An Analysis of Fiber Perishables from the Promontory Caves, UT

by

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Abstract

Recent analyses of the Promontory caves assemblages by Ives and colleagues (Billinger and Ives 2015; Hallson 2017; Ives 2014, 2020; Ives et al. 2014; Johansson 2013; Lakevold 2017, in press; Reilly 2015; Rhode, in press; Yanicki 2019, in press; Yanicki and Ives 2017) have renewed interest in Julian Steward's (1937) hypothesis that the thirteenth century inhabitants of the Promontory caves had ties to Northern Dene language-speakers, thus shedding new light on Dene migration and Apachean origins. These studies have largely focused on the similarities between Northern Dene and Promontory moccasins and ceramics, but other artifact classes—namely fiber perishables—have yet to be examined. This study analyzes the Promontory caves' fiber perishable collection and compares it to fiber perishables made by Subarctic and Southwestern Dene language-speakers, and documents intriguing ties to both in the form of twined mats and a unique form of cordage. The Promontory Culture assemblages also suggest the incorporation of neighboring Fremont ideas in the form of coiled basketry.

Preface

This thesis is an original work by Elizabeth Goldberg. No part of this thesis has been previously published.

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This research was conducted on Treaty 6 territory, a traditional gathering place for many Indigenous peoples including the Cree, Blackfoot, Métis, Nakota Sioux, Iroquois, Dene, Ojibway/Saulteaux/Anishnaabe, and Inuit; and on the homeland of the Goshute, Eastern Shoshone, and Núu-agha-tʉvʉ-pʉ̱ (Ute).

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Chapter 1: Introduction

The 13th century Promontory Cave sites, first excavated by Julian Steward and the University of Utah in the 1930s, have long had an ambiguous status in the Fremont-era Great Basin (Billinger and Ives 2015; Hallson 2017; Ives 2014; Ives et al. 2014; Steward 1937). Located on the northern shore of the Great Salt Lake, the site features rich deposits with a high degree of preservation, including more than 300 moccasins—moccasins that, as Steward first noted in his 1937 analysis of the site, are out of place in the Fremont-era Great Basin, and are steeped in the moccasin construction techniques of the Subarctic (Steward 1937:69; see also Billinger and Ives 2015; Ives 2014; Ives et al. 2014; Reilly 2015; Yanicki and Ives 2017). Other sites in the vicinity of the Great Salt Lake, and even sites as far away as eastern Colorado, have yielded the distinctive "Promontory style" of moccasin, alongside a similarly distinctive pottery tradition, and all have been radiocarbon dated within a tight timeframe (Arkush 2016, in press; Billinger and Ives 2015; Gilmore et al., in press; Ives 2014; Ives et al. 2014; Yanicki 2019, in press; Yanicki and Ives 2017). These Promontory-like sites form what is now called the Promontory Phase (Janetski, in press; see also Yanicki 2019), with the eponymous Promontory Caves defining the Early (13th century) Promontory Phase, and the more southern expressions in the Utah Valley as the Late (14th through 15th century) Promontory Phase.

While Steward (1937) posited that the "Promontory Culture" was evidence of Apachean ancestors on their journey to the Southwest (Steward 1937:87), this theory has been overlooked until recently (Ives 2014; Hallson 2017; Reilly 2015). Steward's academic contemporaries through the late twentieth century were for a long time convinced that the Promontory Phase was simply a different economic expression of the local Fremont archaeological culture. This is in part because Dene language-speaking communities, despite a predisposition for retaining language-identity, have a pragmatic relationship with their material culture, oftentimes choosing to adopt substantive aspects of the material identities of their neighbors when it is advantageous to do so. Coupled with a hunter-gatherer lifestyle, evidence of Dene language-speakers in the archaeological record is usually ephemeral and difficult to identify (Ives 1990, 2003, 2014; Ives et al. 2014).

However, John Ives and colleagues at the University of Alberta and Brigham Young University (Billinger and Ives 2015; Hallson 2017; Ives 2014, 2020; Ives et al. 2014; Johansson 2013; Lakevold 2017, in press; Reilly 2015; Rhode, in press; Yanicki 2019, in press; Yanicki and Ives 2017) have renewed interest in the Promontory Caves assemblages and their connection to Apachean ancestors through both recent excavations and new analyses of existing collections. The moccasins, analyzed afresh, have demonstrated more parallels with Subarctic moccasin construction traditions, as well as decorative styles reminiscent of the Plains world (Ives 2014; Ives et al. 2014). Other artifact classes, such as the diverse gaming pieces, suggest similarly broad contacts across much of western North America (Yanicki and Ives 2017). One would expect that a close examination of some of Promontory Cave's other assemblages will add more to the story of the Promontory people. Textiles in particular can be very revealing when it comes to past social boundaries and interactions, as they require a high degree of skill to make, skill that is acquired through culturally constrained social learning processes and thus are quite resistant to change (Adovasio 2010; Carr and Maslowski 1995; Chaiklin and Lave 1993; Jolie 2014, 2018; Lechtmann 1977; Lemonnier 1986, 1992, 1993; McBrinn and Smith 2006; Minar 2000, 2001; Stark 1998; Stark et al. 2008; Weltfish 1932b), and why the fiber perishable assemblage from the Promontory Caves may be especially revealing.

To date, there is no comprehensive study of the Promontory caves woven fiber perishables and how their construction relates to those recovered from contemporaneous sites in the Great Salt Lake region with and without a Promontory component, nor has there been a study comparing the Promontory caves fiber perishables with those in Dene ethnographic collections (Ives 2014; Ives et al. 2014). That is not to say that the Promontory caves perishable assemblage has been completely ignored; indeed, I have done a limited study of the Promontory caves cordage and matting in comparison to both Fremont-era sites and what is known of cords and mats made by Dene language-speaking communities (Goldberg 2018). Adovasio et al. (2002; see also Adovasio 1979; Adovasio and Illingworth 2014a) have also included the Promontory caves in analyses of pre-contact Great Basin textiles, but these authors do not differentiate the site from other Fremont variants. This is unfortunate, as Ives et al. (2014:619) state that the richness of the Promontory Caves fiber perishable record is “critically important,” because it offers a chance to “[expand] the range of material culture that might be assessed for evidence of an Apachean (or other cultural) presence.” Equally unfortunate is that there have been no comparative analyses of fiber arts among Subarctic and Southwestern Dene, likely caused in equal parts by a scarcity of comprehensive studies of Northern Dene woven basketry, mats, nets, and cordage (save for Demoski 1985; Jones and Luke 1985; and Marie and Thompson 2003 and 2004) and the poor organic preservation conditions of Subarctic archaeological sites (Ives 1990:33, 2003; Jones et al. 2013). These factors make the chance of recovering pre-Contact fiber perishable technologies infinitesimally small for many regions. In addition, there has been a stronger emphasis among researchers of Navajo and Apache fiber perishable arts on the well-attested relationship of those perishables to those of Puebloan groups (Collings 1976; Roberts 1929; Tanner 1968 and 1982;

Whiteford 1988), despite archaeological evidence that suggests only a few centuries of Pueblo influence in basketry, at least among the Navajo (Hester 1962; Vivian 1957).

The purpose of this thesis, then, is to conduct and present a fully comprehensive analysis of woven fiber perishables recovered from the Promontory caves, from both Steward's (1937) original collections and those recovered from more recent excavations. This includes artifacts of plant and animal materials in the form of basketry, mats, nets, cords both twisted and untwisted, and miscellaneous objects such as hoops and fiber bundles. In so doing I seek to identify patterns in their construction to better contextualize the Promontory Caves perishable assemblage within the Great Basin archaeological record, and to identify possible connections to Dene language-speaking communities in the ethnographic present. I will also compare the perishable assemblage to other Fremont-era Great Basin sites, particularly the well-dated, contemporaneous, and neighboring site of Hogup Cave.

Research Questions

Textile construction traits most susceptible to transmission over time are those that involve fine motor habits honed through years of repetition and acquired via learning networks (Gilmore and Larmore 2012; Jolie 2018; Lechtman 1977; Lemonnier 1986, 1992, 1993; Ortman and Cameron 2011; Weltfish 1932b). Variance can speak to multiple social scales of interaction, ranging from an individual or descent group level to representation of entirely separate regions, depending on the trait (Jolie 2018). While reliance on one trait in textile construction alone cannot distinguish between different communities, an in-depth analysis of multiple construction attributes together in a single specimen or single site can help make affiliation distinctions, as in Adovasio and Illingworth (2014b).

Through an in-depth analysis of the Promontory Caves woven fiber perishables, I seek to contribute to answers to following research questions:

1. What techniques were used to make the woven fiber perishables at the Promontory Caves site? Are there any patterns in the variability of technological styles?
    a. Is one direction of twist for cordage preferred over another? Is final twist direction correlated with cord diameter or knot type? What materials are preferred, and how processed are those materials? Can function (such as netting or moccasin lace) for some cords be inferred?
    b. Is twining, coiling, or plaiting preferred for basketry? For matting? Are twined artifacts more often simply or diagonally twined, and what weft twist direction is preferred? Do coiled artifacts have a higher rate of interlocked or non-interlocked stitches, and does this correlate with foundation type? What kinds of splicing are used, and are they affected by work surface? What types of selvage are used? Can any fragments be attributed to the same basket/mat?
2. How do the Promontory Caves woven fiber perishables compare to the wider Great Basin world? Are they distinct from contemporaneous Fremont assemblages, particularly those from Hogup Cave or do they suggest deep connections to long-lived local traditions?
3. Do the weaving techniques of the Promontory Caves perishable assemblage bear any connection to Dene language-speaking communities in the Subarctic? In the American Southwest?

Thesis Overview

Chapter 2 explores what is known about the origins of the Dene language-family and what may have triggered a southward migration. Current theories for routes and timing of Dene migrations will be examined, outlining archaeological, oral historical, linguistic, and genetic evidence. In addition, the chapter will also outline what is known of the Great Basin in the 13th century—the contextual backdrop for the Promontory Caves site—including what is known of the Fremont archaeological complex in that region. This will be followed by the history the Promontory Caves excavations, the content of its assemblages, and evidence for and against the various attempts at ascertaining the inhabitants' ethnic identity, especially the question of a Dene language-speaking presence.

Chapter 3 discusses the methodology of fiber perishable analysis. First, theories of social learning are explored to outline how fiber perishables skills are learned and passed down, and how this process can help us elucidate cultural identities, especially in conjunction with the Direct Historical Approach. Second, I outline the process of my ethnographic literature review. Finally, I explain terminology specific to cordage and textile construction and analysis, followed by an explanation of which artifact measurements were taken, the manner in which I recorded cordage and textile construction typologies, and demonstrate how these measurements will be important to the analysis.

Chapter 4 focuses on quantitative results of the Promontory cordage and twined, coiled, plaited, and lattice-like textiles. These categories are subdivided based on construction typologies outlined in the previous chapter and are explained in detail. Following the Promontory assemblage, Fremont-era cordage and textiles from the neighboring site of Hogup Cave are discussed in a similar fashion. Finally, I outline the results of my literature review of Dene cordage and textiles in ethnographic collections.

Chapter 5 puts the above results in context: the fiber perishable assemblage at Promontory is compared with the fiber perishable assemblage of its neighbor, Hogup Cave, as well as with the evolution of fiber perishable technology within the Great Basin. These both are then compared with my findings of Subarctic and Southwestern Dene fiber perishable technologies. Several aspects of the fiber perishable assemblage speak strongly to a Subarctic collection, including plat sinnet weaves, simple looping netted fabrics, and a possible dog travois basket. Other aspects of the Promontory fiber perishable assemblage show broad connections outside of the Great Basin, including sewn and twined matting, plaited textiles, and three-strand braided twining. Still other traits speak to close relations with their Fremont neighbors, including close coiled, single rod basketry with interlocking stitches and rod and bundle basketry with non-interlocking stitches. The above connections are further strengthened by similar conclusions drawn from other studies of the Promontory assemblages, including the moccasins (Billinger and Ives 2015; Ives 2014; Ives et al. 2014), gaming pieces (Yanicki and Ives 2017), and ceramics (Yanicki 2019, in press).

Finally, Chapter 6 summarizes the results outlined in the previous two chapters, and meshes this study's findings with previous analyses of other Promontory assemblages (Billinger and Ives 2015; Hallson 2017; Ives 2014, 2020; Ives et al. 2014; Johansson 2013; Lakevold 2017, in press; Reilly 2015; Rhode, in press; Yanicki 2019, in press; Yanicki and Ives 2017). Artifacts such as plat sinnets, simple looping netted fabrics, and a diversity of twined end selvages point to the Subarctic; other artifacts, such as three-strand braided twining, sewn and twined mats, plaited textiles, and a dog travois basket point to the Pacific Coast and the Columbia Plateau. The coiled basketry, on the other hand, is very much like that of neighboring Fremont populations. In addition, I identify points of interest that warrant further inquiry, including spatial analysis comparisons within the Promontory fiber perishable assemblage should there be further excavations, as well as an analysis of cordage used in moccasins, whose known function can help predict what instances of isolated cordage may have been used for. In conducting this study I hope to demonstrate the importance of rich perishable artifact assemblages, and how close analyses of these rare finds can yield fresh insights into cultural affiliations present at sites from long ago.

Chapter 2: Background

This chapter will cover the origins and extent of the Dene language-family, theories for the Dene migration to the American Southwest, the archaeological evidence for those theories, and the perspectives of Navajo and Apache communities on their respective origins. In addition, the archaeology of the 13th century Great Basin will be discussed, with emphasis on the Fremont archaeological construct, the site of Hogup Cave, and the history of excavations and findings at the Promontory Caves themselves.

The Dene Language-Speakers

Past linguistic scholars have referred to the Dene language-family as "Athapaskan, a name that comes from the Cree place-name for the Peace River delta in northeastern Alberta, meaning "place where there is grass everywhere". However, "Dene" and its variants are the terms many in the language-family use to refer to themselves—meaning simply "people" (Ives 1990:12-13, 15). Languages within the Dene family have ties to Eyak and Tlingit, and distantly to the Yeniseian languages of Siberia (Ives 2010; Ives et al. 2010; Vajda 2010). Within the Dene language family, there are three geographic subdivisions: the Northern Dene languages of Alaska and Canada; the Pacific Coast Dene languages of California and Oregon; and the Apachean (Navajo and Apaches) languages of the American Southwest and southern Plains. The Northern Dene, the most diverse and numerous of Dene language-speakers, had lifestyles that encompassed communal bison and caribou hunting, boreal forest foraging, and sedentary salmon fishing. They include the Deg Hit'an, Gwich'in, Koyukon, Dena'ina, Holikachuk, Upper Kuskokwim, Hän Hwëch'in, Tanana, Ahtna, Tutchone, Tagish, Tahltan, Dakelh, Tsetsaut, Tŝilhqot'in, Dehcho, Dane-zaa, Tłı̨chǫ, Dënesųłiné, K'asho Got'ine, Sahtuot'ine, Shuhtagot'ine, Yellowknife, Tsay Keh Dene, and Kaska Dena, along with the Tsuut'ina, who moved to the

Plains in recent history (Ives 1990:14-15, 2003; Krauss and Golla 1981; Reilly 2015). Among the Pacific Coast Dene the Upper Umpqua, Tututni-Chasta Costa, Galice-Applegate, Chetco-Tolowa in southwestern Oregon and northern California coast made a living from marine mammal hunting and gathering plentiful molluscs, while the Hupa, Mattole, Sinkyone-Wailaki, and Cahto in interior northern California, and the Kwalhioqua-Tlatskanai along the Columbia River caught riverine salmon and harvested acorns (Ives 1990; Miller and Seaburg 1990; Shipley 1978). The Apachean Dene of the American Southwest and southern Plains include the Jicarilla, Chiricahua, Mescalero, and Western Apache and Navajo in the Puebloan world and the Kiowa and Lipan Apache on the Plains (Foster and McCollough 2001; Opler 2001; Young 1983).

Owing to the linguistic diversity outlined above among the Northern Dene, it is unsurprising then that the Western Subarctic is considered the homeland of the Dene language-family, diverging from their Eyak and Tlingit-speaking neighbors within the past 2,000-3,000 years (Vajda 2010). Genetic evidence likewise shows greater diversity in the north, further cementing the notion of a Subarctic origin (Malhi 2012; Malhi et al. 2003, 2008; Monroe et al. 2013). The people who would eventually become the Pacific Coast and Southwestern Dene came from this northern heartland, migrating to the homelands where colonists first encountered them in relatively recent history (Billinger and Ives 2015; Gilmore and Larmore 2012; Ives 1990, 2003, 2010, 2014; Ives et al. 2014; Kelley and Francis 1994; Reilly 2015; Towner and Dean 1996; Schaafsma 1996:22; Seymour 2012a; Wilshusen 2010). Brugge (2012) goes a step further in describing material culture attributes that may tie Southwestern Dene language-speakers to a particular Subarctic group—such as rod-frame halos used in Deg Hit’an ceremonialism and seen in Navajo art in Dinetah and Canyon del Muerto, or a possible connection between the three forks of the quintessential Navajo forked-pole hogan and the three forks of Dane-zaa dwellings—but the archaeological evidence for a northern origin however is, by its very nature, murky. Acidic boreal soils that rapidly break down all save stone stools, when coupled with the ephemeral archaeological footprint of hunter-gatherer lifeways, make identification of a Dene language-speaking presence difficult (Ives 1990:33, 2003). That does not mean the evidence isn't there, or has yet to be uncovered; rather, "... large archaeological constructs frequently turn out to be polyethnic in character… material culture very often masks, distorts, or inverts social relationships where language and cultural differences certainly are present" (Ives 2010:236). Workman (1976), in his research into Ahtna prehistory, suggested the use of multiple threads of evidence to connect a site to modern descendants; namely, position, linguistics, oral traditions, and the direct historical approach. Position, however, relies on the assumption that population movement has not occurred. The invisibility of cultural or ethnic identity in more limited arrays of material culture, when coupled with movement across a vast landscape, makes it difficult to identify migrating Dene language-speakers in the archaeological record.

