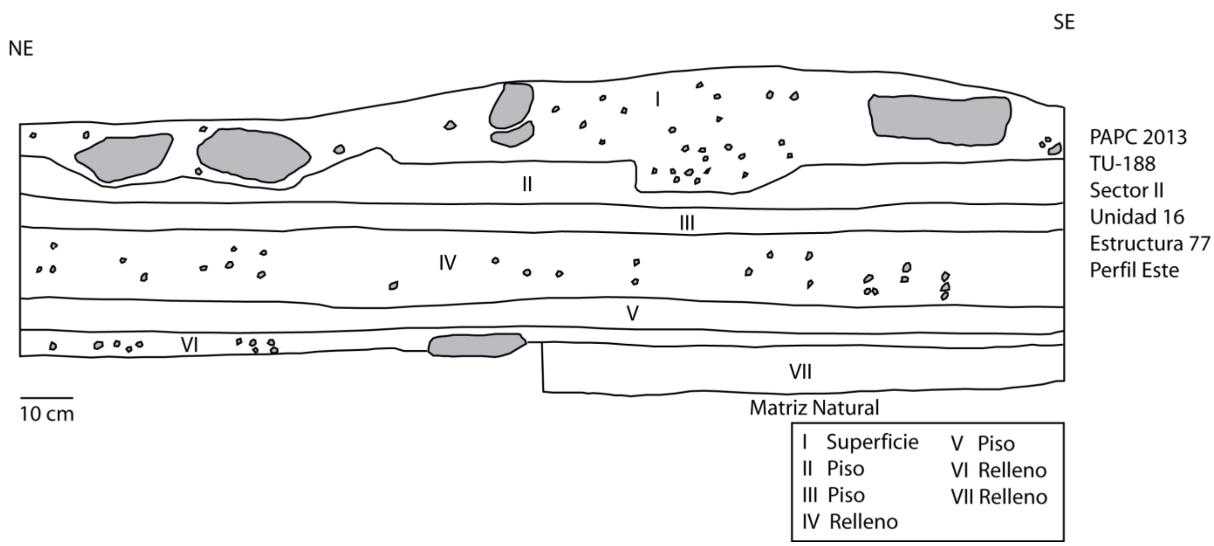


Figure 8.36. Wall profile from unit 16 in the probable kallanka (structure 77).

The three structures with the highest proportions of serving wares were the Inka great hall (60%), structure 79 (56%) and structure 83 (62%). In structure 91, located in a small patio of six small structures, the proportion of serving wares was only 45%. Our excavations in the structure found high concentrations of refuse, including animal bone. The unit also had an extraordinarily high proportion of aribolas—counting for 48% (59 of 122) of the serving wares recovered from the unit. It seems highly likely that structures in this patio were food preparation areas related to ritual feasting and commensal events that took place in the nearby great hall and plaza.

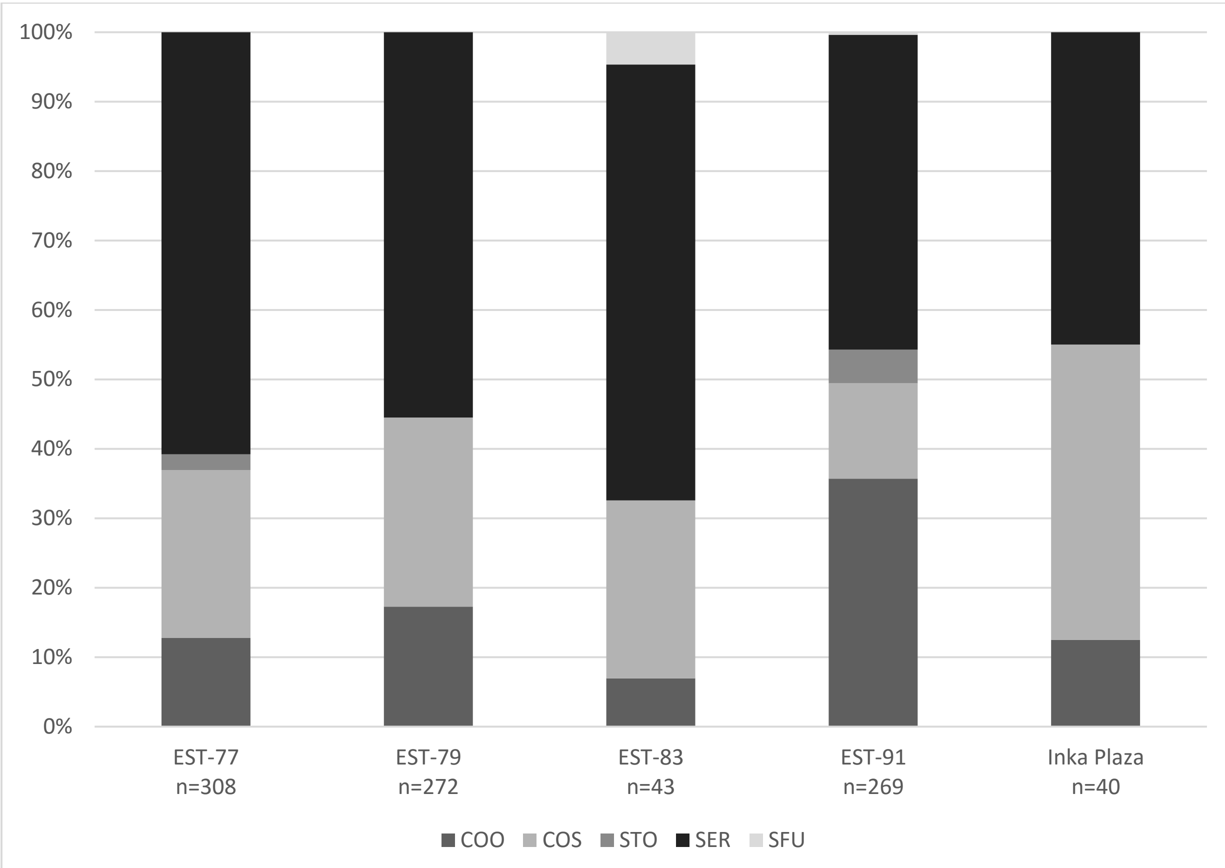


Figure 8.37. Ceramics by functional type, Sector II. COO=Cooking; COS=Cooking or Storage; STO=Storage; SER=Serving; SFU=Special Function.

The final unit was placed in the Inka plaza, adjacent to a transverse wall inside the space. The unit was placed in an attempt to determine the construction sequence of the perimeter wall and transverse wall. The transverse wall was double-faced and the tops of the single course of stones was evident on the ground surface and it was unclear how it related to the plaza space. Unfortunately, our unit just missed the wall join, so it was impossible to determine their construction sequence. However, our excavation did reveal that the wall had been contemporaneous with the use of the plaza. Aside from the perimeter wall, little effort seemed to have gone into formally preparing the space. We found no evidence of artificial leveling, and no formal floor surface. It is likely that the naturally level ground occupied by the plaza was deemed to provide an adequate surface, so no extra effort was expended.

Discussion

Excavation data from within the defensive walls hints at how the defensive core of the site was transformed following Inka arrival in the valley. Three contexts reveal that earlier LIP occupation levels were buried beneath 20-40 cm of fill before new occupation floors. This period of rebuilding coincided with the appearance of LH ceramics. In at least one case (Unit 8), the earlier structure walls were dismantled to prepare the area for new construction. At the same time, new structures filled in previously unbuilt areas within the defensive walls. These structures were built directly atop the natural matrix, and interior areas were leveled with a 10-20 cm of fill below the living surface. The fact that the vast majority of our test units did not encounter pre-LH occupation levels suggests that while there was a residential component during the LIP, there was significant growth and settlement density within the defensive walls during the LH.

By contrast, the great hall, plaza, and adjacent residential compound were placed in an area with apparently no earlier architecture. In Sector II, our excavation found no evidence for residential structures or intensive use prior to the LH occupation of the site. Domestic structures contained only a single living surface, either placed upon the subsoil, or above a layer of moderately compact fill. Only the Inka great hall showed evidence of renewal; the interior space having apparently been resurfaced multiple times.

Public spaces throughout the site were also remodeled and formalized around this time. A small plaza in sector two was leveled, a formal floor was place within the upper wall of the site, and a walled plaza was constructed adjacent to the Inka great hall. Just inside the defensive wall, even more significant changes occurred. The original use surface was covered a thick fill before subsequent use surfaces were laid. The high proportion of serving vessel (76% of the functionally diagnostic assemblage), including numerous aribola and plate fragments speaks to the social significance of the defensive construction. Evidence of burning and significant quantities of LH ceramics hint at the possibility of destruction and renewal (either ritual or destructive) associated with the broader social and political changes at the site. However, these possibilities cannot be resolved at this time.

Change and Continuity at Auquimarka

There were significant changes at the site which coincide with the appearance of local Inka style ceramics. Our excavations suggest a significant rebuilding episode, during which extant architecture was dismantled, the area re-leveled, and upon that the current structures were built. The extent and density of occupation within the walls apparently grew during this time, eventually resulting in a built environment which occupied nearly all the open space of the area. There is little indication that the changes in this sector were centrally orchestrated. With the exception of two formal path segments, the organization of domestic groups within the sector created a labyrinth of pathways, many of which cut through these domestic groups. Residences within this sector were the largest and finest at the site. Setting up house within this area appears to have been reserved for a select few.

Given the lack of centralized planning, the accordance to local architectural styles of domestic architecture, and the apparently un-hurried manner of the later construction episode, the changing residential patterns within the defensive sector suggest locally-driven reconstruction and reconfiguration of the space. We uncovered no evidence of widespread burning or violent destruction of residential areas within the sector. Instead, previous architecture appears to have been carefully dismantled, and was even perhaps reutilized in later construction. There was only very tentative evidence for violent destruction associated with the defensive wall.

Changes continued outside the defensive walls as well. The construction of the kallanka and plaza to the northeast of the defensive sector created a new, formal public space for site residents. Behind the kallanka, a large residential compound was likely home to a new class of leadership. The absence of material markers of direct Inka state influence (i.e. imported ceramics, cutstone masonry), suggests that leadership was most likely drawn from the local community.

These changes at the site likely occurred in phases, perhaps with the construction of the Inka public and administrative architecture occurring after the residential growth within the walls had begun. This would suggest that residents at the site were already experiencing increasing social stratification prior to the establishment of Inka-style administrative architecture at the site. I suggest that this multi-stage process reflects a more protracted period of interaction with the Inka state prior to the establishment of more complete state control of the region. It is possible that this extended period of interaction included violent engagement with the state. An increasing concern for defense related to growing Inka power may have initially driven local elites to settle within the additional protection of the defensive walls.

Occupation behind the defensive walls continued—and may have even increased—well past the marked diminishment in defense across the valley more broadly. So despite a lessening concern for defense, the sector remained symbolically and politically important. The walls both physically delimited and restricted access to this elite residential sector. The transformation of the defensive sector into an elite residential sector shifted the significance of the fortification walls from a fundamentally inclusive monument of community defense to that of social and political differentiation.

Discussion and Conclusions

Evidence from the survey shows that more than half of the fortified settlements and nearly all of the non-residential fortifications were abandoned following the valley's incorporation into the Inka state. This widespread abandonment contrasts with the overall high levels of Late Intermediate Period and Late Horizon settlement continuity that have been previously documented much of the valley. While there may have been legitimate reasons for the Inka to forcibly relocate local populations to non-fortified locations—e.g. fear of rebellion, or a show of imperial power—abandonment seems to have been more locally driven and idiosyncratic. Not all fortifications were abandoned. In fact, the largest settlements and those with the most significant investment in wall construction—and by extension the largest residential population—were the ones that continued to be used throughout the Late Horizon. Instead, fortification abandonment was likely more a reflection of household-level or settlement-level decisions made in response to changing needs. Residents may have simply de-aggregated, choosing to move closer to their agricultural fields or pasturage areas. Others may have been drawn to nearby non-defensive settlements, contributing to growth and nucleation there.

The transformation of defensive settlements during the Late Horizon was not limited to abandonment. Malata and Auquimarka, the two largest fortified settlements were transformed into secondary Inka administrative centers in the valley. These political changes had broader social and spatial consequences within the settlements. At Malata, the transformation to local Inka administrative center shifted the focus away from the massive defensive hilltop that occupied the western third of the site, towards the new central plaza and Inka great halls. By contrast, the changes at Auquimarka transformed, rather than ignored, the monumental defensive architecture at the site. As the need for defense waned, the area within the defensive walls became an elite residential area that was physically demarcated and spatially separated from both the commoner residences to the north, and the Inka administrative complex to the west.

While social differentiation was materialized in similar ways at the two sites—through the construction of larger and more elaborate masonry—their spatial manifestations were distinct. In contrast to the well-defined elite sector at Auquimarka, elite households were distributed throughout the residential sector at Malata. However, in both cases, these status differences were not tied to official Inka spaces, such as the plaza or great halls. At Malata, elite households were no closer to the plaza than any other households. And at Auqimarka, while the elite residential sector was spatially and visually closer to the Inka plaza than the commoner sector, settlement within the walls demarcated the spaces as distinct.

A separate class of domestic patios, which likely belonged to local administrators, do however show greater alignment to the Inka plazas and great halls. At Malata, the organization of this space shows a distinctly Inka logic, with strongly orthogonal patios. Both compounds are both proximate to the Inka plaza, and physically separated from the other domestic areas. The structures themselves, however, are constructed following local norms and maintain the distinctive Collagua-style doorways. These were clearly the work of local labor, either following local norms or a hybrid architectural form. However, it is unclear whether their occupants were local administrators drawn from the resident population, or non-local individuals brought in from elsewhere.

CHAPTER 9

SUMMARY AND CONCLUSIONS

This project employed a multi-scalar approach to understand the nested relationships of cooperation that emerge through war. I draw on this framework to examine how war informed the formation multiple scales of community affiliation that were central to the articulation of the Collagua ethnic polity of the southern Peruvian highlands. This chapter summarizes the findings and discusses their implications for understanding the nature of conflict and local community and polity formation in the Colca Valley during the Late Intermediate Period.

Summary of Findings

Evidence for Defense

The 33 sites documented in this study were clearly defensive in nature (Chapter 5). Sites were located in defensible locations, such as hilltops, ridgetops, or promontories, which limited the number of viable approaches to the site, and made approach to the site more difficult and costly overall. The location of these sites on the high ridges and hilltops surrounding the valley also provided extensive visibility of the surrounding landscape. Sites also demonstrated significant architectural investments in defense. At minimum, all sites had a defended perimeter wall generally with only one gates allowing access to the interior of the site. Perimeter walls were massive constructions, over a meter thick and often over three meters high on the exterior. Many of these sites contained multiple perimeter walls, and defenses were augmented with parapets, bastions, ditches, and guard towers. Defended gates provided additional protection for the most vulnerable points in the site defenses.

Considered together, the intrinsic and constructed features of the sites recorded during survey demonstrate that they were clearly designed to provide defense to the populations that constructed and used the sites. While climactic changes documented for the LIP appear to be reflected in shifts in the local domestic economy, a shift to greater dependence on pastoralism cannot fully explain the location or architectural investments in these sites. The sites recorded during survey are more concentrated in the suni and puna ecological zones, which would have allowed for greater access to key grazing areas in the puna grasslands. However, the overall pattern suggests diversified production practices that drew both on pastoralism and intensive agriculture. Much of the agricultural infrastructure in the valley appears to have been constructed during the LIP, including extensive canal systems and irrigated terraces (Brooks 1992, 1998; Denevan 1988; Wernke 2013). Several fortifications were located in prime valley-bottom agricultural lands, with no direct access to pasturage. Furthermore, even fortified settlements located in suni areas were associated with terrace systems, further suggesting that residents were engaged in both activities. Finally, while the symbolic importance of monumental-scale walls and hilltop locations as boundary markers and prominent landscape features cannot be denied, the defensive context of their construction and use is an integral part of their significance to local communities.

Diversification of Defenses

Defensive sites in the valley included a range of site classes, including fortified settlements, and non-residential fortifications of various sizes. I have argued here that this variation reflects a diversification of defenses, and that fortifications were designed to serve distinct, yet overlapping, defensive purposes. While fortified settlements were primarily constructed by and designed to serve their local resident population, two thirds of the sites recorded had no single residential settlement. Several sites were located in close proximity to large non-defensive LIP residential settlements and likely served as the primary defenses for groups at those sites. Others, located higher along the valley rim, provided protection to pastoralists and their animals as they pastured in the high puna grasslands. Non-residential fortifications were also highly visible features on the landscape with expansive vistas of the surrounding area, indicating they were also strategic observation points. These sites also maintained dense visual connections with other fortifications in the valley, which would have facilitated long-distance communication between defensive sites (Chapter 7). Fortifications were also crucial for monitoring access into and out of the valley, indicating a concern with monitoring regional movement (Chapter 7). The monitoring function of these sites is most clearly indicated by the site of Akunikita (AC-176), which was situated to directly monitor a major prehispanic road leading out of the valley to the south.

I have argued that this diversification of defense reflects a *decentralized but coordinated defensive strategy*. The elaboration of defenses was tied to the size of the population that constructed and used the individual site and reflected local defensive concerns. This indicates that individual sites were executed at a local scale, rather than coordinated through a centralized political authority. Yet fortifications in the valley were constructed in relation to one another both locally and regionally, forming nested relationships of defense.

Local Cooperation

At a local level, coordination for defense clearly brought residents of the valley together in fundamentally new ways. Defensive constructions were corporate projects, coordinated between households that shared a collective need for defense. At fortified settlements, this collective interest also intimately linked households as they went through their daily rhythms. Living in a hillfort often meant highly circumscribed residential areas and dense settlement. These sites grew with little evidence of formal oversight, resulting in tightly arranged domestic groups filling in open areas or arranged in residential terraces (Chapter 6).

While fortified settlements primarily served the households who lived in or adjacent to the defensive walls, non-residential fortifications drew on more extensive social ties. Many of these sites may have served multiple villages and hamlets from the surrounding area, and those located in the higher suni and puna parts of the valley, likely provided periodic refuge for pastoralist communities. Given the indication of diversified domestic economy, these pastoralists may have maintained more permanent homes in lower areas, reflecting broader social ties.

Fortifications were far from the only corporate projects in the valley during the LIP. Extensive canal and irrigated terrace systems were also coordinated at a supra-household level (Wernke 2013). I have argued that defense and water provided parallel and intertwined contexts for local negotiation and cooperation, evidenced in the carved *maquetas* found at several defensive sites representing systems of reservoirs, canals and field systems. I suggest that these parallel domains of cooperation linked politically independent communities through corporate labor and mutual obligation—cooperative relationships that were also a likely source of tension between residents.

As presented in Chapter 7, evidence of supra-settlement coordination can be in the presence of multiple clusters of proximate and intervisible fortifications that could have provided mutual aid during attack. These sites were located well within an hour's walk indicating both that they could have quickly rallied support and that they would have likely been too close to have been enemies.

Chapter 6 illustrates how public gathering spaces and mortuary architecture were intimately tied to the defensibility of sites in the valley. Chullpas and cist tombs are frequently located within and even adjacent to defensive walls, and large cave burials were found at the base of many of the hilltops. While elaborate plazas were generally absent during the LIP, many sites accommodated large open spaces that may have served as areas for public gatherings. Thus, while collective defensive interests drew communities together in new ways, these relationships of mutual obligation were cultivated through more deliberate acts of commemoration and commensalism—practices that were central to the articulation of new community relationships during the Late Intermediate Period.

Regional Ties

The results presented in Chapter 7 also suggest horizontal ties that linked settlements in the valley at a regional scale. Fortifications were highly intervisible, a feature that would have facilitated long-distance communication in the form of smoke or fire signals. An additional possibility not examined here is that individuals could have used auditory signals to communicate over long distances. Casual observations during fieldwork indicate that sound in this highland setting can carry over long distances, and future work could explore this possibility through an archaeo-acoustic study.

Additionally, models of accessibility at a regional scale found that sites were situated in key access points into and out of the valley. This pattern suggests that surveillance and control over crucial entry points was a key defensive concern, and further suggests a concern for threats coming from outside the valley (Chapter 7).

These regional ties are reflected in the widespread formal and stylistic similarities in ceramics and domestic architecture found throughout the valley (Chapters 3, 5 and 7). These similarities across the valley have been noted since the earliest archaeological surveys of the valley (de la Vera Cruz Chávez 1987; Doutriaux 2004; Malpass and de la Vera Cruz Chávez 1986, 1990; Neira Avendaño 1961; Tripcevich 2007; Wernke 2013). In the present study, ceramic analysis found no discernible or patterned differences in decoration, vessel form, or paste types across the valley, indicating a broadly shared cultural tradition. Furthermore, while some local variation in domestic architecture was noted, masonry styles were broadly shared across the valley. Taken together, this evidence suggests networks of regional ties and interaction that extended to defense in the valley.

Fortifications Under Inka Administration

There were significant changes to the use of fortifications as the valley was more fully integrated into the Inka state. Fewer than half of the defensive sites had evidence of continued use during the Late Horizon, indicating that the conflict that initially drove their construction and use had largely subsided. However, not all fortifications were abandoned. The largest fortified settlements continued to be used. I have argued that this pattern reflects household and/or settlement level decisions, rather than Inka administrative fiat. While the small sample size makes definitive conclusions difficult, fortified settlements with continuing occupation were located in more amenable locations, rather than tightly circumscribed hilltops, with ready access to water, agricultural fields, and often pasturage areas. I suggest that residents living in more inhospitable fortifications may have chosen to resettle to non-defensive locations, or to have simply de-aggregated in order to move closer to their agricultural fields or pasturage areas.

The sites of Malata (IC-195) and Auquimarka (TU-188) were more radically transformed into local administrative centers during the Late Horizon. While large by LIP standards, these settlements grew both in extent and density during the LH, following more general patterns of settlement density and nucleation across sites in the valley (see Chapter 3). At Malata, a new plaza and great hall complex was constructed to the east and activity at the site shifted away from the fortified hilltop and was reoriented towards the Inka plaza. These shifts were accompanied by growing settlement density and more marked status differentiation between households. These differences were most clearly reflected in the establishment of a discrete elite patio group that was likely home to a local administrator. For the most part, however, elite houses were distributed throughout the residential area. While the newly constructed Inka plaza shifted the focus away from the defensive hilltop that had been at the center of activity during the preceeding LIP, it was also closely articulated with one of the large cemeteries.

At Auquimarka, the appearance of LH ceramics coincides with growing settlement density of elite households within the defensive walls of the site. As the region was incorporated into the direct rule of the Inka state, local administration extended into the two largest fortified settlements. Administration was materialized in the construction of Inka Great Halls adjacent to walled plazas which would have provided spaces for the realization of public feasting and other commensal events that reinforced connections between the local population and the state apparatus. The plaza at Malata was flanked by two large great halls on the eastern and western sides of the plaza. This new architectural complex created a new area of public engagement, but one that was conspicuously tied to the hilltop cemetery immediately to the northwest of the plaza area. This may have been an intentional move to further connect the new Inka state to the deeper history of the site. However, the new plaza also shifted the locus of the site away from the large defensive hilltop that occupied the western third of the site.

By contrast, the fortified sector at Auquimarka appears to have grown into a marker of status. As the residential density of the sector grew, so too did the material markers of increasing status differentiation. The houses in this sector are both the largest and most finely constructed homes at the site. This resulted in the creation of more concrete spatial boundaries between local elites and the rest of the population. To the north and west of the defensive walls, a new plaza and great hall complex was constructed, along with a small residential sector, in a previously unoccupied plain. While spatially separated from the two large residential sectors at the site, the location of the Inka plaza appears to have followed a similar spatial logic, situated between two prominent mortuary sectors.

While variation in the elaboration of domestic architecture at both sites indicates growing status differentiation during the Late Horizon, differences in settlement patterns suggests local variation. In contrast to the well-defined elite sector at Auquimarka, elite households at Malata were more dispersed across the residential sector at the site. However, at both sites, elite residences were not clearly tied to spaces of Inka administration, such as the plazas or great halls. At Malata, elite households were no closer to the plaza than non-elite households. While the elite sector of Auquimarka was spatially and visually closter to the Inka plza than the non-elite sector, the defensive walls and a canal running through the site clearly demarcated these spaces as distinct.

Under Inka administration, local leaders were more sharply distinguished from the general population. Discrete elite residential compounds were situated near to the plaza areas, but spatially separated from the core residential areas. At both sites, a separate class of domestic patios, which likely belonged to local administrators, do show greater alignment to the Inka plazas and great halls. In both cases, these residential compounds are both more proximate to the Inka plaza, and spatially separated from the other domestic areas. While these structures were likely constructed by local residents, it is unclear whether they reflect local administrators drawn from the resident population or non-local officials brought in from elsewhere. These compounds represent growing differentiation and the establishment of a discrete class of administrators that is not apparent during the LIP.

The Nature of LIP Warfare

A central question in any study of warfare is the nature of conflict observed in the archaeological record. The nature of warfare can reflect both the motivations or causes of conflict, and the scale of political organization of the groups involved. While it is difficult to say for certain the nature of conflict, it is possible to discern several possible scenarios. In this section, I will briefly review and evaluate the primary models of warfare in the valley. I conclude that the defensive settlement pattern in the Colca Valley reflects a concern for threats coming from outside the region, rather than local intra-valley raiding and warfare.

Collapse of MH States

The collapse of the Middle Horizon states of Wari and Tiwanaku around 1000 CE undoubtedly had significant regional impacts. Scholars have suggested this regional disruption could have been the catalyst this period of war, and there is evidence of an increase in violent conflict in the early LIP in some regions (Chapter 2). The research presented here, however, does not support a scenario of conflict brought on by state collapse. Prior research indicates that the valley was peripheral to both Wari and Tiwanaku spheres of influence. Furthermore, Middle Horizon ceramics were exceedingly rare at all fortifications in the study. Only 38 MH sherds were collected, out of 7,777 period diagnostic ceramics, and most of these (68%, 24/38) came from a single site. While future radiocarbon dates will help to establish absolute chronological markers, the lack of Middle Horizon ceramics suggests fortification construction came later and was not tied to the immediate aftermath of the collapse of these two states.

Inter-Ethnic Conflict

As I described in Chapter 3, documentary sources from the valley speak of two distinct ethnic groups in the Colca Valley—the Aymara-speaking Collaguas who occupied the upper central and upper portions of the valley, and the Quechua-speaking Cabanas who occupied the lower central and lower valley—who maintained distinct styles of dress, mythical origins, forms of cranial modification and economic practices. Furthermore, recent bioarchaeological research in the valley by Matt Velasco (2016a) argues that the LIP was an important period of ethnogenesis in the valley. It is possible, then, that the proliferation of hilltop fortifications observed in this study could reflect intra-valley conflict between distinct ethno-political groups. If this were the case, we would expect at minimum to see fortifications in both the lower valley (Cabanas) and central/upper valley (Collaguas). We might also expect to see a concentration in defenses along or near the territorial boundary between the two groups, with the frequency of fortifications dropping off further from this boundary. Another indication would be the presence of an unoccupied buffer zone between the two territories.

A model of inter-ethnic polity conflict is not supported by the results of the survey and excavations of this project. As I discussed in Chapter 3, no fortifications have been identified in the lower valley, despite comprehensive survey of a large area around Cabanaconde. Furthermore, stylistically, ceramics and domestic architecture are overall very homogeneous across the entire valley, with no discernible stylistic boundary between the two groups. In the data presented here, fortifications are distributed across most parts of the central and upper valley, with no concentration of defenses discernible at the boundary with the Cabana territory to the west. If anything, fortifications are *less* concentrated in the western portion of the survey area. Fortifications drop off below Ichupampa on the northern side and Achoma on the southern side, despite extensive Late Intermediate Period settlement in these areas. At the far western edge of the survey area, we identified only two fortifications—Pachamarka (MA-183) and Fortaleza de Chimpa (MD-190).

Inter-Moiety Conflict

Another plausible scenario would be conflict between the two documented groups within the larger Collaguas ethnic group. In the documentary sources, Yanquecollaguas and Laricollaguas were ranked groups that also maintained separate territories, with Laricollaguas largely occupying the areas below the villages of Ichupampa and Achoma, and Yaquecollaguas the areas further up-valley. If conflict in the valley was directed between these two moiety divisions, or perhaps the social groups that preceded them, we would expect to find patterns similar to those described for the scenario of inter-ethnic conflict—fortifications across both areas, concentration of defenses along the border areas, and potentially a buffer zone forming an unoccupied boundary zone between the two groups.

An intra-polity conflict scenario is not supported by the evidence either. Fortifications are more densely clustered in the central valley around Achoma, Yanque and Coporaque, which could suggest a defensive boundary. However, fortifications are entirely absent across large stretches of the area that coincides with the Laricollaguas territory as recorded in the documentary sources, despite documented Late Intermediate Period settlement in these areas. By contrast, in the Yanquecollaguas area, fortifications continue all the way the valley to the far eastern edges of the survey area.

Intra-Valley Conflict

As I discussed in Chapter 3, the brief account of Collagua warfare that appears in Oré, presents a scenario that is best described as local raiding between ayllus seeking to maintain and extend control over agricultural fields. Similar descriptions of pre-Inka warfare appear in documents describing conflict in other regions. Descriptions of pre-Inka warfare recorded by Toledo in the Jauja region, for example, describe local raiding over cultivated fields, food, and women (C. J. Julien 2006). These accounts fit closely with a model of local competition over scarce resources.

The paleoclimactic data from the south-central andes, including recent data from the area just north of the Colca Valley, indicate a period of extended drought and overall cooler temperatures beginning sometime around 1200 CE, during the middle Late Intermediate Period, and continuing until roughly 1300 CE. This suggests a period of climactic stress both in the Colca Valley and across the south-central Andes more broadly. Documentary sources and paleoclimactic data make competition over scarce resources resulting from a period of environmental stress an appealing explanation for the patterns of Late Intermedite Period warfare in the Colca Valley. Additionally, control over access to water may have been an important catalyst for local conflict since the large irrigation systems constructed during this time often changed the course of natural water run-off in many of the micro-watersheds. In a context of pervasive drought, access to water may have been especially contentious. To the west of the valley in the Lake Titicaca Basin, a series of radiocarbon dates indicate that most fortifications were constructed in the middle LIP, broadly coinciding with this period of extended drought and cooler temperatures (Arkush 2008)]. Thus, it is possible that these same patterns may exist in the Colca Valley.

In contexts where raiding is frequent, fortifications are generally wide-spread, and most settlements are generally fortified. Additionally, when raiding is frequent within decentralized groups, the elaboration of defenses is generally roughly equal across settlements, and often directly associated with the size of the local population—and thus the amount of available labor and resources.

Many aspects of the research presented here align with expectations of frequent local raiding. Fortifications are widespread and distributed across the survey area. Defensive sites appear in equal numbers in the central and upper valley. In the central valley, maquetas carved to reflect canal and terrace systems are frequently found associated with fortifications, suggesting that water and defense were intimately tied. Additionally, the size and elaboration of defensive constructions was strongly correlated with site and/or population size, which fits with the expectations of decentralized defense.

However, other patterns observed undermine a scenario of local raiding over scarce resources. First, the majority of fortifications we recorded were non-residential and had extremely low frequencies of cultural materials. These sites were only used periodically as either outposts or refuges, but would have been ineffective in the face of pervasive raiding. Additionally, if we consider the broader settlement patterns in the valley, most settlements during this period were unfortified. Most of the valley's residents made their homes in undefended settlements or in homesteads dispersed across the landscape. And thus, while defense was almost certainly a concern that was widely shared by local residents, most felt secure enough to continue living outside the defensive walls.