Migration and Archaeology

The term "migration" in this paper follows the definition laid out in Ortman and Cameron (2011), which covers movement by individuals and kin groups, who are moving from one community to another, and whose identity in their new community may or may not be reflective of their place of origin. Contact is kept with their homeland for a time through both material exchange, kin ties, and cultural traditions. Ortman and Cameron (2011) also note that not all population movements in the past or even the present fit within this definition. Refugees are forced to migrate due to conflict and/or persecution and in their new home are often relegated to a lower social class, while expansion brings colonizers who enforce their own cultural norms on the native population. There are also those moving due to religious ideology. These alternative migration scenarios are important for archaeologists to keep in mind when studying population movements in the past, as the reasons behind migration affect how strongly the migrant population will be holding on to the culture of their homeland as well as the migrants' social standing (Ortman and Cameron 2011).

The migration scenario most archaeologists are familiar with is that of voluntary migration, which begins as a response to various "push-pull" factors. Migrants may decide to leave their homeland due to declining resources and seek a higher quality of life elsewhere, typically to a place with which they are already at least somewhat familiar (Gilmore and Larmore 2012; Ortman and Cameron 2011). These migrations are headed by solitary men or households who are later followed by others, creating "migration streams"; this is in contrast to the wholesale movement of an entire people in a case of forced migration (Ortman and Cameron 2011:240).

Mills (2011) asks scholars to consider three themes in their studies of past migrations: scale, connectivity, and transformation. Scale encompasses the amount of migrants both in comparison to those left behind and the people encountered at the migrants' destination as well as the distance the migrants travelled. Connectivity examines the breakdown of social networks in the place of origin, the networks between those moving, and the new networks built at the destination, establishing "where migration streams will flow, and the economic, social, and ritual relationships established in the new areas" (Mills 2011:349). Lastly, transformation deals with the consequences of the migration itself—including new ideologies, conflicts, hierarchies, technologies, exchange networks, and ethnogenesis. Mills (2011) also identifies three major models for migration: Colonization of Empty Landscapes; Internal Frontier Migration, where migrants move into the space between different groups; and Diasporas, where migrants move into already settled areas.

Unfortunately as Seymour (2012a, 2012b) points out, migration theory has developed out of studies centered on sedentary populations, although studies focusing on the expansion of highly-mobile Numic language-speakers do exist (Madsen and Rhode 1994). While the models of Mills (2011) and Ortman and Cameron (2011) can be drawn upon in studies of Dene migration to the Southwest, complete reliance on mainstream migration theory would ignore differences in the way mobile populations move. Thus, a different approach is needed to examine how a group of Dene language-speakers moved from the Western Subarctic into the American Southwest, and how to identify sites in between the start and end points.

Most scholars agree that Apachean ancestors split off from their Subarctic kin in the relatively recent past (Billinger and Ives 2015; Ives 1990, 2003, 2010; Ives et al. 2014; Reilly 2015). The main "push" factor given the most attention is that of the East Lobe White River (WRAe) eruption, a major volcanic event that blanketed much of the Yukon and Northwest Territories with volcanic ash between A.D. 846-848. It was preceded by a north lobe eruption and ash fall (WRAn) about 500 years before (Jensen et al. 2014; Kristensen 2020). Alaskan volcanoes, such as the one that formed the White River ash fall, erupt with great ash clouds and thunderstorms, sometimes with acidic rain contaminating water sources and causing great damage to vegetation and freshwater ecosystems, as well as respiratory, skin, and vision problems in addition to a significant psychological impact on those who witnessed such a cataclysmic event (Kristensen 2020; see also Ives 1990). The WRAe eruption, which discharged roughly 50 km^3 of ejecta would have left a mosaic of uninhabitable and disturbed landscapes in the 600,000 km^2 downwind from its Mt. Churchill vent at the southern Alaska and Yukon border. It had the potential to create a ripple effect as those immediately affected were displaced, in turn displacing neighbors when communities were unable to absorb the influx of refugees. This may have detached groups at the southern edge of Dene language-speaking lands, moving them farther south toward the Aspen Parkland ecotone and the northern Plains. There to draw them south was the Plains bison-hunting lifestyle, attractive to representatives of so many languages families in both prehistoric and historic times (Billinger and Ives 2015; Ives 1990, 2003, 2010, 2014; Ives et al. 2014; Reilly 2015).

Ives (2003) argues that for the most southern Subarctic Dene populations, the transition to Plains bison hunting would not have been drastic, as bison hunting in the open environments of the Peace and Athabasca valleys would have already provided them with the necessary experience. He outlines three ways for Subarctic Dene language-speaking communities to be drawn into Plains bison-hunting, with the first similar to how present-day Tsuut'ina and Kiowa Apache communities became involved: by forming alliances with other Plains bison hunters, and sharing use of their pounds and buffalo jumps. These alliances would also provide information about what lay further south, as Anschuetz and Wilshusen (2011) hypothesize was the case when Apachean ancestors first encountered the Tanoan language-speaking Kiowa. Other ways for Dene language-speakers to become involved with bison hunting would be through using pounds and buffalo jumps when not in use by other groups, or by beginning non-communal bison hunting in marginal areas of the northern Plains (Ives 2003). As they moved further south, Apachean ancestors would have encountered the Fremont in northeastern Utah, who by A.D. 1150 had largely transitioned from maize horticulture to wetlands foraging (Coltrain and Leavitt 2002; Janetski 1994), from whom they could have recruited for communal bison hunts, a subsistence method that can produce great surpluses, and thus was inherently attractive (Ives 2010; Yanicki, in press).

Hypotheses for Routes to the Southwest. By the time Spanish colonizers entered the Southwest, Apachean peoples were well-established hunter-gatherers on the Plains, trading bison products with Puebloan peoples (Eiselt 2006, 2009, 2012, in press; Habicht-Mauche 1991; Ives 2003; Seymour 2012a; Spielmann 1983, 1991). It would seem intuitive then to find an Apachean presence in Plains archaeology. However, archaeology's reliance on material culture to identify past peoples can make it difficult to identify population movements, even when archaeologists are actively looking for them. Ortman and Cameron (2011:237) write that "traditional conceptualization of cultures as… unitary phenomena, like biological species, that could be followed across time and space…" leave little space for material change in the archaeological record. As one moves further back in time, these cultural identities are "less likely to have existed in the same form" (Ortman and Cameron 2011:237). Ancestral Apacheans are no exception. Dene language-speaking communities, despite their resistance to language change, rapidly adopt the material culture of their neighbors, adding another layer of difficulty when attempting to identify their presence in the archaeological record—a difficulty compounded with the ephemeral archaeological footprint of hunter-gatherer lifeways (Hester 1962; Ives 1990; Ives et al. 2014; Ortman and Cameron 2011; Seymour 2012a, 2012b).

When all of the above is considered, it should not come as a surprise that there is no consensus on the route, timing, number, or nature of Ancestral Apachean migration to the Southwest, or that until recently few archaeologists have searched for the evidence left behind (Gilmore and Larmore 2012; Gordon 2012; Ives 1990; Matson and Magne 2007; Schaafsma 1996; Seymour 2012a; Thompson and Towner 2017; Towner 2016a, 2016b; Towner and Dean

1996; Warburton and Begay 2005; Welch et al. 2017; Wilcox 1981). Wilshusen (2010) identifies four major barriers to identifying Apachean ancestors, emphasizing the Navajo in particular, in the archaeological record: the difficulties in tracing ethnicity back in time, as outlined above; little attention given to consistencies of historical and descendant accounts of the time period; the aforementioned inadequate sampling of the archaeological record; and a tendency among scholars to focus only on the Plains and the Apache, or the southern Rockies and the Navajo, while making little attempt to join these studies despite the likelihood of a single Dene speech community in the American Southwest in the early 1600s. When attempting to identify Ancestral Apacheans in the archaeological record, Sapir (1936; see also Billinger and Ives 2015; Ives 2014; Yanicki and Ives 2017), recommended scholars consider four "strata" that should be present in Apachean cultures: a northern layer, representing their Subarctic origins; followed by adaptation to the pre-equestrian Plains; then an initial non-Puebloan Southwestern influence; and finally a strong Puebloan influence. Seymour (2012b) considers alternative ways to identify mobile groups like the Ancestral Apache in the archaeological record; namely, that "big trips" occurred over an extended period of time, with small groups temporarily moving into new territories for seasonal or daily subsistence purposes before moving back into known territories (see Seymour 2012b:380, Figure 17.3). Over time, these territories would shift to include those newly-ventured areas, creating the migration process. Seymour (2012b) also draws on Chiricahua and Mescalero Apache occupational patterns, where small groups of allied families would come together temporarily for ceremonies and subsistence, dispersing again afterwards. She envisions a similar process for Ancestral Apache migration, with small groups coming together under a popular leader and gradually shifting their range.

Past hypotheses for Ancestral Apachean arrival in the Southwest can be categorized according to route, such as Plains Border, High Plains, Rocky Mountains, and Intermontane, and combinations of the above, as well as timing: A.D. 800-1000, A.D. 1200-1400, and post-Spanish. Founding population size is also a point of scholarly contention (Ives 1990; see also Gilmore and Larmore 2012; Schaafsma 1996; Towner and Dean 1996; Wilshusen 2010). The early entry date for arrival in the Southwest stems from one of the earliest hypotheses for Ancestral Apachean migration: the "enemy peoples" hypothesis, where the entry of Dene language-speakers into the Southwest resulted in the consolidation and abandonment of Pueblo territory (Kidder 1962; see also Ives 1990; Kelley and Francis 1994). The theory of a late (c. A.D. 1450-1500) arrival via Plains migration route gained traction at the beginning of the 20th century with the work of historian A.B. Thomas to establish the western Plains from A.D. 1600-1750 as Apachean territory, as well as archaeological work connecting the Dismal River archaeological culture in Kansas and Nebraska with the Plains Apache (Gunnerson 1960, 1968, 1987; Hester 1962; Hill et al., in press; Ives 1990; Schaafsma 1996; Towner and Dean 1996, Wedel 1959; Wilshusen 2010). The Rocky Mountain and Intermontane hypotheses emerged shortly thereafter following Steward's (1937) work in northern Utah's Promontory Caves, a few sites in western Colorado, and the Largo archaeological culture in New Mexico (Huscher and Huscher 1942; Mera 1938).

The early entry "enemy peoples" hypothesis lost traction as evidence emerged for a drought preceding Pueblo retraction (Wilcox 1981; see also Billinger and Ives 2015; Hester 1962; Ives 1990, 2014; Kelley and Francis 1994). The Spanish referred to the early Apache-Navajo as "Querechos", who, at least by the 1600s, had two basic divisions: hunter-gatherers who sometimes cultivated maize and lived in the mountains and uplands of northern New

Mexico, trading with Jemez, Zia, and Santa Clara Pueblos; and nomadic "vaqueros" of the Plains and eastern New Mexico, who traded bison products with Taos, Picuris, and Pecos Pueblos (Anschuetz and Wilshusen 2011; Eiselt 2012; Wilcox 1981; Wilshusen 2010). Based on these historical records, Gunnerson (1979; see also Ives 1990:47; Kelley and Francis 1994) argued for an Apachean presence in the Southwest by A.D. 1500, raiding the Pueblos by A.D. 1525, and then leaving for the Plains and trading Plains goods with their former enemies. Wilshusen (2010) and Anschuetz and Wilshusen (2011) propose a similar timeframe, with Apachean ancestors entering the Southwest around A.D. 1450, into areas depopulated by the Pueblos in the previous century. By A.D. 1525, they theorize that Southwestern Dene populations were splitting into Mountain and Plains adaptations, diverging into separate speech communities by A.D. 1600, and Navajo emergence by 1650 at the latest. Others, such as Wilcox (1981) and Schaafsma (1996) argued for an even later arrival with a small founding population post-A.D. 1700, dismissing evidence for Rocky Mountains and Intermontane routes as stemming from the Fremont archaeological culture.

But recent work by Gilmore and Larmore (2012) brings forth more evidence for a "Plains Margin corridor", with migrating Dene moving between the Rocky Mountains and the Great Plains. Their evidence comes from new dates on Dismal River archaeological culture ceramics in Colorado and Wyoming, representing a tight date range of A.D. 1300-1650. These ceramics come from high elevations and in marginal, low-site density areas, from just after a population decline in eastern Colorado that began in A.D. 1150. This would have left the area open and uncontested for occupation by Ancestral Apacheans (Gilmore and Larmore 2012). Franktown Cave, a Colorado site with a Promontory component, is also from this area (Gilmore et al., in press). Work by Seymour (2012c) on the impact of terrain on Ancestral Apachean migration further supports the possibility of Rocky Mountain and Intermontane routes. The Colorado River has specific crossing points or "gateways" into the Southwest, such as Cisco and Moab in eastern Utah and Grand Junction and Delta in western Colorado. These crossing points would create funnels into the Southwest, and are located directly north of the earliest Dene sites in New Mexico and Arizona (Seymour 2012c). This may account for why a Dene presence west of the Rockies is limited geographically in scope, as well as explain the substantial cultural differences between Plains and Southwestern Apache groups, even "[shifting] one migration track far enough west to accommodate the Promontory Point material" (Seymour 2012c:156). Seymour (2017) also presents evidence for an early Apachean arrival in the Southwest at the Three Sisters site in southeastern Arizona, with radiocarbon dates from a roasting pit indicating several occupation periods, including one from approximately A.D. 1374 ± 40. Thomas (2017) cautions about the calibration stochastic distortion effect (CSD) which effects radiocarbon dates within particular time frames entering the protohistoric to historic periods, inflating or deflating the calibrated dates. However, he concurs with Seymour's conclusion that the Three Sisters site is one of the earliest Ancestral Apache sites in the Southwest and that it was occupied multiple times.

Tracing a route from the Subarctic to the Southwest is also difficult when the starting point is unknown. Ives (1990, 2010) postulates a "recent and rapid" departure for Apachean ancestors, living with or beside Dene language-speaking communities in the Alberta Aspen Parkland ecotone. This ecotone would have been a permeable barrier between the boreal forest to the north and the plains to the south, allowing Dene language-speakers a passageway to the Plains. Their invisibility in the archaeological record, Ives (1990, 2010) states, is not due to lack of evidence, but rather the identification of their archaeological footprints as something or someone else. Seymour (2012a) notes a similar issue in the Southwest, with non-Dene ceramics found on Dene sites. These ceramics may have been obtained through various means, including raiding and trading, obscuring whether any ceramics found on Dene sites were made by Dene language-speakers themselves. Intermarriage with neighboring peoples further complicates the matter (Seymour 2012a). On the other hand, many of the expected material culture attributes for proto-Dene in the Subarctic are consistent with those of pre-differentiation Dene in the Southwest, including brush huts or wickiups, semi-subterranean structures in sites occupied during the colder months, and reuse of sites (Seymour 2012a). This suggests that Ancestral Apachean sites in the spaces between would have similar features.

The focus on a single route to the Southwest also obscures the complexity with which peoples, past and contemporary, lived. Hunter-gatherers, including Dene language-speakers, often had different land-use practices over the course of a year, such as hunting bison seasonally or only on occasion. Given this, the social aspect of bison hunting through trade and the gathering of peoples may have motivated Dene language-speakers to move southward from multiple points (Ives 2003). Brugge (2012) also acknowledges the possibility of multiple migration routes, suggesting that if there were Dene language-speakers who entered the Southwest from the Great Basin, they would have crossed the mountains in pursuit of bison from the Plains. This scenario is in turn supported by some Navajo oral traditions.

Regardless of which route or routes Ancestral Apacheans took to the Southwest, there are some circumstances surrounding their travel that are not disputed. Genetic analyses of Y-chromosome data and sequence variation in mtDNA haplotypes demonstrate that Ancestral Apacheans underwent a founder effect, with further fissioning events as they travelled into the Southwest evidenced from reduced mtDNA haplogroup A diversity (Malhi 2012; Malhi et al.

2003, 2008; Monroe et al. 2013; see also Billinger and Ives 2015; Ives 2014). But by the time of Spanish contact, Apachean societies were a large and significant part of the Southwestern world. Their oral traditions support genetic data demonstrating that many non-Dene joined Apachean societies, such as the Puebloan origins of some Navajo clan ancestresses (Ives 2014; Malhi 2012; Wilshusen 2010; Zolbrod 1984). The work of Malhi (2012), Malhi et al. (2003), and Monroe et al. (2013) further shows that Navajo and Western Apache populations have Southwestern ancestry dating further back in the female line than other Apachean peoples, an ancestry that fits best with a one-way incorporation of Tanoan and Fremont women into Dene societies.