Furthermore, there is significant diversity of fortification types across the valley. Fortified settlements and outposts near to major settlements provided direct defense for the residents of particular communities. Some, such as Auquimarka, Malata, Choque Mamani, and Achomani had relatively large resident populations. Other fortifications were located high on the puna, providing temporary protection for those pasturing their herds. Other, more remote outposts were positioned to increase their visibility of the surrounding landscape, monitoring the movements of people traveling into and out of the valley. Many of these site were highly intervisible with one another, facilitating communication and serving as key nodes for relaying messages of impending threats across the valley. This diversification of defense suggests that fortifications served particular defensive needs integral to the functioning of a broad regional defensive network.

In comparison to other regions, the Colca Valley has remarkably well developed styles of local ceramics and domestic architecture, to the extent that they complicate distinguishing a clear boundary even between the macro-affiliation groups of the Collaguas and the Cabanas. Analysis of a number of stylistic and compositional attributes of ceramics collected show no patterned differences across the valley. Taken together, it is impossible to define clear cultural or defensive boundaries that would suggest that conflict was localized to groups within the valley. This contrasts sharply with patterns observed in the Colla region around Lake Titicaca, where ceramic styles and clusters of fortifications indicate a series of social and political divisions that likely oriented local conflict (Arkush 2010). In the Colca Valley we see broadly shared cultural traditions that support my argument of a regional defensive network that linked several smaller alliance clusters.

External Conflict

While accounts of warfare by Oré and other documentary sources suggests local raiding, it is possible to read these accounts in a slightly different manner. In Oré's account, he speaks of defending the lands and fields that the ayllu possessed, which may perhaps refer to a more general notion of protecting one's homeland or domain, rather than the more specific notion of fields. As Susan Ramírez has observed:

> Although the domain occupied by a community or ethnic group was loosely defined, shrinking or expanding with the capacity of a given subject population to use and maintain it, that domain became the group's physical manifestation—its homeland—as continued long-term use became intimately bound to the group's sense of identity. (Ramírez 1998:53).

Additionally, the term *ayllu* within Andean societies was highly flexible, and could be used to refer to social-political groupings at any number of scales. Ethnographic work by Tristan Platt in the highlands around Potosí, Bolivia, highlights the nested and scalar nature of the term *ayllu*, which can be applied to each of the four main segementary levels—from the larger macro-ethnic to the smaller cabildos consisting of just a few dispersed hamlets or *estancias* (Platt 2009). Conceptions of enemies and allies, outsiders and insiders, are similarly relative terms that refer to the particular *ayllu* scale in question. Two cabildos may compete, but remain allies in conflicts involving the macro-*ayllu*.

Thus, it is possible to read accounts by Oré and others as more general statements about defense of territory against a group of antagonistic outsiders, at some unspecified scale. There are several lines of evidence in the research presented here that warrant consideration of external warfare between local Collaguas communities and some threat (or threats) from outside the valley.

As I described above, distributions of defensive settlements, and cultural materials such as ceramics or domestic architecture, do not indicate clear defensive or territorial boundaries within the valley. Instead, fortifications are widely distributed across the central and upper valley. Furthermore, I have argued variation between fortifications reflects a diversification of defense that suggests the presence of a regional defensive network that linked several smaller alliance clusters. Taken together, this suggests a pattern of coordinated defense built through mutual defensive aid. But perhaps the strongest evidence for external conflict is the clear concern for monitoring key access corridors into and out of the valley. As I demonstrated in Chapter 7, fortifications were located in areas that granted the easiest access to the valley from the surrounding puna areas.

There are several possible scenarios that can help explain a context of external threat. The first is a pattern of antagonism between valley groups and other more distant ethnic polities. Travel from most regions into the valley would have come across the high puna expanses that lay to the north, east and south of the valley. This scenario would explain the broad distribution of fortifications along both sides of the valley. It would also fit with the disproportionate location of fortifications in the higher suni and puna ecozones—areas best positioned to monitor for arriving groups and would have provided a first line of defense against attack. This type of regional-scale conflict could have been motivated by raiding for herd animals that were pasturing on the puna.

Raiding for herd animals is a common practice among pastoralist groups (Gray et al. 2003; Salzman 2002; Sweet 1965) and is often an easier task than raiding directed towards agricultural stores, which would have required the additional logistical task of loading and transporting bulky provisions that were likely stored in heavy ceramic vessels across long distances. Captured animals, by contrast, can literally transport themselves. In a context of external warfare, raiding for agricultural stores would have been even more unlikely in the Colca Valley, where agriculturalist settlements were located closer to the valley floor and would have required an arduous climb back up the steep valley sides, slowing retreat and leaving raiders more vulnerable to counter attack by neighboring groups in the valley.

Another possible scenario would be extended conflict with a particular group. In this case, we might expect a concentration of defenses along the most vulnerable border between the two groups. One possibility would be extended conflict between groups living to the east in the Lake Titicaca Basin, where extensive defensive settlement patterns have also been documented (Arkush 2010)(Figure 9.1). The results of the mobility analysis presented in Chapter 7 showed an important access corridor in the area closest to the basin in the far eastern edge of the survey area. This corridor was also heavily fortified with three large non-residential fortifications flanking both sides of the river. At the same time, fortifications were also located in several other key access points around three sides of the valley, suggesting that threats were not isolated to that corridor. However, it is also important to consider that patterns of movement and conflict could have shifted over time, as attackers attempted to circumvent known defenses, and valley residents responded by constructing additional forts.

Movements of this scale would have required significant travel times by attackers regardless of which direction they were coming from (Figure 9.2). However, examples from ethnographic accounts from other regions do provide examples of groups traveling up to 9 days to carry out an attack (e.g. Fadiman 1982). Long distance travel across the highlands has a deep history, and llama caravans were essential to regional exchange and trade. Studies of contemporary llama caravans demonstrate that caravans can cover distances of between 15 and 25 km per day, depending on the terrain and cargo loads, and travel for 20-25 days at a time (Nielsen 2000; Tripcevich 2008). Thus, raiding by groups from across the puna is a reasonable possible scenario.

Inka Imperial Expansion

It is also possible that fortifications in the valley were constructed to protect against an encroaching threat from Inka imperial forces. Inka expansion into the Colca Valley has typically been seen as non-militaristic, forged through alliance, rather than force (Cook and Cook 2007). In contrast to the Chanca, Huanca, Lupaca, Colla and other groups, where documentary sources record major resistance to the Inka, there are few mentions of the Collaguas in these histories. One of the few mentions is from Oré (Oré 1992 [1598]:159 [141]), who describes a marriage alliance between the two groups:

> En servicio de Mayta capac Inga, que tuvo por mujer a Mama Yacchi natural de los Collaguas, hizieron los indios de aquella provincia una grande casa toda de cobre para aposentar al Inga y a su mujer, que como a patria la vinieron a visitar[12]…

While Oré's narrative speaks of a marriage alliance with Mayta Capac, it is most likely a reference to a high-ranking member of his *panaca* (royal lineage), or a war leader under Inka Pachacuti (Cook and Cook 2007:17; Wernke 2013:101-102). Mayta Capac was only the fourth in

[12] "In the service of Mayta Capac Inka, who had for his wife the one Mama Yacchi, native of the Collaguas, the Indians of the province made a great house entirely of copper to accommodate the Inka and his wife, when they would come and visit her homeland…" (my translation).

the Inka dynastic sequence and substantially pre-dates the Imperial expansionist period (Pease 1977 140-1). Instead, drawing on drawing on dates from other southern highland regions, such as the Lake Titicaca Basin and Moquegua (Bauer and Stanish 2001:251-255; Stanish 2003:208); scholars have suggested similar mid-fifteenth century dates for Inka state expansion in the Colca Valley (Wernke 2013:101-102).

Fortification construction and use in other parts of the southern highlands—such as Lake Titicaca, and northern Chile— predate the traditional chronology of Inka conquest in those regions by approximately 200 years (Arkush 2008; Zori and Brant 2012). The early dates and long-term use of fortifications, generally supports a models of local-scale raiding, perhaps in response to climate stress, rather than resistance to Inka state expansion. However, it is likely that conquest of the region was preceded by a period of contact and interaction, and even earlier military forays. South of Lake Titicaca, 14th century dates have been associated with Inka ceramics from the site of Caquiaviri (Pärssinen and Siiriäinen 1997). There are still few radiocarbon dates for Inka presence In the Colca Valley, however, there are a few indications of pre-15th century interaction with the Inka. Malpass reports a mid-14th century date from trench excavations of agricultural terraces with high densities of what he calls “Inca or Inca-influenced,” ceramics, almost certainly referring to what is referred to here as Collagua Inka (Malpass 1986:159-163). Additionally, new radiocarbon dates obtained from bone and mortar from tombs with high concentrations of local Inka-style ceramics, place the tombs squarely in the 13th century (Velasco 2016a). While the contexts of these dates—agricultural terrace fill and looted tombs—calls for caution, they suggest a pattern of longer-term interaction between Colca Valley residents and the Inka state that likely predated actual Inka administration in the valley.

Initial interactions between the Inka and Colca Valley residents could have included general exchange between the two groups, and even more symbolic reciprocal gift exchanges of high status goods, animals, and marriage partners. These exchanges may have become more politically charged as the Inka state began to exert greater militaristic force as they expanded their control throughout the region. It is likely that Colca Valley residents had knowledge of Inka attacks and conquests in other nearby regions, which could have prompted fortification construction. The northern side of the valley offers the most direct access to the valley from the Cuzco region, and would be the most logical location for a fortified border against the Inka, although approaches from other directions are also possible. According to local informants, two known routes to the Cuzco region pass very close to the large fortification of Pumachiri (CO-158) above Coporaque in the central valley, and two smaller paired forts—Pukara Killa (TU-185) and Chaillita (TU-186)—above Tuti in the upper valley.

Overall, the distribution of fortifications across the valley could support a scenario of Inka conquest. While fortifications are not limited to the northern side of the valley, many of the fortifications on the south side of the valley are located near to large Late Intermediate Period settlements, such as Juscallacta, Achomani, and Yanque. The more intensive fortification in these areas may have been intended to protect these larger population centers, which may have also been emerging as important centers of elite influence. Furthermore, ceramic data from surface collections, as well as excavations at Auquimarka demonstrate that occupation of fortifications was contemporaneous with Inka expansion into the region. However, absolute dates of fortification construction are needed to determine whether Inka expansion was a primary motivation for conflict, or just the latest of several.

Figure 9.1. Approximate location of southern highland ethnic groups mentioned in Spanish colonial sources and defensive settlement patterns. After Arkush 2006; Sillar 2012; D’Altroy 2002.

Figure 9.2. Estimated travel time from valley to surrounding areas. Assumes a travel distance of 20 km per day (Tripcevich 2008).

Discussion of Explanations for Warfare

In this section, I have outlined a number of possible explanations for the patterns of fortification in the valley drawing on the results of this research and what is currently known about the broader social and political dynamics of the region during the Late Intermediate Period. Several possible explanations show a clear lack of fit with the research presented and can be dismissed. Warfare in the Colca Valley cannot be explained by the collapse of the Middle Horizon states of Wari and Tiwanaku. By all indications, the central and upper valley were peripheral to both states, and materials recovered show a clear break, both with earlier settlement patterns and with ceramic styles, indicating that the defensive settlement patterns did not arise from the immediate aftermath of the terminal MH. Additionally, explanations of either inter-ethnic conflict between the Collaguas and the Cabanas, or inter-moiety conflict between Yanquecollaguas and Laricollaguas were not supported. Previous research has shown that fortifications were absent from the Cabanas area in the lower valley. And while many LIP sites were defensibly located, the absence of extensive fortification around Cabanaconde contrasts sharply with the patterns observed for the central and upper valley and indicate that the threat of conflict was significantly lower there. The Laricollaguas area in the lower-central valley follows a similar pattern, with defensibly positioned settlements, but very few fortifications. Furthermore, there was no evidence of a fortified boundary that would support either scenario.

Distinguishing between internal, small-scale conflict among Collaguas groups, and external conflict is more complicated. Fortification was extensive across the survey area, a pattern that fits with ethnographic accounts of pervasive raiding or other local antagonism. However, as a whole, most residents in the valley lived in non-fortified settlements and most fortifications were non-residential in nature. This pattern conflicts with expectations from ethnographic research that show that in areas with pervasive local raiding, most settlements are fortified. Furthermore, this research and others have demonstrated the presence of broadly shared cultural traditions across the valley, and it is not possible to identify distinct social or political groups within the region. It is important to remember, however, that the materials most readily available to archaeological analysis are not transparent measures of social or political boundaries (Janusek 2005), and exchange and cultural transmission are not the antithesis of conflict. In fact, conflict can be most intense between those to whom we are closest.

As I argue in Chapters 6 and 7, however, fortifications served a number of distinct, but overlapping, defensive needs that suggests a broader defensive network directed toward threats that lay outside the valley. Some, such as fortified settlements and proximate refuges were designed to directly protect local residents. Others, however, were positioned to protect key access points into and out of the valley, or to relay signals of approaching threat across longer distances. I argue that these diverse defensive uses reflect a broader nested defensive structure that linked local alliance groups through mutual aid. This pattern, and the particular concerns with monitoring key access points into the valley fits most clearly with a pattern of local defensive coalitions coordinated against external threat.

Internal and external conflict, however, are not mutually exclusive categories, but instead often overlap particularly in contexts of political decentralization. It remains possible, and even likely, that conflict during the Late Intermediate Period oscillated between local, small-scale conflict and broader defensive coalitions against more distant groups. As valley residents sought to manage agricultural production through the construction of large irrigation networks, conflicts over water access and territorial claims over fields and pasturage areas may have been a particular point of contention. It is also possible that patterns of conflict shifted over this long 400-year period, and future absolute dating will likely shed more light on this question.

As I have argued here, however, local conflict, in the absence of external conflict, does not adequately explain the patterns of fortification that have been presented here. Instead, the data show a clear pattern of external conflict with groups approaching the valley from across the puna regions that lie to the north, east, and south of the valley, which may have included a pattern of ongoing raiding, perhaps for herd animals, or more entrenched conflict with an antagonistic group, such as the Inka. Future research will help to clarify these possibilities.

A Landscape of War and the Foundations of Community

Defensive concerns provided a set of shared interests that linked individuals and households at multiple scales. Defensive settlements were coordinated between households who were then intimately tied through their daily rhythms of movement through the settlement and out to their fields and pasturage. Those who lived in non-fortified settlements drew together to construct fortifications that could serve multiple settlements and more dispersed households, both in valley-bottom areas and along the valley rim, close to where they would pasture their herds. At a local scale, access to water to irrigate agricultural field required negotiation and coordination across settlements. These supra-settlement coordinations are further reflected in local alliance clusters, which would have provided defensive support during attack (Chapter 7). The necessities of water and defense were likely closely intertwined during the Late Intermediate Period, and may have provided mutually-reinforcing contexts for negotiation, coordination, and cooperation. At a broader scale, the dense visual connections between fortifications, diversification of defenses, and concern for monitoring access into and out of the valley, suggest broader regional defensive ties (Chapter 7).

Taken together, these nested scales of coordination and cooperation, driven by shared defensive concerns drew the decentralized settlements of the Colca Valley into horizontal networks founded on commitments of mutual aid. This research and prior investigations in the valley demonstrate growing differentiation both between households and between settlements during the Late Intermediate Period, reflected both in the size and elaboration of households and the places where people were interred. These growing status differences, however, do not reflect political centralization or hierarchization. While some fortified settlements were very large, and show greater differentiation between households, many prominent settlements during this time, such as Uyu Uyu, Juscallacta, and San Antonio, were associated with fortified outposts and the settlements themselves were not fortified.

Political organization during the LIP in the valley has been described as heterarchical, comprised of largely autonomous and differentiated communities whose political relationships were fluid. My findings largely support this characterization, however, heterarchy is an analytically blunt concept and calls attention to the need to directly address the practices that provided a context for such fluid ranking. For central valley residents, the construction of irrigation canal networks provided one such context for ongoing negotiation, coordination and cooperation (Chapters 3 and 6). The long feeder canals that channel water to the agricultural fields that line the hillslopes often drew multiple settlements into relationships of interdependence.

I argue that war provided another such instrumental context of ongoing coordination and cooperation. As I have shown here, the patterns of fortification in the valley reflect overlapping and nested scales of cooperative relationships. These scales of relationships also imply different levels of commitment and sets of obligation. At a very local level, cooperation required direct investment in the construction of defenses, and likely obliged residents from every household to join in defensive and perhaps offensive conflicts. However, cooperation in the face of war was a shared concern for protection likely made these cooperative actions easier, and the quotidian experiences of living together in close quarters would have facilitated such coordination.

Between allied groups, cooperation likely required coming to the aid to a neighboring site when needed, and perhaps commitments to abstain from offensive action against one’s neighbors. While these relationships also relied on shared interest in defense, they required greater trust, and thus these relationships likely required greater negotiation and more explicit cultivation. At a broader scale, regional defensive relationships would have entailed a commitment to sharing and relaying information, and commitments to abstain from offensive action. However, these relationships were likely even more tenuous and were more explicitly cultivated.

These nested and scalar relationships of cooperation, propelled by a context of conflict, lay at the foundation for emergent constellations of community within the valley. As I have argued here, cooperation in defense was not restricted individual settlements or local alliance networks, but to extended to the broader valley region. As tensions rose with external groups, a context of external conflict may have further propelled regional coordination in defenses and coalescing pan-valley social identities between communities that came to be recognized as Collagua.

The process of fortification was central to the emergence of an emplaced Collagua identity. In Barth’s (1969) classic discussion of ethnic groups, he suggests that group identities, largely taken for granted, become more salient and marked at their boundaries, as interactions and contestations heighten perceptions of “us” and “them” emphasized the importance of boundaries. This notion that social identities become crystallized through contestation can be seen in discussions of warfare, where fortifications are conceived as manifestation of social or political boundaries. However, I would suggest that fortifications in the Colca Valley do not (or at least, do not only) reflect a materialization of the Collagua territory. Instead, fortifications were themselves the means through which the relationships of affiliation and ties of mutual obligation that formed the basis of the Collagua political community became emplaced in the landscape.

APPENDIX A

SUMMARY TABLE OF SURVEYED SITES

Site Code	Site Class	Ecozone	Elevation	# Structures	Residential Area (ha)	Site Area (ha)	Wall Area (m^2)	Ascent Time (min)	Near Visible Area (km^2)	Far Visible area (km^2)
AC-175	Medium Residential	Suni	3646	36	1.07	2.4	353.0	26	18.7	142.8
AC-176	Small Non-residential	Suni	3804	-	-	0.8	567.3	25	12.3	168.3
AC-177	Small Non-residential	Kichwa	3508	-	-	0.2	252.9	18	8.0	45.8
AC-178	Small Non-residential	Suni	3691	-	-	0.3	237.6	29	17.6	173.4
CA-191	Large Non-residential	Puna	4069	-	-	8.2	708.3	27	12.8	95.1
CA-192	Large Non-residential	Puna	4027	-	-	7.2	625.1	24	11.2	92.8
CA-193	Large Non-residential	Puna	4061	-	-	19.2	671.4	27	17.3	95.2
CA-194	Small Non-residential	Suni	3928	-	-	0.1	25.3	20	10.5	36.6
CA-203	Small Residential	Suni	3845	1	0.6	2.8	175.4	18	7.9	21.1
CH-181	Medium Residential	Suni	3913	9	12.6	19.7	612.6	27	8.9	39.2
CH-182	Small Non-residential	Suni	3764	-	-	0.8	323.2	36	22.1	168.7
CH-196	Small Non-residential	Puna	4177	-	-	1.7	505.1	28	9.0	166.6
CO-151	Large Non-residential	Suni	3778	-	-	4.3	1046.0	27	16.1	166.7
CO-158	Large Non-residential	Puna	4573	-	-	4.2	413.8	44	26.8	409.0
CO-165	Large Non-residential	Kichwa	3498	-	-	0.7	473.5	14	13.5	66.4
CO-167	Small Non-residential	Kichwa	3494	-	-	2.8	1934.1	17	12.4	84.4

CO-168	Small Non-residential	Kichwa	3493	-	-	0.8	964.5	16	16.3	96.3
CO-187	Large Residential	Suni	3683	39	24.8	24.8	119.0	32	0.8	1.0
CO-189	Large Non-residential	Suni	3950	-	-	3.9	1275.3	22	17.8	81.4
CO-201	Small Non-residential	Suni	3784	-	-	0.3	155.3	26	13.2	170.0
IC-195	Large Residential	Kichwa	3421	172	4.0	17.3	1918.9	27	16.8	83.0
MA-183	Large Non-residential	Puna	4072	-	-	6.3	1302.3	65	20.6	139.3
MD-190	Large Non-residential	Kichwa	3598	-	-	3.0	814.3	66	14.0	161.8
SI-197	Medium Residential	Suni	3972	25	3.8	12.4	195.5	23	9.9	51.0
SI-198	Medium Residential	Puna	4001	23	8.4	25.5	233.7	30	7.1	14.39
SI-199	Small Residential	Puna	4362	2	6.0	19.3	267.6	21	14.4	188.4
SI-200	Small Non-residential	Puna	4249	-	-	0.3	144.2	22	10.6	134.1
SI-202	Small Non-residential	Suni	3909	-	-	0.7	81.4	24	8.0	37.6
TU-185	Small Residential	Suni	3950	8	1.1	3.5	673.8	20	9.3	20.9
TU-186	Small Non-residential	Suni	3940	-	-	0.5	356.1	19	10.4	26.5
TU-188	Large Residential	Suni	3903	152	2.2	20.2	930.3	17	7.8	20.8
TU-204	Small Non-residential	Suni	3852	-	-	2.0	297.9	21	10.9	11.8
YA-184	Large Non-residential	Suni	3936	-	-	10.9	1717.8	60	20.2	238.4

APPENDIX B

SITE DESCRIPTIONS AND MAPS

Achoma

Achomani (AC-175)

Other names: San Miguel

Elevation: 3664 masl

UTM: 209807 E, 8266667 N

Site class: Medium residential

Site Location

The site is located on a ridgeline that extends north-south to the west of the village of Achoma. The eastern slopes of the ridge are extensively terraced, and most remain under cultivation today. The western slopes are steeper, but the remains of abandoned terraces are still visible. The summit of the site has a wooden cross and a small catholic shrine.

Defenses

Defensive walls are located in the southern-most portion of the site enclosing the primary residential area. A total of seven defensive walls were identified. The four outermost walls primarily run east-west, protecting the only easy access to the site, which is from the south. The topography rises to the north, and the inner walls serve as both residential terraces and defensive walls. The two upper-most walls encircle the highest point of the site. Most walls have only one access, and these accesses are offset from one another. The outer-most wall, which has been mostly destroyed by a modern road which crosses just outside of the site to the south, has one identifiable access which is flanked on the eastern side by a small circular structure, which may have served as a guard tower. Between the first two defensive wall, the ground has been further incised forming a ditch. Two of the walls have parapets in the areas closest to the accesses.

Residential areas

The defensive walls enclose a residential area containing a total of 36 domestic structures. Most are concentrated in the flat open area in the southern portions of the site, with the remainder occupying the higher terraced areas. Structures are predominately rectangular in form. The four circular structures were likely used for storage. Domestic architecture at the site were in general constructed of finer masonry styles; most often worked blocks arranged in courses.

Burial Spaces

Two burial caves, which also appear to have served as stone quarries for the domestic architecture at the site, were located on the western slopes of the ridge. Both caves were highly disturbed, with comingled skeletal remains and fragments of textiles and some broken ceramic, primarily LIP styles. A number of circular chullpas were clustered along the high eastern slopes around the site apex, and another likely chullpa was located just inside the second defensive wall. Within the leveled platform at the apex of the site, we identified 10 circular cist tombs, all of which had been looted. Two additional cists were located adjacent to domestic structures, and another just inside the outer defensive wall. All burial contexts were looted.

Other Features

The apex of the site consisted of two walled areas enclosing a leveled space. The southern-most area, which was enclosed by a large defensive wall had two structures—a circular structure with its doorway facing east; and a elevated rectangular platform adjacent to the southern wall with three cists. These structures did not appear to be domestic in nature. The rectangular platform, which measured X by X meters, and reached a height of X m, could have served as a storage or burial area. The adjacent northern walled platform was open and had a number of looted cists, suggesting it at least in part served as a small cemetery area.

Approximately 70 m to the north of the residential area, is a large rectangular platform with a stepped access located at roughly the center of the eastern side. The platform has 5 primarliy circular cists. The cists were looted and very little material was found in association, suggesting this may have served as a storage structure. Further north along the same ridge, was a large open and leveled platform with walls along three sides.

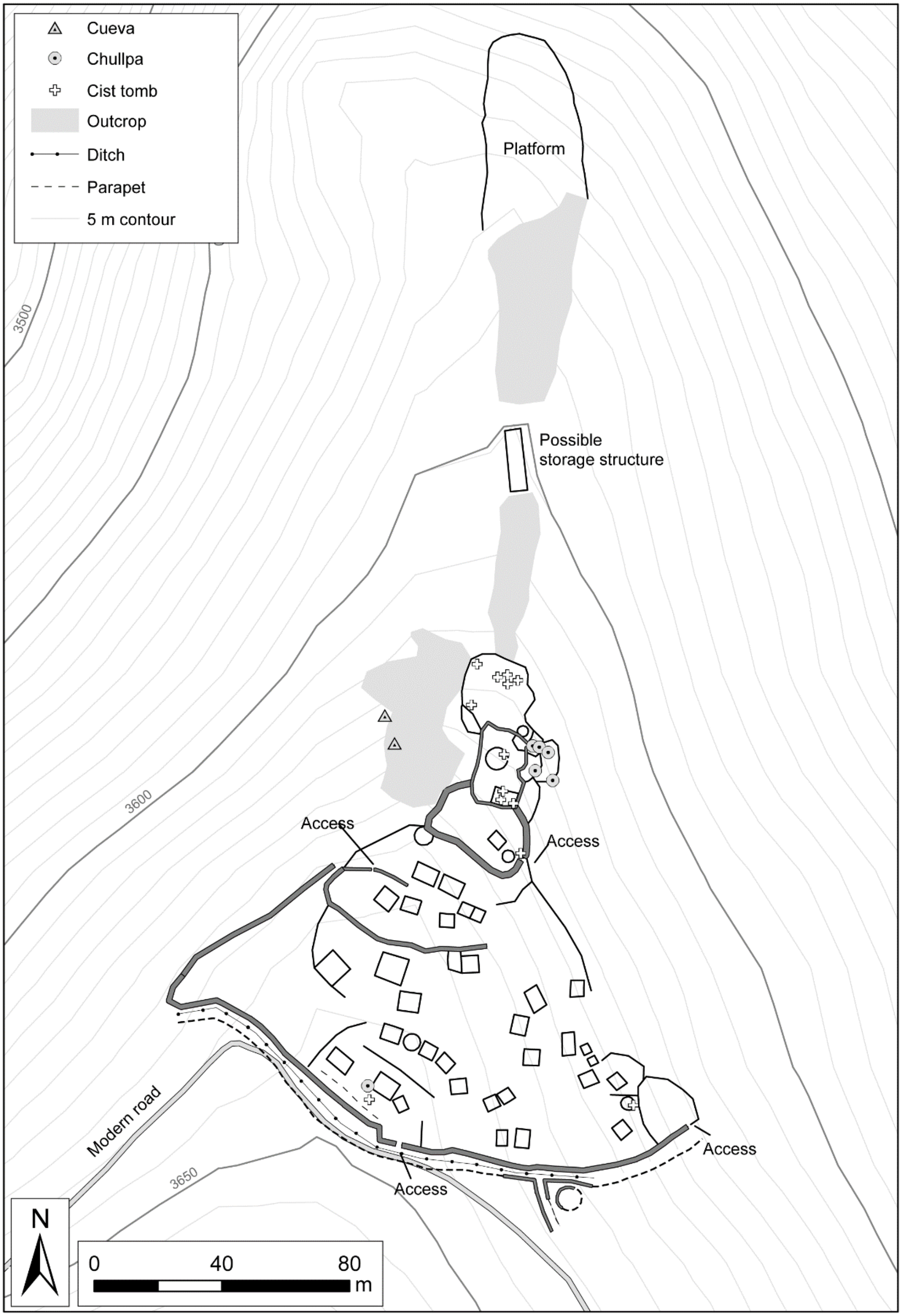


Figure B.1. Plan map of Achomani, AC-175

Figure B.2. View of the primary defensive and residential sector from the south east.


Figure B.3. The primary defensive and residential sector from the south.

Figure B.4. Possible storage platform can be seen in the center of the frame, with the northern platform beyond.

Figure B.5. Access to platform.

Figure B.6. Preserved access in defensive wall.

Figure B.7. A domestic structure.

Figure B.8. Burial cave and possible quarry.

Figure B.9. Defensive wall.

Akunikita (AC-176)

Other names: Auccanikita

Elevation: 3824 masl.

UTM: 209327 E, 8265550 N

Site class: Small non-residential

Site Location

The site is located on a moderate rise along a ridgeline in the high puna south of the village of Achoma. The western slopes are more moderate and now-abandoned preshipanic terraces reach up to approximately 100 meters below the elevation of the site. A sharp cliff defines the eastern side of the site. A well-preserved prehispanic path (Camino de Jucuire), which leads from the valley to the puna to the south passes along the western side of the site. To the north is the site of Cahualli, which consists of a series of corrals.

Defenses

The site consists of two large defensive walls. The exterior wall (to the south), extends roughly from the path to the west to the cliff face to the east, and does not fully encircle the site. A third wall meets it, forming a gate through which the path passes. The interior wall is roughly triangular in form, and forms a complete perimeter. One access was identified along the western side, and a parapet was identified along the wall adjacent to it. The centers of the southern portions of both primary walls were roughly twice as thick and were likely used for observation. Talons along the interior of the wall provided Access.

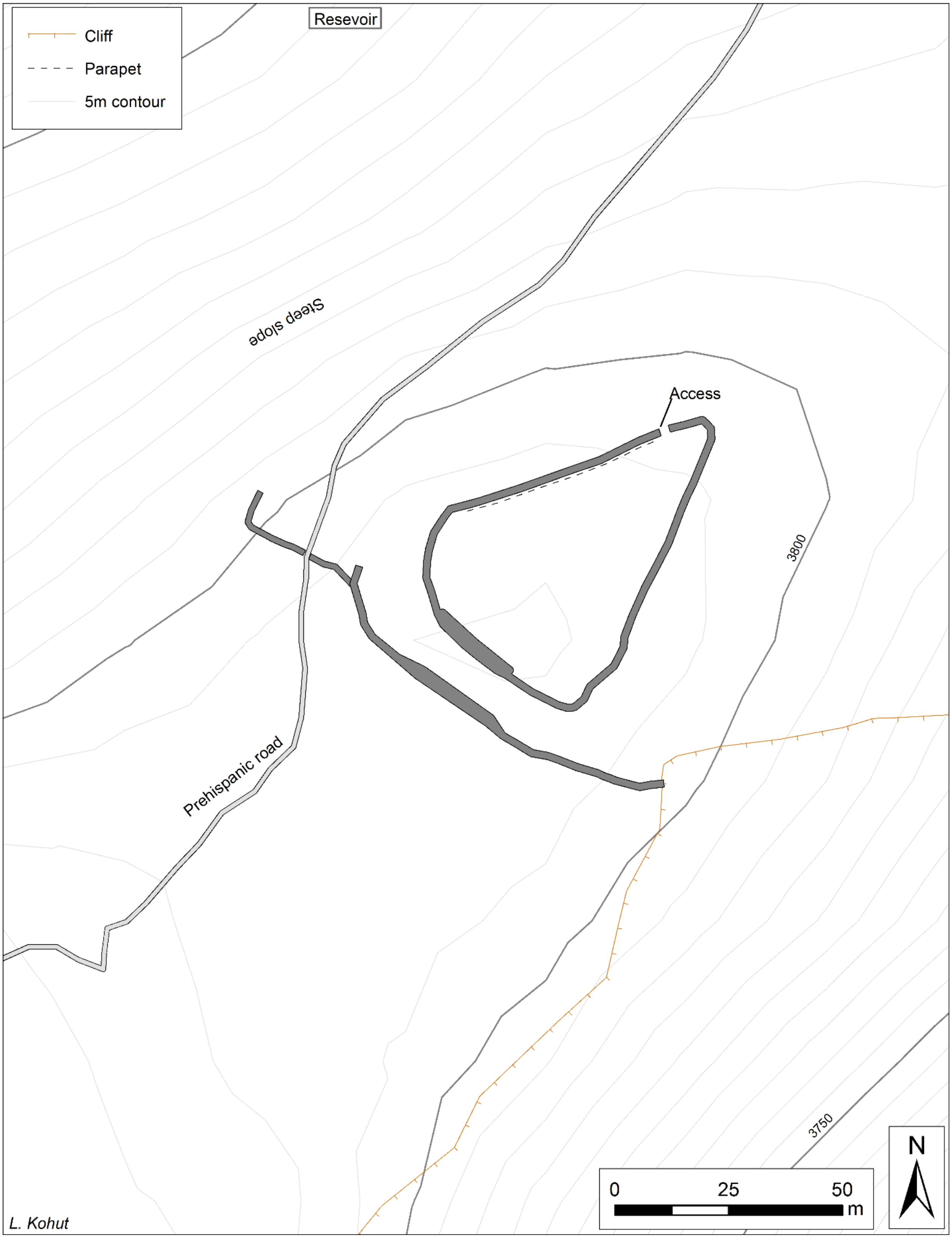


Figure B.10. Plan map of Akunikita, AC-176.