Linguistic data tell a similar story: all Apachean languages share internally innovated-- not borrowed-- words for plants and animals that would not be familiar to their Subarctic ancestors, such as maize and wild turkeys. This suggests a small, cohesive speech community (Billinger and Ives 2015; see also Ives 2014; Wilshusen 2010). Dispersal westward resulted in fissioning events that created the distinct Apachean speech communities seen today, with Plains and Kiowa Apache making up the eastern end of the dialect chain and Navajo at the western end (Billinger and Ives 2015; Ives 2014). Ives' (1990:350) study of Northern Dene kinship systems further shows that while cross-cousin marriage was common in parts of Alaska, the Yukon, and northern BC, shifts in Dravidian kin systems are prevalent among other Canadian and Apache Dene populations, where cross-cousin marriage becomes taboo. For example, Tsuut'ina and Kiowa Apache populations use sibling terms to refer to cross-cousins and thus enforce small co-residential group exogamy. Based on this and the clear genetic evidence, Ancestral Apacheans developed a preference for exogamy from these shifts in otherwise Dravidian kin system, a practice which would also have helped to form alliances upon entry into the Plains and Southwestern worlds (Ives 1990, 1998; see also Ives 2010; Reilly 2015).

Ives (2010) outlines several parameters for Ancestral Apachean expansion from the Subarctic. The first is a small founding population with endogamous marriage that experiences growth both internally but most importantly by incorporating neighboring peoples and especially women. The founding population then adopts the material and ceremonial culture of their neighbors upon exposure to new physical and cultural environments, but maintain their language in spite of all the above (Ives 2010). The Kiowa Apache and Tsuut'ina, as mentioned above, both demonstrate how small founding populations can be drawn into and thrive in the Plains cultural "vortex" (Ives 2003). This scenario, then, is feasible for an ancestral Apachean population as well.

Oral histories among Southwestern Dene language-speakers vary on their respective origins. The oral histories of the Chiricahua Apache tell of migration into the Southwest along the flanks of the Rocky Mountains, which would be consistent with the earliest archaeological evidence outlined above of a Dene presence in the Southwest (Seymour 2012a). The Navajo, on the other hand, contend that the Dinétah—the region centered around Ch'ool'i'i (Gobernador Knob) and Dzil Na'oodilii (Huerfano Mesa) in the northwestern corner of New Mexico—is their ancestral homeland, with To'aheedli (where the San Juan and Los Pinos rivers meet) as the site of the Gathering of the Clans (Anschuetz and Wilshusen 2011; Hester 1962:17; Kelley and Francis 1994:165; Wilshusen 2010; Zolbrod 1984).

The Gathering of the Clans in Navajo oral history tells how different peoples each formed one or more ancestral Navajo clans, bringing with them varied social practices, histories, knowledge, and skills—including basketry—which they shared in the emerging Diné identity (Wilshusen 2010; Zolbrod 1984). This ethnogenesis fits well with the genetic evidence outlined above, namely that Southwestern Dene peoples, and in particular the Navajo and Western

Apache, have a deep history of incorporating neighbors into their society (Yanicki and Ives 2017). Brugge (2012) interprets the Gathering of the Clans somewhat differently, inferring that the early Navajo were Southwestern hunter-gatherers who incorporated Dene language-speaking migrants into their culture, ultimately adopting their tongue.

Regardless, oral histories can offer archaeologists another line of evidence for past societies. Echo-Hawk (2000) asserts that oral traditions are reliable sources on a group's ancestry if they fit the following criteria: that it is a group account of their own origin; historical rather than fictive; and can be supported by other lines of evidence. In the case of the Navajo's Gathering of the Clans, all of the above are true (Wilshusen 2010).

Seymour (2012a:6) notes that "the expectation for the presentation of a single cohesive perspective [with regards to archaeology and oral histories] is a feature of modern politics", as oral histories often vary even within tribes. Researchers are more likely to represent the oral histories of those with the most social capital regardless of whether or not other community members agree. She points out that each of the sixty Navajo clans have separate origin stories that have been passed down in different historical contexts; the same is true for the Western and Chiricahua Apache. In addition to all of the above is the impact of modern politics with its own distortive lens. To help distinguish Southwestern Dene language-speakers in the ethnographic present from their ancestral counterparts in the archaeological record, Seymour (2012a:10) introduces the idea of "pre-differentiation [Dene]" in order to acknowledge the likelihood that these early migrants changed in material and social culture prior to and during their time in the Southwest, rather than taking oral histories at face value. This includes the incorporation of peoples encountered along the way. While there has been a plethora of research on the ways Plains and Southwestern peoples influenced Apachean cultures, as more evidence comes of migrations along and to the west of the Rocky Mountains the influence of Great Basin peoples must also be considered.

The Great Basin in the 13th Century

Based on dates from Dismal River ceramics from Colorado and Wyoming (Gilmore and Larmore 2012; Gilmore et al., in press), the Three Sisters site in Arizona (Seymour 2017), Navajo oral traditions (Zolbrod 1984), and data from the Promontory caves, Dene language-speakers may have started entering the Southwest by the 13^{th} century (John Ives, personal communication 2020). Looking west and north to the eastern Great Basin, a region centering on the area of Utah north of the Colorado River and neighboring parts of Wyoming, Nevada, Idaho, and Colorado (Adovasio 1986), one would expect to see a Dene presence either at the same time or a little before. This section examines what we know archaeologically of the eastern Great Basin in the 13th century, and thus the peoples migrating Dene language-speakers would encounter: the Fremont.

The Fremont. The Fremont Complex is the collective name for the various farming and foraging peoples who lived in Utah and parts of Nevada, Idaho, and Colorado from approximately AD 700 to 1300. These archaeological peoples have been defined primarily by a shared pottery, basketry, distinctive figurines, a variety of fixed architectures, and rock art tradition alongside a sedentary lifeway with at least some reliance on maize agriculture in combination with foraging. Significant Fremont-era sites in the eastern Great Basin include Danger and Hogup Caves (Adovasio 1970, 1979, 1986; Adovasio and Illingworth 2014b; Adovasio et al. 2002; Aikens 1966, 1970; Goff 2010; Hallson 2017; Ives et al. 2014; Jennings 1957; Madsen and Simms 1998; Martin et al. 2017; Simms 2008; Yanicki and Ives 2017; Yanicki 2019).

By the later 13th century, the Fremont were in the middle of the third drought since A.D. 990 (Benson et al. 2007; Kohler et al. 2014). Maize horticulture suffered and decreased in importance after the destabilization of the first drought in the 11^{th} century and was abandoned after the second drought in the 12^{th} century, and just after the end of the 13th century, Fremont material culture would disappear from the archaeological record (Aikens 1966; Billinger and Ives 2015; Coltrain and Leavitt 2002; Ives 1990, 2003, 2014; Ives et al. 2014; Kelley and Francis 1994; Madsen and Simms 1998; Wilshusen 2010; Yanicki and Ives 2017). With no easily distinguished direct descendants, the ultimate fate of the Fremont remains uncertain. Fremont populations in more southern habitations likely were absorbed into the Puebloan world (Kohler et al. 2014), while those in the northeastern Great Basin who already supplemented maize with a hunting and gathering lifeway may have abandoned horticulture completely in favor of communal bison hunting (Ives 2003, 2014), a shift similarly made by ancestors of the Kiowa (Ortman and McNeil 2018).

The Fremont were not the only peoples undergoing significant change at this time: the Puebloan world significantly contracted, and the Mississippian region east of the Great Plains saw the collapse of Cahokia (Benson et al. 2007; Kohler et al. 2014). The time just before and during the 13th century saw "significant cultural fluidity that included a number of human migrations… and new social landscapes that in many cases featured a greater range of opportunities for hunter-gatherer populations" (Ives et al. 2014:618; see also Kemp et al. 2017; Kohler et al. 2014; Ortman 2016; and Schwindt et al. 2016). This is the backdrop with which new inhabitants came to live in the Promontory Caves

The Promontory Caves

The Promontory caves were first excavated by Julian Steward and the University of Utah from 1930-1931. Steward visited 11 cave sites in the vicinity of the Great Salt Lake, with Caves 1 and 2 yielding the most artifacts (Steward 1937; see also Billinger and Ives 2015; Hallson 2017; Ives 2014; Ives et al. 2014; Reilly 2015). Cave 1 in particular yielded artifacts from "a culture which is entirely new" (Steward 1937:6). Cave 1 is 30-35 meters deep and 40-45 meters wide for a total area of approximately 1300 m^2, with a ceiling ten meters high in the center (see Fig. 2.1, 2.2). A rockfall divides the cave into two parts, with most artifacts found west of the rockfall (Lakevold 2017, in press). Cave 2 is closer to the shore of the Great Salt Lake at only 85 meters above lake level. Both Cave 1 and Cave 2 were likely formed through wave erosion due to the presence of deep-lake carbonates, which only form in caves and sheltered areas inundated by water (McGee et al. 2012; Lakevold 2017, in press).

Steward's (1937) initial interest was to detect the earliest occupations in the Promontory caves, but he found little evidence of human occupation earlier than the Promontory Phase, a fact that makes Cave 1 stand out from the rest of the region. Many cave sites in the Eastern Great Basin, such as Danger and Hogup Caves (Aikens 1970; Jennings 1957; Martin et al. 2017), have well-stratified occupation histories. Cave 2 has more developed stratigraphy than Cave 1, with an *Anodonta* shell dating to over 10,000 years ago (Janetski, in press). However, like Cave 1, the most significant occupation was the comparatively recent Promontory Phase (defined below), which dates to approximately A.D. 1250 in Cave 1 and A.D. 1350 in Cave 2 (Ives et al. 2014; Janetski, in press; Steward 1937:106). It was from this occupation level—in places padded with

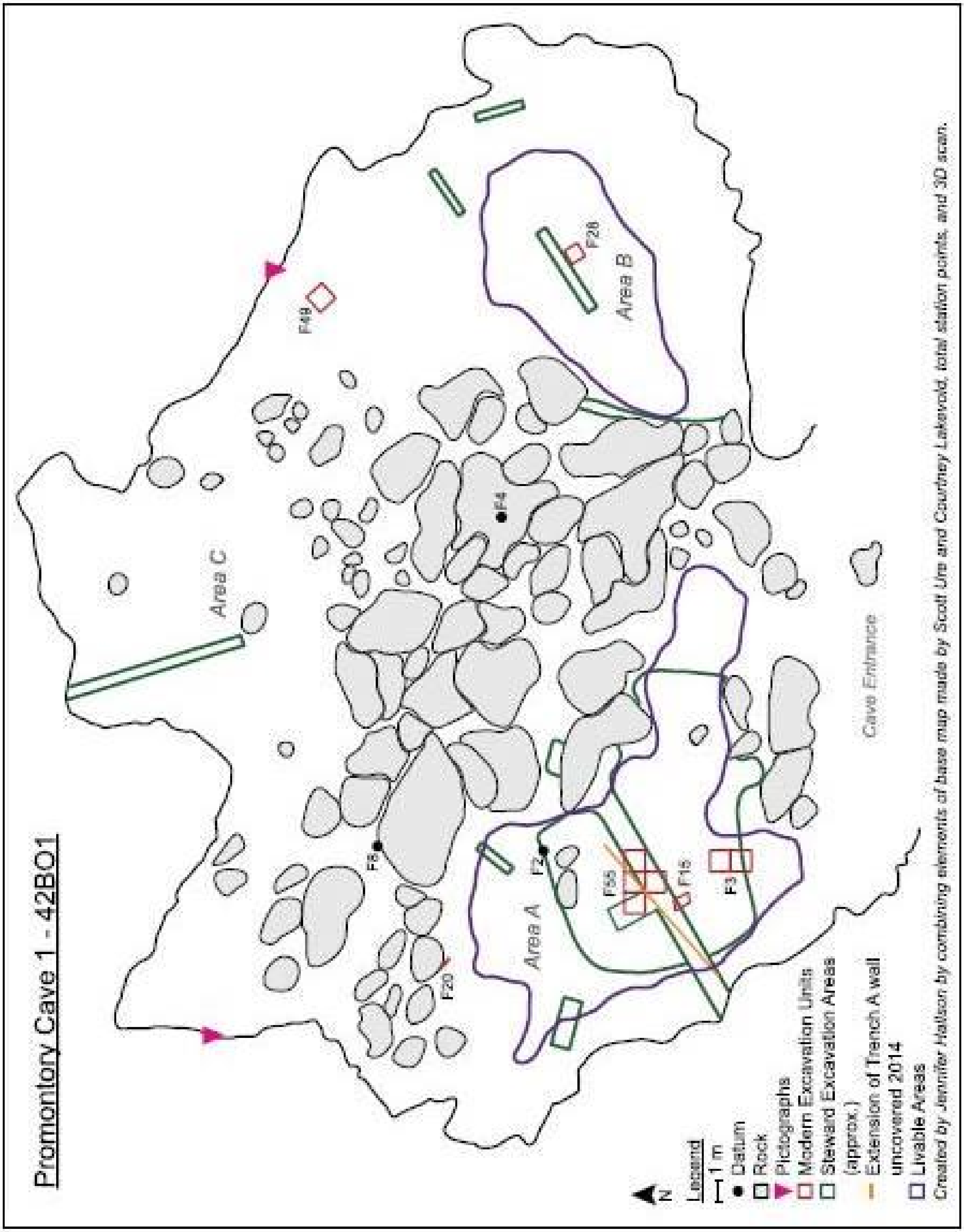

Figure 2.1: Plan map of Promontory Cave 1. Use with permission from Hallson (2017).

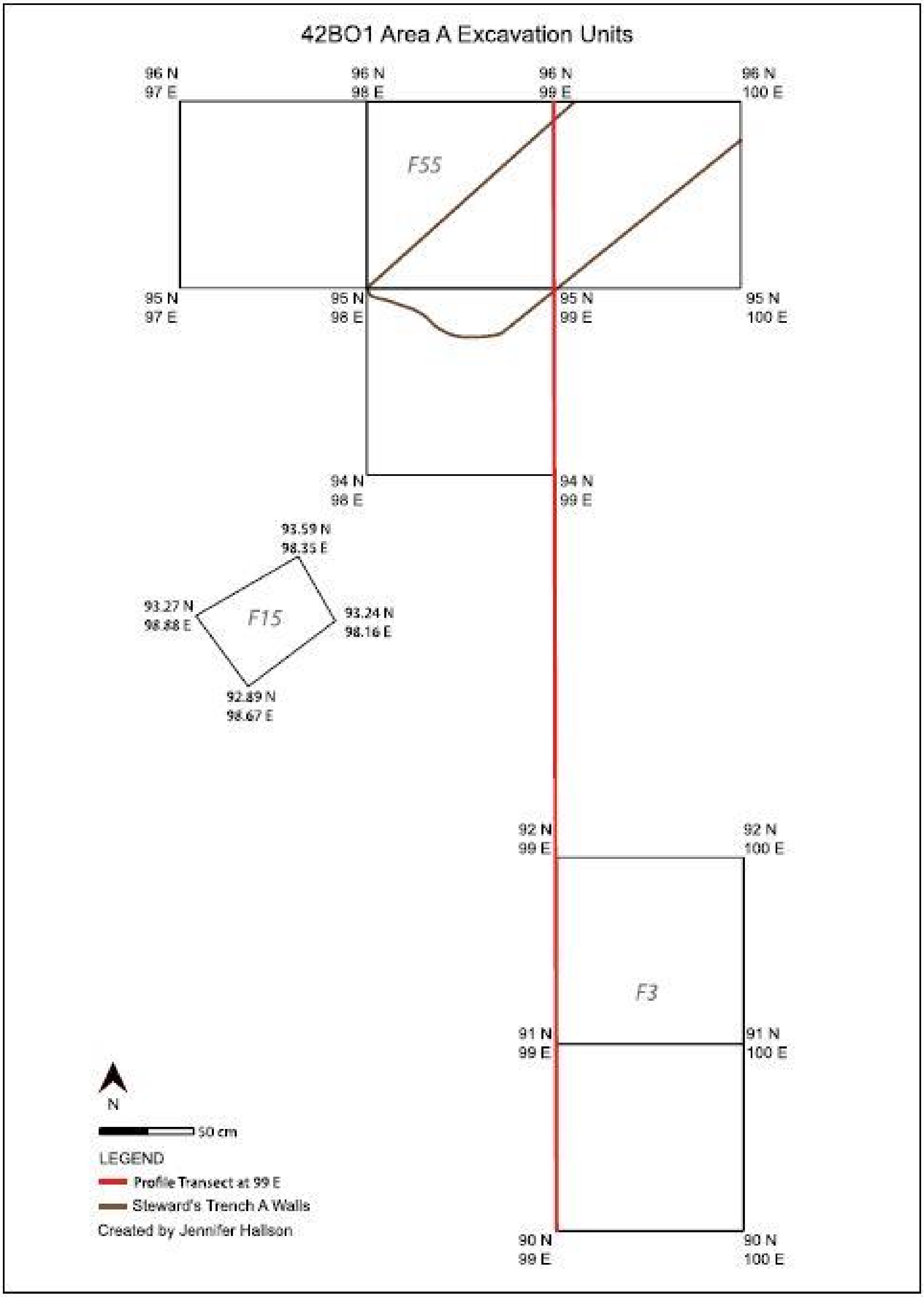

Figure 2.2: Map of 42BO1 Area A excavation units. Used with permission from Hallson (2017).

masses of juniper bark up to 15-20 cm thick—that the majority of artifacts in Caves 1 and 2 were found (Steward 1937). Recovered from the Promontory Phase stratum were fragments of arrow butts, foreshafts, points, and smoothers; bow fragments; fire drills; digging sticks; juniper bark rings; wood fragments wrapped with sinew, among other humanly modified wood fragments; cane gambling pieces; hoop-and-dart game pieces; gaming bones; bone awls; bone tools; bone modified with butchering marks from food processing or modified for adornment, such as tubular beads; hoof, horn, and antler objects; shell fragments; woven textiles such as mats, bags, basketry, nets, and more; twisted and knotted cords of plant and animal fibers; various hide objects, including two mittens, a bag, and an irregularly woven piece here classified as a lattice-like textile; a possible water drum top; and 250 pieces of footwear, 245 of which came in a distinctive moccasin pattern. (Steward 1937). Cave 3 yielded arrow butts and foreshafts, digging sticks, and one cord, and other caves contained points and bone awls. All caves had pottery save Cave 10 (Steward 1937). Renewed excavations from 2011-2014 were conducted by the University of Alberta and Brigham Young University (Hallson 2017; Reilly 2015).