Figure B.11. Akunikita from the north-west. Walls can be seen in the center of the frame at the horizon.


Figure B.12. Camino de Jucuire as it passes through the wall.

Figure B.13. Exterior of the defensive wall.

Figure B.14. Talons along the interior of defensive wall.

Figure B.15. Defensive wall.

Koricancha (AC-178)

Elevation: 3724 masl

UTM: 209746 E, 8266479 N

Site class: Small non-residential

Site Location

The site is located at the northern edge of the puna to the south of the village of Achoma. Steep slopes are found around the western, northern and eastern sides of the site, and the only access to the site is from the south.

Defenses

The site consists of a walled enclosure, roughly D-shaped, and a second defensive wall extending to the east, until the terrain gets very steep. Each wall had just one access each. Wall width ranged from 0.6 m to 2 m, and reached heights of up to 3 m.

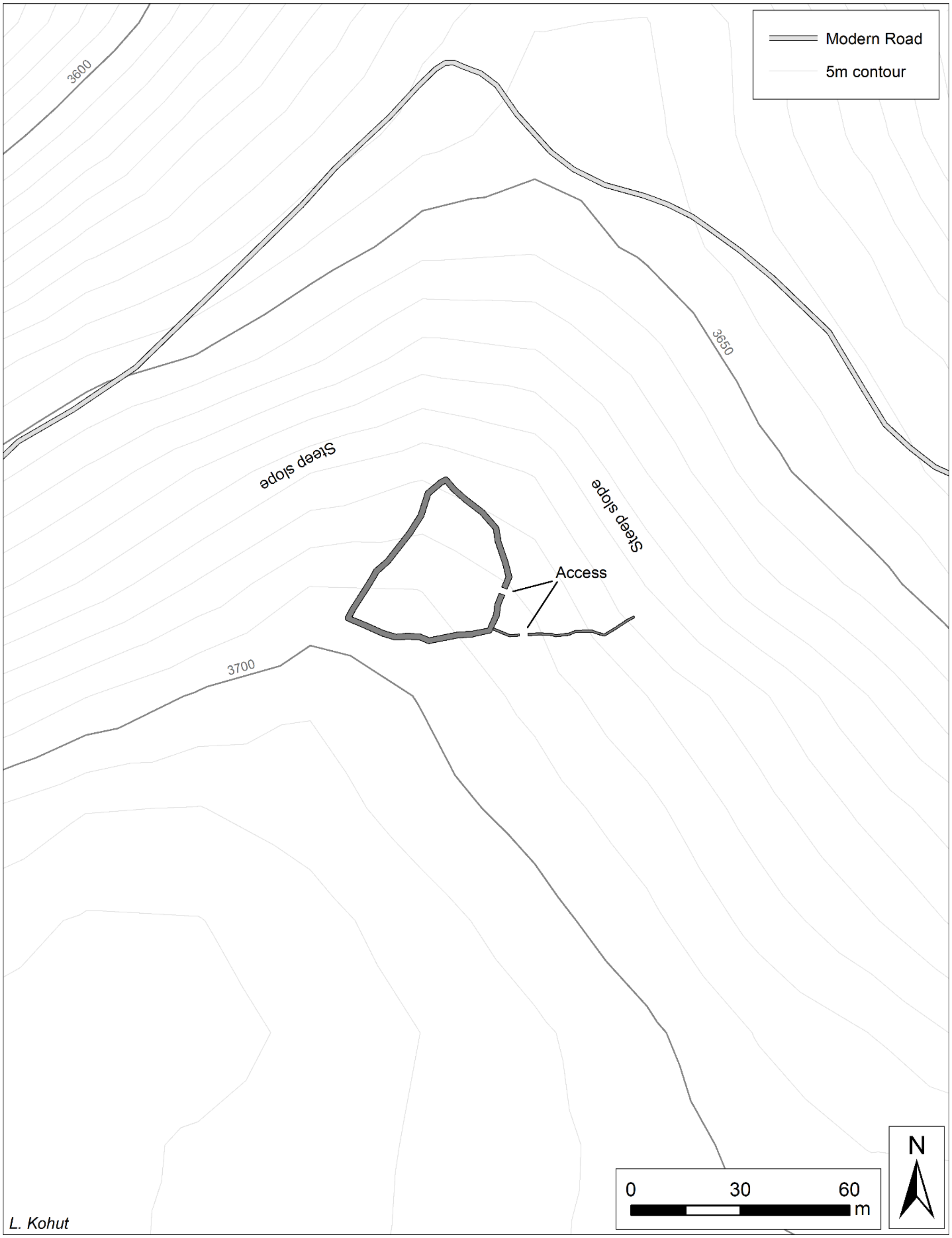


Figure B.16. Plan map of Koricancha, AC-178.

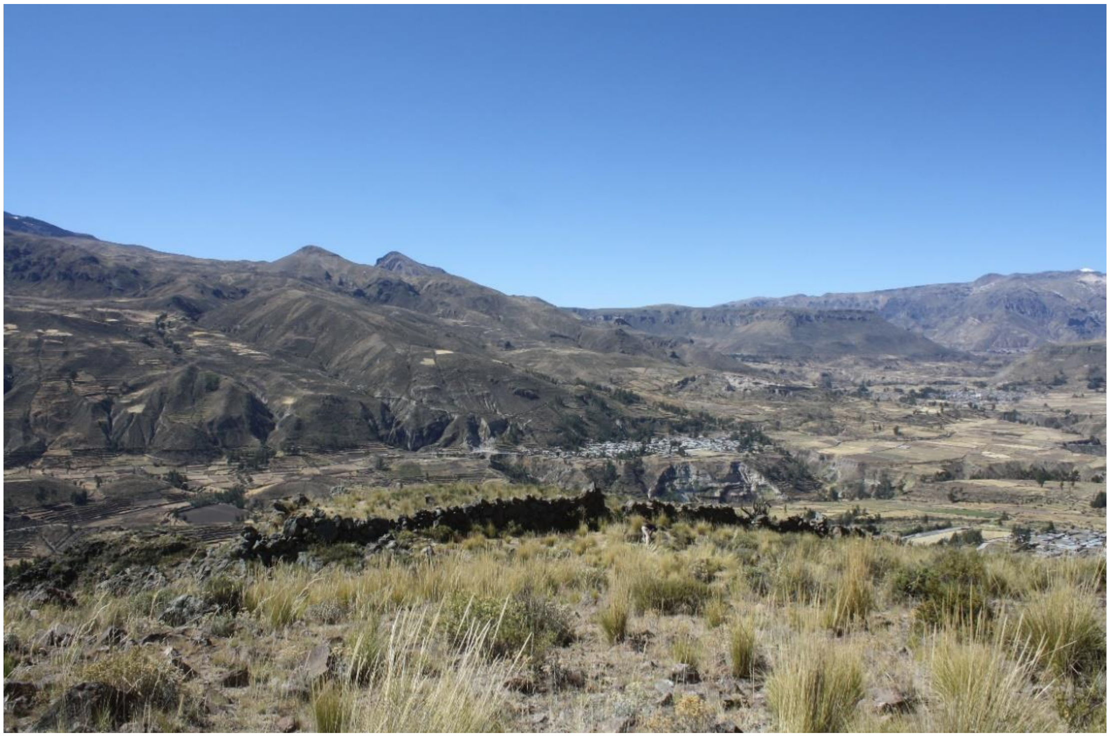


Figure B.17. View of Koricancha from the north.


Figure B.18. Gate in defensive wall.

Figure B.19. Defensive wall.

Figure B.20. View of Koricancha from the east.

Pilluni Moqo (AC-177)

Other names: Pillone Pata

Elevation: 3594 masl

UTM: 210891 E, 8266306 N

Site class: Small residential

Site Location

The site is located on a rocky rise at the northern edge of a plateau above the village of Achoma to the southeast. The northern half of the site is surrounded by steep slopes, rocky outcrops and sharp cliffs. The only accessible side of the site is from the south and east. The site is surrounded on most sides by agricultural fields and terraces which are still under cultivation

Defenses

The site consists of two defensive walls which encircle the hilltop. Additional defensive walls may have previously existed, but have been incorporated into agricultural terrace. The outer wall has a single Access along the southern side, and we were not able to determine the access in the interior wall.

Residential and Burial Spaces

During our survey, we identified two structures at the site, one quadrangular, the other circular. Reconnaissance of the site in 1991 (Oquiche Hernani) identified three additional circular chullpas within the walled space at the highest part of the site, none of which were visible during our visit to the site. Relatively high amounts of lithic debitage was recovered from the site, and Oquiche Hernani (1991) mentions recovering several obsidian projectile points.

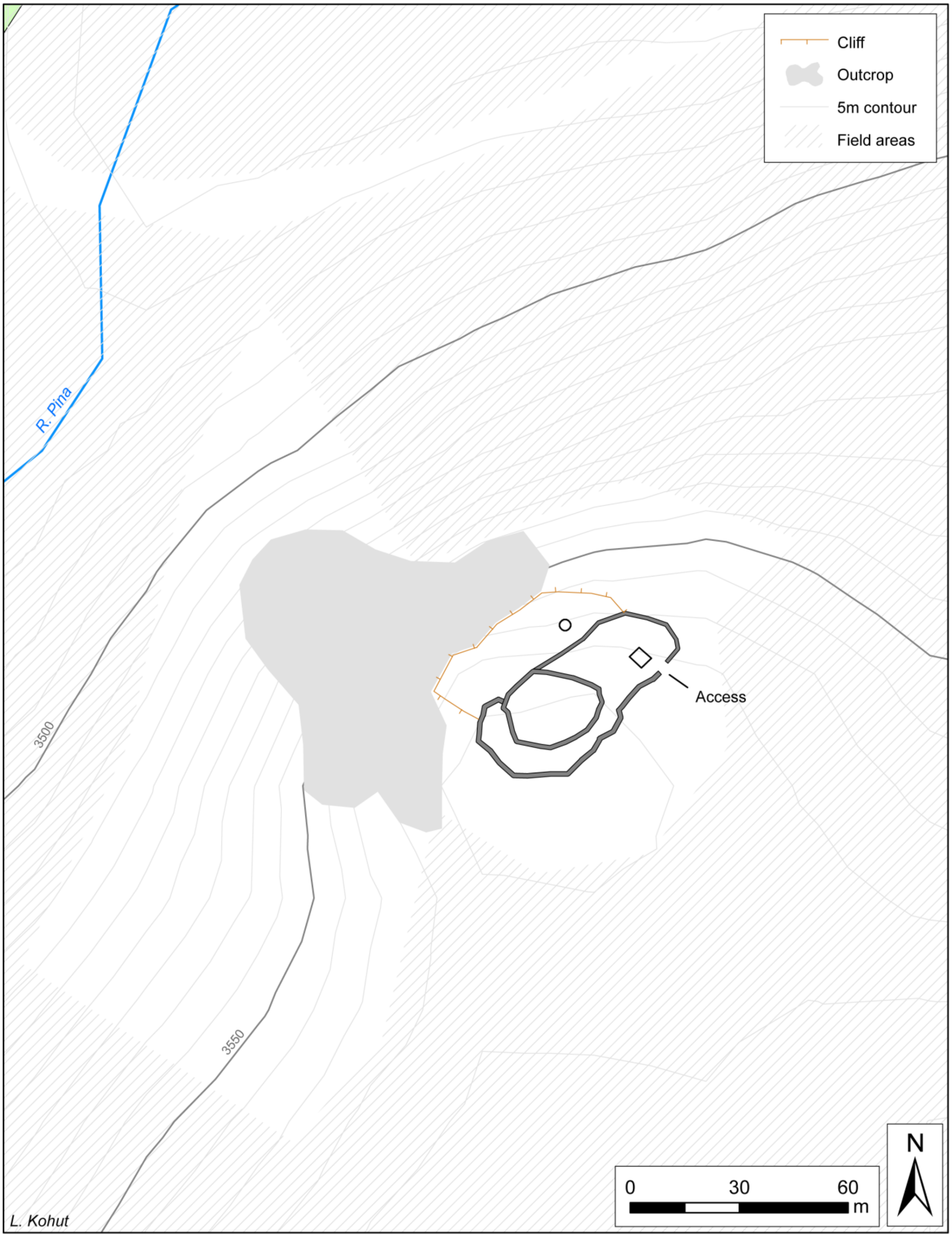


Figure B.21. Plan map of Pilluni Moqo, AC-177.


Figure B.22. View of Pilluni Moqo from the southwest.


Figure B.23. Defensive wall

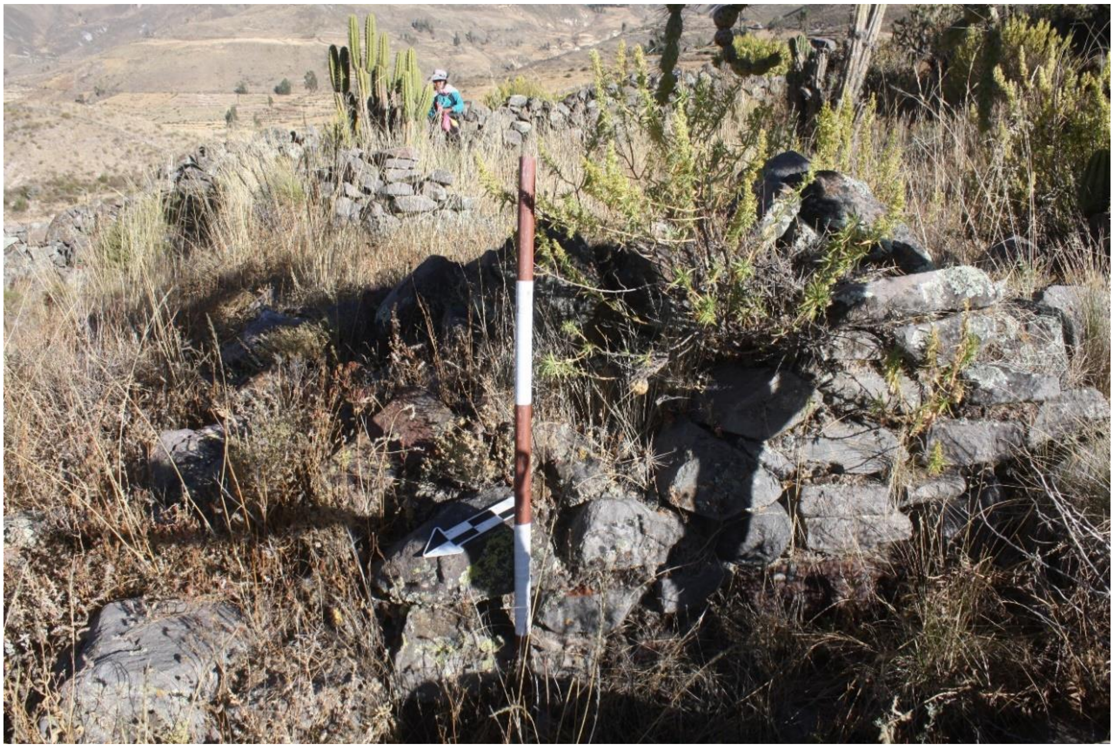


Figure B.24. Remains of domestic structure.

Callalli

Cabeza de León (CA-191)

Elevation: 4085 masl

UTM: 239827 E, 8283988 N

Site class: Large non-residential

Site Location

The site is located at the apex of an impressive cliff on the southern banks of the Lluta River, a tributary to the Colca River, to the east of the village of Callalli. Sheer cliffs surround the hill along three sides, with the only access to the site from the east.

Defenses

The site has seven defensive walls which extend roughly north-south to protect the accessible eastern side of the site. The walls terminate in large rocky outcrops or drop offs.

Descripción: Es un lugar ubicado estratégicamente en un cerro natural, el cual el acceso es controlado por el lado este, lado donde existen muros defensivos construidos para restringir el acceso al sitio, muros que se extienden en una linealidad que sigue la característica del terreno. En la cima existe una piedra el cual está rodeada por un muro de piedras.

Other

A small circular structure, likely a chullpa, was located in the high slopes of the site. A cache of likely sling stones was found near one of the walls. A complete miniature ceramic vessel was found at the site.

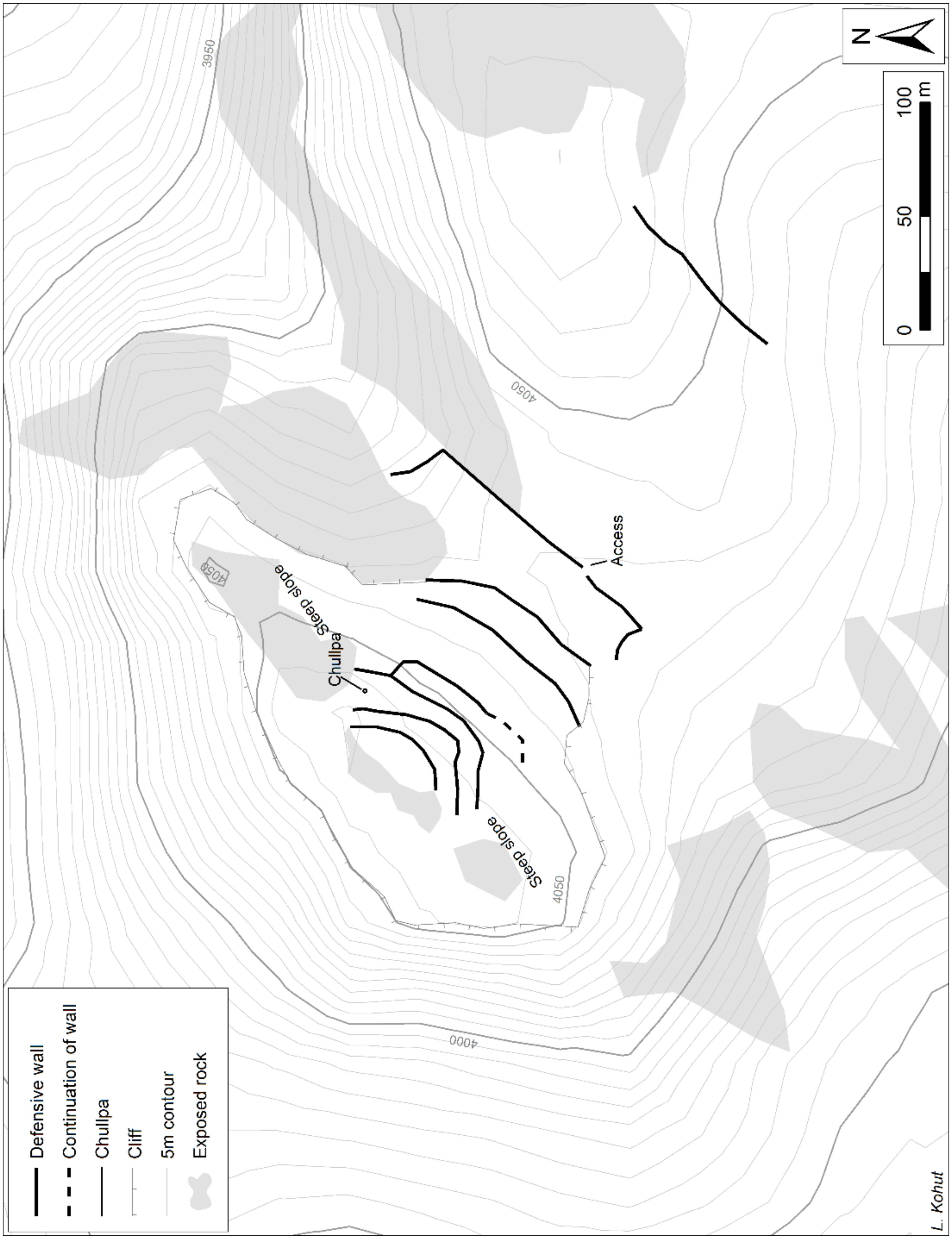


Figure B.25. Plan map of Cabeza de León, CA-191


Figure B.26. Location of Cabeza de León viewed from the west.


Figure B.27. Cabeza de León viewed from the east.


Figure B.28. Exterior side of one of the defensive walls.


Figure B.29. Possible sling stones.

Ankasuyu (CA-192)

Elevation: 4062 masl

UTM: 240702 E, 8285196 N

Site class: Large non-residential

Site Location

The site is located east of the village of Callalli on a hilltop on the northern side of the Lluta River, in a small plain between it and one of its smaller tributaries Y. This hilltop has a large rocky escarpments on the eastern and western sides, and steep slopes along the southern side. The defensive walls are concentrated along the northern side, which provides the only easy access to the site. To the east, there is a modern estansia.

Defenses

Six walls protect the accessible northern side of the site, extending east-west where they join exposed rugged rock outcrops on either side. At the top of the site, defensive walls, cliff faces, and exposed rock form a perimeter barrier. Within this area, there is a walled enclosure with an access located to the southeast.

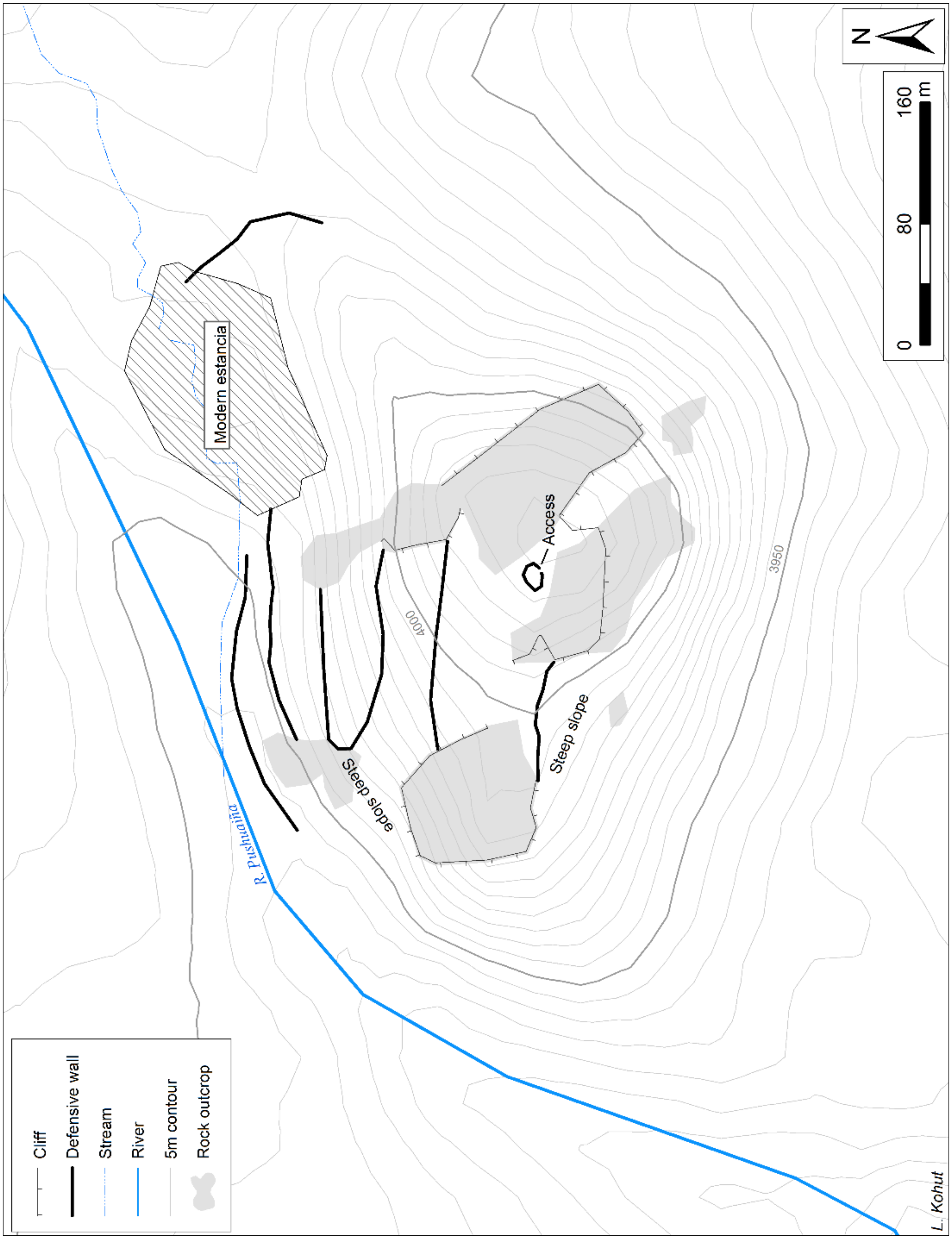


Figure B.30. Plan map of Ankasuyu, CA-192.


Figure B.31. View of Ankasuyu from south.


Figure B.32. Ankasuyu viewed from the north.


Figure B.33. Defensive wall.


Figure B.34. Base of defensive wall.

Auccinamayu (CA-193)

Other names: *Paucachata*

Elevation: 4082 masl

UTM: 238140 E, 8285373 N

Site class: Large non-residential

Site Location

The site is located on the northern banks of the Lluta river, to the east of the village of Callalli. The site occupies a rocky hilltop with steep slopes and cliffs along most sides. Access to the hilltop if only possible from the north.

Defense

Defensive walls are concentrated along the northern side of the site, where two long linear walls extend southeast-northwest, ending in rock outcrops or cliff sides. Within this area are several additional defensive walls, including two walled enclosures. Two additional walls are located along the Eastern slopes.

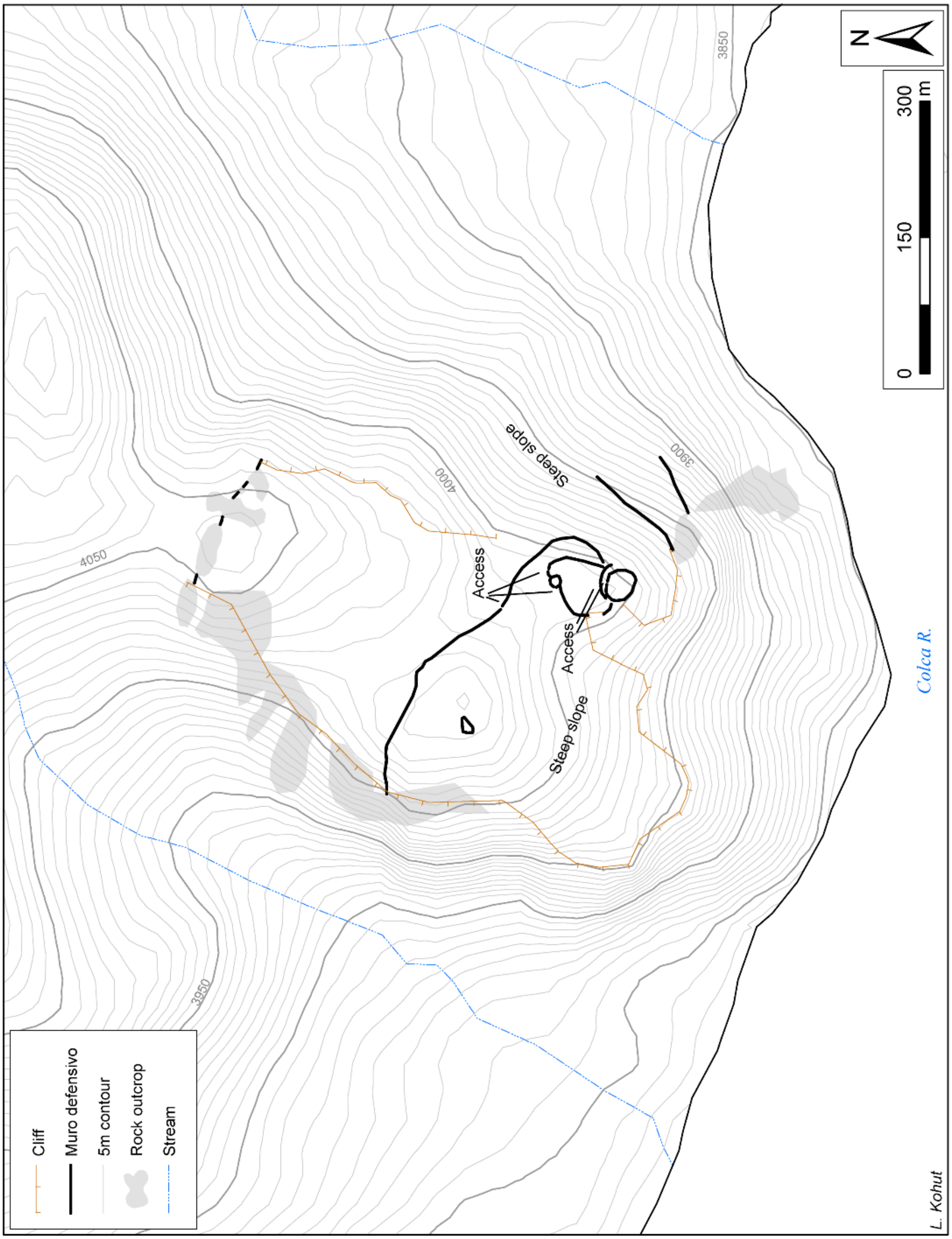


Figure B.35. Plan map of Auccinamayu (Paucachata), CA-193


Figure B.36. Location of Auccinamayu, viewed from the south.


Figure B.37. View of site from the north.

Figure B.38. Defensive wall.

Figure B.39. Preserved access.


Figure B.40. Defensive wall.