Steward believed that given the closest freshwater source was 4 km away, the Promontory Caves were only occupied in the winter when snow could be melted as a water source (Steward 1937; see also Ives 2014). However, more recent studies on faunal remains and seeds recovered from the caves suggest year-round occupation, with inhabitants coming and going throughout the year, as there were periods of time without human occupation based on the presence of wild sheep, antelop, deer and leporid dung (Hallson 2017). The seasonal campsite 10OA275 in southeast Idaho, with similar ceramics in terms of form, temper, and paste, and occupied in the same timeframe as Cave 1, may have been part of this seasonal round (Arkush 2016, in press; Hallson 2017; Yanicki 2019).

Ives (2014) suggests that the population of the Promontory Phase inhabitants in Caves 1 and 2 were more in the range of a microband who subsisted on bison and antelope hunting, with no evidence of subsistence on wild seeds (Billinger and Ives 2015). The caves could hold 150-200 individuals and still offer relative privacy based on how its shape and internal rockfalls muffled sound (Hallson 2017; Lakevold 2017). However, when the presence of domestic activities that take up a lot of space (like processing staked-down bison hides) are taken into account, the number drops down to 30-50 individuals (Ives et al. 2014). Analysis of moccasin sizes suggest that more than 80 percent of the moccasins was worn by children or subadults under 12, suggesting a growing population (Billinger and Ives 2015; Ives et al., in press).

Much of the more recent research into the Promontory Caves has focused on the more than 340 moccasins recovered by Steward (1937), the 2011-2014 excavations, and present in other private and museum collections (Billinger and Ives 2015; Ives 2014; Ives et al. 2014). The majority (73.1%) the moccasins have been mended, suggesting they were used and reused before discard (Billinger and Ives 2015). There are also repurposed, "scavenged" pieces of moccasins involving ankle wraps and vamps. Altogether, the moccasin and other evidence suggests that domestic activities took place at the site, involving a population "... with a refined sewing tradition, not the stray deposition of an occasional item of footwear" (Ives 2014:156). Given that individuals would go through multiple pairs of moccasins in just one season, Reilly (2015) suspects that the number of moccasins at Promontory Caves is far larger than that recovered, and estimates based on moccasin length, number, and the average area of bison hide, that anywhere from 120 to 542 bison were killed to produce the Promontory moccasins. This number does not include other ways that bison hide was put to use at the site, from other clothing items and robes to hide cords, requiring an average of 5-10 bison hides per person per year to sustain the domestic activities. Hallson's (2017) study of artifact accumulation estimates the number of moccasins removed or still present in the Promontory caves at around 2400.

Steward (1937:83, 86) had estimated the Promontory Phase occupations as beginning around A.D. 1200, arriving prior to and continuing after the end of the Fremont archaeological culture (see also Billinger and Ives 2015; Hallson 2017; Ives et al. 2014). Fifty-one new AMS dates from artifacts recovered by Steward show that he was not far off, ranging from 662-826 years B.P. (cal. A.D. 1166-1391) in both Caves 1 and 2. Ceramic residue ages are slightly younger, dating from 330-610 years B.P. (cal. A.D. 1290-1465) (Ives et al. 2014), although residue dates can be less reliable. Bayesian modelling of the Promontory Caves AMS dates further narrows the occupation window to around 20-50 years between A.D. 1250-1290, or about two generations (Ives et al. 2014; see also Thomas 2017 for the strengths of Bayesian modelling). While there is uncertainty surrounding why such a rapid, intense occupation would move on just as rapidly, by A.D. 1400 many other sites in the vicinity of the Great Salt Lake and into the Utah Valley were occupied by populations making Promontory-style ceramics, but with greater emphasis on wetland rather than bison resources (Ives et al. 2014; Janetski 1994, in press). These sites encompass the later Promontory Phase, defined by Promontory ware ceramics and, in earlier sites, reliance on bison hunting. The change in subsistence at later sites, with a switch from sheltered to open sites, may be due to a decline in bison populations at the end of the 13th century (Billinger and Ives 2015; Janetski, in press).

Promontory Origins

For decades after Steward's (1937) publication, there was little further research into the former inhabitants of the Promontory caves. Aikens (1966; see also Ives et al. 2014) saw the Promontory Phase as a Fremont cultural variant, and the Fremont as a whole of Apachean origin, although the Fremont were later proved to have originated far earlier than Promontory. Sites with a Promontory Phase then came to be known as part of the "Promontory Problem" (Forsyth 1986; see also Ives 2014) and remained unaffiliated with any other known archaeological culture or their modern descendants, which gives archaeologists an opportunity to examine this portion of the record within the context of ethnogenesis (Yanicki 2019, in press). Billinger and Ives (2015; see also Ives et al. 2014) lay out three possible scenarios for the origins of the Promontory Caves population. They were either: 1) a terminal Fremont group who had moved away from maize horticulture in favor of bison hunting; 2) one of the first groups of Numic-speaking peoples, such as the Shoshone, to arrive in the northeastern Great Basin in the late prehistoric era and continued living there through the ethnographic present; or 3) a group of migrating Ancestral Apacheans.

Comparisons to the Fremont and Numic-speakers. The early ceramics recovered from Promontory caves in some ways resemble Fremont Uinta Gray ware, with crushed calcium carbonate and crushed calcite tempers and thin walls, but are well-made enough that Yanicki (2019, in press) suspects the Promontory inhabitants arrived with their own ceramic tradition derived from the Uinta Fremont. He argues that prior to the Promontory caves occupation, the Promontory inhabitants encountered Uinta Fremont, and actively recruited Fremont women into their society at a time when subsistence centered on bison would have been an attractive alternative to farming (Yanicki 2019, in press). Discrepancies in refinement within the Promontory ceramic assemblage can be attributed to differences in skill between the recruited Fremont women and learners, both women without a background in ceramic-making and children (Yanicki, in press). In contrast, the Promontory ceramics are significantly different from

Shoshonean pottery in the absence of pointed bottom Intermountain ware and "flower pot" forms made by northern Shoshone (Yanicki 2019, in press).

Hock, Fremont, and Hogup moccasins are all very different from the moccasins recovered from the Promontory Caves. Hock moccasins are formed from the cylindrical skin of the lower limb of an ungulate, and Fremont and Hogup moccasins have a "top downward" manufacture while Promontory moccasins are sewn from the bottom-up (Ives 2014; see also Brugge 2012; Ives et al. 2014; Yanicki and Ives 2017). Hock and Fremont moccasins are not as well-tanned as those from the Promontory Caves and date to centuries earlier. They also have far coarser stitching, averaging 1 stitch per cm or less, whereas Promontory moccasins have 7-8 stitches per cm. Hock and Fremont moccasins also favor antelope or deer hide, and while some Promontory moccasins are also made from these animals, bison hide with the fur turned inward is the material of choice. The Promontory Caves craftswomen still managed to sew much more finely despite their preference for this much thicker material (Ives 2014).

In addition to the ceramics, evidence for a Fremont presence at the Promontory Caves comes in the form of the coiled basketry (see Discussion) and three red petroglyphs found in Cave 1. Two of these depict triangular-bodied, human-like figures which resemble figures from other Fremont sites. The third is of a faded mountain sheep (Steward 1937:87-88, 121; Ives 2014). In contrast, the only evidence for a Shoshonean presence is a fragment of a diagonally-twined winnowing tray, but it is AMS radiocarbon dated to 165 ± B.P., and thus was deposited long after the Promontory Phase inhabitants left the caves (Ives et al. 2014; see also Hallson 2017; Yanicki and Ives 2017).

Steward (1937:122-123) saw great discontinuity between the Promontory Phase and earlier occupations. The absence of diagnostic Shoshonean artifacts such as steatite vessels and

Shoshone knives also renders a Numic connection an ill-fit, a point Steward (1937:7, 86; 1955), who had done much ethnographic work with Numic-speaking populations and was thus familiar with their material culture, also made. That brings us to the third scenario: that the Promontory Phase inhabitants somehow involved Apachean ancestors.

Connections to the Dene World. Steward (1937) himself concluded that the Promontory Caves were connected to Dene language-speakers, though it took decades for this theory to gain any attention. Ives (2014) believes this is in part due to Steward's own championing of cultural ecology and processualist approaches to interpreting archaeological sites, forcing migration interpretations to fall out of favor. As discussed in the previous sections, the tendency of Dene language-speaking communities to adopt the material culture of their neighbors makes it difficult to identify them in the archaeological record. Additionally, their material culture at this point in history would appear neither wholly Subarctic, Plains, nor Southwestern in origin; rather, we should expect to see a blend of these traits, especially given that Navajo and Apachean groups as we know them today did not yet exist (Ives 2014).

To begin with an example from the Promontory Caves assemblage, the pottery would seem to set the inhabitants apart from Dene language-speakers. The archaeological record of the western half of the Canadian Subarctic has shown the Subarctic Dene to be aceramic. However, Navajo and Apache communities developed Plains- and Southwestern-influenced pottery traditions. Promontory ware thus could be an example of Apachean ancestors assimilating a pottery tradition from their neighbors, such as the Fremont, as convincingly argued by Yanicki (2019, in press). Steward (1937:44) also notes that the ollas recovered from the Promontory Caves are shaped in a similar fashion to water drums among modern Navajo populations, and may imply a connection; a hide drum cover also recovered strengthens this connection.

The presence of *chi-thos*, a problematic term but typically used to describe D-shaped, bifacial tabular scrapers, at Promontory Caves shows a connection to the Canadian Subarctic. These stone tools are well-known both in the archaeological and ethnographic records in the western North America as hide-processing tools, but are unusual for a Fremont site and are absent from nearby Hogup and Danger Cave assemblages for 2000 years prior to the Promontory Phase (Billinger and Ives 2015; Brugge 2012; Ives 2014; Ives et al. 2014; Reilly 2015; Yanicki and Ives 2017).

More connections toward the north come in the form of the Promontory Caves' obsidian sources. Obsidian from Promontory Phase deposits come predominantly from the Malad obsidian source 80 km to the north (Janetski 1994; see also Billinger and Ives 2015, Ives 2014). Gaming pieces recovered from the site are more like those from the Subarctic and Pacific Coast Dene than Great Basin Fremont, and with much greater variety—a variety that is likely due to the incorporation of women from other societies, a scenario already evidenced in the ceramics (Yanicki 2019, in press), given that dice games are typically played by women (Yanicki and Ives 2017). More evidence for the incorporation of women will be seen later in analyses of the fiber perishable artifacts.

Few artifacts of clothing (save for the moccasins) were recovered from the caves. Through the lens of a Dene language-speaking presence, the fact that Dene peoples hold their garments in high regard even when worn through may explain this apparent discard discrepancy (Reilly 2015; Thompson 2013:18). The vast amounts of shredded juniper bark throughout the caves is reminiscent of the homes of Subarctic Dene, many of whom use spruce boughs to cover the floors of their homes and were regularly replaced with fresh branches. With no spruce trees in the Great Basin, shredded juniper bark may have served as a substitute (Hallson 2017).

The assemblage most suggestive of a cultural discontinuity reflected in the Promontory caves would be Steward's 250 moccasins, 245 of which are sewn in the distinctive Promontory style. The rest of the moccasin assemblage consists of five hide "sandals", moccasin pads or linings, and fragments (Billinger and Ives 2015; Ives et al. 2014; Steward 1937). While the "sandals" are typical for the region, they are far outnumbered by the Promontory style of moccasin, which is more akin to styles in the Subarctic and Great Lakes region than those from Fremont sites and further west (Hatt 1916), a fact that drew Steward (1937) to his conclusion that the Promontory site had northern, and most likely Dene, ties. Northern Dene moccasins have been categorized by the Bata Shoe Museum as a BSM 2(Ab) style, characterized by having a soft sole, an apron or vamp over the arch that meets a front seam running into a pointed toe, a T-seam at the heel, and all sewn in two pieces; slightly later in time comes the BSM 2(Bb) style, which lacks the center toe seam, and has an apron sewn directly to the lower edge to create a puckered toe (Thompson 1990, 1994; Webber 1989). Most Promontory moccasins are sewn in the BSM 2(Bb) style, save one example from Cave 2 (42BO2 10070) that is sewn in BSM 2(Ab), demonstrating that both historic Subarctic moccasin styles were known to the Promontory caves inhabitants (Ives 2014). A moccasin found from the melting Yukon ice patches, AMS radiocarbon dated to 1430 ± 40 radiocarbon years BP, is in the BSM 2(Ba) style, a minor variant of the BSM 2(Bb) form because it has a straight seam at the heel (Greer and Strand 2012). This discovery demonstrates that the Promontory moccasin construction techniques were present in the western Subarctic 700 years before the assemblage at the Promontory Caves (Ives 2014; see also Billinger and Ives 2015; Ives et al. 2014; Yanicki and Ives 2017). Other Promontory-style moccasins have been recovered elsewhere. A single moccasin from the Colorado site of Franktown Cave is contemporaneous with the Promontory assemblage (Ives et al. 2014). The decoration of the Promontory moccasins (quillwork sewn with parallel rows of sinew) is similar to that of modern Dënesųłiné moccasins (Reynolds 1977). Moccasin piping to cover apron seams uses cord wrapped in basketry material, a common Subarctic practice. However, the red battleship-shapes on a cream background used as decorative design on one moccasin seems to be a combination of Subarctic and Plains decorative traditions, a strong piece of evidence for the Promontory Caves representing a cultural midway point for Ancestral Apachean populations (Ives 2014:156).

The extensive work by John Ives (2014, 2020), Joel and Janetski and colleagues (Billinger and Ives 2015; Hallson 2017; Ives et al. 2014, in press; Johansson 2013; Lakevold 2017, in press; Reilly 2015; Rhode, in press; Yanicki 2019, in press; Yanicki and Ives 2017) on the Promontory cave assemblages, but in particular the moccasins, support Steward's (1937) original hypothesis of the site's Dene origin. Bayesian modelling of artifacts with "northern" as opposed to "southern"-seeming traits show that while their ages overlap, "northern"-seeming artifacts predate those characteristic of the region, pointing to an intrusive population that over time adopts the material culture of their new neighbors. Bayesian modelling for the dates of more finely sewn artifacts versus coarser ones show the most finely sewn artifacts were deposited at the onset of occupation (Ives et al. 2014). The women at the Promontory Caves would have brought these sewing skills with them along with their expertise in bison hide tanning, generating social capital in the Great Basin world (Reilly 2015). This is also seen in Spanish historic records of Apachean women trading bison hides with the Pueblos, bridging social interactions that led to the incorporation of Puebloan women into Apachean society (Eiselt 2006, 2009, 2012, in press; Habicht-Mauche 1991; Spielmann 1983, 1991; Yanicki and Ives 2017). This process was likely already underway at the Promontory Caves.

Fine skills like moccasin sewing traditions can help archaeologists identify affiliations, as they are unlikely to change over time. While the sewing seen at the Promontory Caves is widespread throughout the Subarctic, it is only Dene language-speakers one would expect to see in the Great Basin at that time (Ives 2014; Ives et al. 2014). This does not mean that only Dene language-speakers were at Promontory—given the hardships faced by Fremont populations in the 13th century, the comparatively rich bison hunting conducted by these northern newcomers would offer a compelling incentive to intermarry with them (Hallson 2017; Ives 2014; Yanicki 2019, in press; Yanicki and Ives 2017). The contemporaneous Fremont site of Chournos Springs (42BO1915) lies only four km away from the Promontory Caves, and the presence of pottery and one-rod-and-bundle basketry at Promontory suggests that trade with Fremont populations took place, if not wholesale incorporation of new members of that society (Hallson 2017; Lakevold 2017, in press; Yanicki and Ives 2017). Basketry and other perishable artifacts, like moccasins, are made using skills learned through socially-bound learning networks that can be used to identify site affiliation, as outlined in the following chapter.

Chapter 3: Methods

This chapter covers the theoretical background for my research—namely, the application of social learning theory to archaeological assemblages, as well as the benefits and drawbacks of the direct historical approach to artifact interpretation—and a literature review of fiber perishable artifacts among Dene language-speakers in the ethnographic present. This is followed by a summary of my data collection methods.