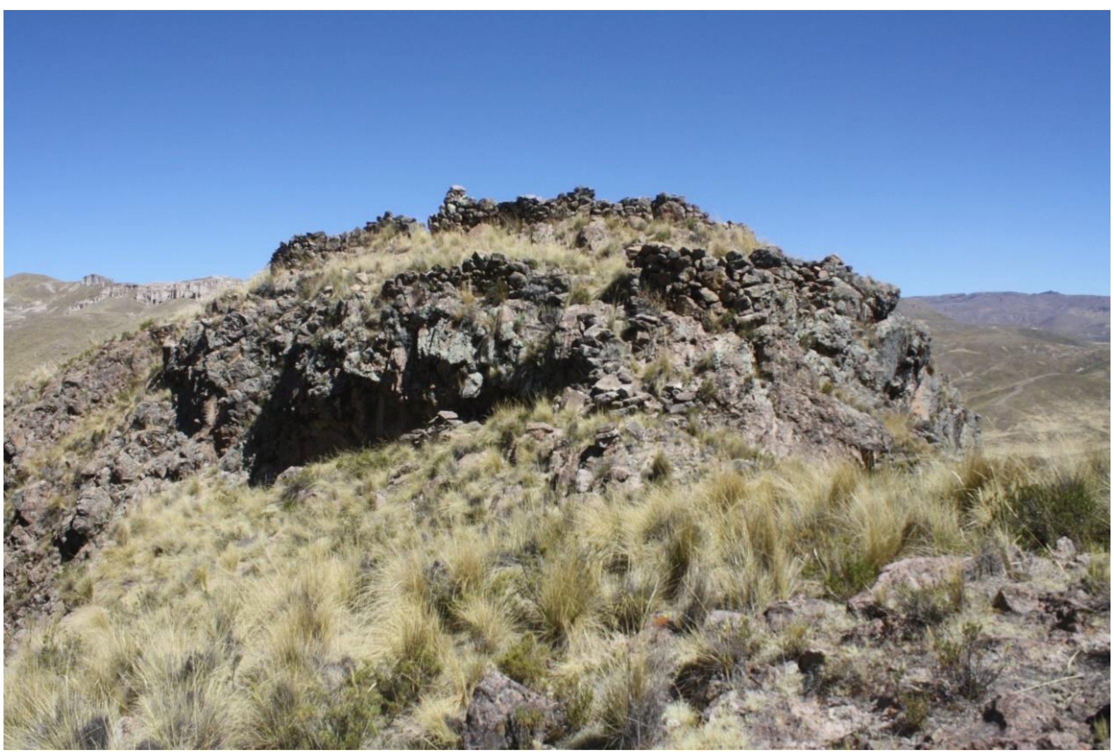


Figure B.41. Walled hilltop.

Campanayucc (CA-194)

Other names: Confluencia

Elevation: 3956 masl

UTM: 237022 E, 8285651 N

Site class: Small non-residential

Site Location

The site is located on a ridge at the conflucence of the Colca River and the Lluta River, between the villages of Callalli and Sibayo.

Defenses

The site consists of a single roughly circular walled enclosure, with an Access on the northeastern side. Given the small size of the site, it likely served as a strategic outpost for monitoring.

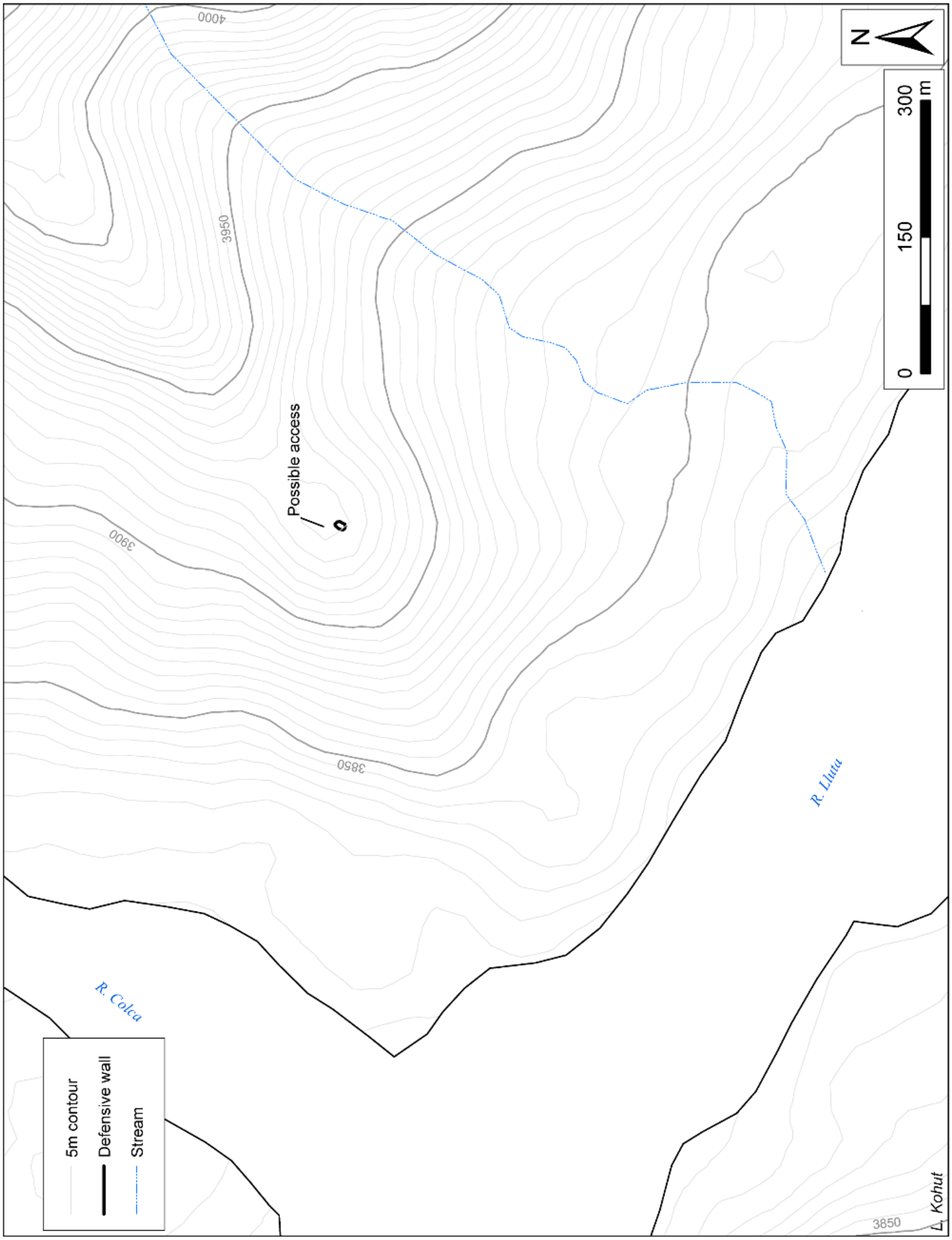


Figure B.42. Plan map of Confluencia, CA-194.

Figure B.43. Location of Confluencia, with the Lluta River in the foreground.

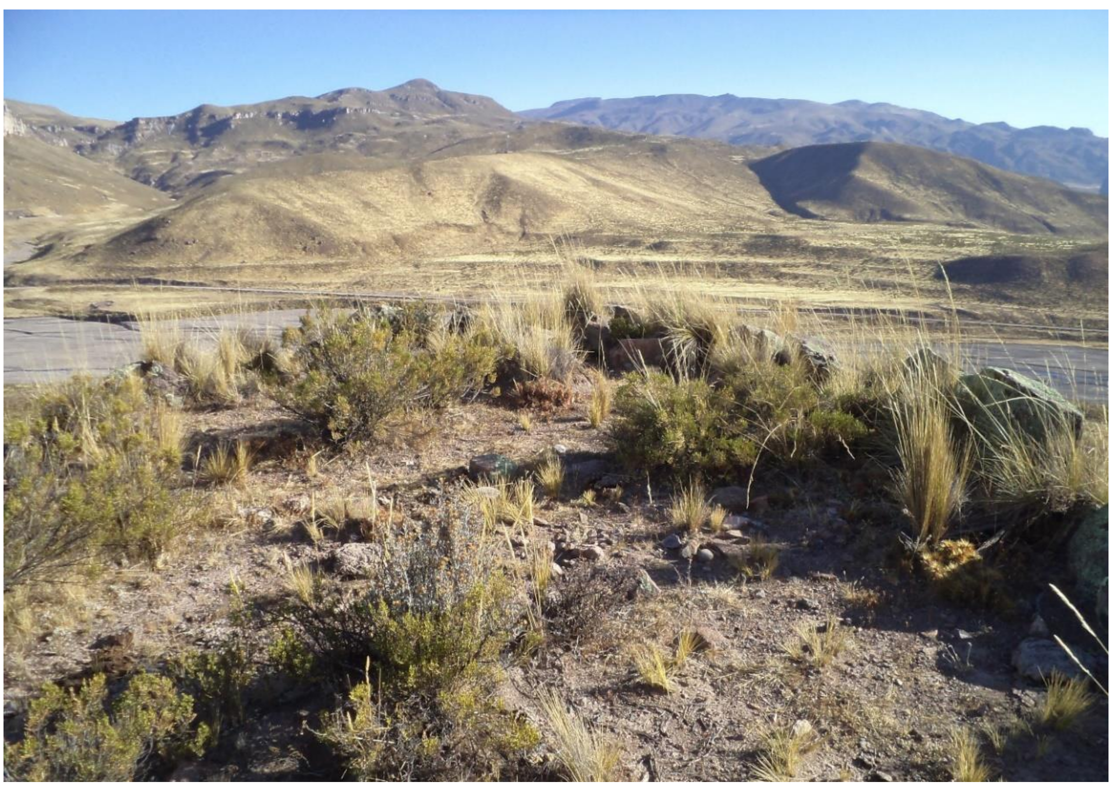


Figure B.44. Walled enclosure, looking east.


Figure B.45. Defensive wall.

CA-203

Elevation: 3845 masl

UTM: 232279.164 E, 8282429.374 N

Site class: Small residential

Site Location

The site is located to the west of the village of Callalli on a hilltop on the southern side of the Colca River, at the confluence with the X river. The site occupies a rocky hilltop surrounded on most sides by broken ground and cliffs. The only access to the site is from the southeast. Its location adjacent to two rivers provides additional barriers.

Defenses

The defensive architecture in concentrated on the rocky hilltop. There are two walled enclosures, along with additional lateral walls, particularly along the more accessible southeastern side.

Residential and Burial Areas

Three quadrangular structures were found within the defensive architecture. However, most domestic architecture was found in a series of residential terraces below the hilltop to the northwest. Most structures were heavily disturbed, with only bases remaining. Additionally, a number of circular chullpas were located in this area, forming a small cemetery sector.

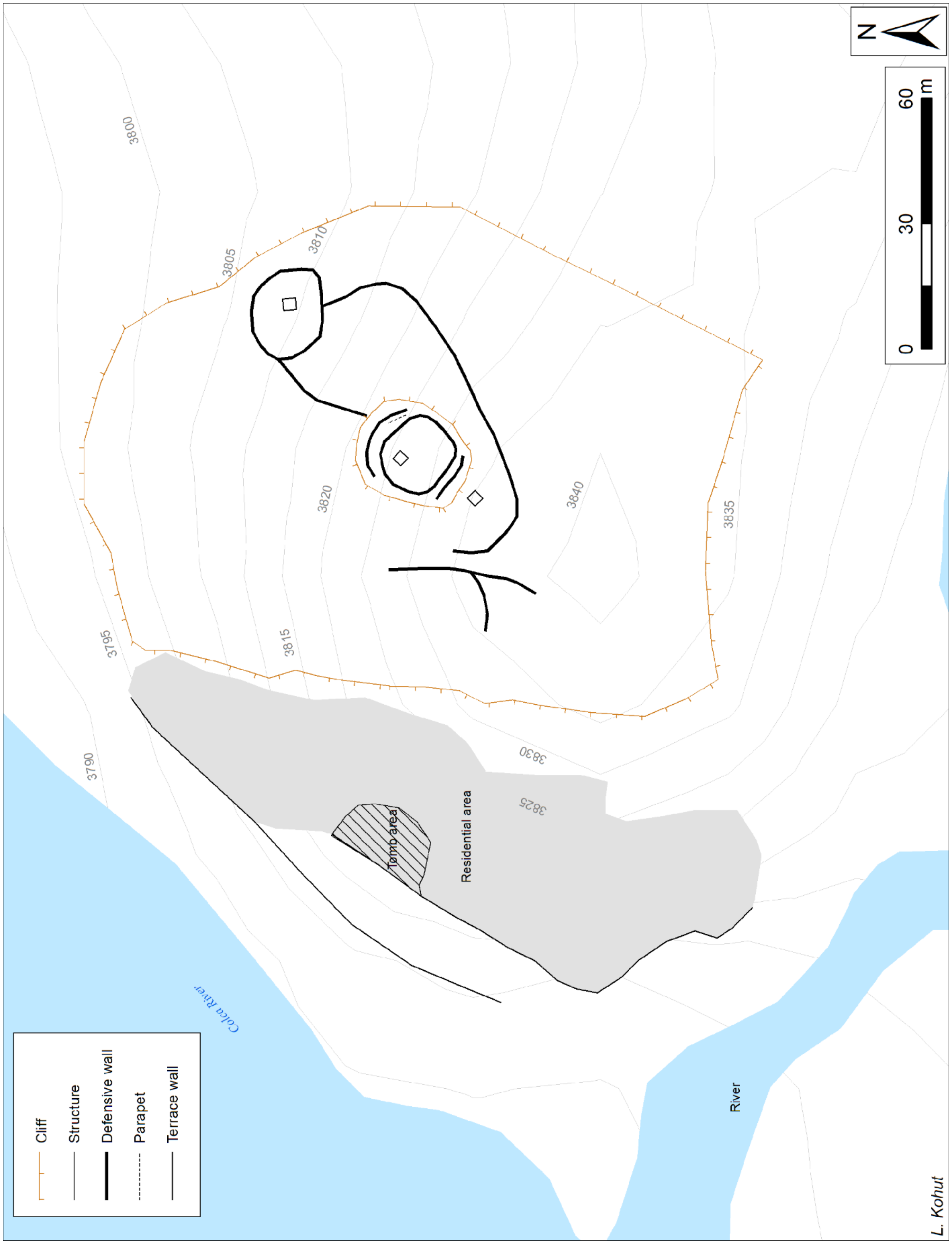


Figure B.46. Plan map of CA-203

Figure B.47. View of CA-203 from the north.

Figure B.48. Circular chullpa


Figure B.49. Defensive wall.


Figure B.50. View of the residential and cemetery sector.

Chivay

San Andrés (CH-181)

Elevation: 3817 masl

UTM: 221890 E, 8268573 N

Site class: Small residential

Site Location

The site is located on a ridgeline immediately to the south of the village of Chivay. The site is surrounded on most sides by agricultural terraces, most of which are still under cultivation.

Defenses

At least two defensive walls fully encircle the hilltop. Portions of several other defensive walls were identified in the lower terraced areas. It is likely that these walls were previously perimeter walls as well, but have since been incorporated into the agricultural terraces.

Residential Areas

The site has been heavily disturbed by ongoing agricultural activity, but the remains of 9 structures are still visible. Structures are quadrangular in form. While they are all single-room structures, some were found in linear arrangements sharing walls on the short axis. Residential structures were located within the terraces below the encircled hilltop.

Other Features

A rectangular platform was located in the walled hilltop. Measuring 6.5 by 3.7 m. The site is surrounded by extensive terracing.

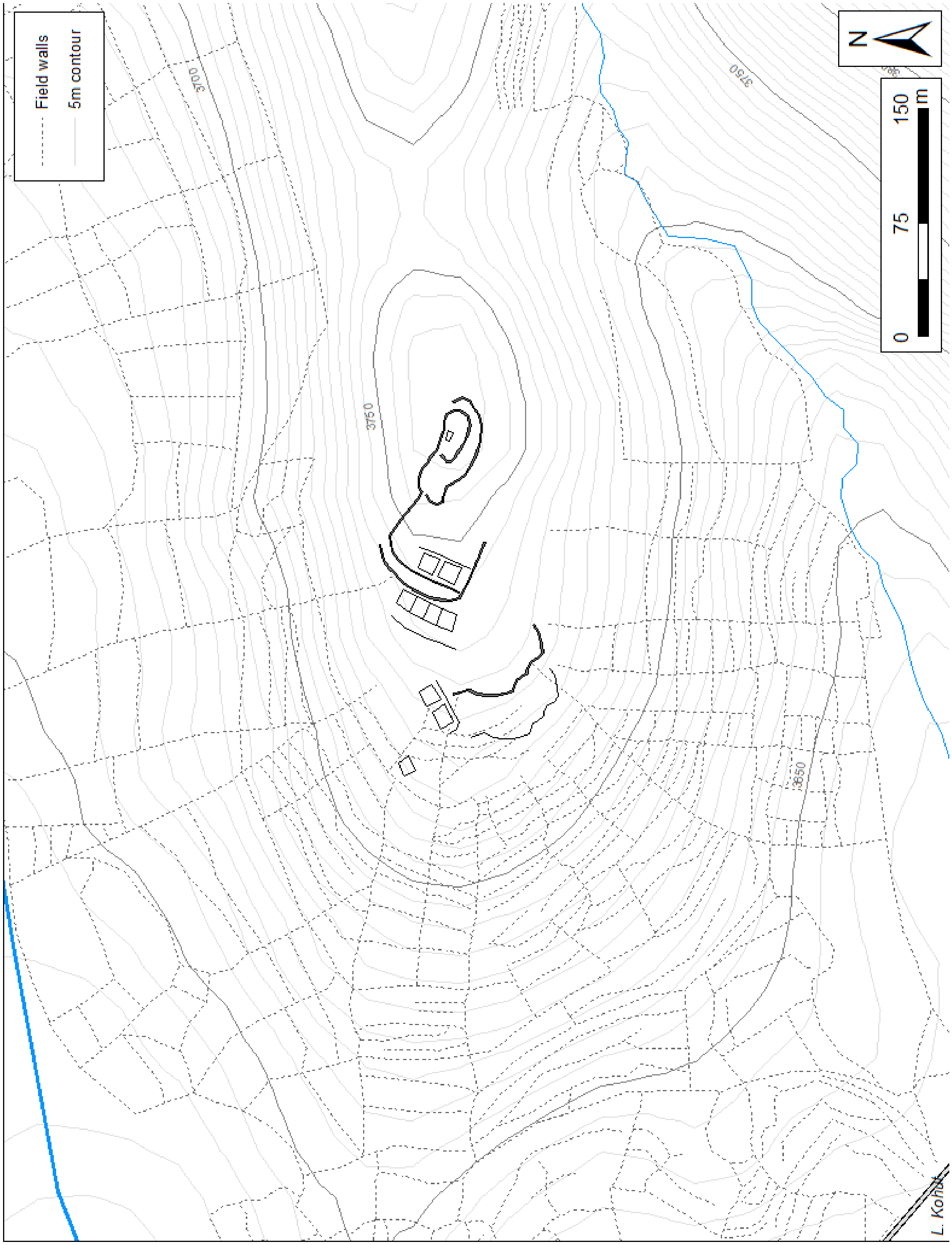


Figure B.51. Plan map of CH-181, San Andres.


Figure B.52. San Andres viewed from the southwest.


Figure B.53. View of the ridgeline, looking west.


Figure B.54. Defensive wall.


Figure B.55. Defensive wall.


Figure B.56. One of the better preserved structures at CH-181.

Mollepunku (CH-182)

Elevation: 3910 masl

UTM: 220563 E, 8267169 N

Site class: Small non-residential

Site Location

The site is located on a high ridgeline to the southwest of the village of Chivay. The site is surrounded on most sides by steep slopes. Agricultural terraces flank the lower reaches of the ridge. The highway to Arequipa passes to the north and east of the site. A radio tower is located at the apex of the site.

Defenses

The site defenses consist of two large perimeter walls which enclose the hilltop. The inner wall has been partially destroyed by construction related to the radio tower at the site, and only approximately half of it was still visible. The lower wall formed a complete perimeter around the site. Few materials were found at the site, and consisted only of lithic debitage.

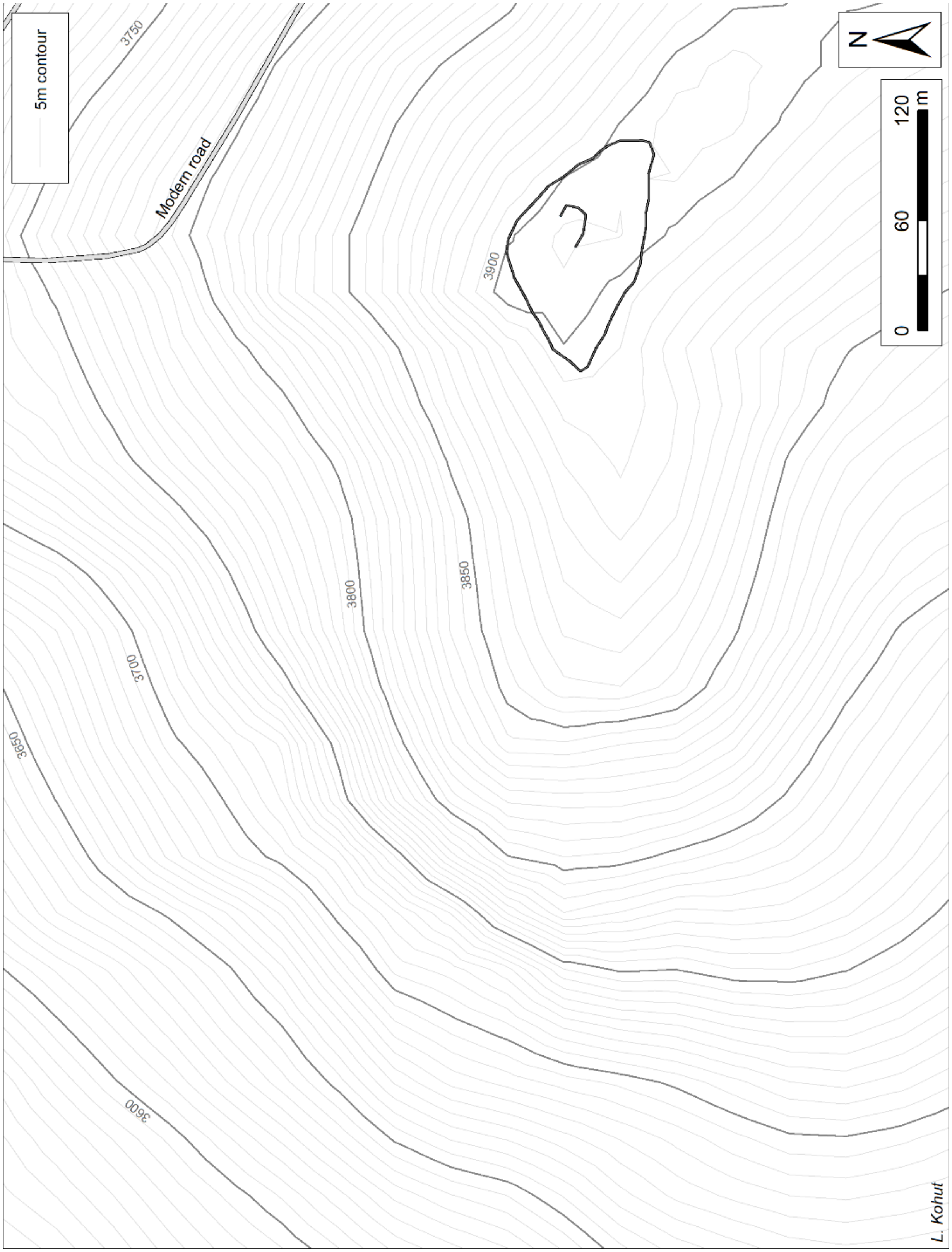


Figure B.57. Plan map of Mollepunku, CH-182.


Figure B.58. Location of Mollepunku, viewed from the north.

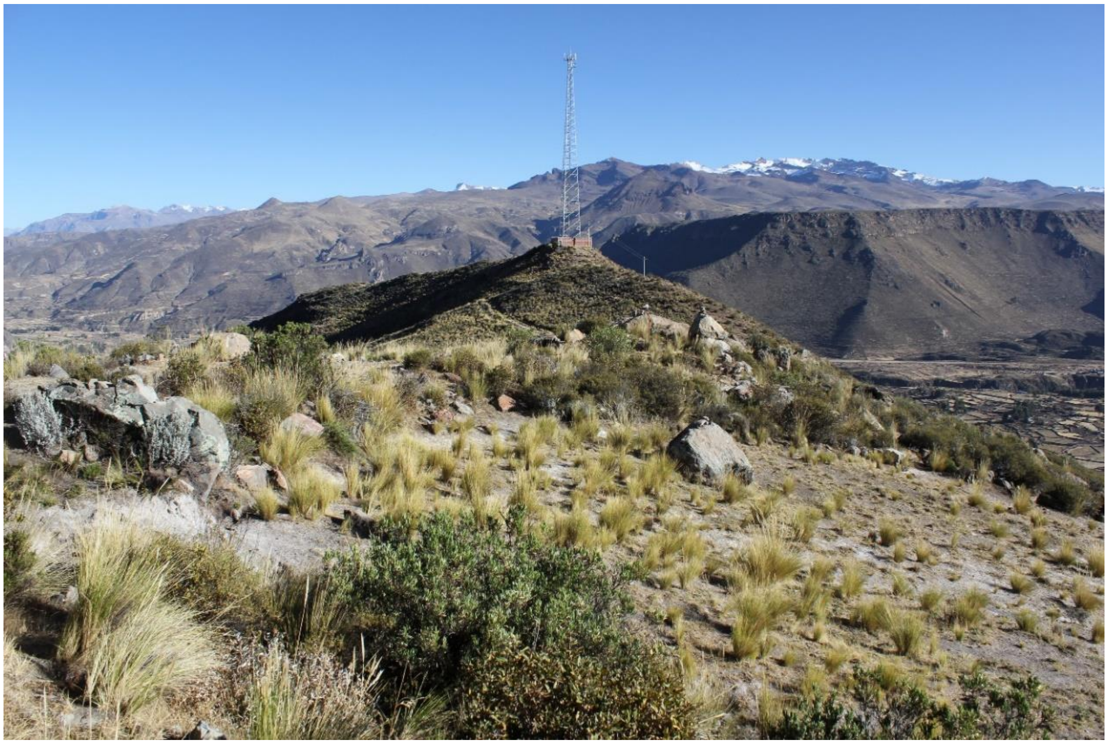


Figure B.59. Mollepunku viewed from the east.


Figure B.60. Defensive wall.


Figure B.61. Exterior of defensive wall.

Llanquipina (CH-196)

Elevation: 4176 masl

UTM: 219414.20 E, 8264958.72 N

Site class: Large non-residential

Site Location

The site is located on a rocky hill in a quebrada to about equidistant between the village of Chivay and Yanque. The hilltop is surrounded on three sides by cliffs and rocky outcrops. The only access to the site is from the south. There are several bofedales immediately surrounding the base of the site. Further below to the north, the area is extensively terraced. The site is located approximately 700 m upslope from the Late Intermediate Period village of Juscallacta. A long canal runs east-west just south of the site.

Defenses

Site defenses are concentrated on the southern side of the site, which provides the only access. The two lower walls run east-west terminating in steep cliffs and rock outcrops on either site. The outer wall has a single access, and the inner wall, has three accesses. The center access in this wall is baffled. The western most access leads into a relatively open area, which may have been used as a corral. The upper portion of the site is fully enclosed by a defensive wall.

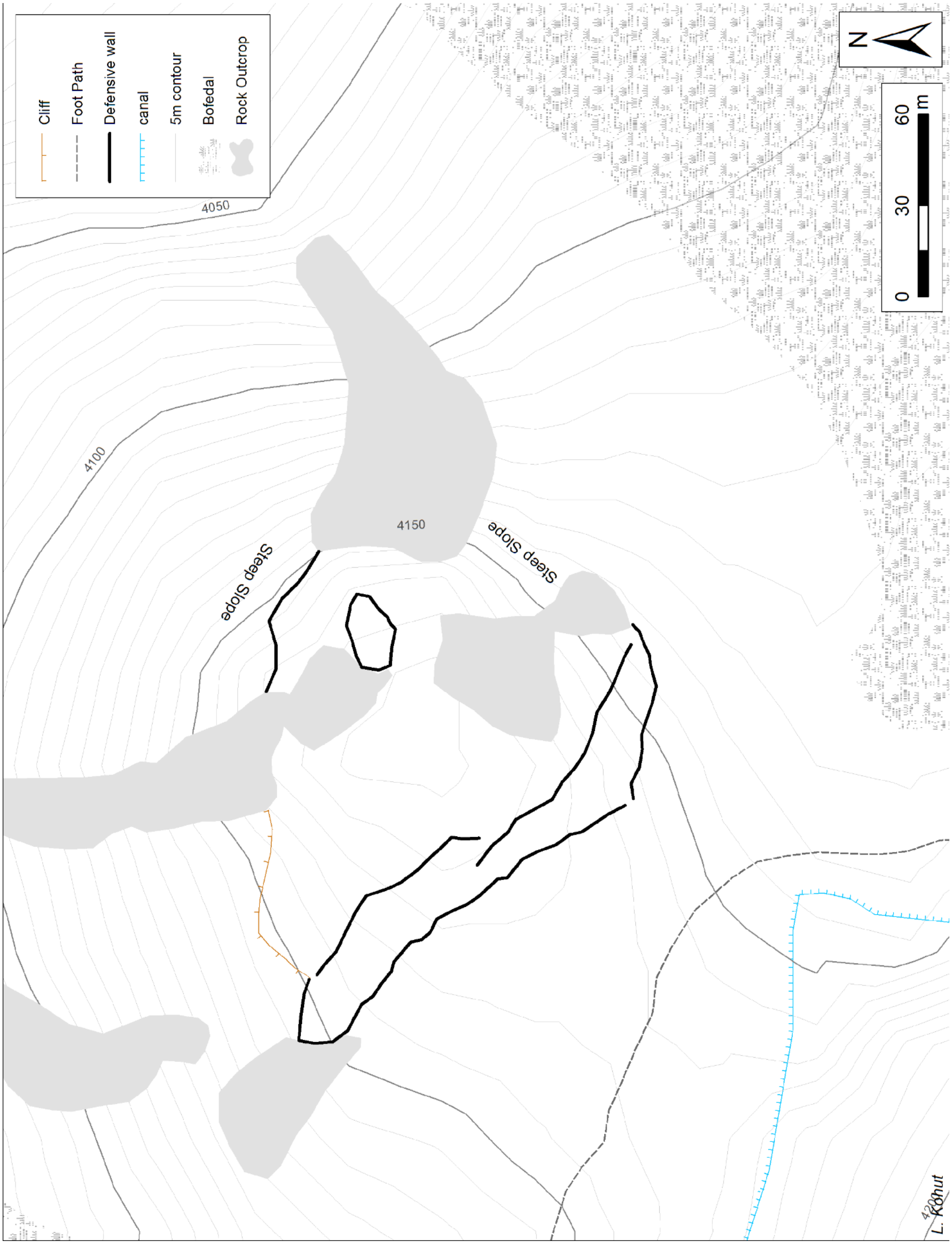


Figure B.62. Plan map of Llanquipiña, CH-196.


Figure B.63. Location of Llanquipiña viewed from the northwest.


Figure B.64. Llanquipiña viewed from the north and upper residential sector of Juscallacta.


Figure B.65. Llanquipiña viewed from the southeast.


Figure B.66. Access in one of the defensive walls.


Figure B.67. LIP settlement of Juscallacta viewed from the summit.


Figure B.68. Defensive wall.

Coporaque

Chilaq'ota (CO-151)

Elevation: 3789 masl

UTM: 215106 E, 8270394 N

Site class: Large non-residential

Site Location

The site is located on a high flat-topped promontory to the east of the village of Coporaque. The plateau runs north south, with moderate to steep slopes along the western, southern, and eastern sides. To the north, the terrain continues upward, leading to the puna. The site is closely associated with several prominent Late Intermediate Period sits. The settlement of San Antonio/Chijra occupies the eastern and southern slopes below the plateau. The residential areas of this site are concentrated in the extensive bench terraces which occupy the slopes. Although the settlement had a long occupation (LIP through early Colonial) prior excavation of these terraces indicate they were initially built in the LIP (Denevan 2001; Malpass 1987; Treacy 1989). In a cliff overhang above the settlement of San Antonio/Chijra and only 200 m from Chilaq'ota, is the chullpa cemetery of Fatinga. Excavations by Matthew Velasco at the site have dated the tombs to the Late Intermediate Period [diss].

To the north of the site is a reservoir, which previously provided water to irrigate the terraces on the upper slopes just below the plateau, before they were abandoned during the Colonial period (Wernke 2013:313). The canal travels along the western edge of the site, before descending to the south.

Defenses

A series of three lateral defensive walls run east-west along the northern side of the site, which provides the easiest access. Where visible, these walls had a single entrance each, offset from one another. Toward the southern end of the site, a series of walled enclosures occupy a natural rise and are surrounded by a fourth defensive wall. The lateral walls have smaller walled enclosure areas adjacent to them whose purpose is unclear. One quadrangular structure was identified adjacent to the second defensive wall.

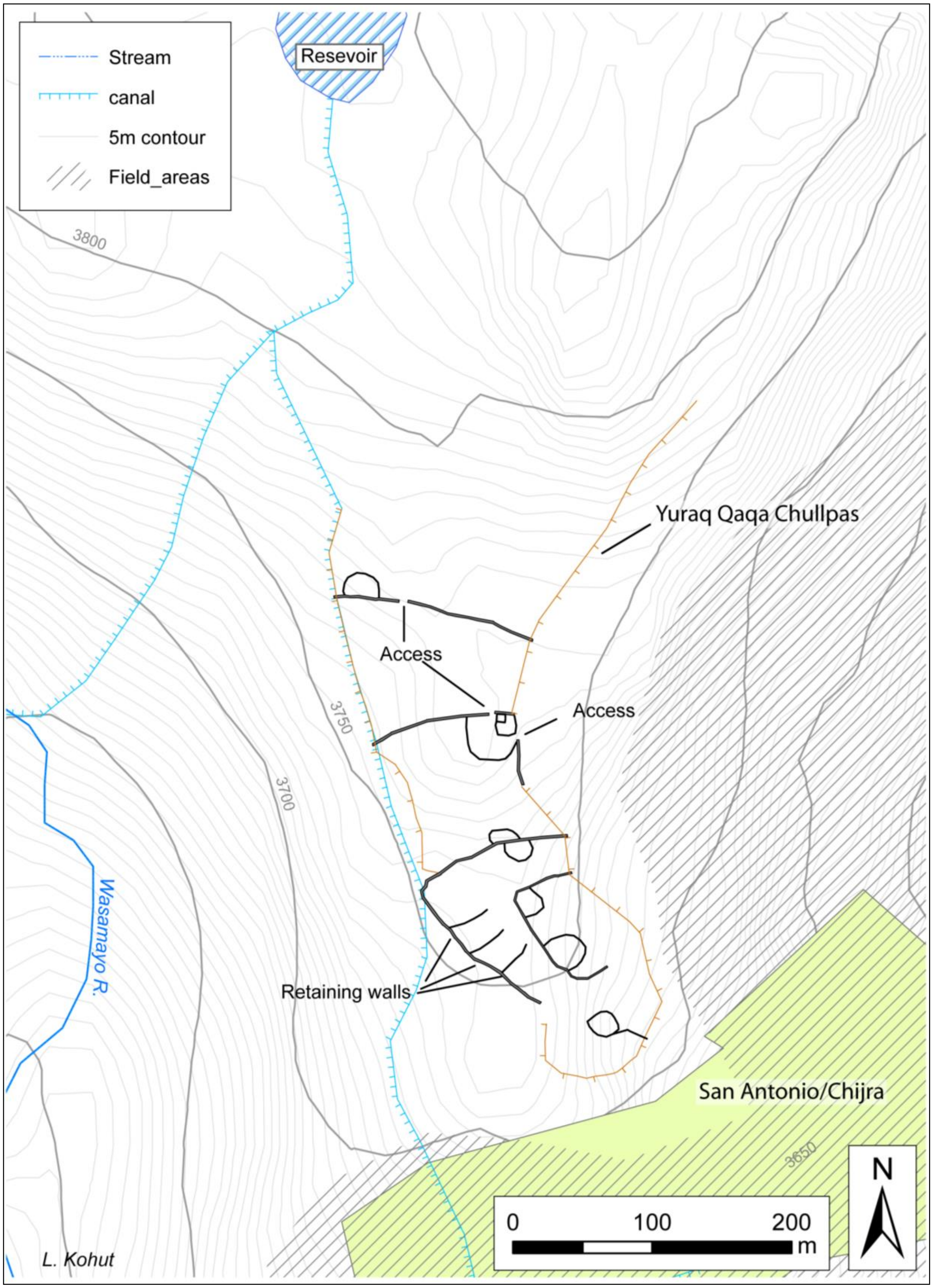


Figure B.69. Plan map of Ch'ilaqota, CO-151. Site boundaries for San Antonio/Chijra redrawn from Wernke 2013.

Figure B.70. Chilaq'ota viewed from the east. The LIP/LH/Colonial settlement of San Antonio is located in the terraces below.

Figure B.71. Looking north across the site.


Figure B.72. View of one of the walled enclosures within the site.


Figure B.73. Defensive wall.


Figure B.74. Structure adjacent to defensive wall.


Figure B.75. Defensive wall.

Pumachiri (CO-158)

Elevation: 4554 masl

UTM: 215423.18 E, 8273637.04 N

Site class: Large non-residential

Site Location

The site of Pumachiri is located on a high and prominent peak to the south of the village of Coporaque. Today, the peak serves as an important *apu* for the village. The peak itself is rocky and rugged, consisting of exposed rock and extremely steep slopes on most sides. To the northeast of the peak, the terrain is somewhat less steep. The area to the north, east and west of the peak has large areas of bofedal.

Defenses

There are three defensive walls at the site. The outermost wall is a long, linear wall that runs roughly southeast-northwest, protecting the more moderately sloped northeastern side. Two additional walls are located along the more rugged peak, forming perimeters with rock outcrops and cliff faces. Well preserved accesses were located to the southeast.

Other Features

A number of small circular to ovoid structures were located in the southeastern slopes of site. The rustic structures consist of a single face of stone, with no mortar or rubble fill. The low density of materials at the site, and the coarse nature of the constructions indicates that they were not used a permanent, long-term residential structures, but were rather intended for temporary and periodic use.

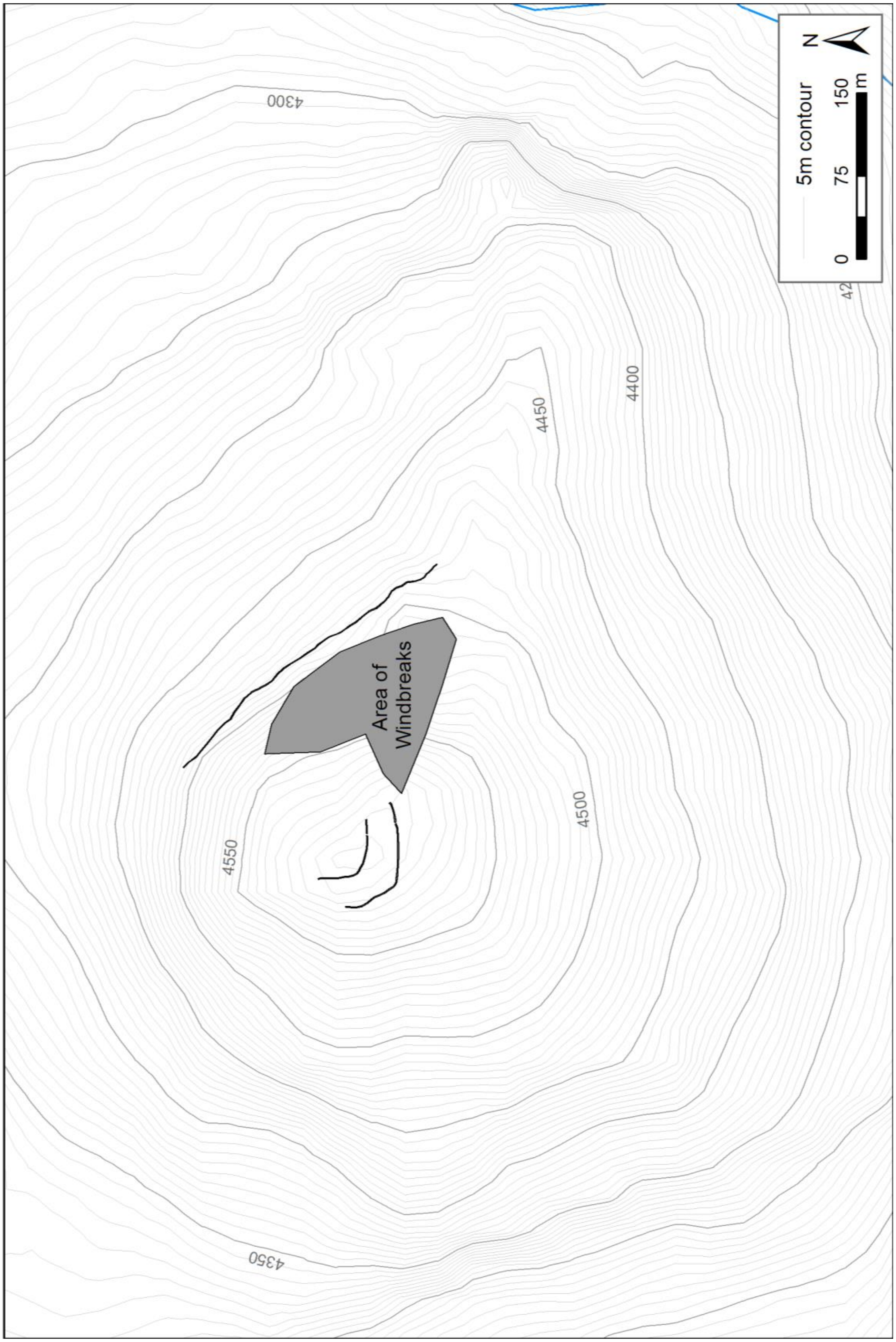


Figure B.76. Plan map of Pumachiri (CO-158).

Figure B.77. Pumachiri viewed from the southwest. The village of Coporaque can be seen in the foreground.

Figure B.78. North side of Pumachiri. Defensive wall indicated by arrows.

Figure B.79. Small windbreak. Access oriented east.

Figure B.80. Wall access.

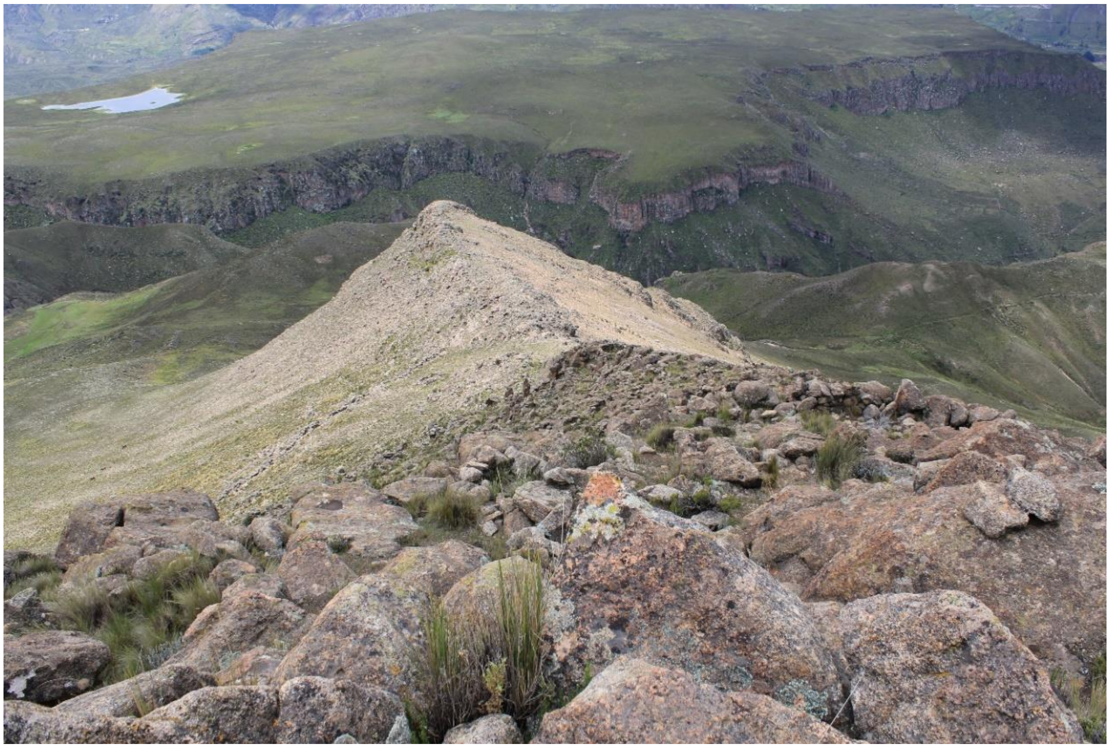


Figure B.81. Area of windbreaks.

CO-165

Elevation: 3496 masl

UTM: 217364.98 E, 8268477.64 N

Site class: Small non-residential

CO-167

Elevation: 3495 masl

UTM: 217077.77 E, 8268748.66 N

Site class: Small non-residential

CO-168

Elevation: 3493 masl

UTM: 216980.86 E, 8268985.01 N

Site class: Small non-residential

Site Location

The sites of CO-165, CO-167, and CO-168 are located on a series of small rise within a broad pampa nestled in the agricultural fields to the south east of the Village of Coporaque.

Defenses

The site of CO-165 consists of two primary defensive walls that encircle the hilltop. Site CO-167 consists of a primary defensive wall that partially encircles the hilltop, extending along the north, east, and southern sides of the hilltop. Site CO-168 consists of two defensive walls that fully encircle a small hilltop.

Other Features

The are surrounding the site contains a series of large field walls (up to 5 m wide) that are very broad and often punctuated by circular cists, rougly 3 m in diameter. This feature has been termed “agro-mortuary” walls, and presumably served to both define field boundaries and as burial cists.

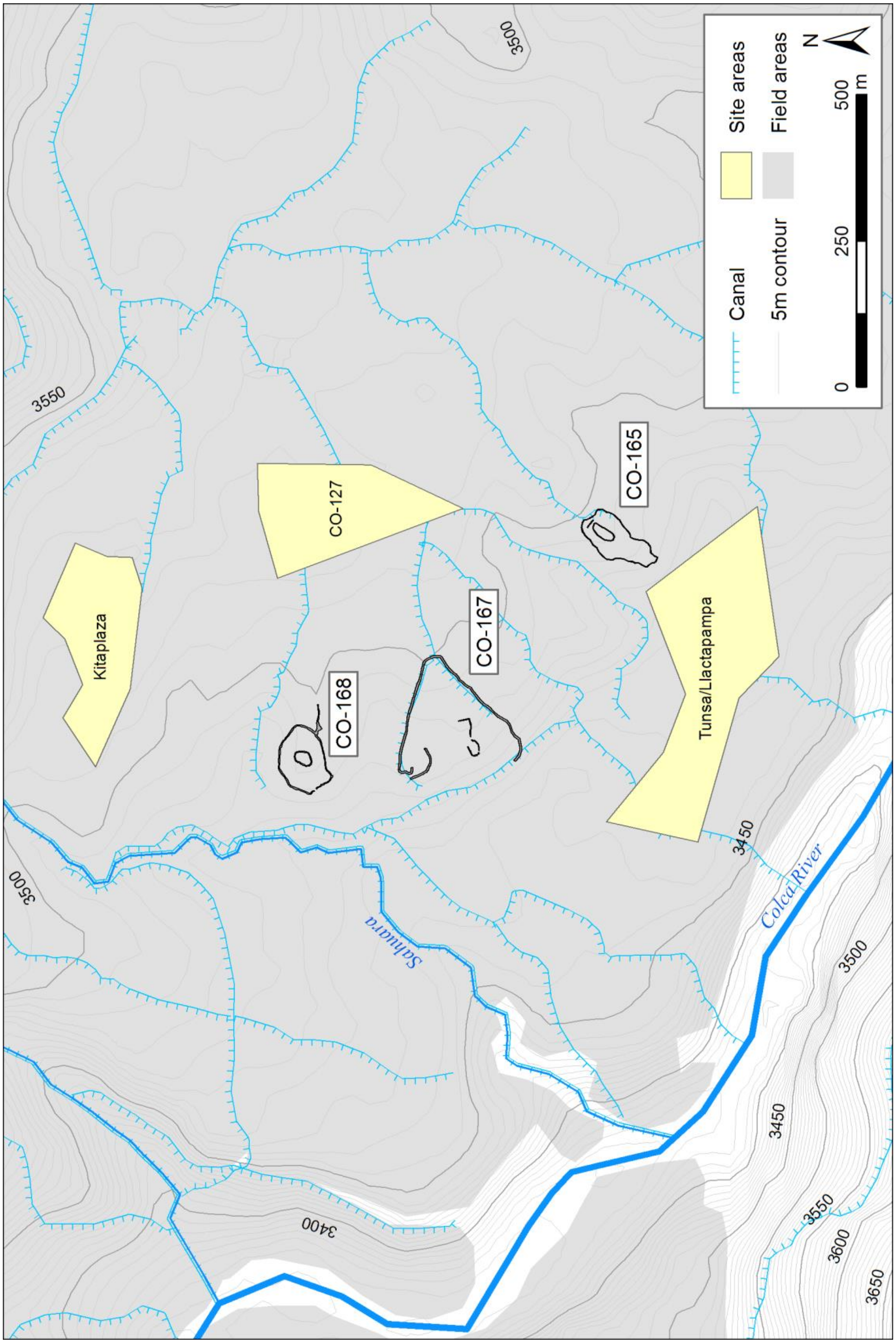


Figure B.82. Location of CO-165, CO-167, CO-168 and their relation to nearby LIP settlements. Settlement areas redrawn from Wernke 2013.

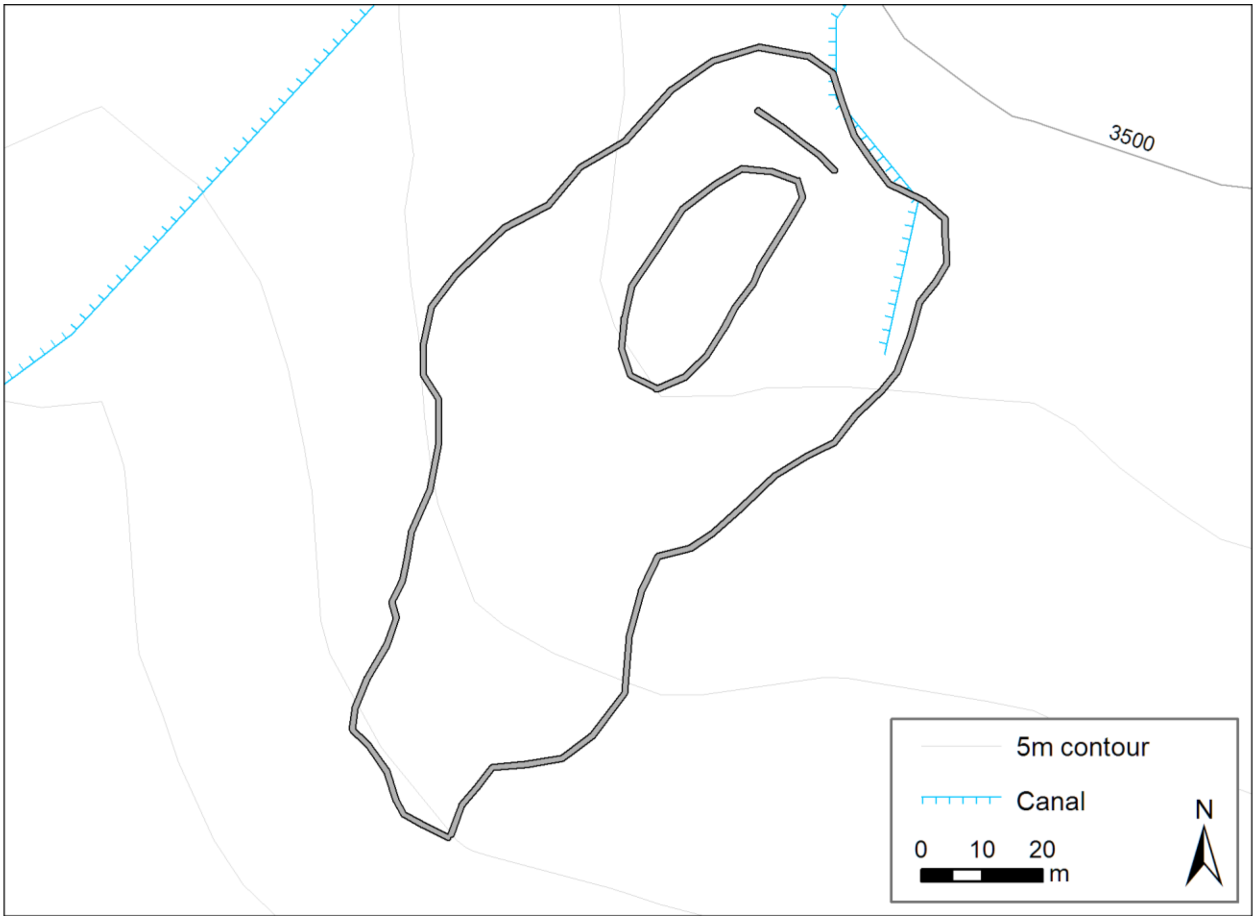


Figure B.83. Plan map of CO-165.

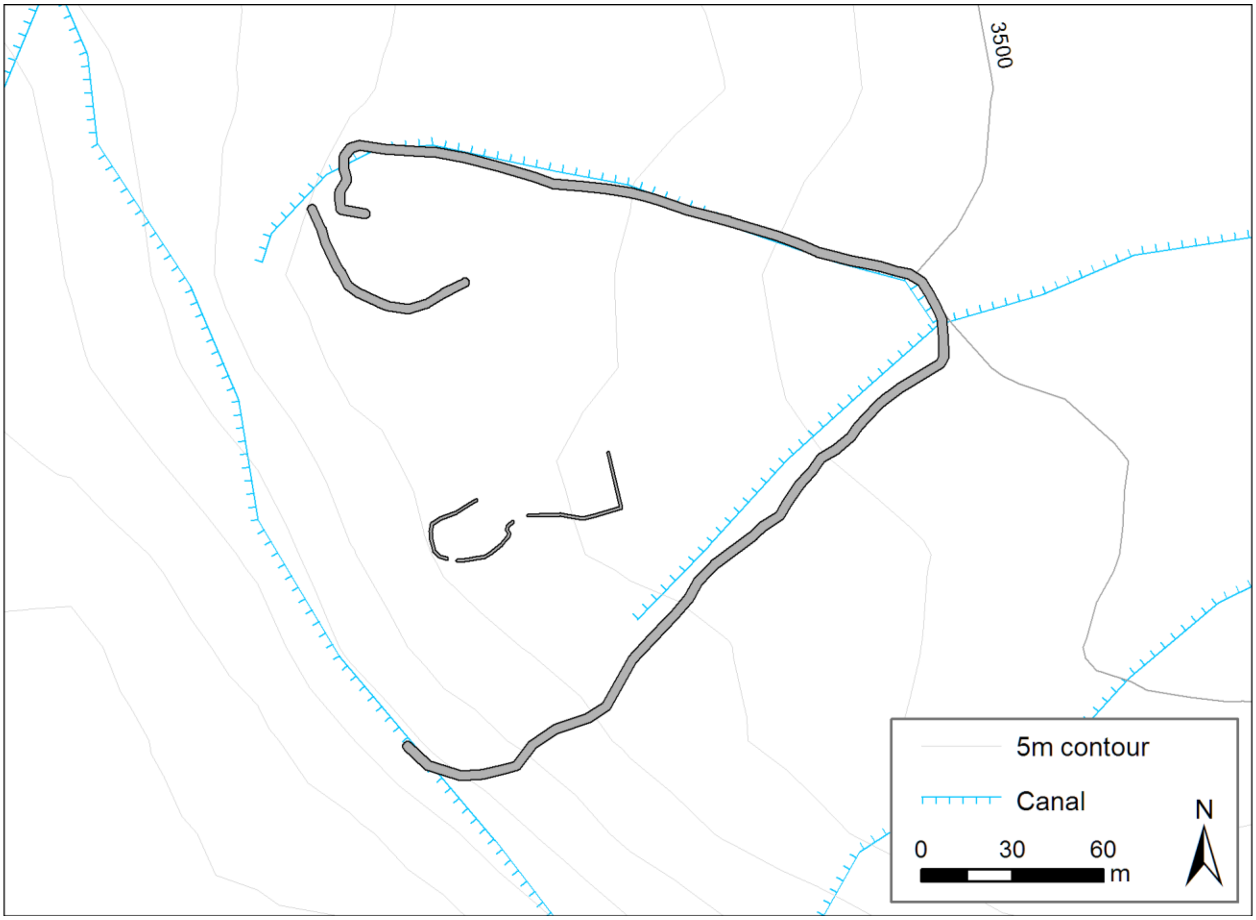


Figure B.84. Plan map of CO-167.

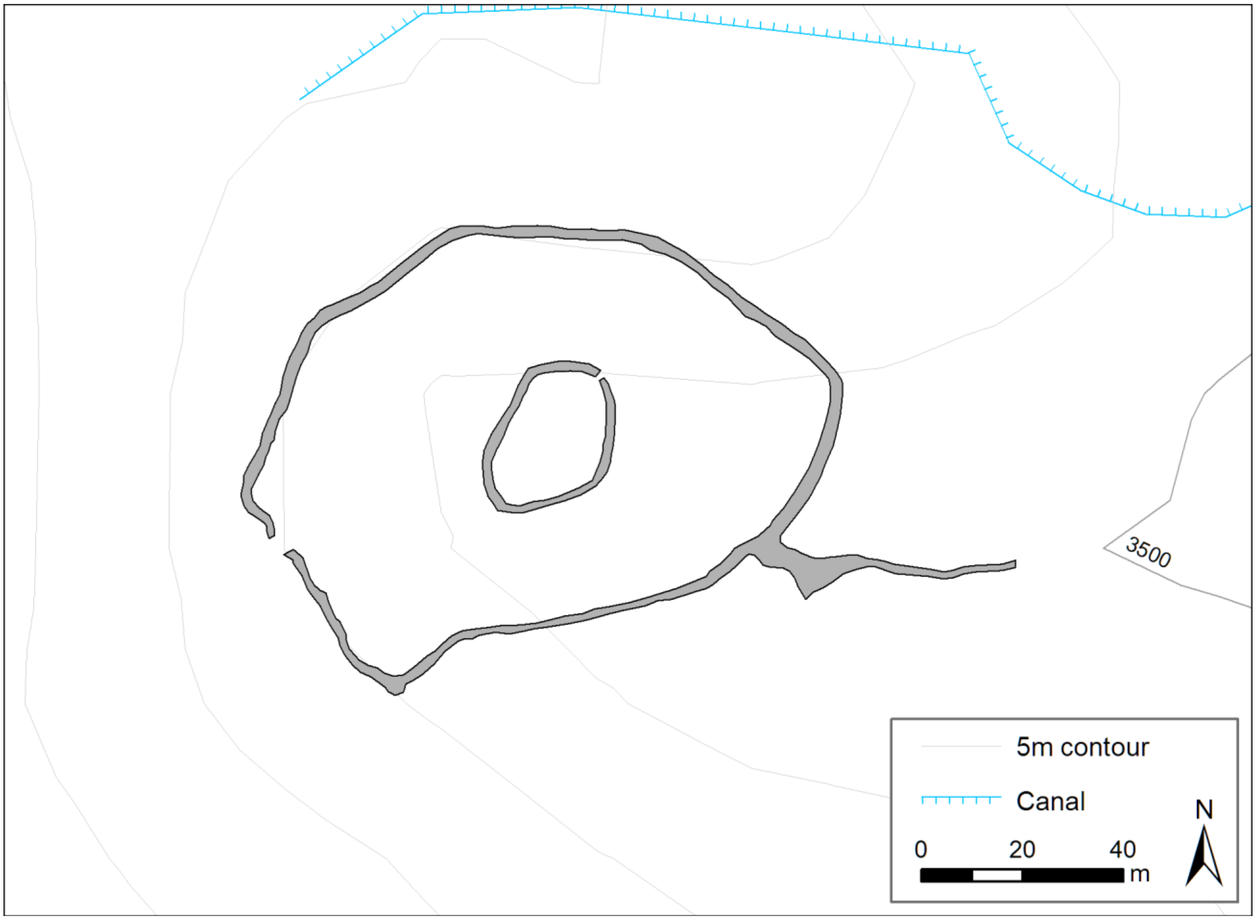


Figure B.85. Plan map of CO-168.

Figure B.86. Location of sites CO-165 (right), CO-167 (center), CO-168 (left) viewed from the south.

Figure B.87. Defensive wall at CO-165.

Pukara (CO-189)

Elevation: 3,985 msnm.

UTM: 222733 E, 8275605 N

Site class: Large non-residential

Site Location

The site is located on a high hill at the end of a flat plain. The southeastern side of the site ends in a cliff that drops 300 meters to the Colca River below. The north western half of the site rises steeply. The plains to the northwest of the site have grazing areas.

Defenses

At the summit of the primary hilltop are two walled enclosures. This area is protected by the two primary defensive walls which run roughly north-south, terminating on either end in steep drop offs. Access in the outermost wall were not clearly identifiable, but the interior wall had two preserved accesses. The central one was baffled, and the southern one was narrow enough to only allow single file entry. To the west of the primary hilltop, two additional walled enclosures were located along a lower ridge. These likely served as additional outposts and observation points.

OtherFeatures

A single structure was found at the site, located near the walled enclosure to the west of the hilltop. This small circular structure was poorly preserved, but may have served as an observation post or a burial structure.

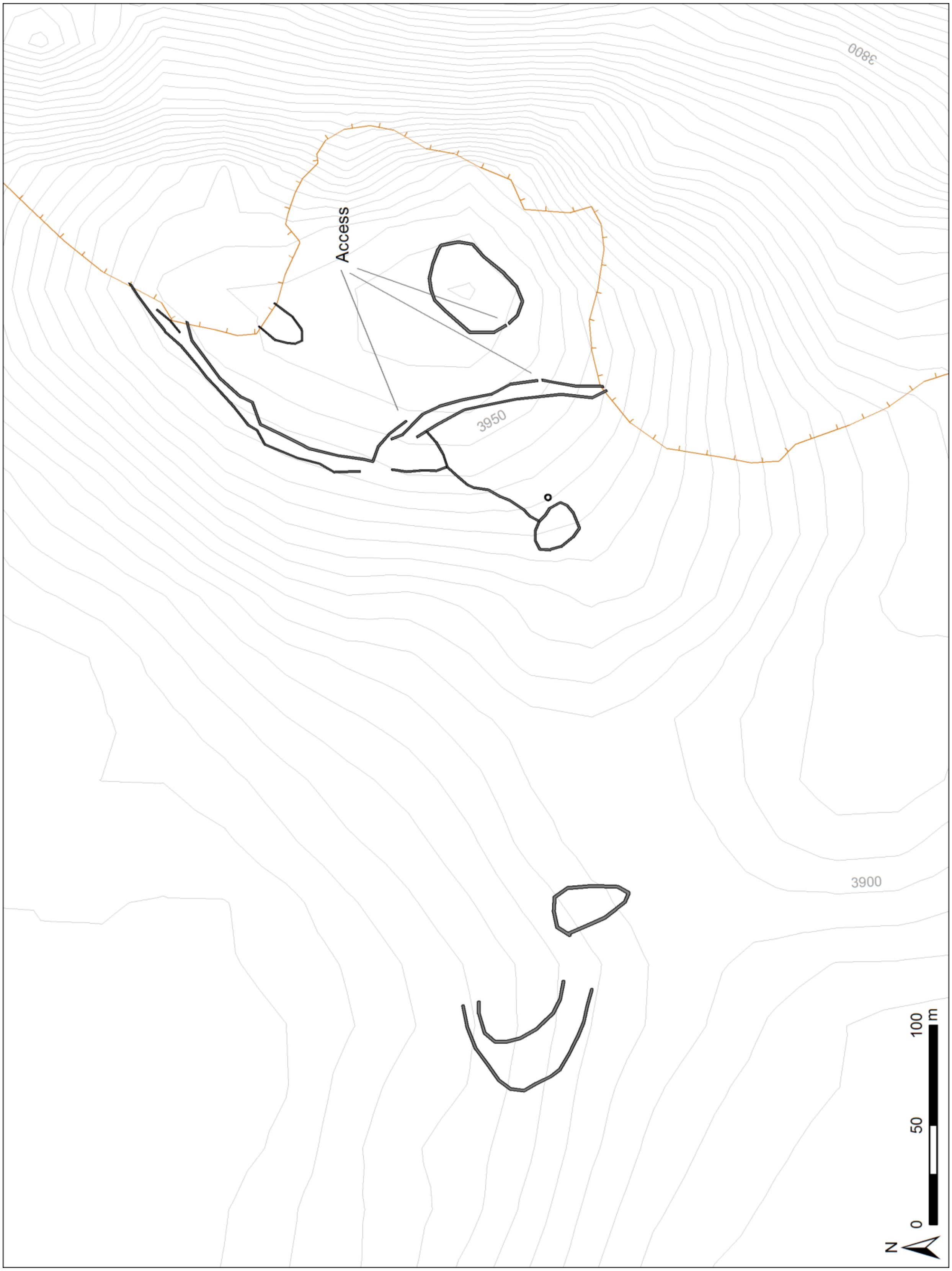


Figure B.1. Plan map of Pukara, CO-189.