Social Learning, Cultural Transmission, and Learning Networks

Social learning refers to learning that takes place within a social context, encompassing learning through observation (or copying) and verbal instruction. Social learning can be examined through situated learning theory, in which learning takes place unconsciously simply by participating in daily activities (Chaiklin and Lave 1993; Jolie 2014, 2018; Lave 2011; Lave and Wenger 1991). Such participation leads to "communities of practice", wherein practitioners utilize shared production techniques within local traditions, a process strongly tied to identity based on these shared practices (Minar and Crown 2001). These communities of practice can help researchers better understand processes of enculturation (Hughes et al. 2007; Wenger 1998). In archaeology, studies of communities of practice have aided in identifying social boundaries and interaction among ancient potters (Dobres 2000; Stark et al. 2008; Wendrich 2012). As learners practice their craft, the repetition of the particular motions required to make a pot or a basket become more automated and consistent, as demonstrated in educational and neurophysiological research (Caine and Caine 1994; Krakauer and Mazzoni 2011; Minar and Crown 2001; Singer 1982; Wolpert et al. 2011). This automation results in the conservation of material culture traits and, in addition to social learning, is another reason why certain aspects of material culture are resistant to change (Carr and Maslowski 1995; Crown 2007; Dobres 2000;

Minar 2000, 2001; Minar and Crown 2001; Newton 1974; Pryor and Carr 1995; Wendrich 2012).

However, resistance to change does not mean that technology is static and never-changing, or that there is no artifact variation within communities of practice. To tease apart the ways in which aspects of material culture change while others stay the same, researchers can turn to cultural transmission theory. Studies of cultural transmission focus on the ways in which new cultural traditions arise, either through phylogenesis (from within) or ethnogenesis (from without) (Boyd and Richerson 1985; Richerson and Boyd 2005; see also Jolie 2018). Vertical and horizontal transmission are the strongest forms of cultural transmission, with the former occurring from one generation to the next (such as parent to child), and the latter occurring between members of the same generation regardless of relatedness; oblique transmission is a third form of cultural transmission, wherein cultural knowledge moves from one generation to the next, but in cases where the recipient is not a direct descendant (Cavalli-Sforza and Feldman 1981; Boyd and Richardson 1985; Shennan and Steel 1999). Cultural transmission theory also considers the ways in which certain cultural variants transmit more easily than others. These biases in transmission can be categorized as either direct or indirect, where the former is content-dependent (in that some trait of the transmitted content makes it more likely to be transmitted) and the latter is context-dependent (in that transmission is determined by social cues) (Boyd and Richerson 1985; Henrich and McElreath 2003).

Social learning and cultural transmission theory take different approaches to artifact variability and consistency. As Jolie (2018) points out, this is due to the fact that social learning approaches view variations in technology as intentional and meaningful, a deliberate act meant to either conform or distance communities of practice from other peoples. On the other hand, cultural transmission approaches view technological variation as unintentional and arising from mistakes in imitation. However, researchers (Jolie 2018; Stark et al. 2008) tend to agree that these theoretical conflicts as necessary when investigating the complex ways humans create and pass on technology, especially in contexts such as archaeology where datasets are limited and span great spatial and temporal distances.

Material culture attributes that reflect unconscious learning practices have been used as a proxy for social interactions and boundaries (Carr and Neitzel 1995; Gilmore and Larmore 2012; Haas 2006; Minar 2001a, 2001b; Ortman and Cameron 2011; Stark 1998; Stark et al. 2008). Lechtman (1977) first developed the concept of technological style and was followed by Lemonnier (1986, 1992, 1993). Rather than examining whether or not style was intentional, the two researchers focused on the process of social learning and the choices made during the artifact manufacturing process, known as the *chaîne opératoire*, or operational sequence. In Lechtman and Lemonnier's views, it is the entirety of artifact production, rather than specific traits, that speak to the social context and conditions under which the artifact was made. Technological and stylistic traditions then, under *chaîne opératoire*, are held by individuals, who by interacting with each other ensure that these technological traditions are transmitted down generations through "learning networks," products of shared histories of learning and teaching that create the patterning of variation in the material culture we examine. Jolie (2018) argues that the concept of learning networks is more suited to understanding the role of teachers and learners in cultural transmission and the difficulty of identifying social identities in the archaeological past than the related theories of communities of practice and cultural transmission theory. Learning networks "[foreground] the considerable influence of interaction in the creation of stylistic variation over time" (Jolie 2018:164) and, as such, are better able to identify social boundaries on the small scale.

The technological attributes of textile construction are similar to ceramic vessel formation techniques, in that these traits are representative of learning networks and thus "document decisions made during the manufacturing process that, collectively, reflect shared histories of learning the craft" (Jolie 2014; see also Adovasio 1979, 2010; Adovasio and Illingworth 2014; Adovasio and Pedler 1994; Weltfish 1932b). These manufacturing decisions can even persist for thousands of years, such as the basketry traditions of the Klamath-Modoc in south-central Oregon, which are visible in the archaeological record of the region up to 9,000 years ago (Jolie 2004). The learning networks involved in the creation of basketry, and the repetitive motions involved in weaving a basket, result in motor habits that are highly resistant to change and can reveal past social boundaries and interactions (Jolie 2014, 2018; Polanich 1994, 1995; Weltfish 1932b). Specific traits most susceptible to this process are methods of starting and finishing, the twist direction of twined wefts, and the work direction, foundation type, and foundation arrangement of coiled basketry (Jolie 2014, 2018). Weltfish (1932b) specifies that the usefulness of basketry for comparative studies between past and present peoples depends on the strength of the historical connection. Likewise, a single basket trait cannot distinguish different communities, but multiple construction attributes together in a single basket or observed at a single site can help make affiliation distinctions, as Adovasio and Pedler (1994) state. In their paper on the arrival of Numic language-speaking peoples in the Great Basin, Adovasio and Pedler point out that there is no known case of groups suddenly altogether altering their perishable technology. Though intragroup innovations occur, these innovations tend to spread slowly, and the subsequent basketry is still distinguishable from that of other groups. Certain traits or features may be traded or borrowed from group to group but basket construction techniques do not appear to spread wholesale without modification. When archaeologists encounter a radical change in the region's basketry, they can reasonably infer that the assemblage is intrusive. Jolie's (2018: Table 4.1) consolidated data on technical choice variation in textiles and approximate social scale is extremely helpful in determining whether textile variants within and between sites are likely to represent different descent groups and individuals or entire cultural areas, although there is some overlap. As we will see in the following two chapters, many of the textiles found at Promontory speak to differences at the regional level.

Direction of cordage final twist is likewise demonstrably conservative across time and space (Carr and Maslowski 1995; Minar 2000, 2001). Since the woven structures of nets or baskets are readily visible, cordage twist direction is also less likely to be adopted from group to group or by craftspeople newly incorporated into a given society. Carr and Maslowski (1995) argue that there are three exceptions to this statement—that while cordage spin is predominantly a passive, enculturated trait, certain factors such as raw material, method of production, handedness, and belief systems about the spin can alter spin direction. However, Minar's work (2000, 2001) and the work of McBrinn and Smith (2006) dispute the first three. Handedness and spin method are not adequate to explain the persistence of cordage spin direction across time in a particular group, as when cords are plied together, they hold better when twisted together in the direction opposite that which they were spun. As such, it is necessary for spinners to know how to twist cordage in either direction. Rather, it is the *introduction* of a new spin method that may change the direction of initial spin, as new motor habits must be formed. Material likewise has little effect on initial spin direction. While Carr and Maslowski (1995) assert that some fibers have a natural slant, and thus might make it easier to spin these fibers in that direction initially, Minar (2000, 2001) and McBrinn and Smith (2006) find that though spinners also assert that some fibers are easier to spin in a particular direction, which direction is inconsistent. All, however, agree that differences in spin geographically may reflect different ethnic or linguistic groups, and that differences in spin direction within a site may reflect different intracommunity learning pools or even sexual division of labor. Temporal differences in cordage spin may reflect migrations, intrusions, and population replacement (Carr and Maslowski 1995; McBrinn and Smith 2006; Minar 2000, 2001).

Minar (2000, 2001) gives four possibilities for the persistence of cordage twist as a cultural marker. The first is the teaching and learning process, where students imitate their teacher and thus learn to twist cordage in a particular direction, regardless of whether or not they are aware that this process can be seen in the cordage itself. Such a process creates a community of practice, which on a large scale can correspond to cultural identity but can also vary within a cultural group itself. The second possibility for cordage twist preservation is the automatization of motor skills; with repeated action, the process of spinning in a particular direction becomes automatic and done without conscious thought. To change direction requires renewed concentration on the task, and thus will only change when there is pressure to do so. Related to this is the third possibility, the "practicality of efficient production" (Minar 2000)—the attempt to change spin direction will involve many mistakes and result in, as one of Minar's (2000) informants put it, "messy consequences". Lastly, many cultures have beliefs surrounding directionality, that there are "right" and "wrong" ways to spin, or the association of one spin direction with taboo concepts or sacred contexts (Minar 2000).

Analogies and the Direct Historical Approach

When speaking of fiber perishable technologies, there is an underlying assumption that basketry, cordage, and other objects are primarily the work of women (Brumbach and Jarvenpa 2006, 2007; Gilchrist 1999; Murdock and Provost 1973; Wylie 2002). As such, the sorts of teacher-student relationships that occur in the passing down of these technologies emerge between mothers and daughters, mothers-in-law and daughters-in-law, and so on. However, such an assumption is based on Eurocentric notions of gender roles and often are not reflected in reality. Reilly (2015) found that men as well as women undertook hide tanning in some Dene language-speaking societies, and Kantner et al. (2019), in their study of fingerprints left on Ancestral Puebloan ceramics, found that men and women created ceramic vessels in roughly equal numbers, contrary to previous archaeological assumptions (see also Crown 2007). In this case, inferences of who made the Promontory Caves fiber perishable artifacts are based on analogies to Dene language-speaking populations in the ethnographic present. The Deg Hit'an of the Subarctic are one Dene language-speaking group where the gender of cordage-makers is well-documented. While Osgood (1970) observed women making twisted cordage, basketry, matting, nets, and clothing, men would also make cordage when used in association with hunting and fishing implements.

Analogies form the basis of the Direct Historical Approach, where archaeologists use information from modern descendant cultures to interpret archaeological finds and from them extrapolate how their ancestors may have lived (Hallson 2017; Reilly 2015; Seymour 2012a, 2012c). While the evidence to-date from the Promontory Caves indicates that its population is neither wholly like their presumed Dene language-speaking Subarctic origins or their Apachean endpoint, these populations are the closest we have to an analogous one, albeit an imperfect analogy. Indeed, this is precisely what Seymour (2012a, 2012c) cautions, and identifies as the source of the invisibility of Apachean ancestors in Southwestern archaeology—for if archaeologists search for Apachean ancestors only by seeking the material culture of their present-day descendants packaged in centuries-old contexts, how would they find them? Adding to this invisibility is the Dene proclivity to adopt the material culture of their neighbors (Ives 1990) and the genetic evidence indicating the incorporation of others into early-Apachean societies (Malhi 2012; Malhi et al. 2003, 2008; Monroe et al. 2013), discussed in the previous chapter. Thus, while the presence of definitively "Dene" or "Subarctic" material culture traits at the Promontory Caves can serve as evidence of their presence, the *absence* of these traits does not mean that Dene language-speakers were themselves absent. Given that the Promontory moccasins' construction attributes speak strongly to a Dene presence, the absence of similarly diagnostic attributes in the Promontory woven fiber perishables would indicate at the very least trade with contemporaneous Fremont neighbors, if not wholesale incorporation and intermarriage with Fremont basketmakers and weavers. In order to ascertain just how "Dene" were the Promontory Caves woven fiber perishables, I conducted an extensive literature review of Subarctic and Southwestern Dene cordage, basketry, and nets.

Literature Review

I consulted a series of references (including ethnographies and cultural element distributions) to obtain a thorough understanding of woven fiber perishable construction among Subarctic and Southwestern Dene language-speakers. My notes were divided first by tribal affiliation or group—an imprecise division that does not necessarily correspond with how these groups self-identify, especially when it comes to the Dene language-speakers of the Subarctic (Ives 1990)—with a "general" category for sources that spoke for the language family as a whole, followed by fiber perishable type: cordage, netting, basketry, and mats. An "other" category was included when necessary, as well as an "archaeology" category on the rare occasion when information on archaeological specimens attributed to a particular group was available. For ease of access, the information was then compiled into a Microsoft Excel spreadsheet for each fiber perishable type, with structural attributes along the x-axis and cultural affiliation along the y-axis. This layout eased the search for overarching patterns and key differences between groups. Structural attributes are outlined in detail in the following chapter; however, for the literature review not all attributes were exploited for analysis as measurement-based data in particular is not always present in the literature, and which structural attributes were recorded varies.

Tribal affiliations and groups covered by this literature review are summarized in Table 3.1. Subarctic Dene language-speaking groups I was unable to obtain fiber perishable data for include the Tanacross and the Dinak'i or Upper Kuskokwim; for the Southwest, the Lipan and Kiowa Apache peoples. Literature review sources not covered above include Adovasio (1979, 1986), Adovasio and Illingworth (2000, 2014a, 2014b), Adovasio and Pedler (1994), Adovasio, Andrews, and Illingworth (2009), Adovasio, Pedler, and Illingworth (2002), Thompson (1994, 2001), Idiens (1979), Malcolm (1985), Jones and Luke (1985), Demoski (1985), and Fang and Binder (1999).

Analysis of Fiber Perishable Artifacts

The word "fiber" is here used to exclude perishable artifacts that are not fibrous; that is, those that cannot be woven, twisted, knotted, etc., such as objects of wood or bone. That does not mean that all fibrous perishable artifacts conform to the above, as we will see with the numerous specimens of untwisted hide or sinew cord at the Promontory Caves. While synthetic and mineral fibers do exist, the purposes of this paper require only the consideration of animal fibers such as fur, hair, and sinew, and plant fibers such as leaf, bast (stem), bark, and root fibers (Emery 2009:5). In addition, I will not be examining wooden shafts and like artifacts. Instead, I am focusing on cordage and woven textiles.

Table 3.1: Ethnographic Sources

Ahtna	Thompson 2013; VanStone 1979
Dakelh	Clark 1974; Thompson 2013
Dane-zaa	Clark 1974
Deg Hit'an	Nelson 1983; Osgood 1970; Thompson 2013; VanStone 1979, 1996
Dehcho	American Museum of Natural History online collections; Andrews 2006; Canadian Museum of History online collections; Clark 1974; Hail and Duncan 1989; Honigmann 1946; Lamont 1977; Marie and Thompson 2003 and 2004; Richmond 1972; Thompson 2013; VanStone 1979
Dena'ina	Clark 1974; Jones, Fall, and Leggett 2013; Osgood 1966; Thompson 2013; VanSone 1979; Yale Peabody Museum online collections
Dënesųłiné	American Museum of Natural History online collections; Andrews 2006; Canadian Museum of History online collections; Clark 1974; Cooper 1938; Thompson 2013; Marie and Thompson 2004; Marie and Thompson 2003; Mason 1946; Richmond 1972; VanStone 1979
Gwich'in	American Museum of Natural History online collections; Andrews 2006; Canadian Museum of History online collections; Clark 1974; Duncan and Carney 1988; Hail and Duncan 1989; Heine et al. 2007; Nelson 1983; O'Brien 2011; Osgood 1936; Thompson 2013; Vanstone 1981 and 1979

Hän Hwëch'in	Clark 1974, Cruikshank 1979; Thompson 2013
Holikachuk	Thompson 2013
K'asho Got'ine	Clark 1974; Cooper 1938; Duncan and Carney 1988; Hara 1980; Marie and Thompson 2004; Richmond 1972; Thompson 2013
Kaska Dena	American Museum of Natural History online collections; Canadian Museum of History online collections; Clark 1974; Honigmann 1954; Thompson 2013
Koyukon	Clark 1974a and 1974b; Hail and Duncan 1989; Nelson 1983a and 1983b; Nelson, Mautner, and Bane 1982; Thompson 2013
Upper Tanana	VanStone 1979
Sahtuot'ine	Clark 1974; Osgood 1933; Thompson 2013; Marie and Thompson 2004
Shuhtagot'ine	Thompson 2013
Tagish	McClellan 2011; Thompson 2013
Tahltan	American Museum of Natural History online collections; Albright 1984; Canadian Museum of History online collections; Clark 1974; Emmons 1911; Thompson 2013; VanStone 1979
Tanana	Clark 1974; McKennan 1959; Nelson 1983; Thompson 2013
Tłı̨chǫ	Andrews 2006; Clark 1974; Cooper 1938; Duncan and Carney 1988; Hail and Duncan 1989; Helm, Carterette, and Lurie 2000; Marie and Thompson 2003 and 2004; Mason 1946; Richmond 1972; Thompson 2013
Tsay Keh Dene	Clark 1974; Jenness 1937; Thompson 2013
Tŝilhqot'in	Laforet 1992; Thompson 2013; VanStone 1993
Tsuut'ina	American Museum of Natural History online collections; Canadian Museum of History online collections; Jenness 1938

Tutchone	Canadian Museum of History online collections, Clark 1974, Cruikshank 1979, Honigmann 1954, McClellan 2001, Thompson 2013
T'atsaot'ine	Clark 1974
Chiricahua Apache	Mails 1974; Opler 1996; Tanner 1982; Whiteford 1988
Jicarilla Apache	American Museum of Natural History online collections; Collings 1976; Mails 1974; Tanner 1968, 1982; Whiteford 1988; Yale Peabody Museum online collections
Mescalero Apache	Collings 1976; Evans and Campbell 1952; Mails 1974; Tanner 1968, 1982; Whiteford 1988
Western Apache	Collings 1976; Evans and Campbell 1952; Johnson and Reader 2001; Mails 1974; Roberts 1916, 1929; Tanner 1968, 1982; Weltfish 1932a; Whiteford 1988
Navajo	Collings 1976; The Franciscan Fathers 1910; Hester 1962; Johnson and Reader 2001; Kluckhohn, Hill, and Kluckhohn 1971; Morris and Burgh 1941; Newman 1974; Roberts 1929; Tanner 1968; Tschopik 1940; Vivian 1957; Weltfish 1930, 1932a, 1932b, 1944

Cordage. The term "cordage", when used in archaeology, is generally meant for fibers that have been twisted and plied together into yarn (Emery 2009). However, a definition based on function may be more useful here than Emery's—not all cords are twisted, such as a single cut strip of hide that still

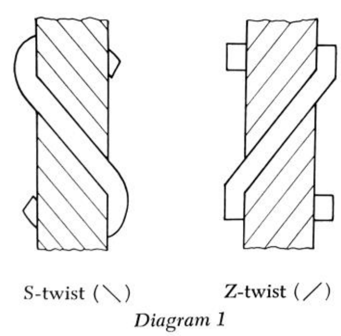

Figure 3.1: Diagram of cordage final S- and Z-twist. From p. 11 in Irene Emory, *The Primary Structures of Fabric: An Illustrated Classification.* The Textile Museum, Washington, D.C. 2009.