Figure B.2. Pukara, viewed from the north.


Figure B.3. Pukara viewed from the west.


Figure B.4. Lower defensive walls.

Choque Mamani (CO-187)

Elevation: 3727 masl

UTM: 223758 E, 8276684 N

Site class: Large settlement

Site Location

The site is located adjacent to the Colca River within the deeply incised canyon. Access to the canyon is sharply constrained by steep slopes on all sites. The canyon area provides a unique warmer microclimate within the upper valley area. The sides of the canyon here are extensively terraced and many remain under cultivation. Local informants report that the area is warm enough to grow maize.

The defensive architecture at the site is located on a rocky hilltop at the end of a long and narrow land bridge on the southern banks of the river. The hilltop is surrounded on most sides by steep cliffs and exposed rocks and boulders. Access to this part of the site is limited to the southeastern side.

Defenses

The site contains a discrete defensive sector located on a rocky hilltop at the far end of a narrow land bridge. However, exposed rock outcrops prevent access to the site via the land bridge. Access to the hilltop is restricted to the southeastern portion of the hilltop. A defensive wall with a screen access protects this access point. There are two additional concentric walls within the hilltop area. The middle wall has a single access with a parapet located to the west of the access. The innermost wall fully encircles the hilltop and a well-preserved access is located to the southwest.

Access to the site is well hidden to someone unfamiliar with it. Approaching from the southwest the land bridge appears to provide access to the site and the accesses in the two inner walls are clearly visible. However, access from this side is prevented by a large rocky peak that is situated between the landbridge and the fortified hilltop. Access is instead located along the southwestern side and is both hidden and well-protected.

Storage and Residential Areas

Within the defensive walls we identified a total of 39 structures. Most (28) were free-standing circular structures located primarily on the western and eastern slopes of the hilltop. The remaining 11 were built along the interior of the inner-most defensive wall, with several build adjacent to one another. No human remains and very few serving wares (n=4) were found in and around these structures, indicating that these were likely storage structures, rather than mortuary features.

To the west of the defensive sector was a dense sector of circular structures. These structures ranged in size, and likely represent a mix of both residential and storage structures. Across the river, the slopes are extensively terraced and domestic structures were found scattered throughout the agricultural terraces.

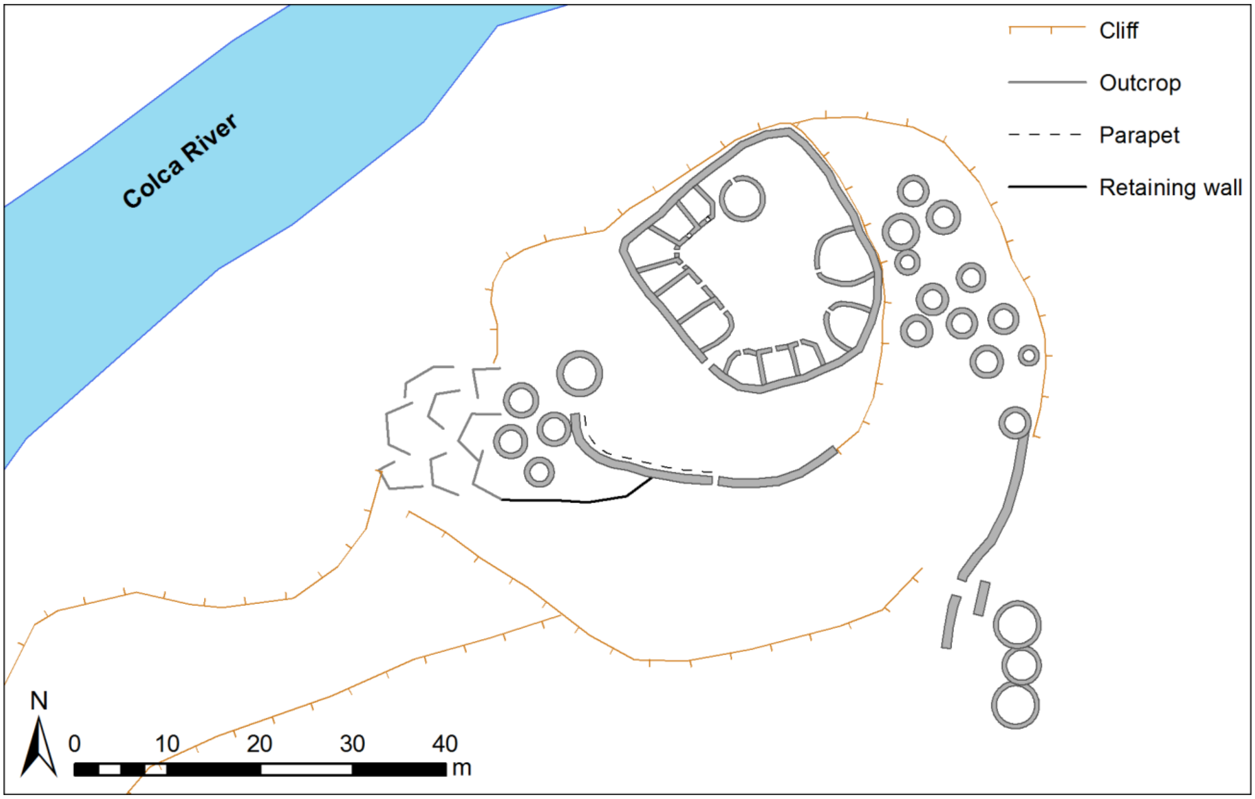


Figure B.89. Detail of fortified sector at Choque Mamani, CO-187.

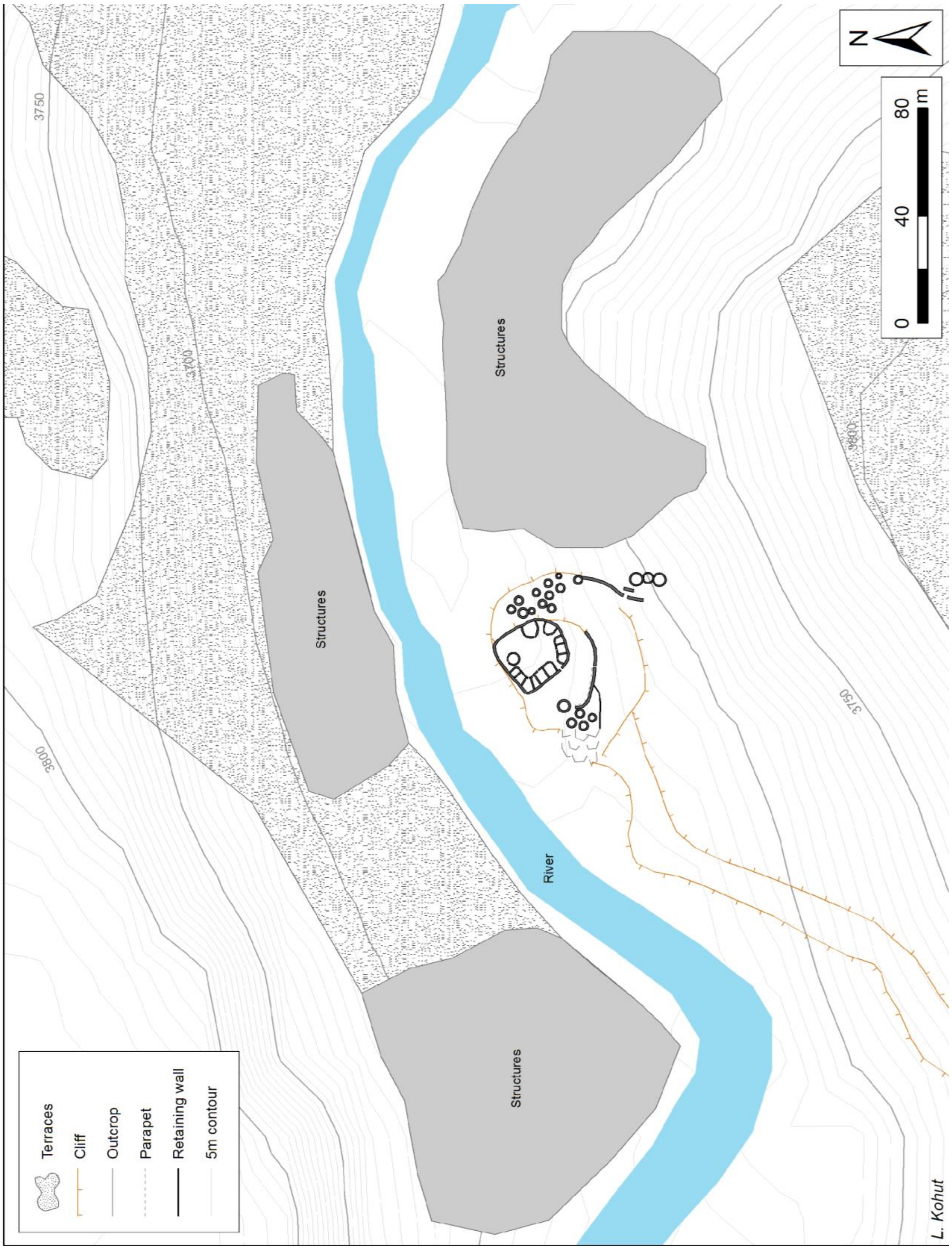


Figure B.90. Plan map of Choque Mamani, CO-187.

Figure B.91. Location of Choquemamani, CO-187, viewed from the southwest. Defensive sector indicated with vertical arrow; land bridge indicated with horizontal arrow.

Figure B.92. Defensive sector from the southwest.


Figure B.93. Defensive sector viewed from the southeast.


Figure B.94. Close up of defensive walls. Note the preserved access (indicated by arrow).

Figure B.95. Wall parapet.

Figure B.96. Concentration of circular structures to the west of the defensive sector. Structures likely reflect a mix of storage and living structures.


Figure B.97. Terraces to the north across the river.

CO-201

Elevation: 3781 masl

UTM: 213798.41 E, 8269648.47 N

Site class: Small non-residential

Site location

The site is located at the end of a ridgeline on the northern side of the valley, approximately 2.5 km to the west of the village of Coporaque. The ridge itself is surrounded on three sides by moderate to steep slopes, with the easiest approach from the north and east. The late pre-hispanic settlement of Uyu Uyu lies downslope to the south on a raised flat-topped promontory amongst the valley-bottom agricultural fields.

Defenses

The site consists of two primary defensive walls that encircle a small hilltop. The site presents several small accesses. The site offers extensive views of the surrounding landscape, and likely served as a defensive refuge and lookout for the near-by settlement of Uyu Uyu.

Figure B.98. Plan map of CO-201.


Figure B.99. Location of CO-201, viewed from the east.


Figure B.100. The settlement of Uyu Uyu viewed from the summit.

Figure B.101. Outer defensive wall.

Ichupampa

Malata (IC-195)

Elevation: 3438 masl

UTM: 209400 E, 8268199 N

Site class: Large Residential

Site Location

The site of Malata encompasses a large hill situated within the valley-bottom agricultural area to the west of the village of Ichupampa on the north side of the river. The site is one of the few fortifications located within the primary zone of agricultural production. Bench terraces and rock-walled fields cover nearly all of the surrounding areas below 3600 masl, many of which remain under cultivation. The eastern portion of the hilltop, which also has the most extensive settlement, is relatively flat. To the west, the terrain raises steeply forming a very pronounced hilltop that is encircled by defensive walls. The western hilltop is surrounded on all sides by moderate to steep slopes.

Brief description

The site of Malata is a large and complex site whose occupation spanned the Late Intermediates Period to the early Colonial period. The architectural core of the site covers an area of more than 13 ha, and we documented over 150 domestic structures.

Sector I

Sector I comprises the entire residential area of the site, which extends along the slightly undulating terrain that comprises the eastern portion of the area. The residential area consists of a total of 172 structures. Structures were arranged in tightly-pack domestic patio groups. A distinctive orthogonal patio group was located to the east of the plaza, forming an elite and/or administrator residential group.

Sectors II and III

Sectors II and III are two cemeteries of cist tombs located on two small hilltops at the periphery of the residential sector. A number of looted tombs were located in this area, and a number of decorated serving vessels were collected here.

Sector IV

Sector IV consists of a roughly-rectangular plaza measuring 46 x 41 m flanked on two sides by long, rectangular structures on the eastern and western sides. The western structure is poorly preserved and only the first course of stones was visible in many places. This structure measured 19 x 6 m and had 4 doorways that opened onto the plaza. The eastern structure is much better preserved. The structure measured 37 x 7 m and at one point had four doorways that opened onto the plaza. Three of the doorways had been sealed at a later point. Additionally, the northern terminal end had been modified into a half-hexogonal shape. This structure was likely an Inka great hall that was later transformed into a rustic colonial chapel, with the northern terminal end serving as the apse.

Sector V

Sector V consists of a large hilltop located in the western half of the site. The hilltop presents three primary defensive walls that fully encircle the area. A series of aligned accesses were located on the eastern side of the hilltop, leading up to the apex. A few small circular and quadrangular structures were located within the defensive walls and were likely either small lookouts or *chullpas*. At the apex of the site there was a small rectangular platform.

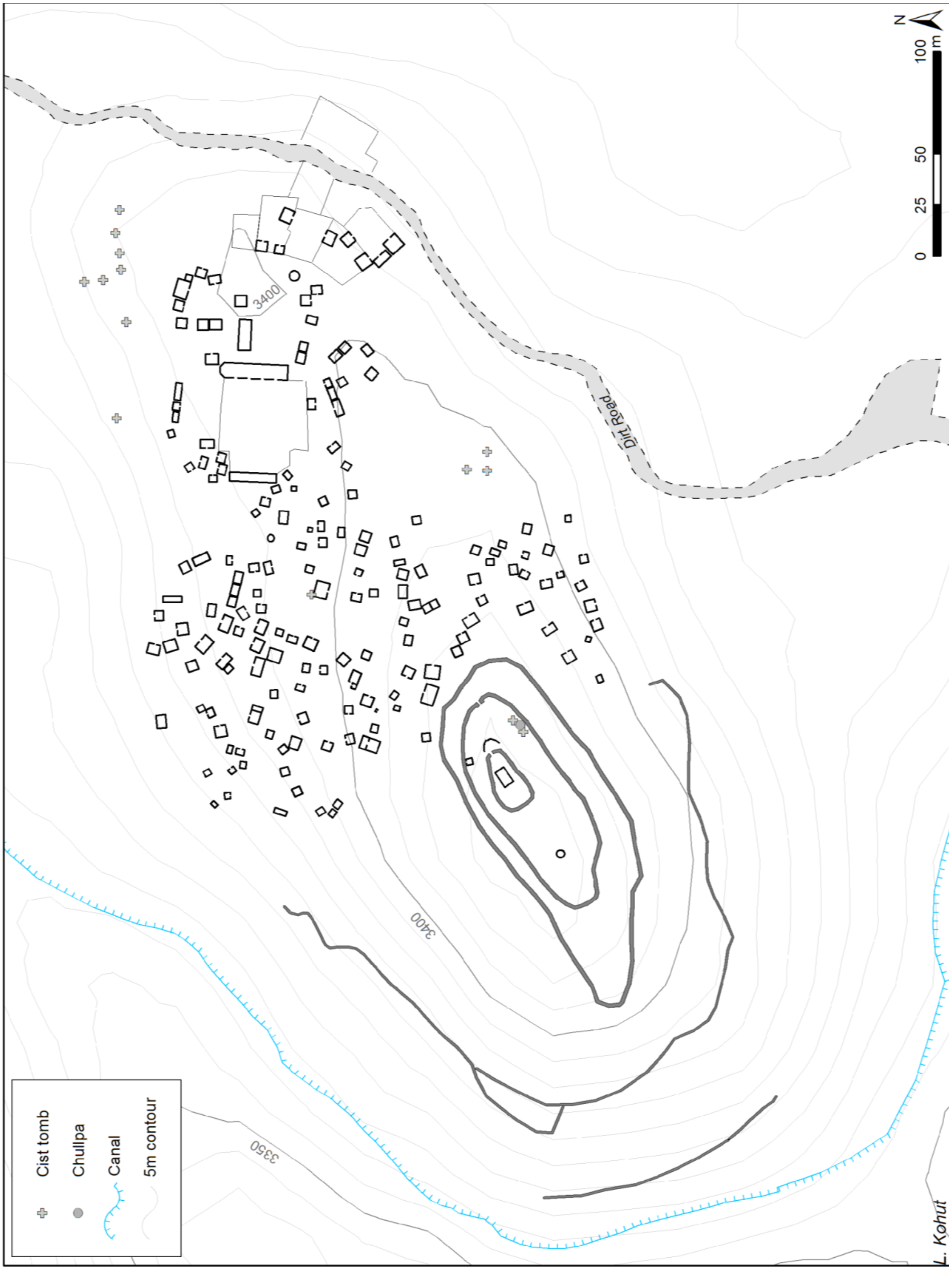


Figure B.102. Plan map of Malata, IC-195


Figure B.103. View of IC-195 from the south.


Figure B.104. A large domestic structure at IC-195.

Figure B.105. View of the defensive sector from the east. The residential area is visible in the foreground.

Maca

Pachamarca (MA-183)

Elevation: 4186 msnm.

UTM: 200245 E, 8267844 N

Site Class: Large non-residential

Site Location

The site is located at the top of a high ridgeline that extends roughly north-south to the west of the village of Maca on the southern side of the valley. The landform is called Pachamarca. The site was located the extreme western edge of the survey area. To the south of the site is the broad puna. In area where the site is located the ridgeline narrows with steep escarpments along three sides. In the middle portion of the site area, the ridge becomes extremely narrow and rocky, requiring significant bouldering to cross. The site is very high and difficult to access. From the modern village of Maca, it took us three hours of climbing with a donkey to reach the site. The remoteness of the site has contributed to its incredible preservation.

Defenses

There are two primary clusters of defensive constructions along the ridgeline. The southernmost portion consists of a large defensive wall that extends primarily along the southern and eastern portions, terminating in the west where a dramatic cliff prevents access. To the east, the wall ends where the terrain rises steeply to form a rocky hilltop. There was evidence of a semi-circular lookout along this outer defensive wall. To the northeast of walled enclosure was a second smaller walled enclosure situated on a higher rocky rise. In this area, we identified three circular structures, measuring approximately 6 – 7 m in diameter. Continuing north, the ridge narrows significantly, with steep escarpments along the eastern and western sides. Here the ridge is very rocky and difficult to traverse.

Further south, the terrain rises again to form a hilltop with steep slopes around all sides. Approaching from this side, two large fortification walls, each with well-preserved accesses can be observed, very narrow with well-preserved lintels. Access through these doorways was very difficult and required a climbing the very steep hillside. These doorway appear were likely not the primary accesses used by local residents to access the site (see below), and instead appear to have been placed to deliberately attract individuals unfamiliar with the site though these more difficult doorways. Two large transverse walls continued down the hillslope to the east.

A series of 4 concentric defensive walls encircle most of the hilltop, only terminating where the terrain gets so steep to be unaccessible to the north and east. In the outermost wall, at least one access gate was identified to the west, and likely served as the primary access to the site for defenders of the site.

Taken together, Pachamarka exhibits a complex of defenses which appear to have served both to protect against attack, and also to monitor the surrounding landscape. The southern defenses were likely primarily used for monitoring purposes. Defenses here are lighter (though still extensive), and the main defenses were concentrated further south. Additionally, the site appears to have been designed to lead attackers along the precipitous rocky ridgeline, leading them to a pair of difficult to access gates.

Other Features

Aside from the circular structure within the southernmost defensive complex, there were no other structures. There has been little archaeological survey of this part of the valley, and so we do not yet know where the individuals who used the site lived. On the lower escarpments of the Pachamarka landform, we identified a series of tombs built into the cliff face. The tombs were located in cave features with a wall constructed along the exterior face. The remains of red pigment were found on the interior and exterior of the caves.

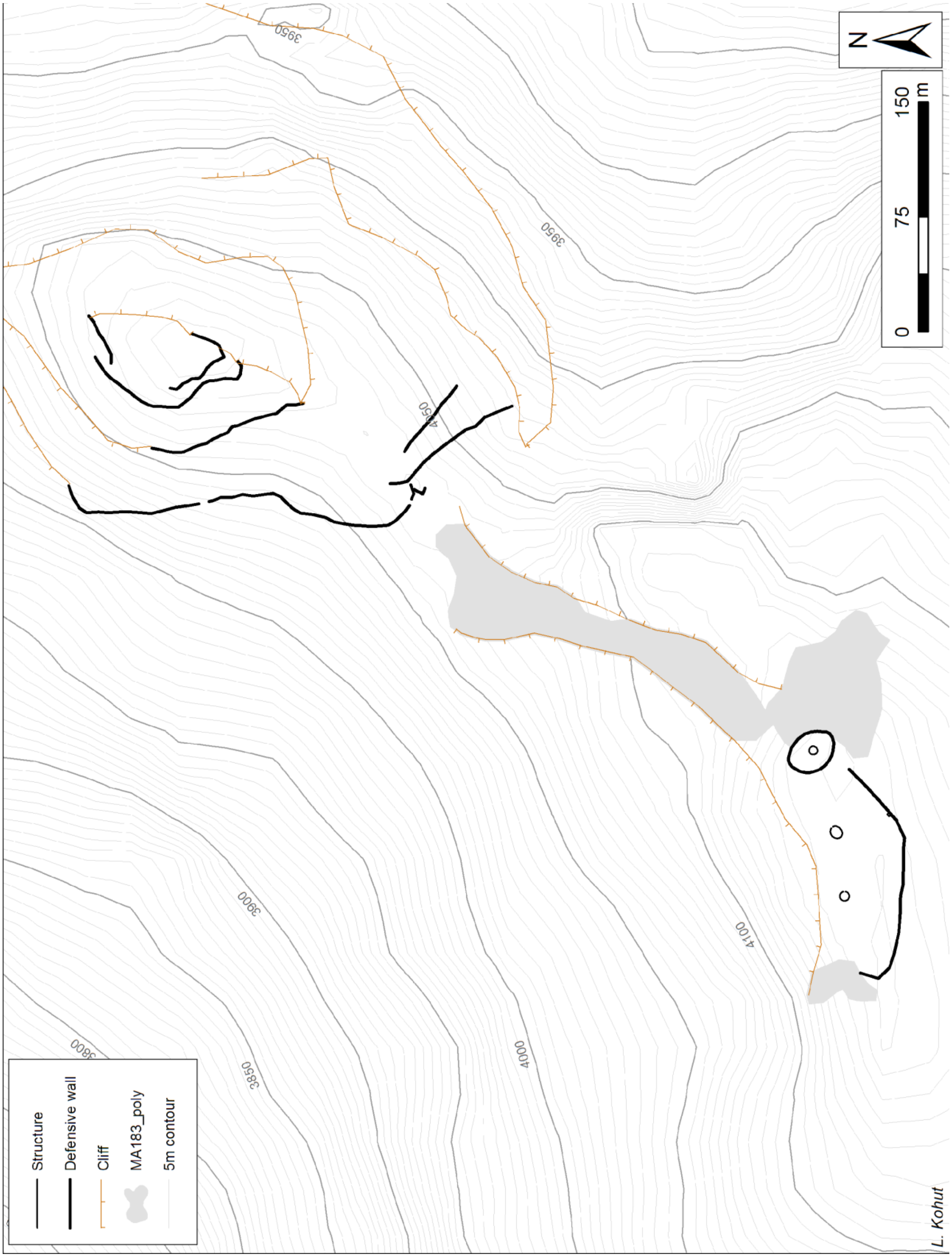


Figure B.106. Plan map of Pachamarka, MA-183.

Figure B.107. View of primary defenses; looking south.

Figure B.108. Southern defensive sector, view of defensive wall.


Figure B.109. Looking south at primary defensive sector. Note the narrow ridge leading to the site.

Figure B.110. One of the accesses.


Figure B.111. View of the defensive walls on the western side of the hilltop.

Madrigal

Fortaleza de Chimpa (MD-190)

Elevation: 3621 masl

UTM: 194844 E, 8273755 N

Site class: Large non-residential

Site Location

The site is located at the top of a ridgeline to the west of the village of Madrigal on the north side of the river. The site is located on the far western edge of the survey area. The site occupies a ridgeline that extends roughly north-south, with steep cliff faces to the west and south, and precipitous slopes to the east which form the quebrada of the Chimpa river. To the west of the site, the terrain becomes very rugged, home to the relatively isolated village of Tapay. The site has been reconstructed and currently serves as a minor tourist destination in the region.

Defenses

The primary approach to the site is from the east. A series of terraces line this approach from the east. The primary defenses are located along the top of the ridge, where a very large defensive wall encircles the top. The wall ranged from 1 to 3 meters in breadth, and was 7 meters high on the exterior side. On the eastern side of the wall is a single gate entrance. There is evidence of a parapet along the eastern side of the wall. Within the walled enclosure are two circular structures, which could have served as temporary housing at the site, or which may have been chullpas. A second access is located to the south and leads to a second walled enclosure.

Figure B.112. Plan map of Pachamarka, MA-183.

Other Features

At the far southern end of the ridge, there is a large rock outcrop with several circular chullpas around the base. It is possible that this rock outcrop served as a *huaca*. A second mortuary feature—a large burial cave—was located to the south of the site along the eastern path that leads to the site. Ceramics from the cave reflected both LIP and LH styles. Outside the defensive walls to the east were a large number of *maquetas*, or stone monoliths that show canal and terrace systems. More than a dozen of these stones were identified in a range of sizes.

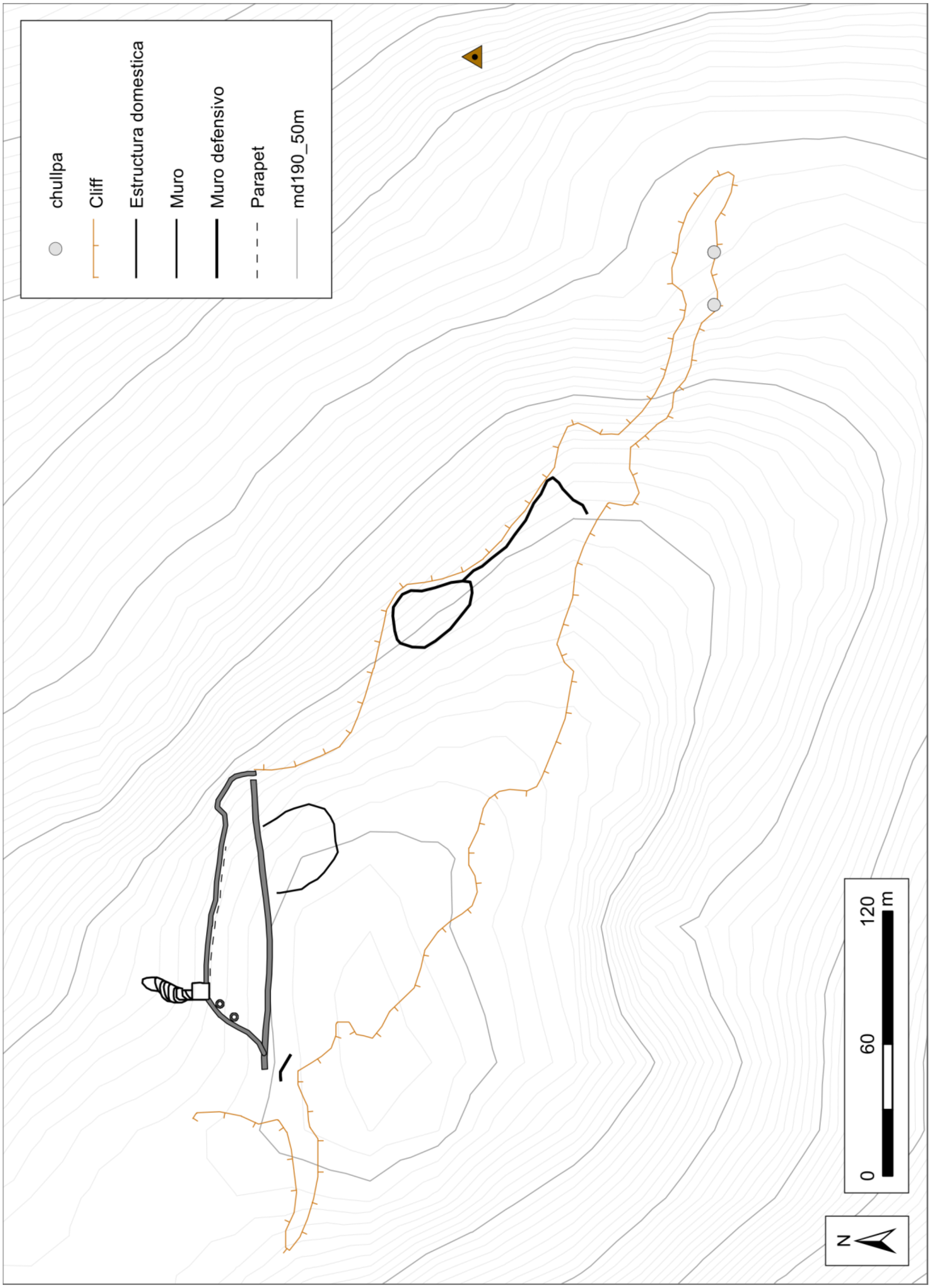


Figure B.113. Plan map of Fortaleza de Chimpa (MD-190).

Figure B.114. Location of Fortaleza de Chimpa, viewed from the east.

Figure B.115. Cave below the site.


Figure B.116. View of the site from the northeast.


Figure B.117. View of the outer defensive wall (reconstructed).


Figure B.118. A non-reconstructed portion of the same wall.


Figure B.119. View of rock outcrop huaca at the southern edge of the site.


Figure B.120. Reconstructed access to the site.


Figure B.121. Cluster of maquetas at the site.

Figure B.122. Abutting chullpas beneath a rock escarpment.

Sibayo

Markarani (SI-199)

Elevation: 4329 masl

UTM: 230235.68 E, 8287818.77 N

Site class: Small residenial

Site location

The site is located in the puna region north of the valley between the villages of Tuti and Sibayo, approximately 2.5 km east of the highway that runs from Sibayo to Caylloma. The site defenses are located along a rocky hilltop, and a residential area was identified at the base of the hilltop to the east. A modern *estancia* (homestead) is located at the base of the hilltop to the north, and much of the lower residential area has been dismantled to construct corrals for sheep and camelids.

Defenses

The site defenses are concentrated around the rocky hilltop, which is most accessible from the western side. The hilltop is encircled by 5 primary defensive walls. Several preserved accesses were visible along the western side, roughly aligned with one another.

Residential area

A likely residential area was identified below the hilltop to the east. The area has been substantially modified by the construction of modern corrals, and only two structures remain. One was quadrangular and the other circular.

Other features

At the apex of the site was a rectangular platform, approximately X by X m, and a height of X meters. The platform appears to have been filled and leveled.

We recovered a number of lithic artifacts from the site, including cores, flakes and a single obsidian point.

Figure B.123. Plan map of Markarani, SI-199.


Figure B.124. View of Markarani from the east.


Figure B.125. View of the residential area to the east of the fortified hilltop.

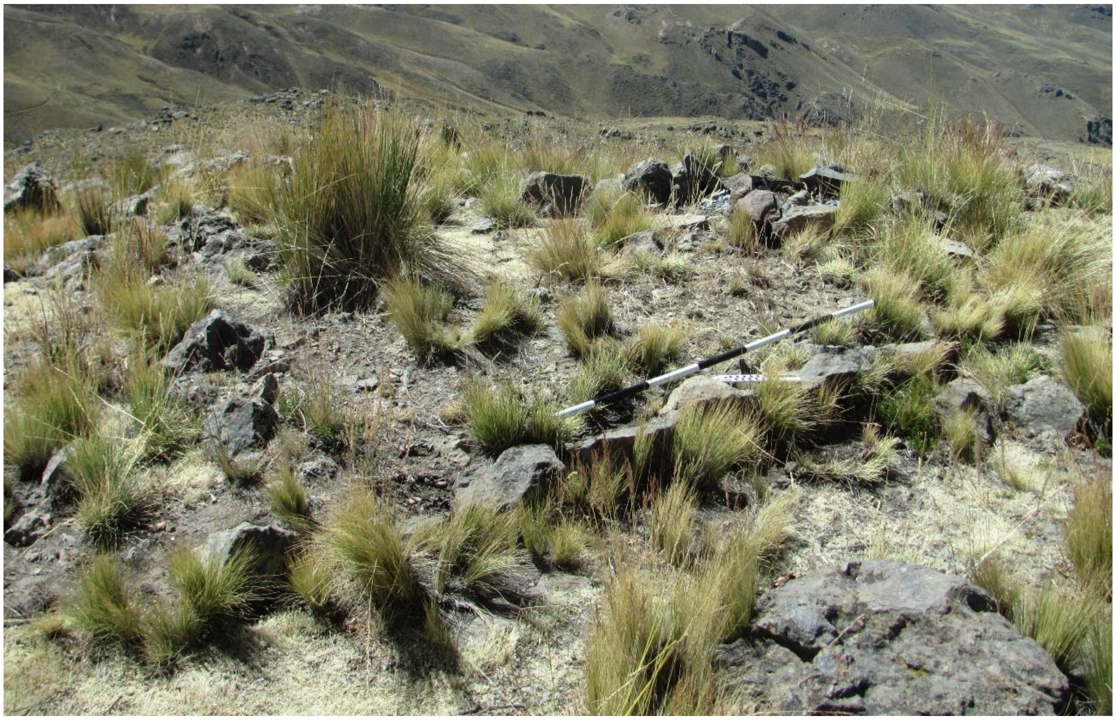


Figure B.126. Rectangular platform at the apex of the site.


Figure B.127. Structure foundation.

Paraq'ra (SI-198)

Elevation: 3983 masl

UTM: 235646.42 E, 8289115.23 N

Site class: Small residential

Site Location

The site is located at the confluence of a small tributary and the Colca River to the north of the village of Sibayo. The residential area of the site occupies a flat plain along the tributary river. The defensive architecture is nestled within a rock outcrop on to the south of the residential area.

Defenses

Six defensive walls surround the rock outcrop. The lower five walls, which lie on the eastern side are form a series of stepped terraces. The highest wall encircles the top. Across the quebrada to the north, a circular enclosure is located along a ridgeline, which may have served as a look out post or as a corral.

Residential area

The residential area is concentrated on a lower plain on both sides of the quebrada. There are a total of 31 domestic structures, primarily circular in form, which are likely a mix of both residences and storage structures. A larger rectangular structure with a half-hexogonal terminal end is likely an early Colonial chapel.

Other features

There are 10 small circular structures in the defensive area of the site, which are likely chullpas. The structures form two clusters. Several terraces are also located on either side of the quebrada.

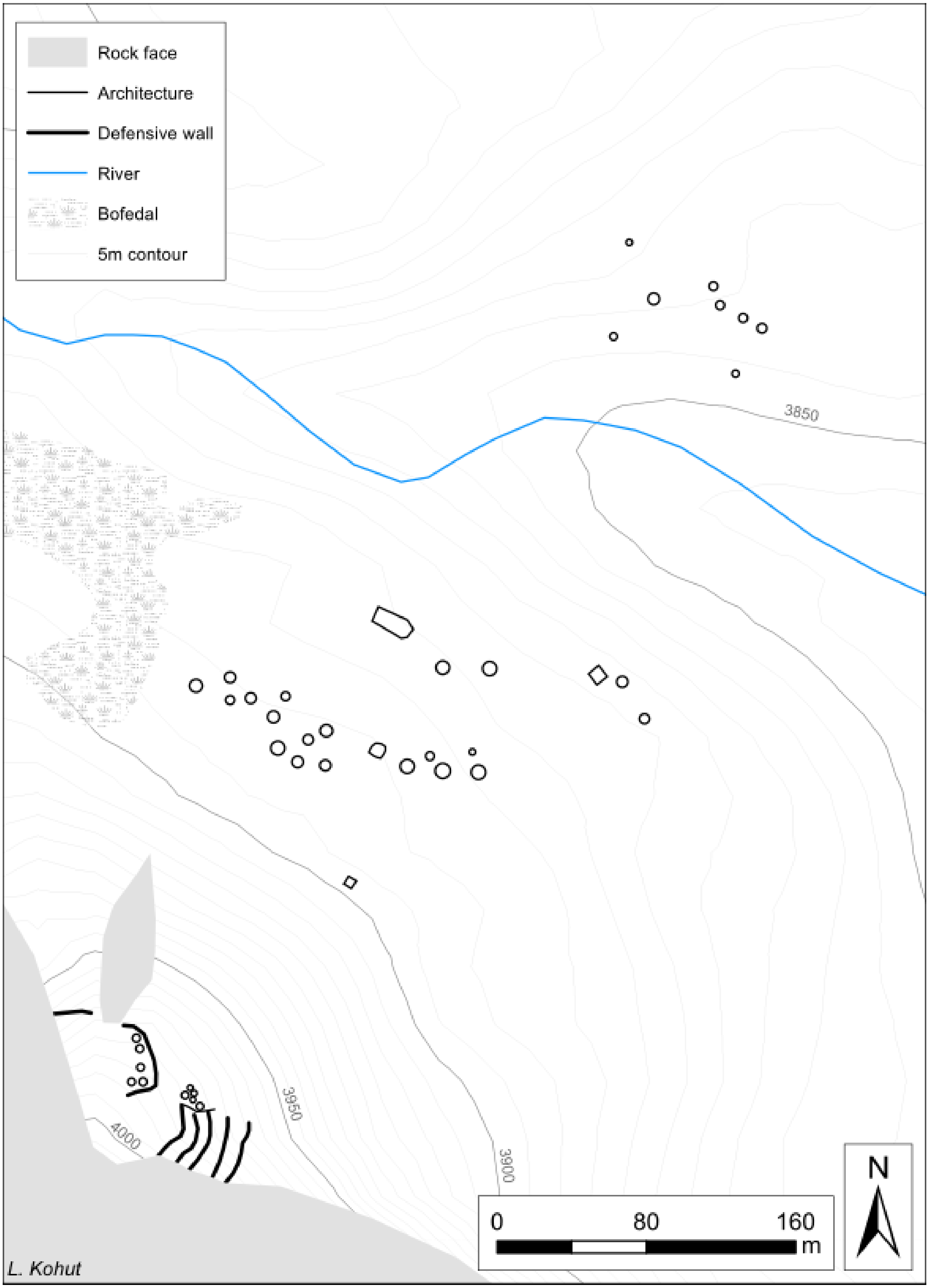


Figure B.128. Plan map of Paraq'ra, SI-198.

Figure B.129. View of the residential area of the site, looking east.

Figure B.130. Small circular structure within the defensive area.


Figure B.131. Exterior of defensive wall.

Pukara Ocre (SI-200)

Elevation: 4247 masl

UTM: 233423.92 E, 8287514.49 N

Site class: Small non-residential

Site Location

The site is located on a rocky hilltop approximately .25 km to the west of the highway between Sibayo and Caylloma. The site lies to the west of the village of Sibayo on the northern side of the valley. The rock hilltop has steep slopes along the northern, eastern, and southern sides, and the western side is defined by a steep cliff face. There is a modern estancia to the north east of the site below the hilltop with a number of corrals.

Defenses

The hilltop is encircled by two primary defensive walls which partially enclose the hilltop terminating on either end to the west where the cliff face and rock outcrops naturally prevent access. The lower defensive wall has two gates, one on the northern side, and the other on the southern side. The southern access is screened by a smaller wall forming a defended gate. The upper wall is a half-circular wall that faces to the east where the site is most accessible. There were no structures or ceramics found at the site. The top of the site provides extensive vistas of the surrounding puna areas.

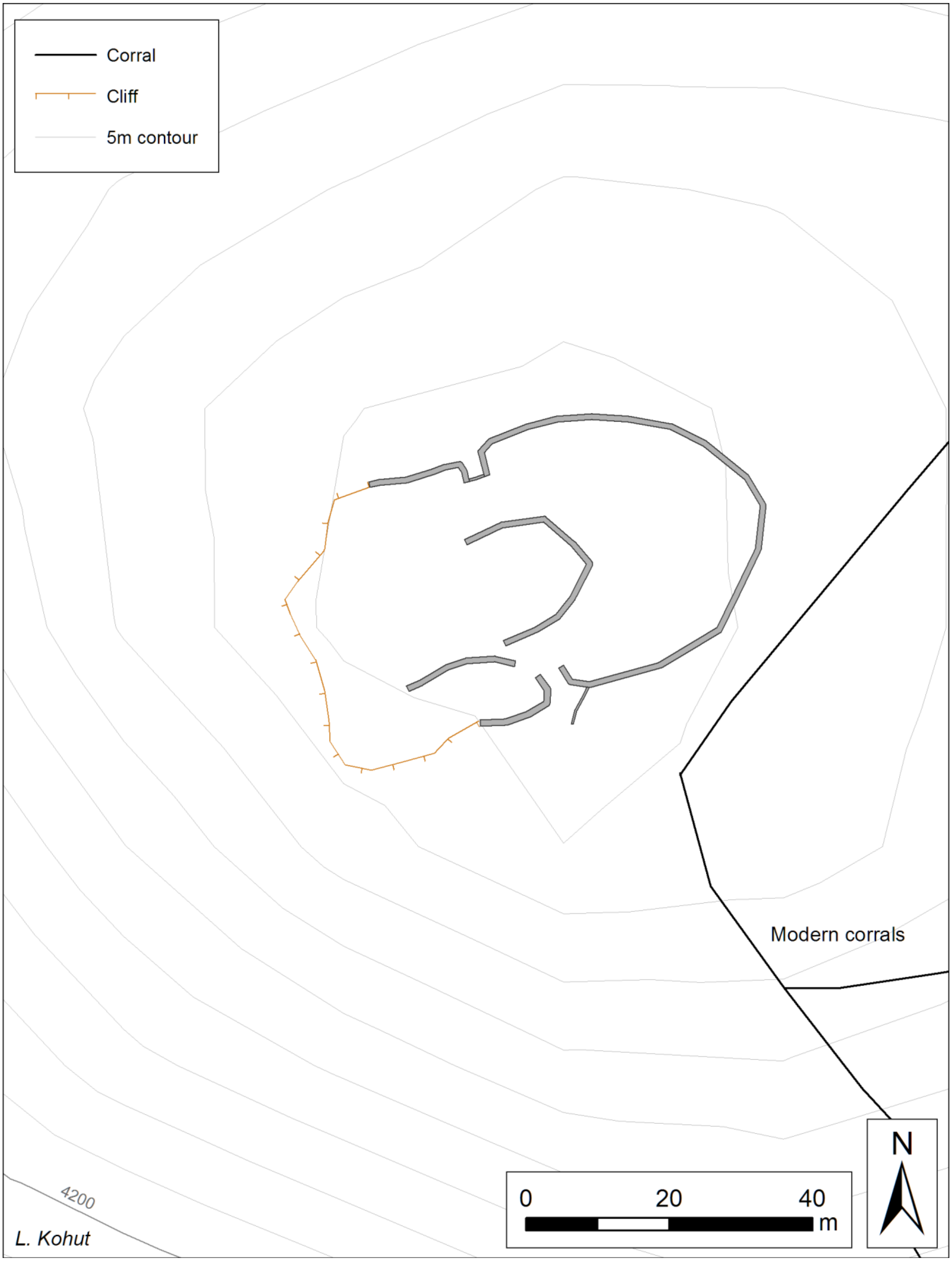


Figure B.132. Plan map of Pukara Ocre, SI-200.


Figure B.133. View of Pukara Ocre from the southwest.


Figure B.134. Outer defensive wall.


Figure B.135. Southern wall access.

Pukarilla (SI-197)

Elevation: 3865 masl

UTM: 233430.53 E, 8284114.59 N

Site class: Medium residential

Site Location

The site is located between the villages of Tuti and Sibayo on the northern side of the Colca River. Most of the site architecture is located on the western side of a small quebrada, although terraces are located on the hillslopes to the east of the quebrada as well. To the north, east and west of the site the terrain rises steeply to the puma, and most of the site is located in the lower area protected on most sides by the surrounding ridges.

Defenses

The primary defenses are located on a rocky rise on the western side of the site. The rocky hilltop is surrounded on three sides by cliff faces. Two primary defensive walls run along the western side of the hilltop, terminating on either end in rock outcrops and cliffs. The exterior wall has a parapet along most of its extent. This wall had two accesses, located on either end of the wall. The southern-most access has a smaller wall in front of it, forming a screened gate. The more interior wall had four niches on the interior. We did not identify the access through this wall, but it was most likely located on the southern and/or northern extremes of the wall where it is more poorly preserved. Additional walled enclosures on the higher ridge to the west may have served as additional lookouts or corrals.

Residential Areas

The residential area is located to the north and east of the primary defensive sector on the lower hillslopes and plains along the banks of the quebrada. The structures were arranged in small patio groups or residential terraces along the slopes. Most structures were circular in form, although a couple of examples of quadrangular structures were also identified. We recovered both LIP and LH Collagua ceramics from the residential sector, indicating it was used across the LIP and LH.

Other Features

The areas around the site were extensively terraced. Terraces were concentrated along the southern slopes leading up to the defensive sector, along the hillside to the east of the quebrada, and to the north along the quebrada as it rises to the higher puna grasslands. Given the high elevation of the site, the terracing was quite extensive. The higher ridge to the west of the site had a series of larger walled enclosures that may have served as corrals. Additionally, a large bofedal was located immediately to the west of the tributary river.

Two clusters of abbuting *chullpa* mortuary tombs were identified at the site. One was located to the east of the primary defensive sector, at the base of the rock escarpment that forms the hilltop. The second cluster was located to the north, adjacent to another escarpment near a series of terraces. The chullpas were roughly semi-circular in form, constructed of a double-faced wall with mortar. All the chullpas were extensively looted, but numerous human remains were still present.

The area immediately to the west of the main fortification walls was a large, flat and open, and may have served as a plaza or other form of public gathering space.

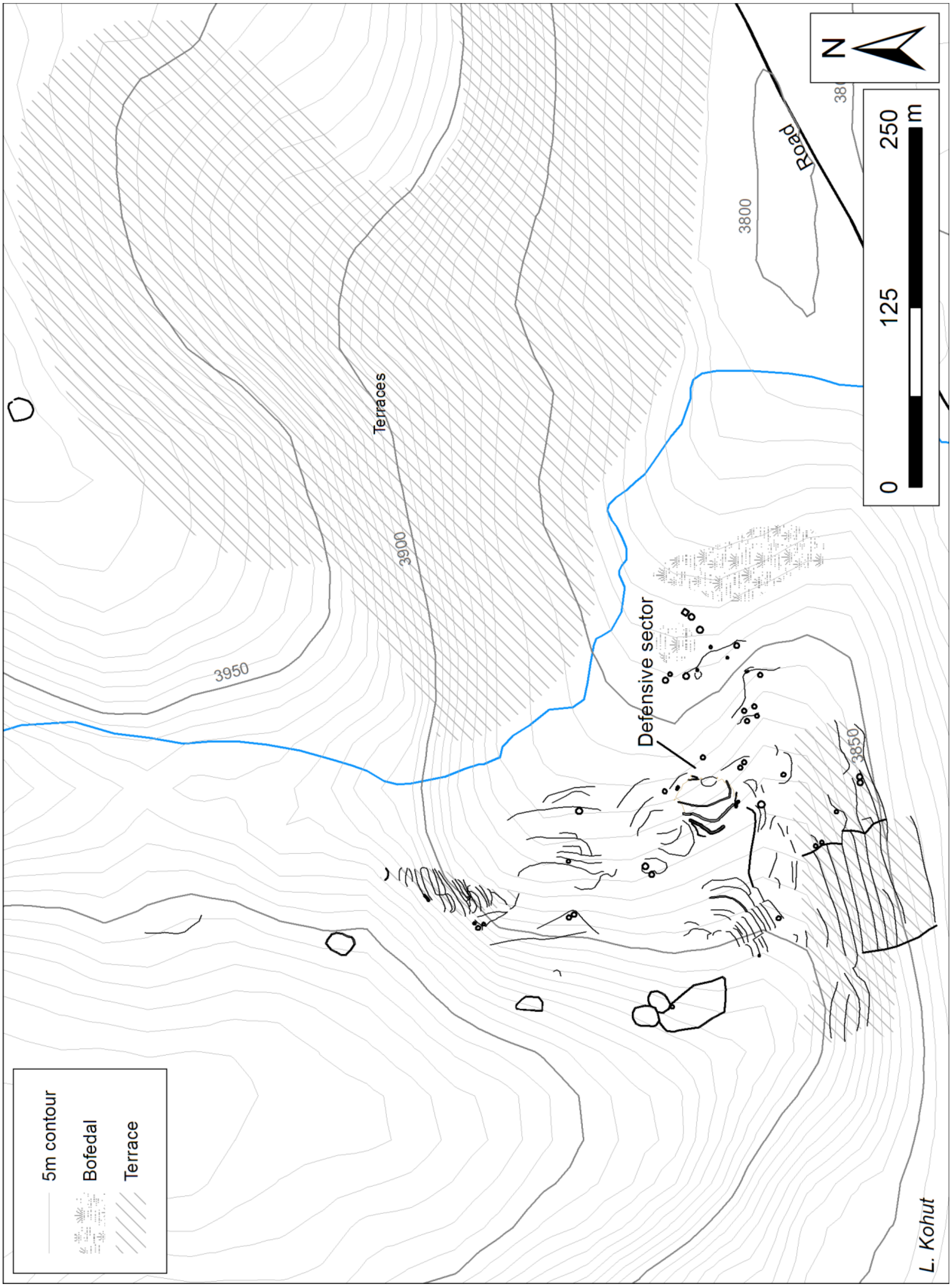


Figure B.136. Plan map of Pukarilla, SI-197.

Figure B.137. Detail of defensive sector at Pukarilla, SI-197.


Figure B.138. Primary defensive sector viewed from the northwest.


Figure B.139. Abbutting chullpas.


Figure B.140. View of the residential sector to the north and east of the defensive sector.


Figure B.141. Domestic structure.

Figure B.142. Defensive wall.

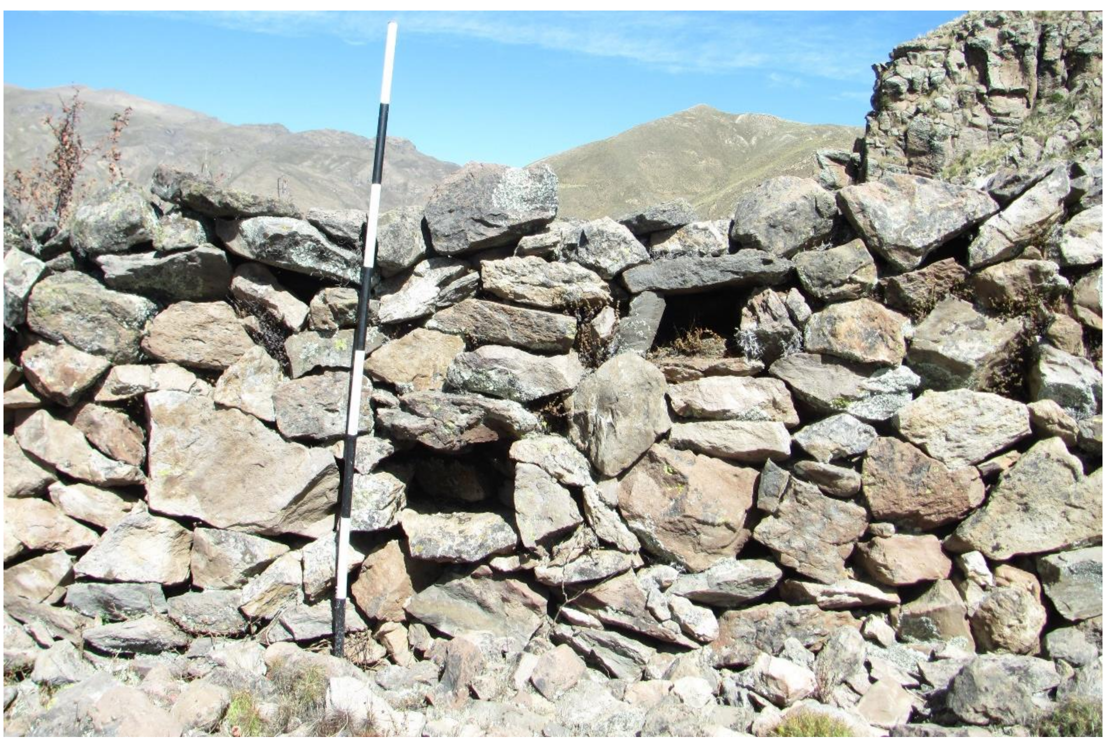


Figure B.143. Niches on interior of defensive wall.

SI-202

Elevation: 3906 masl

UTM: 231313.86 E, 8282150.06 N

Site class: Small non-residential

Site Location

The site is located on a rocky promontory on the north side of the Colca River between the villages of Tuti and Sibayo. The site area is defined by a large rock outcrop to the north and east. The southern and western sides of the site are surrounded by steep cliff faces. The only access to the site is from the east where the slopes are more moderate. The site lies just across the Colca River from the small fortified settlement of CA-203, and may have served as a refuge or lookout for that settlement.

Defenses

The site area is defined by a series of four concentric walls that are focused to the northern side of the site, which is the only access. The walls are not very long, connecting large rock outcrops to the east and the cliff faces to the west. Each of the three northernmost walls ends shortly before the rock outcrop to the east, forming a gate. A small quadrangular structure was located adjacent to the access of the third defensive wall, which may have served as a guard post. The most interior defensive wall forms a semi-circle, terminating on either end at the cliff. Within this interior wall were two rectangular structures which share one of the shorter ends.

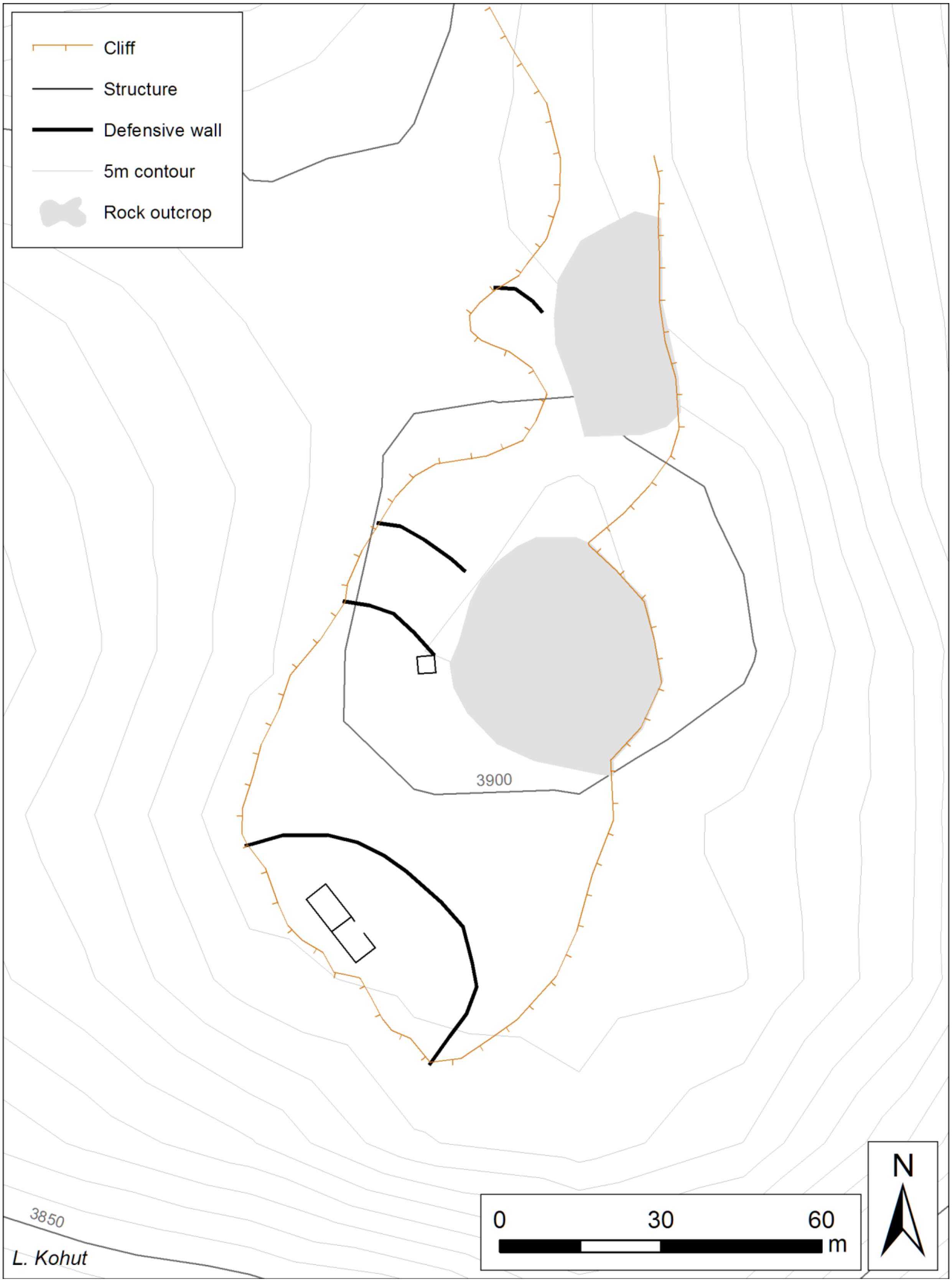


Figure B.144. Plan map of SI-202

Figure B.145. View of site location from the south.

Figure B.146. Approach to the site from the east.

Tuti

Pukara Killa (TU-185)

Elevation: 3978 masl.

UTM: 226097 E, 8282046 N

Site class: Small residential

Site Location

The site occupies a ridgeline on the northern side of a small quebrada to the north of the village of Tuti on the northern side of the Colca River. A prehispanic path follows the quebrada. The non-residential fortification of Chaillita (TU-186) lies on a ridge just across the quebrada.

Defenses

The site had two primary defensive sectors. The uppermost one (to the northeast) consists of a walled enclosure consisting of two defensive walls that fully encircle the hilltop. This is also where the domestic structures were located. The second defensive sector lies to the southwest, occupying a rocky rise. This area is encircled by two defensive walls

Residential area

The residential area of the site was located within the upper defensive enclosure. We identified 9 circular structures. Much of this area had been disturbed by corral construction related to a nearby estancia.

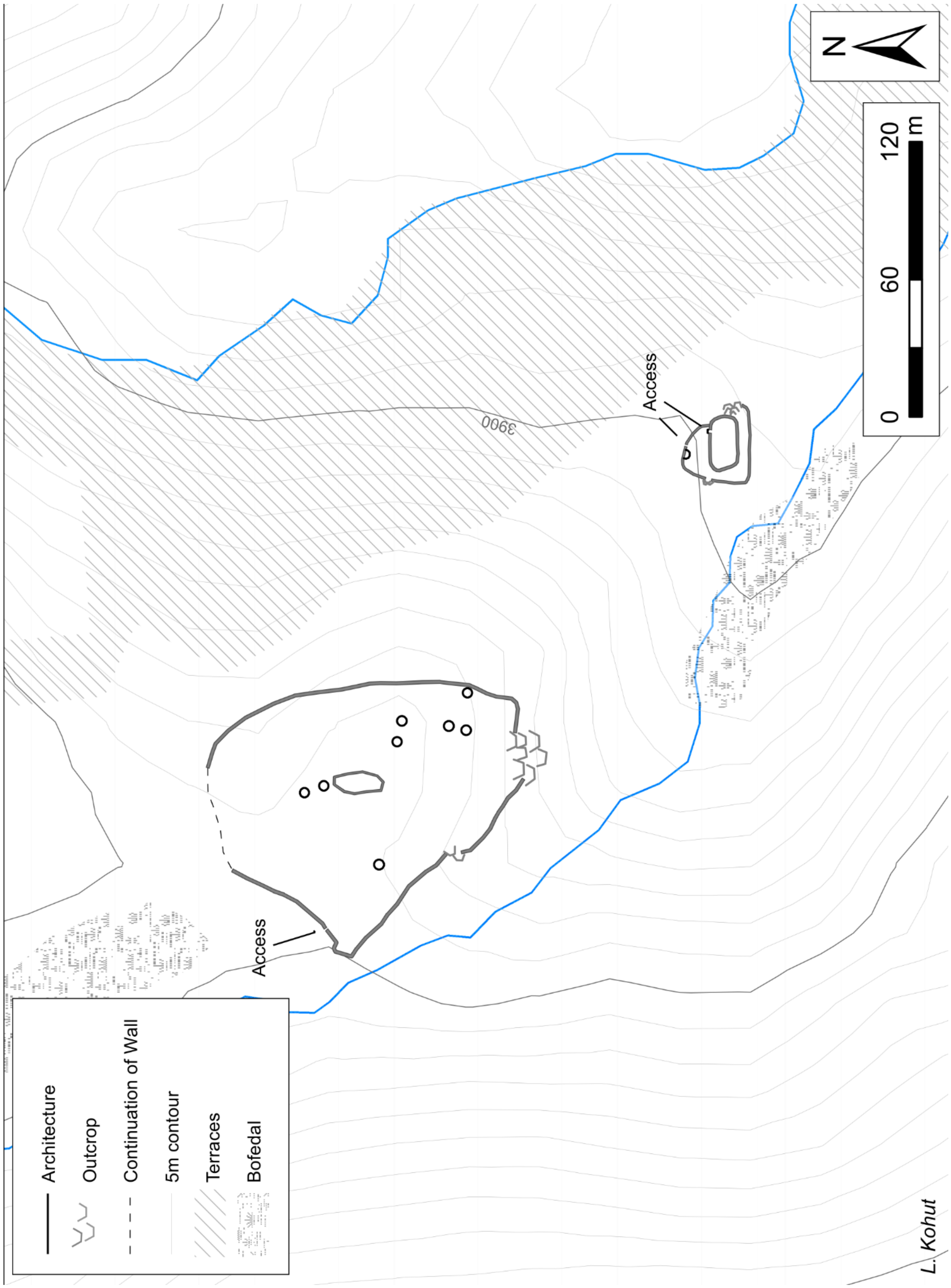


Figure B.147. Plan map of Pukara (Pukara Killa), TU-185.

Figure B.148. View of Pukara from the west. Defensive sectors indicated with arrows.