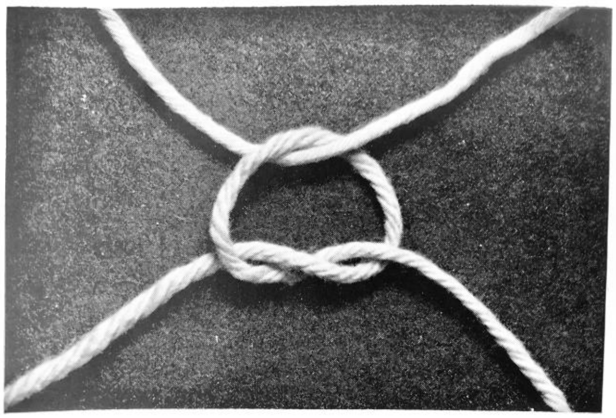

FIG. 19 *Simple knot : overhand.*

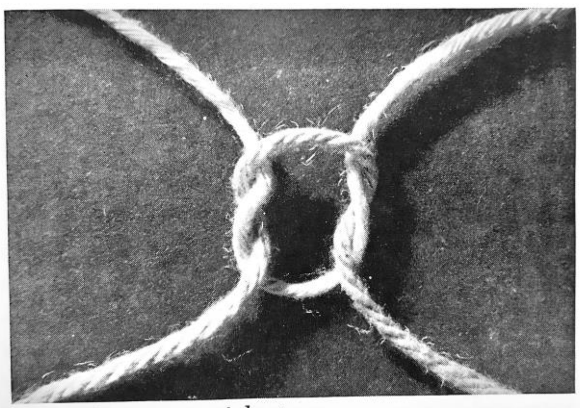

FIG. 29 *Square,* or *reef, knot.*

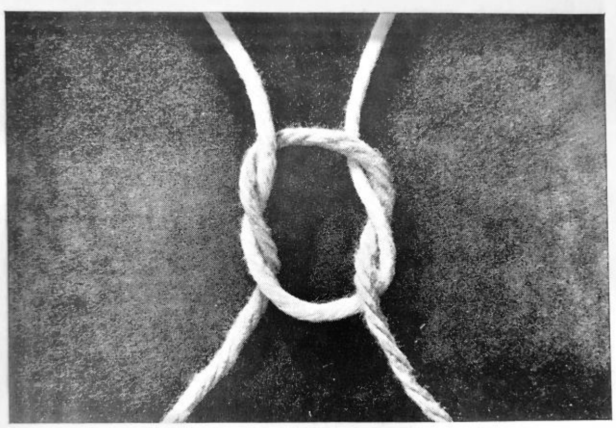

FIG. 31 *Vertical granny knot.*

Figure 3.2: Three common knots. Top: overhand knot. Middle: square knot. Bottom: granny knot. From p. 34 and 37 in Irene Emory, *The Primary Structures of Fabric: An Illustrated Classification.* The Textile Museum, Washington, D.C. 2009.

serves the same purpose as twisted and plied cords. Cordage is predominantly differentiated based on direction of twist, number of plies, and the material of which it is made. Twist direction (Fig. 3.1) is either Z-twist (fibers slanting down from right to left, /, when the cord is held vertically) or S-twist (fibers slanting down from left to right, \, when the cord is held vertically) (Emery 2009).

Cords may also be tied in knots, the many kinds of which can be used to distinguish cultural affinity in the past. Some common knots include overhand, square, and granny knots (Fig. 3.2). Knots can tie cords together into larger structures such as nets, although not all nets are held together by knots. Other structures, such as simple looping (Fig. 3.3), create so-called “knotless netting,” although this common term is imprecise (Emery 2009:46). In its place Emery

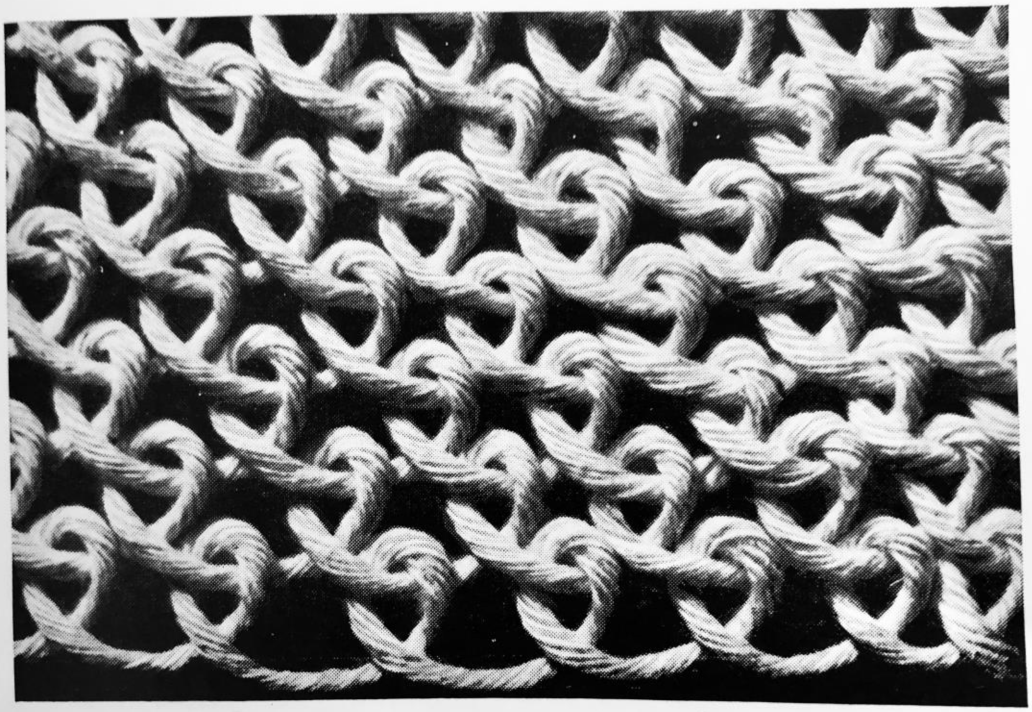

FIG. 9 *Simple looping* (or *buttonhole looping*) crossed left-over-right.

Figure 3.3: Simple looping netted fabric. From p. 31 in Irene Emory, *The Primary Structures of Fabric: An Illustrated Classification.* The Textile Museum, Washington, D.C. 2009.

suggests “net-like simple looping;” from here on in this paper these structures are referred to as simple looping netted fabrics to distinguish them from knotted nets.

Woven Textiles. The term textile is often used to refer to items of cloth woven with the aid of a loom or similar tools (Adovasio 2010:1), but is used here to encompass basketry, mats, bags, and other items that utilize similar structural techniques but are not so readily classified. “Basketry” is here used to refer to rigid or semirigid woven structures. The same weaving techniques are used to create mats—essentially flat, two-dimensional baskets—and flexible bags, intermediate between these two other forms. These structures are primarily categorized based on

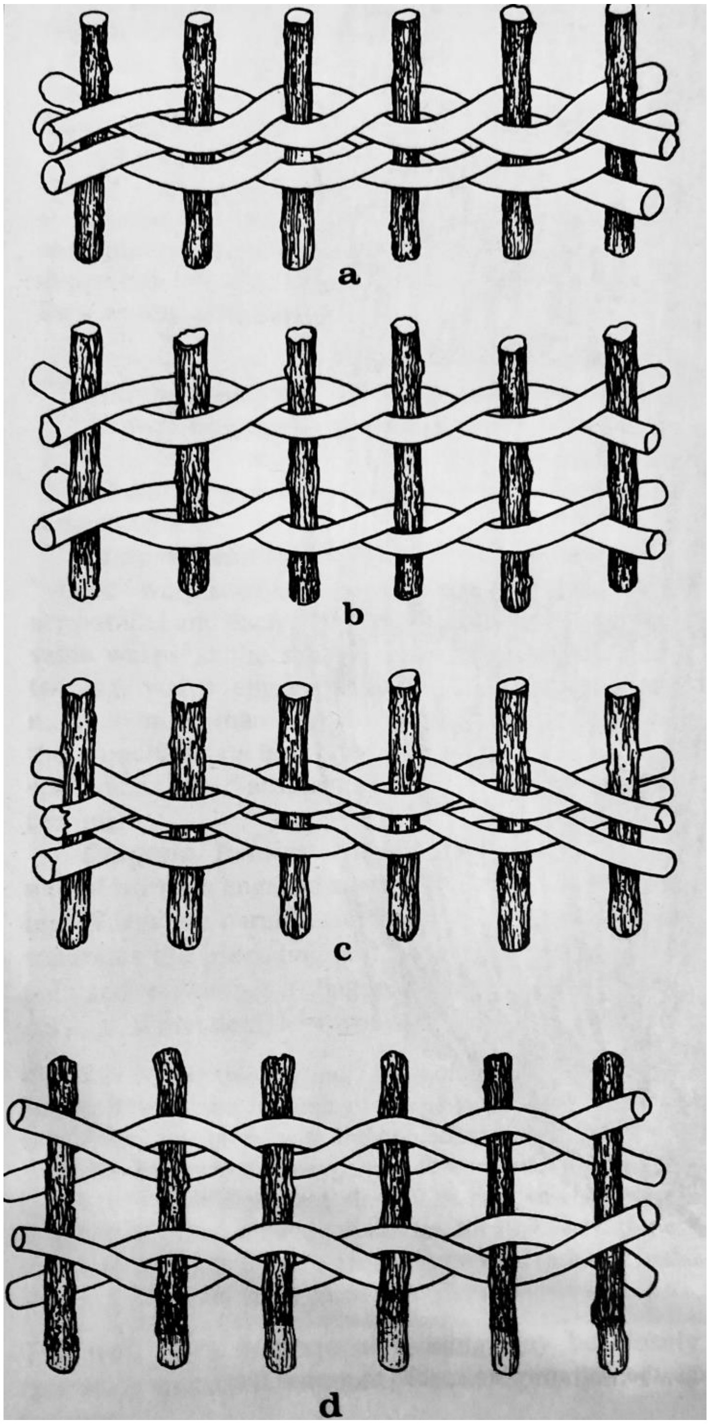

Figure 3.4: Types pf simple twining. a) close simple twining, S-twist wefts. b) open simple twining, S-twist wefts. c) close simple twining, Z-twist wefts. d) open simple twining, Z-twist wefts. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

the three most common but distinct weaves: twining, coiling, and plaiting. (Adovasio 1979, 2010; Driver 1969).

Twined basketry is made by moving horizontal wefts around stationary vertical warps. Wefts are often paired or tripled ("three strand" or "trebled") while warps may consist of single elements or multiple elements acting together as a unit. Different forms of twined basketry can be distinguished by the spacing of their weft rows, the ways wefts and warps engage at each weft crossing, the number of wefts and warps, the stitch twist directions of the weft rows, material, method of starting, selvage, splicing, form, decoration, and the wear-patterns or function (Adovasio 1979, 2010; Weltfish 1932b). Weft rows in twining can be arranged in three basic ways: as close twining, where weft rows lie so close together that the warps cannot be seen; as open twining, where the weft rows are spaced apart so that the warps are visible; and as a mixture of the two. The ways weft rows can engage with warps are greater in number, but only two are common. The first is simple twining, where only one warp (or warp unit) is engaged at a time (Fig. 3.4); the other is diagonal twining (or "twill" or "alternate pair," see Emery 2009), where alternate warps are engaged at each weft crossing (Fig. 3.5). A third method for warp engagement is the use of both methods (Adovasio 2010); other techniques, such as cross-warp twining and wrapped twining, are not discussed here as they do not occur

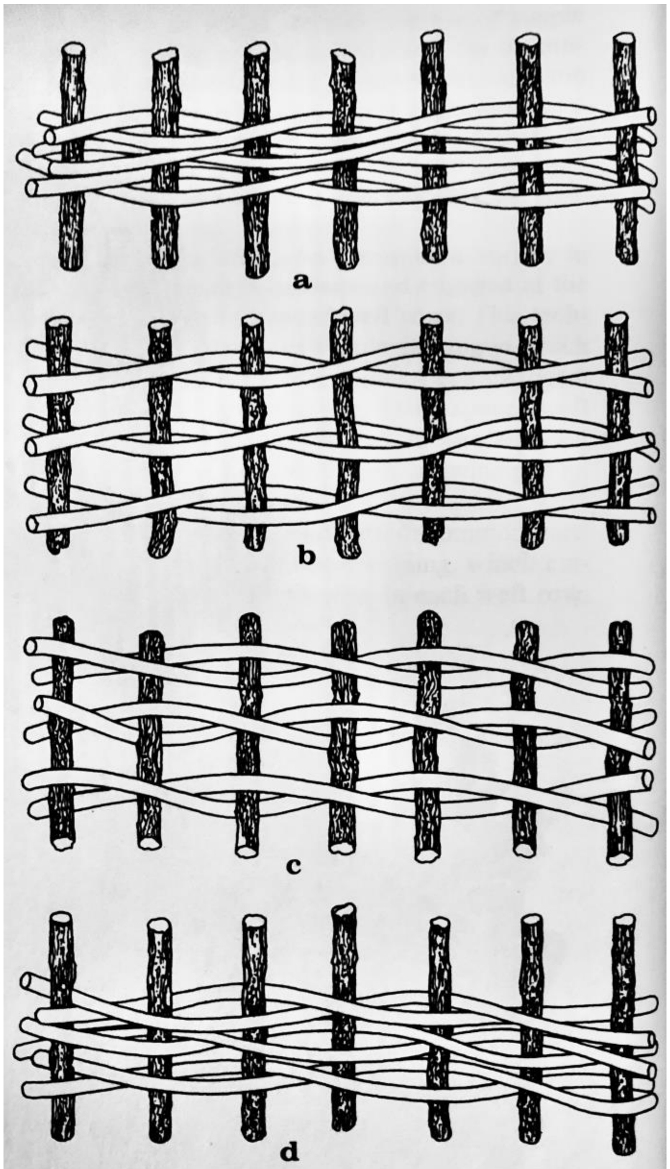

Figure 3.5: Types of diagonal twining. a) close diagonal twining, S-twist wefts. b) open diagonal twining, S-twist wefts. c) open diagonal twining, Z-twist wefts. d) close diagonal twining, Z-twist wefts. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

in the area of study. Three-strand braided twining, which involves the use of three weft elements alternately engaging two warps followed by one warp at a time (Fig. 3.6), is a rather uncommon variant of three strand weft twining that is found at the Promontory caves, and is discussed in more detail with the descriptions of these artifacts.

There are also other attributes that can be used to distinguish twined textile types. Like twisted cordage, weft rows also twist in either S or Z directions, a distinction made when weft rows are oriented vertically, like a length of cordage (Figs. 3.4 and 3.5). Different methods of starting can be distinguished based on the number, composition, and arrangement of warp and weft elements (Adovasio 2010:18). Warp starts may be arranged end to end, crossed over each other (Figs. 3.7, 26), or both; arranged in arcs (Figs. 3.7, 29); arranged in V's (Figs. 3.7, 28); and more (Adovasio 2010:32-34). Weft engagement with warps may change near the center as well as near the selvage, or edge. Twined selvages can come in either simple or composite forms, with simple selvages using only elements present in the basket wall and composite selvages introducing a new element(s) (Adovasio 2010:35-37). Simple selvages include truncated or knotted warps (Figs. 3.8, 32 and 33), as well as warps folded back on themselves at various angles and reinserted at different points in the construction (Figs. 3.8, 36 and 37). For wefts, a simple selvage may appear as a knot at the end of a weft row (Fig. 3.9, 42), simply looped back around the terminal warp element (Fig. 3.9, 43), or a continuous weft, where the weft elements are continued into the next row, sometimes twisted together as they move vertically down before being reinserted (Fig. 3.10) (Adovasio 2010:38-39). Composite selvages include a wide range of possibilities, but some of the more common ones involve a third element forming a braid or stitch with the terminal warps (Fig. 3.11) (Adovasio 2010:39). Splicing is the insertion of new warp or weft elements while weaving. Warp splices may be added into a pre-existing weft crossing, or, especially when near an expanding center, into a new weft crossing (Fig. 3.12, 49). Sometimes two new warps are spliced simultaneously through folding one warp element into a V shape (Fig. 3.12, 50) (Adovasio 2010:40-41). Weft splices may be laid in over or under (Fig. 3.13) or bound to exhausted weft elements (Fig. 3.14) (Adovasio 2010:42). There are numerous techniques used in decorating a twined basket, but given that the Promontory Caves basketry remains undecorated, this topic is not be expanded upon.

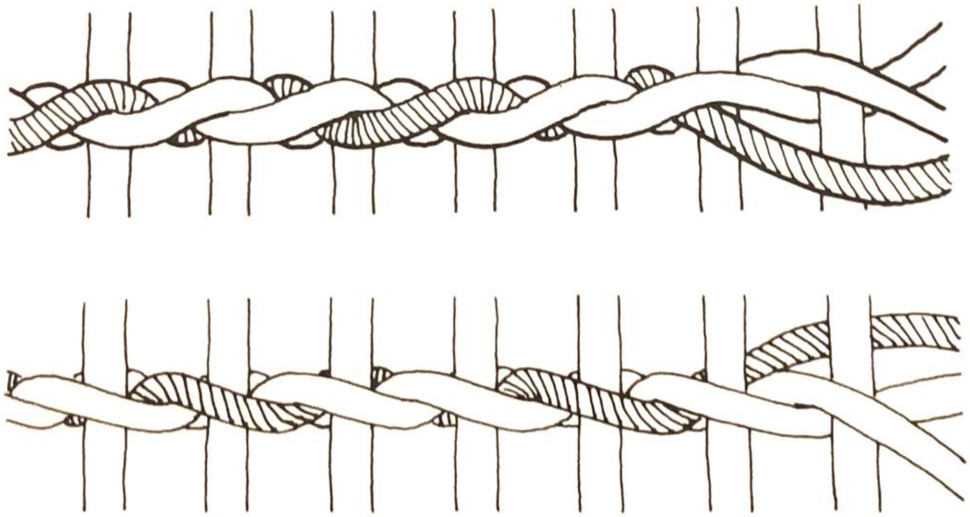

Diagram 29

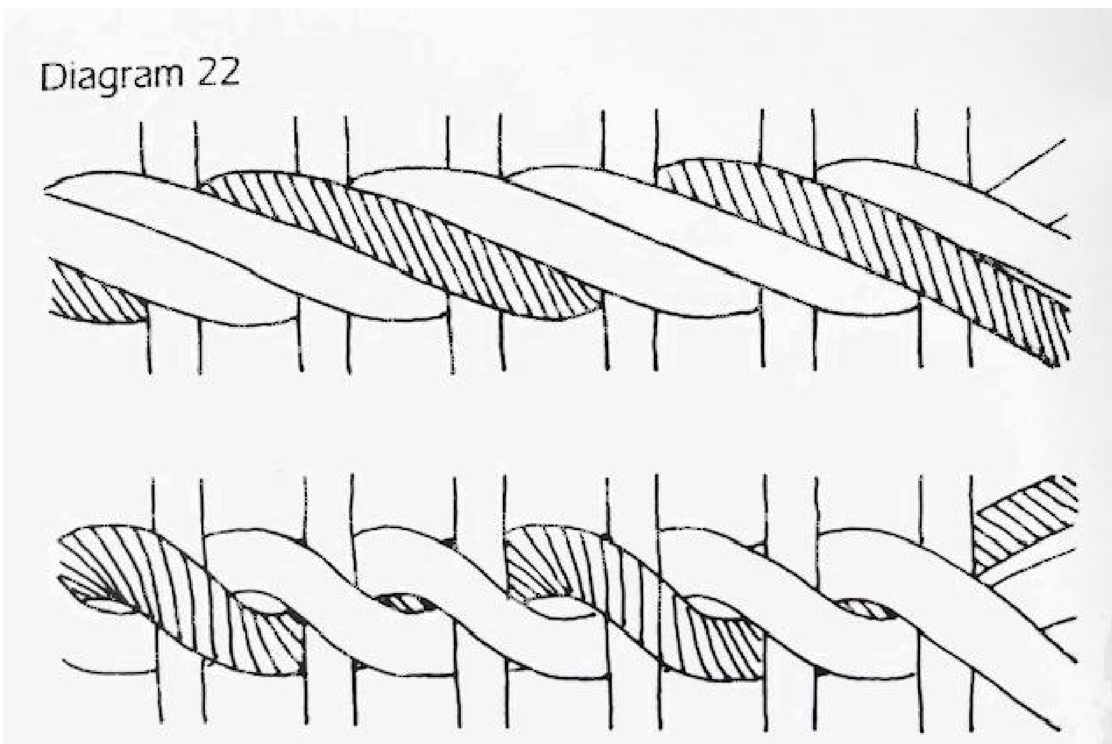

Figure 3.6: Diagram 29 (Fraser 1989:81) shows three-strand braided twining on both faces of the twined textile. Note how the apparent weft twist switches from S to Z. This is in contrast to three-strand twining shown in Diagram 22 (Fraser 1989:76) where the weft twist appears the same on both faces of the twined textile. David W. Fraser, *A Guide to Weft Twining and Related Structures with Interaction Wefts,* 1990, pp. 76 and 81, Diagram 22, Diagram 29. Reprinted with permission of the University of Pennsylvania Press.

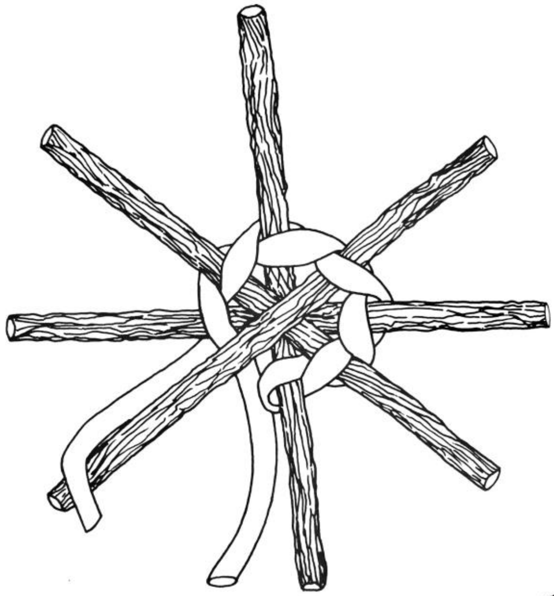

Fig. 26. Schematic example of a twined center with four warp elements crossed in pairs.

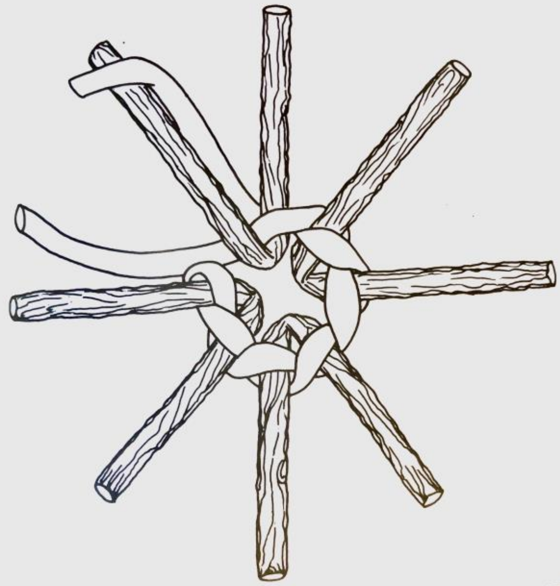

Fig. 29. Schematic example of a twined center with the warps arranged in a series of non-intersecting V's.

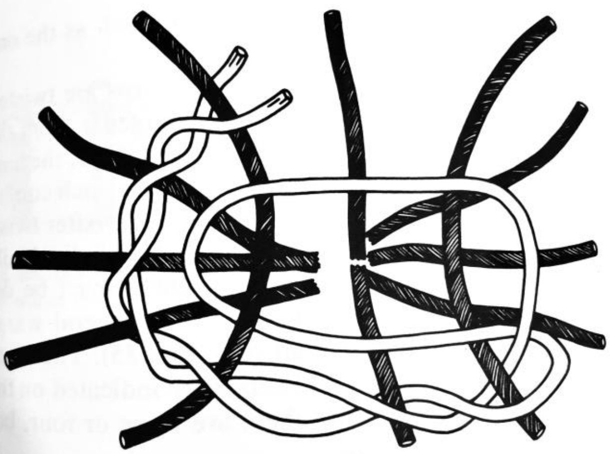

Fig. 28. Schematic example of a twined center with the warps arranged in non-intersecting arcs. The weft "pair" is actually a single element folded around a number of warp elements.

Figure 3.7: Three examples of twined textile centers. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

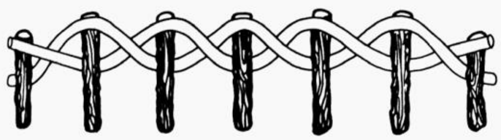

Fig. 32. Schematic example of simple twined end selvage with the warps truncated after the final weft course.

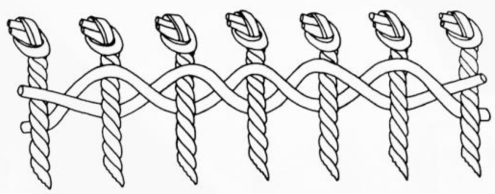

Fig. 33. Schematic example of simple twined end selvage with the warps knotted on themselves after the final weft course. The knots are simple overhands.

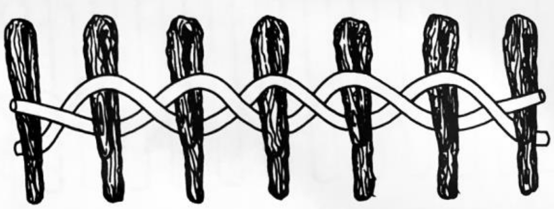

Fig. 36. Schematic example of simple twined end selvage with the warps folded back on themselves at an angle of 180°.

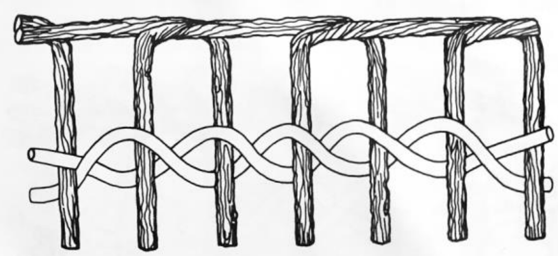

Fig. 37. Schematic example of simple twined end selvage with the warps folded at an angle of 180° and reinserted into adjacent warp rows.

Figure 3.8: Four examples of twined end selvages. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

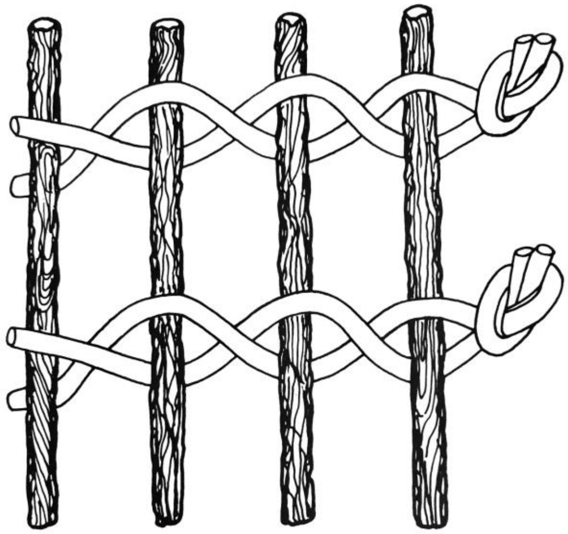

Fig. 42. Schematic example of a simple side selvage terminated with an overhand knot.

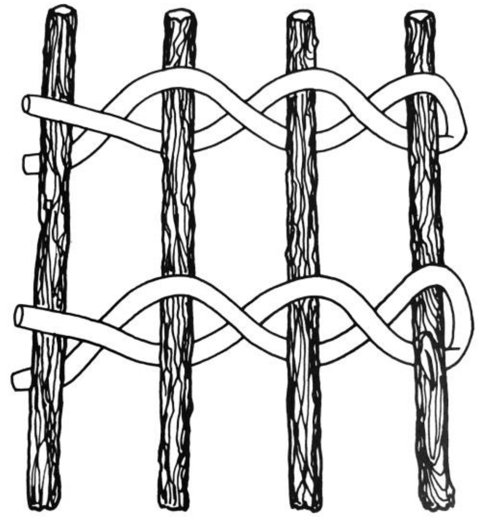

Fig. 43. Schematic example of simple side selvage in which a single weft is looped around the terminal warp element.

Figure 3.9: Two examples of twined side selvages. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

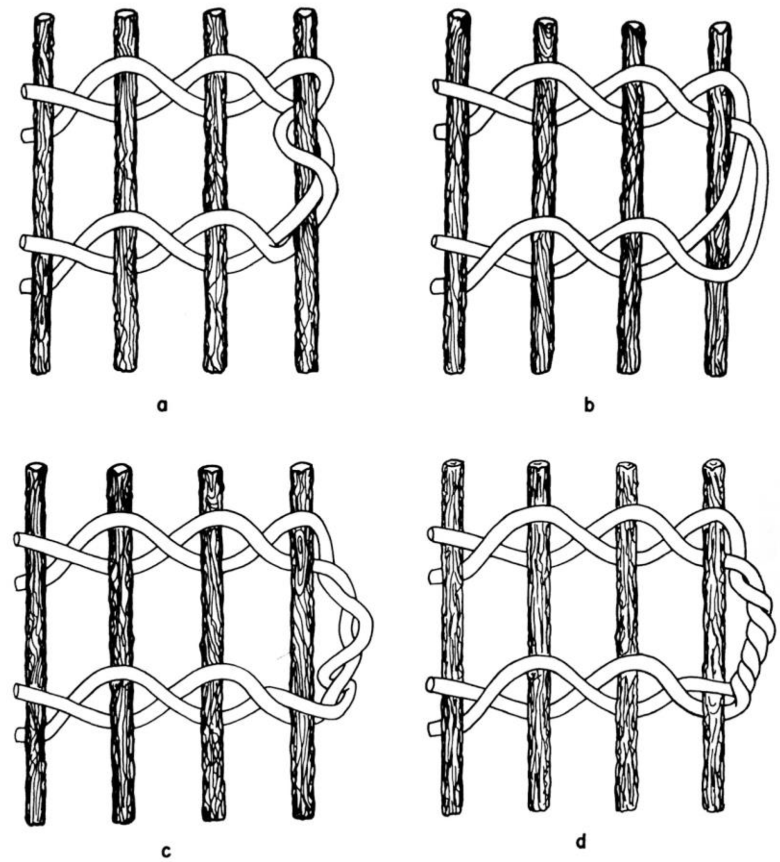

Fig. 44. Variations of continuous weft, simple twined side selvages.

Figure 3.10: Four examples of continuous weft twined side selvages. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

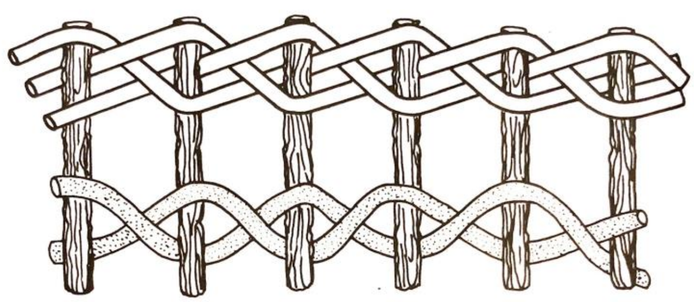

Fig. 45. Schematic example of composite selvage in which a three-element braid is produced by adding a third functional weft element.

Figure 3.11: Example of three-element braid composite twined end selvage. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

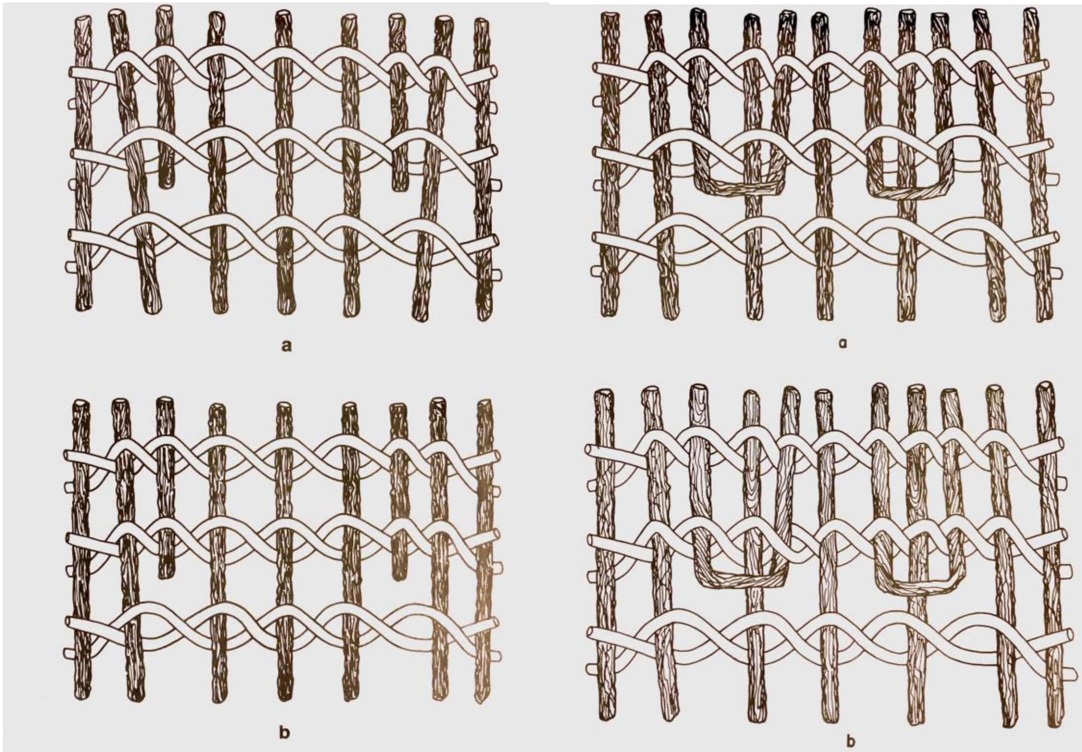

Fig. 49. Methods of adding new warp elements. **a,** Incorporation into pre-existing weft crossings. **b,** Initiating new weft crossings.