Figure B.149. Lower defensive section of Pukara.


Figure B.150. Defensive wall.


Figure B.151. Gate in defensive wall.

Chaillita (TU-186)

Elevation: 3975 masl

UTM: 226433 E, 8282292 N

Site class: Small non-residential

Site Location

The site is located on a ridgeline on the southern side of a small quebrada to the north of the village of Tuti on the north side of the Colca River. The site of Pukara (TU-185) is located on a similar ridgeline on the northern side of the quebrada. A prehispanic path follows the quebrada between the two sites.

Defenses

The site had two primary defensive walls which encircle the ridgeline. The defensive walls were constructed of large boulders, stacked without mortar, and frequently incorporate rock outcrops to form the enclosure. The site had no domestic structures, and no cultural materials were found on the surface. The site was likely used in tandem with Pukara just to the north, forming a local defensive complex that may have been used to monitor the prehispanic path along the quebrada.

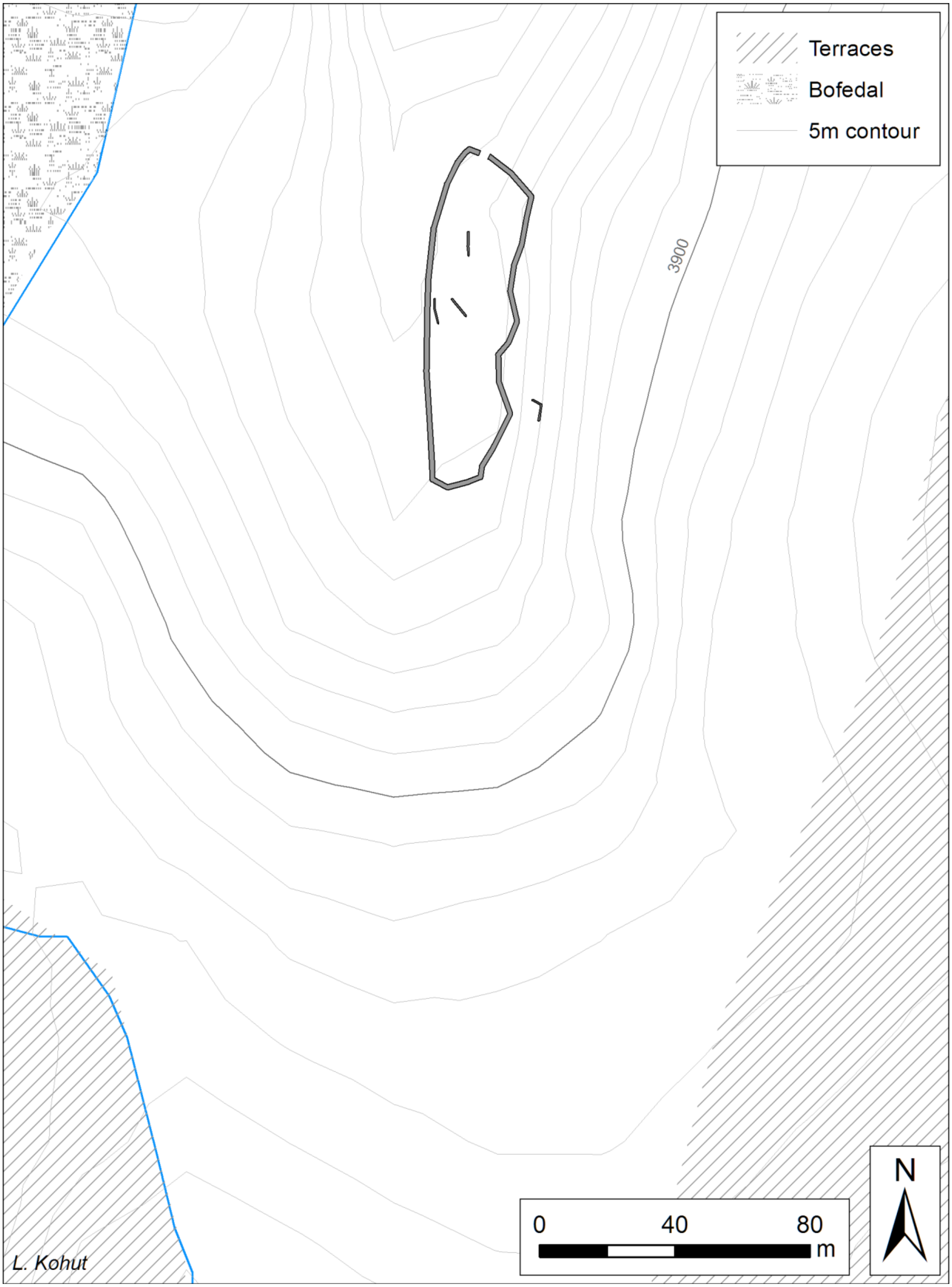


Figure B.152. Plan map of Chaillita (TU-186)


Figure B.153. View of Chaillita from the southwest.

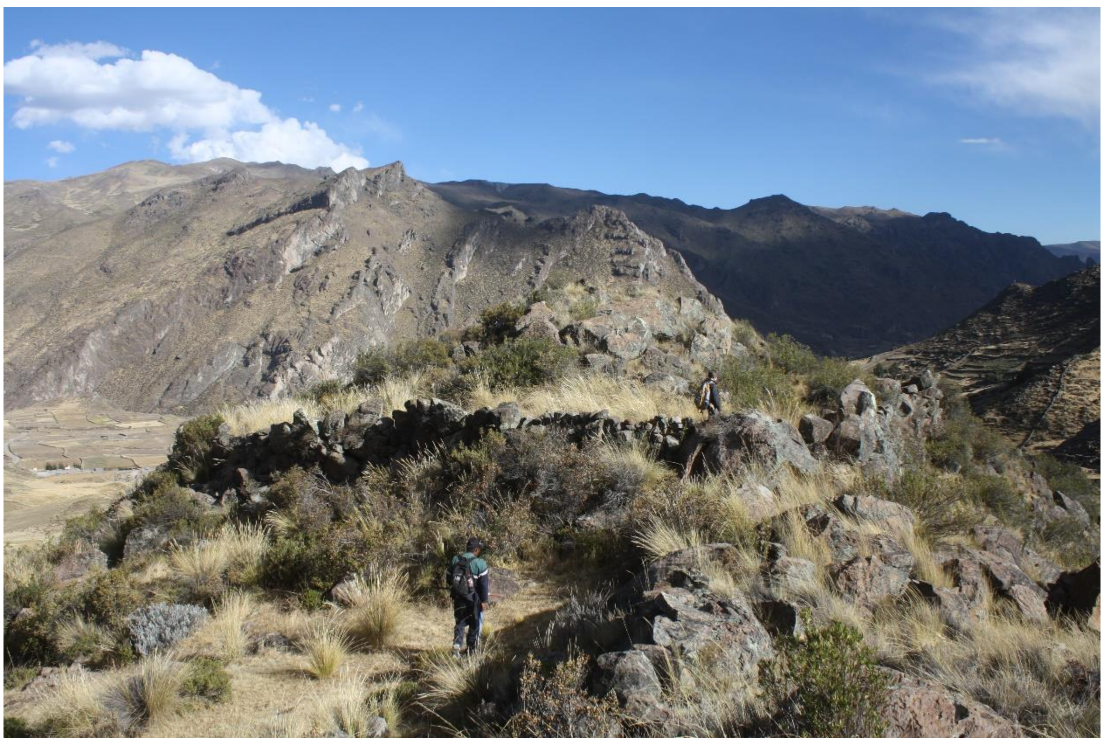


Figure B.154. Defensive wall.

Auquimarka (TU-188)

Elevation: 3859 masl

UTM: 223171 E, 8276870 N

Site class: Large residential

Site Location

The site is located between the villages of Chivay and Tuti on the northern side of the Colca River. The site occupies a large plain at the edge of a gorge that drops precipitously to the Colca River below. The defensive architecture occupies a finger-like promontory above the river. Residential areas are located within the defensive sector and on the plains to the north of it. The site was divided into three sectors: Sector I, the defensive sector; Sector II, an administrative and residential sector to the northwest; and Sector III, a sprawling residential sector to the northeast.

Defenses

The site defenses are all located in Sector I. This sector is defined by a finger-like promontory with cliff faces on three sides. The only access to the site is from the north. Here, a series of defensive walls protect the northern side. The two outer walls form a complex crab-claw defended access with an open area between them. Each of these walls have parapets, offering further defenses along this vulnerable access. The walls further to the interior form a series of defensive walls, which also serve as retaining walls. The highest part of the site is fully encircled by a large defensive wall.

Residential Areas

Sector I: Sector I consists of the primary defensive sector, which also encloses a densely settled residential area. The structures here consist of both circular and quadrangular structures, arranged in domestic patio groups. The structures here are among the finest at the site, containing the largest and most elaborate of any at the site. A formal pathway runs north-south through the site.

Sector II: Sector II consists of a cluster of domestic and public architecture. Excavation at the site revealed that this sector was constructed during the Late Horizon. A rustic Inka great hall and plaza complex is a primary feature here. The great hall structure measures X by X m and has four doorways that open onto a walled plaza. To the west of the great hall/plaza complex is a complex of domestic structures that were likely home to a local administrator. A smaller patio contained a number of small quadrangular structures that were likely associated with food preparation.

Sector III: Sector III consists of an expansive open residential area to the northeast of the defensive sector. Structures here were more poorly preserved, but consisted primarily of smaller circular structures arranged in a series of domestic patio groups.

Mortuary Architecture

We identified both cist tombs and chullpas at the site. Cist tombs were located both in residential areas, and immediately adjacent to defensive walls. Chullpas were primarily found on the rocky rises on the pampa in the northern portion of the site. Both quadrangular and circular chullpas were identified and were often found in pairs with one quadrangular and one circular chullpa.

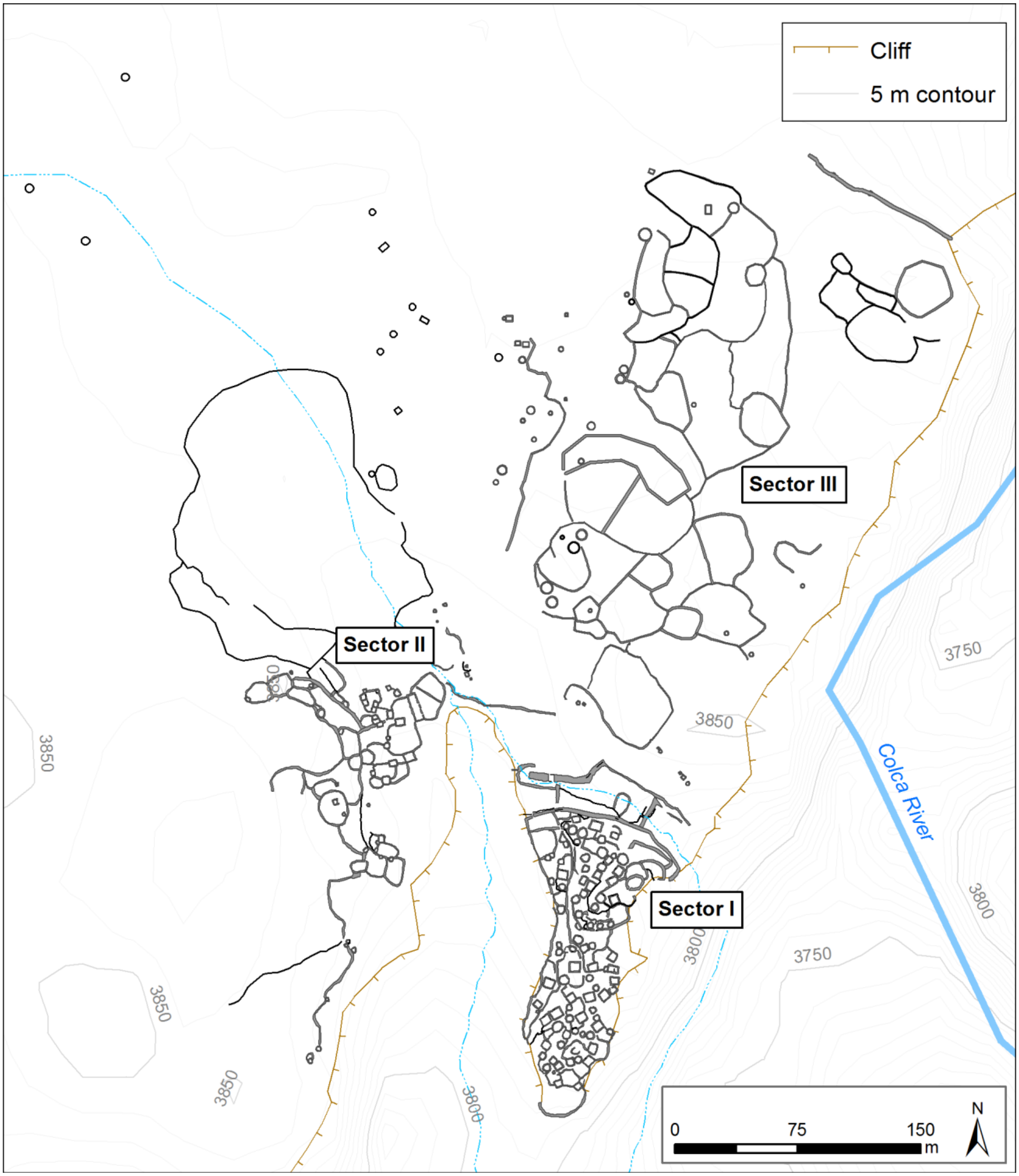


Figure B.155. Plan map of Auquimarka (TU-188).

Figure B.156. View of Sector I from the north.

Figure B.157. View of the Colca River gorge from the southern end of the site. Choque Mamani (CO-187) can be seen in the distance.


Figure B.158. Outer defensive wall.


Figure B.159. Parapet on the interior of the wall.

Figure B.160. View of residential area in Sector I, looking south.

Figure B.161. High status domestic structure in Sector I.


Figure B.162. Looking northeast towards Sector III.


Figure B.163. A well-preserved chullpa at the Auquimarka.

Figure B.164. Looking northwest towards Sector II.

Yanque

Pallaqlle (YA-184)

Elevation: 3960 masl

UTM: 217082 E, 8266690 N

Site class: Large non-residential

Site Location

The site occupies a long ridge by the same name which is to the east of the village of Yanque on the southern side of the Colca River. The narrow ridge has steep slopes on both the eastern and western sides, and terminated in a cliff on the northern side.

Defenses

The site defenses consist of three walled hilltops and a long transverse wall that runs along the western edge of the ridge. The walls encircling the hilltops take advantage of natural defenses, such as cliffs and rock outcrops to form walled enclosures. The transverse wall runs X meters along the western ridge. Associated with the site, we also identified two maquetas, one located on the path to the site, and the other embedded in one of the defensive walls.

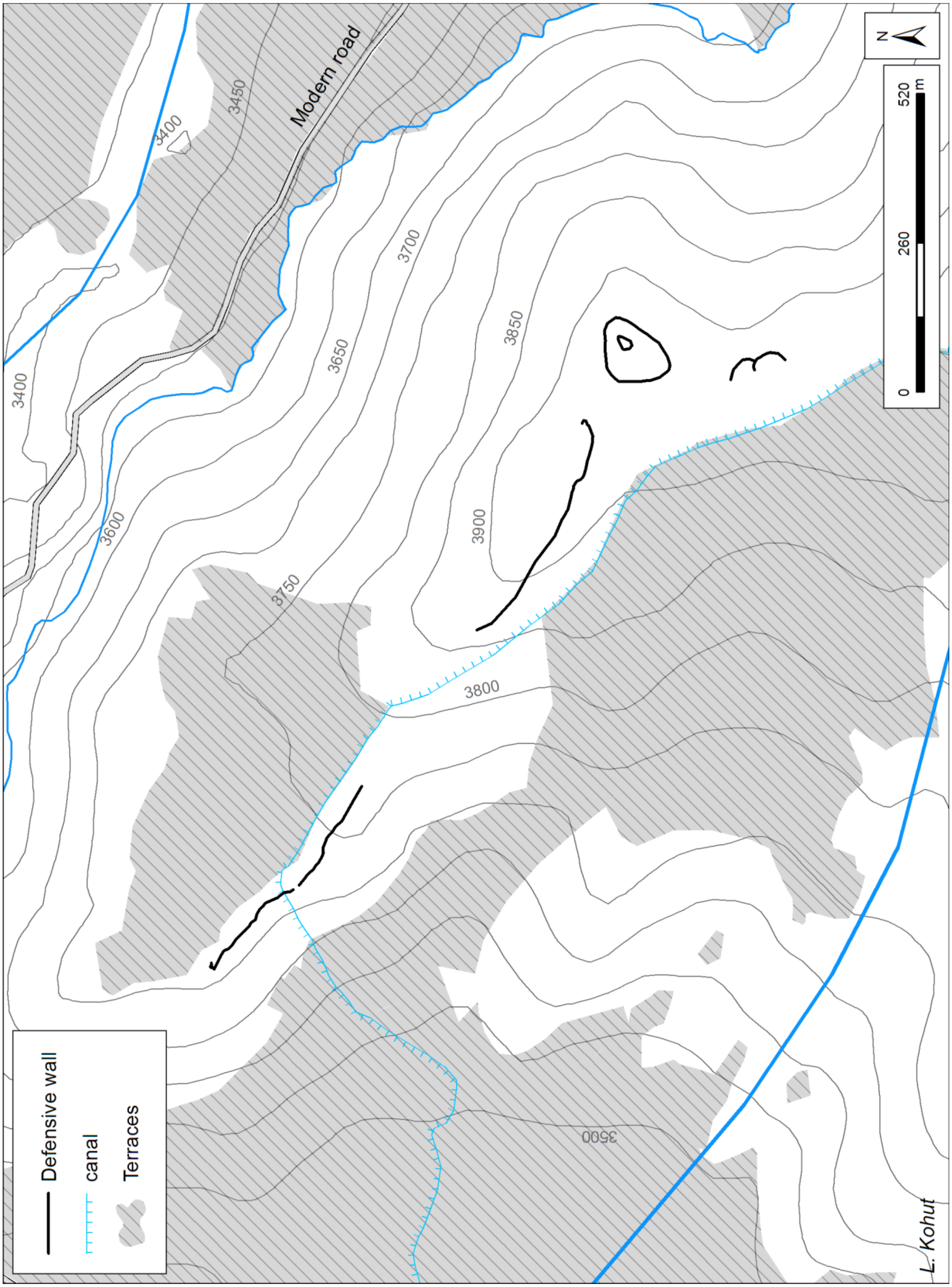


Figure B.165. Plan map of Pallaqlle (YA-184).

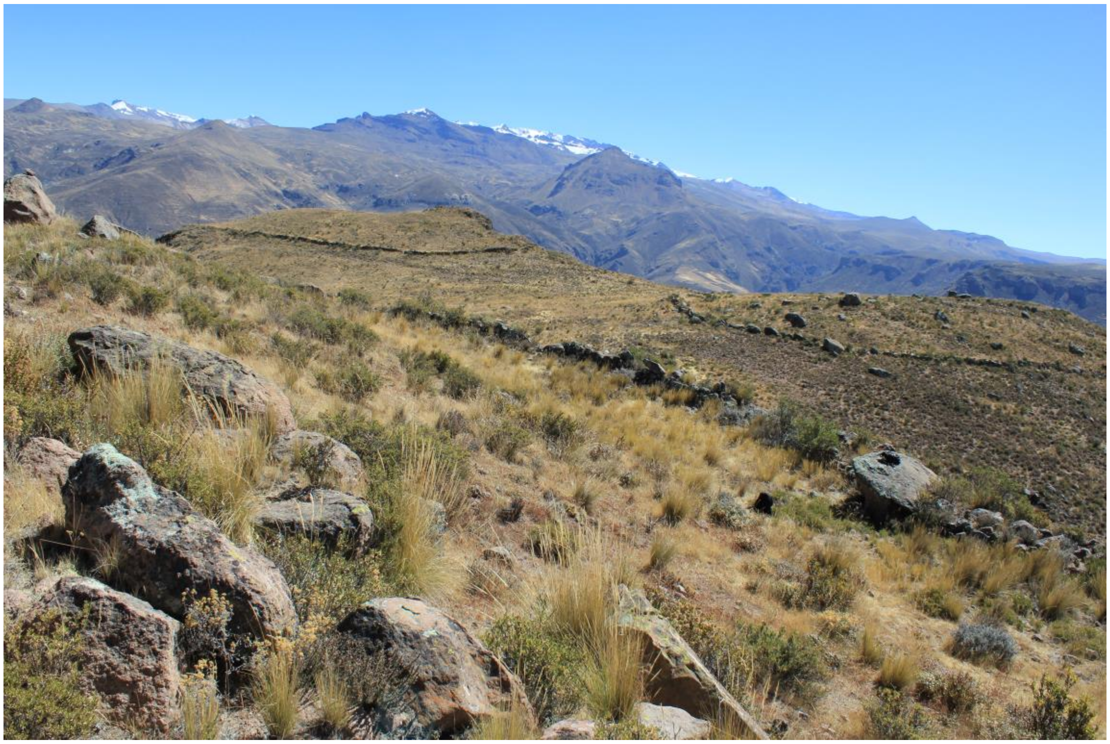


Figure B.166. View of two of the walled hilltops, looking east.

Figure B.167. Maqueta within one of the defensive walls.

Figure B.168. Defensive wall.

Figure B.169. Transverse defensive wall.

APPENDIX C

CERAMIC CHRONOLOGY

The ceramic classification used in this dissertation follow the local serration elaborated by Wernke (2003), which built upon earlier work by Malpass and de la Vera Cruz (de la Vera Cruz Chávez 1987, 1989; Malpass and de la Vera Cruz Chávez 1986, 1990). Broadly, Late Intermediate Period ceramics from the valley share similarities with other near-by LIP styles such as Chuquibamba. In his chronology, which was based exclusively on surface collections, Wenke suggested that Collagua I and II broadly correspond to the LIP, and Collagua III and Collagua Inka correspond to the LH, with Collagua III representing either a transitional form or a local LH style, and the Collagua Inka style representing a local expression of Inka-style ceramics. Chronologically, I classify Collagua I, II and III styles as Late Intermediate Period styles, and Collagua Inka as Late Horizon. This chronological classification is based on evidence from both surface collection and excavation.

Extensive systematic surface collection at Achomani (AC-175) recovered large quantities of Collagua I, II, and III styles, but only a few Collagua Inka fragments. The high quantities of Collagua III ceramics and paucity of Collagua Inka ceramics suggests that while the two styles may have been produced contemporaneously, that Collagua III ceramics were in use prior to Inka administration in the valley. This classification is further supported by systematic surface collections at Malata (IC-195), where Collagua I, II and III ceramics show similar spatial distributions throughout the site, and contrast significantly with spatial distributions of Collagua Inka ceramics. Finally, well-stratified excavated contexts at Auquimarka uncovered early floor contexts with Collagua II and III ceramics, but no Collagua Inka ceramics. In these contexts, Collagua Inka ceramics appear first in a stratum of fill that superimposes the earlier occupation level, and then in increasing quantities in subsequent strata. Taken together, this data suggest that Collagua III ceramics predate Inka administration in the valley.

Table C.1. Stylistic attributes of Collagua ceramics.

Style	Collagua I	Collagua II	Collagua III	Collagua Inka
Code	CO1	CO2	CO3	COI
Period	LIP (Early-Mid?)	LIP	LIP (Late?)	LH
Paste	Semi-compact to compact, with sparse to abundant very fine to fine sand temper, with occasional feldspar inclusions.			
Firing	Variable, but mostly reduced core			Oxidized
Finish	Well burnished			Finely polished
Slip	Dark cherry red, some orange-red, expediently applied			Bright red, orange-red; evenly applied.
Vessel form	Closed, deep, straight-sided or flaring bowls	Like CO1, plus rounded bowls, cantaros	Flat-bottom bowls with flaring, straight or rounded sides	Shallow open plates, large aryballoids, cups, beakers, pitchers

Late Intermediate Period Styles (Collagua I-III)

Collagua I, II and III ceramics are all similar in terms of surface treatment, paste and firing. Stylistic categories were distinguished based on differences in vessel form and, to a lesser extent, surface decoration.

Ware

Collagua I-III ceramics are made of a semi-compact to compact paste that are sand-tempered with various sand, volcanic, quartz or feldspar inclusions, generally ranging from very fine to fine in size and ranging widely in their abundance in the paste matrix. Vessels were fired in a reduced environment producing a dark reduced core. Collagua I-III ceramics are covered with a dark or cherry red slip, applied expediently to the all or part of the interior and exterior surfaces, which were then well-burnished.

Vessel Forms

Collagua I vessels consisted primarily of bowls that were either cumbrious and slightly constricted, straight-sided, or slightly flaring bowls with straight sides and flat bases. Collagua II vessels were more included many of the same Collagua I forms, but were generally more open with rounded bass and also included cantaros. Cantaros are jars with vertical necks and flared rims with spheroid bodies. Collagua III ceramics consist of more open flaring bowl forms, with either straight or curved sides.

Decoration

When decorated, LIP styles are generally decorated with relatively thick black paint, and sometimes white paint. Collagua I, II, and III ceramics were primarily differentiated based of surface decoration. Collagua I vessels were decorated on the exterior surface, typically just below the rim of the vessel, forming horizontal design fields. Decorations include curvilinear and geometic motifs, and occasionally zoomorphic representations, such as birds. Design fields were often delimited by horizontal, and sometime vertical, lines. Rim decorations were also common, generally consisting of regularly-spaced tic marks.

Decoration on Collagua II vessels was also generally executed on the exterior surface, although more open vessel forms were decorated on the interior surface. In both cases, decoration was typically located just below the rim. Designs tend to be more curvilinear, and common motifs included horizontal wavy lines, often delimited by straight lines above and below, as well as concentric arcs that drape from the rim, often in multiple. , Decorated Collagua II vessels typically consisted of thick curvilinear designs executed in black paint just below the exterior rim, and occasionally located below the interior rim of more open flaring vessels. The most common design consisted of thick draping arcs hanging from the rim.

Collagua III vessels were more open, and decoration was generally executed on the interior surface, also just below the vessel rim. The most common decorative motifs were horizontal wavy lines, in single or pairs, around the rim. Other designs included “M” and “V” shapes, sometimes accompanied by circles or dots.

Late Horizon (Collagua Inka)

Collagua Inka ceramics differ from Collagua I, II, and III ceramics in form, decoration, and slip.

Ware

Many Collagua Inka vessels were executed in the same semi-compact to compact sand-tempered paste as LIP ceramics. I number of Collagua Inka pastes had more abundant and larger quartz inclusions; this paste was more common in aribaloid forms. The slip was highly distinctive from Collagua I-III ceramics, generally more orange-red or bright red in color. In general, Collagua Inka cermaics had more even and complete slip coverage. Collagua Inka plates generally had full slip coverage on both the interior and exterior of the vessel. More closed forms, such as aribaloids, were slipped on the exterior, and the interior slip formed a distinct edge where it ended along the intior of the lip. These ceramics were also more finely burnished than LIP wares.

Vessle Forms

Large open plates and aribaloids were the most common forms recovered. A number of jars with a single handle were recovered, and only a few examples of cups were found. Collagua

Inka plates are very open, with slightly curved sides. Some of the plates had lugs or handles. Aribaloid vessels had large flaring necks, handles joined below the shoulder, and lugs.

Decoration

Collagua Inka plates were decorated on the interior surface, most commonly in black paint, but also occasionally using white, brown or red paint as well. The most common decoration found of Collagua Inka plates were thin, finely drawn concentric lines along the rim. These were sometimes accompanied by draping arc or "V" forms arranged in groups. Additional decorations were often added to the interior surface of the plates. These designs included a number of zoomorphic and other reprentational motifs, such as camelids, birds, fish, ají and foot plows. A variety of geometric motifs were also used, often extending vertically from the rim.

Decorations on aribaloids included lines along the interior of the lip. On the exterior of the body, decoration was typically found just below the neck, often consisting of multiple vertical lines that extended over the shoulder and handle. Some geometic motifs were also found on the exterior body.

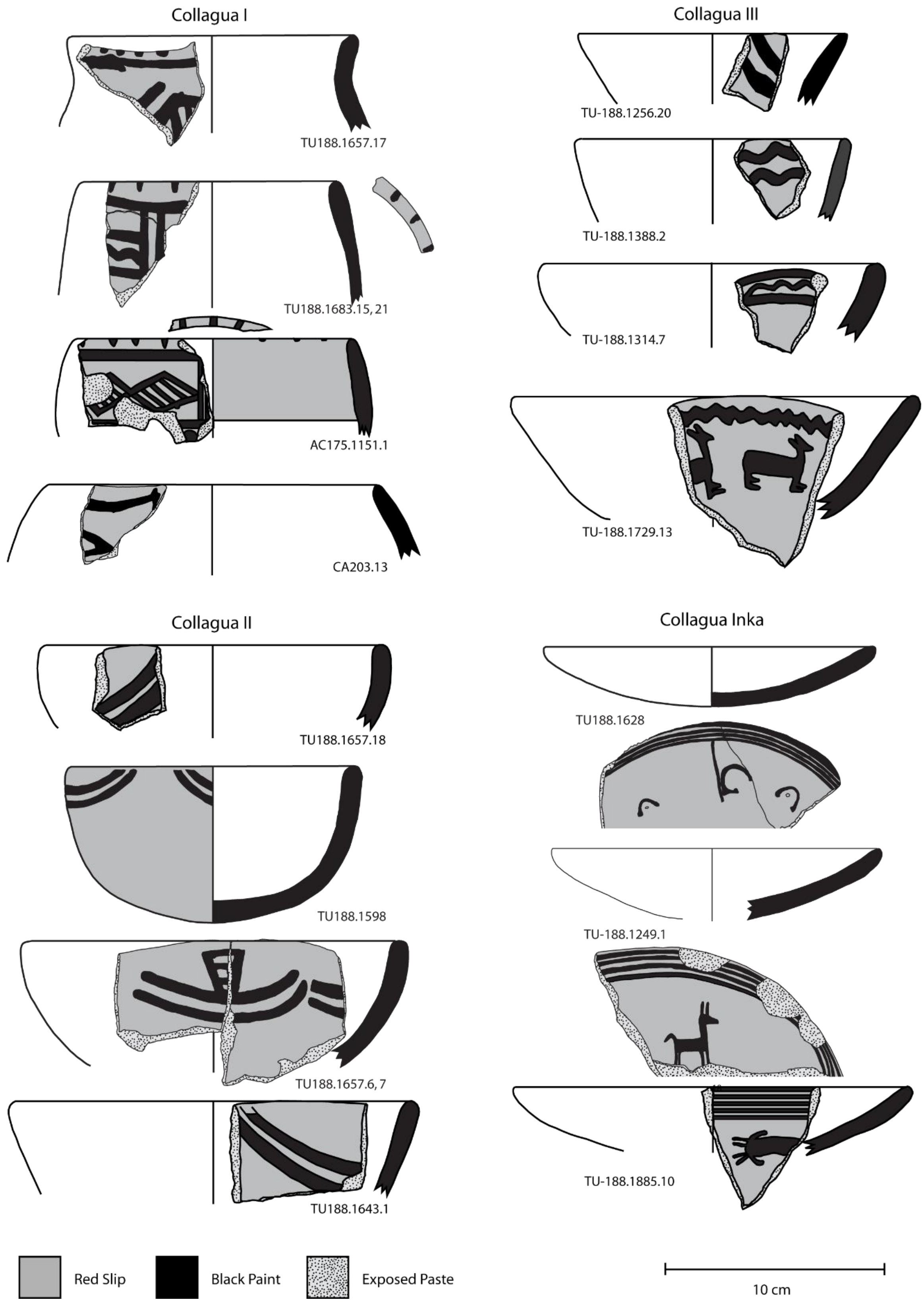


Figure C.1. Overview of Collagua vessels.

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