Fig. 50. Variations of twined warp splices produced by folding new warps into a V and inserting them into pre-existing weft crossings.

Figure 3.12: Examples of twined warp splices. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

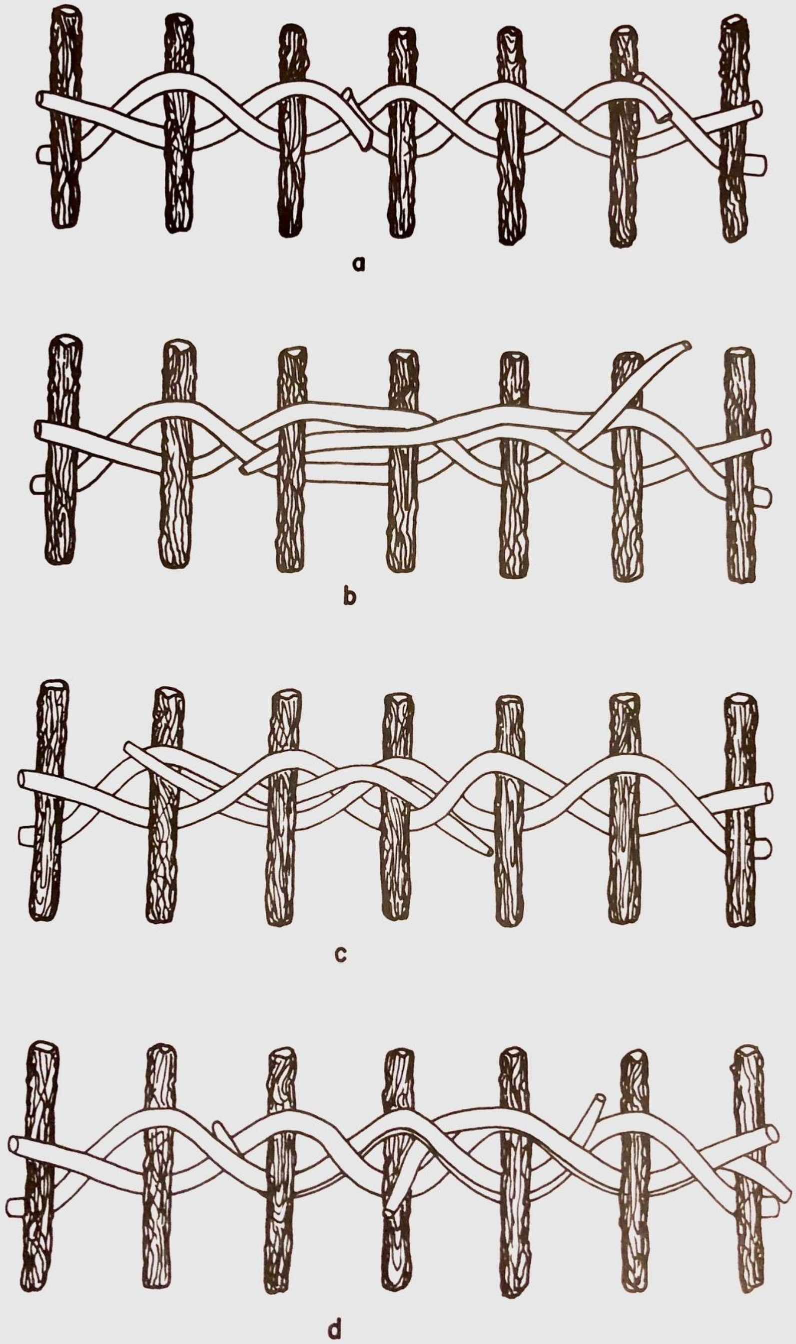

Fig. 52. Variations of twined weft splices in which new wefts are laid in at the ends of or beneath the exhausted wefts.

Figure 3.13: Variations of laid-in twined weft splices. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

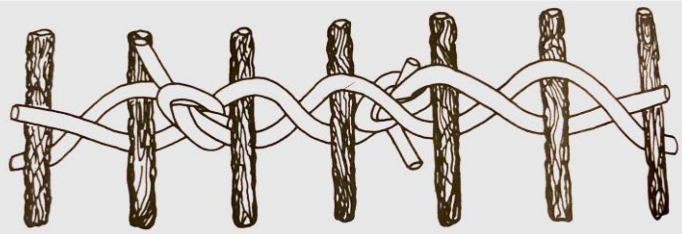

Fig. 53. Schematic example of a twined weft splice produced by knotting new and exhausted wefts. The knots are simple overhands.

Figure 3.14: Overhand knotted twined weft splice. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

Coiled basketry involves the sewing of a stationary, horizontal foundation with moving, vertical stitches (Adovasio 2010:53). Different structural types can be distinguished based on the spacing of the foundation, foundation type, stitch type, work direction, work surface, method of starting, rim type, splicing, decoration, mending, form, material, and wear patterns or function (Adovasio 1979, 2010; Weltfish 1932b). Coiled foundations can be made from three different element types arranged in four possible ways. The elements consist of rods in whole or split forms, bundles of plant fibers or twigs, or welts or splints (thin flattened stick or fiber strips). These elements are then arranged either singly (Fig. 3.15), horizontally with different elements placed side by side to create a thicker basket wall (Fig. 3.16, 67), stacked with different elements arranged vertically one on top of the other (Fig. 3.16, 68), or bunched with different elements arranged in a triangle formation (Fig. 3.16, 69) (Adovasio 2010:60-61). Stitches on coiled basketry come in three different types but only simple stitches are considered here.

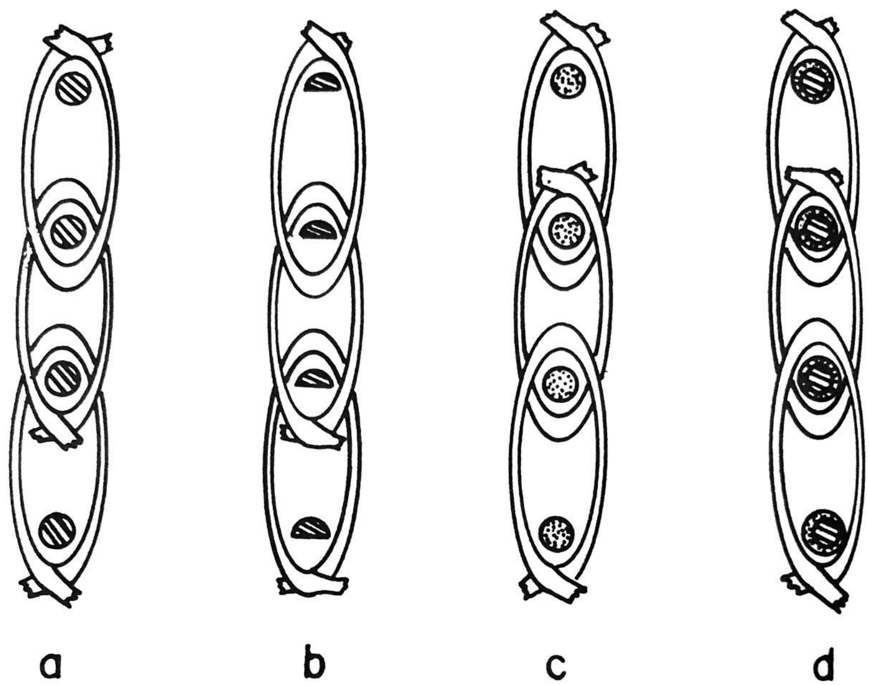

Fig. 66. Cross sections of common single element foundations. **a,** Whole rod. **b,** Half rod, flat side down. **c,** Bundle. **d,** Bundle with rod core.

Figure 3.15: Examples of single element coiled textile foundations. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

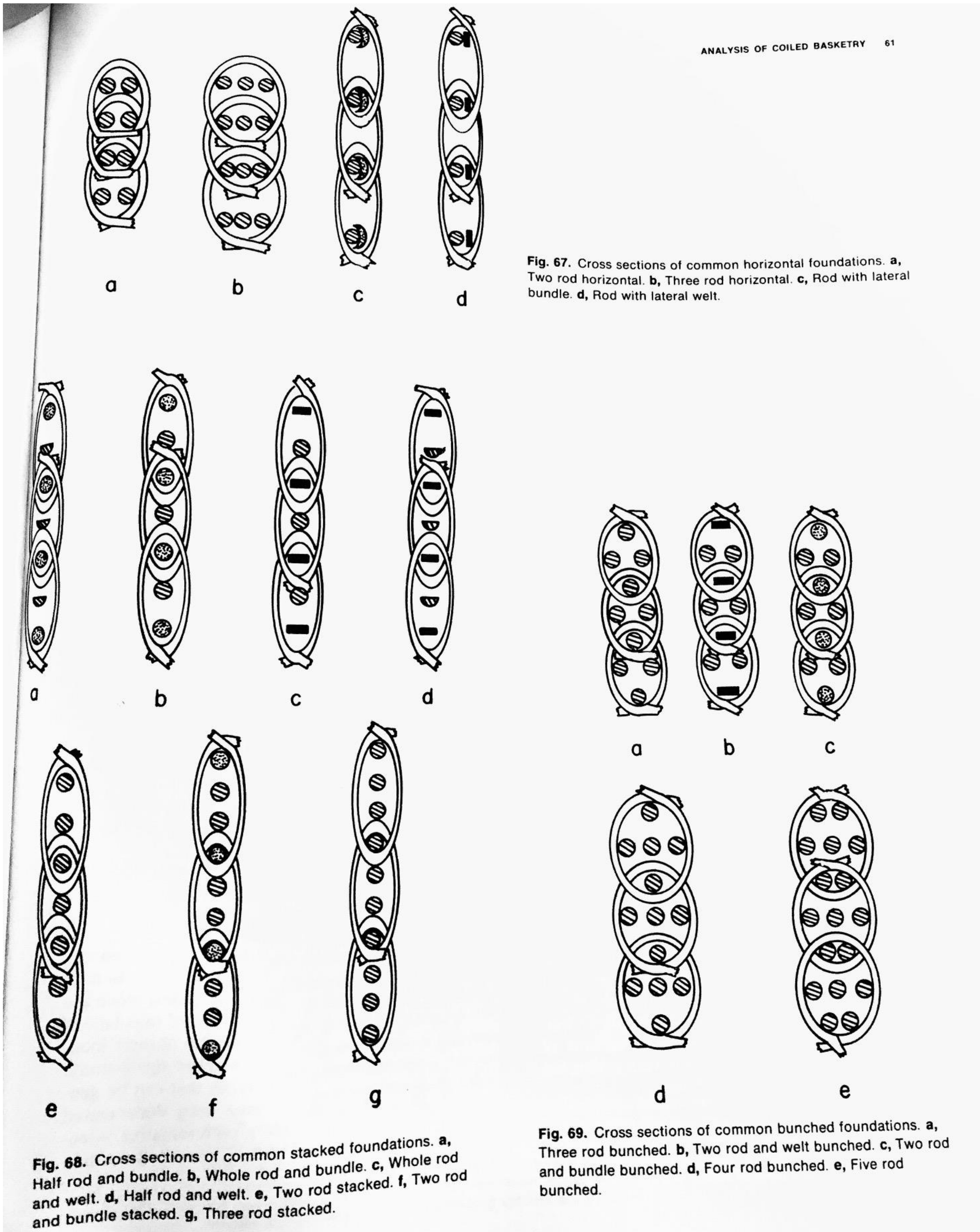

Figure 3.16: Examples of coiled textile foundations. 67: Examples of horizontal foundations. 68: Examples of stacked foundations. 69: Examples of bunched foundations. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

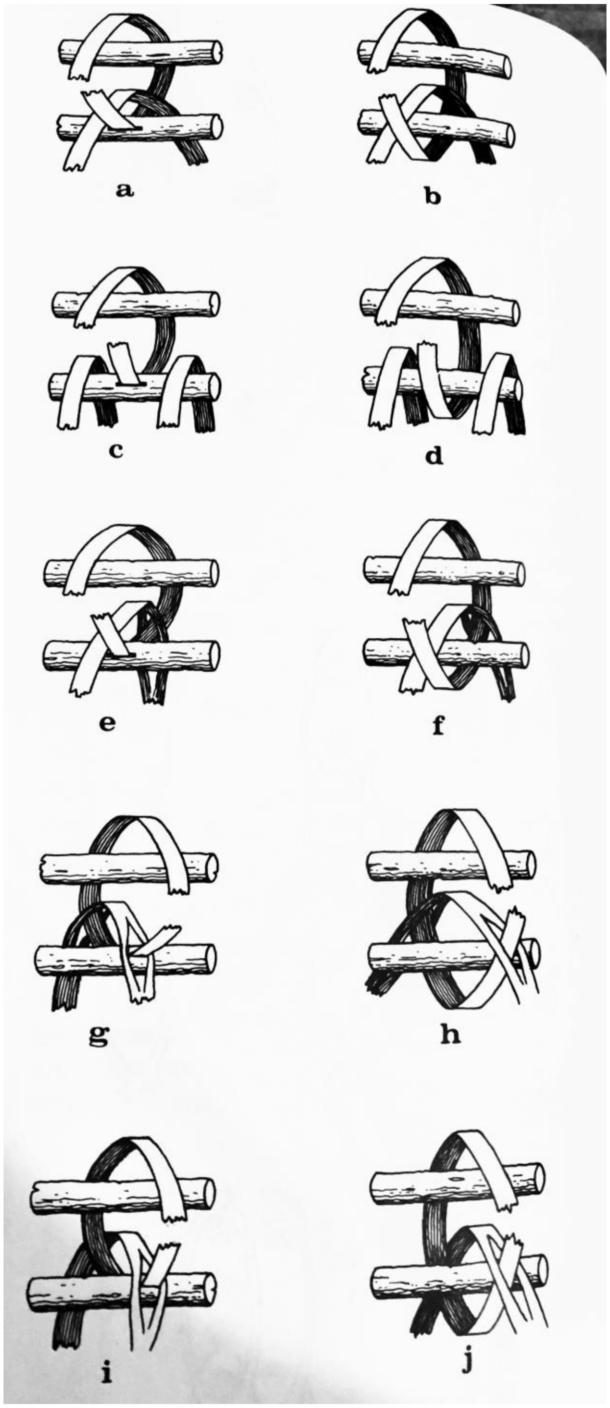

Figure 3.17: Coiled textile simple stitch types. a and b) interlocking. c and d) non-interlocking. e and f) split on non-work surface. g and h) split on both surfaces. i and j) split on work surface. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

Simple stitches go once around the foundation while engaging the coil below, and come in either interlocking (catching the top of the stitch directly beneath), non-interlocking, or split (either intentional or unintentional, where the stitch directly beneath is pierced by the new stitch on one or both surfaces) subtypes (Fig. 3.17) (Adovasio 2010:62). Coiled textiles can be divided into close or open structures based on whether or not there is space between foundation units (Adovasio 2010:70). Coiled textiles can also be differentiated by their work surface, or the surface that the awl was inserted to make a hole to receive the stitch, often but not always the surface facing the weaver. The awl pierces through the work surface and emerges on the non-work surface. Stitches on the work surface of a basket have a slight constriction on their upper halves from the wedging of the awl, and appear smoother than on the non-work surface, which may be splintered or torn (Adovasio 2010:74). Broadly speaking, shallow bowls or trays are worked on the concave surface while deep baskets are worked on the convex surface. When coupled with stitch slant (either right-to-left, R-L, or leftward; or left-to-right, L-R, or rightward), the direction of work can be ascertained (Fig. 3.18). A convex work surface with R-L slanted stitches indicates the basket was worked clockwise, while L-R slanted stitches indicate a counter-clockwise work direction. Conversely, R-L slanted stitches on a concave work surface indicate a counter-clockwise work direction while L-R slanted stitches indicate a clockwise work direction (Adovasio 2010:74).

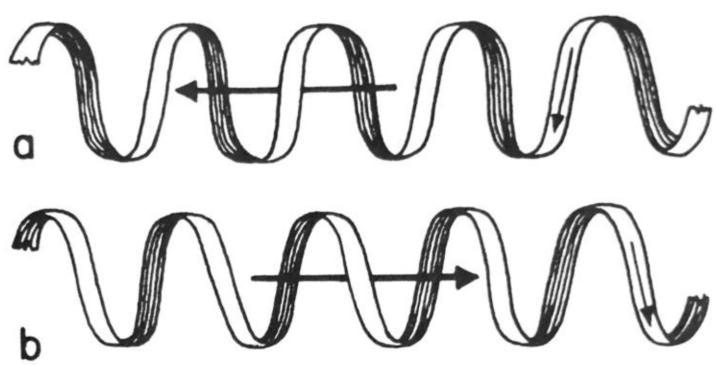

Fig. 81. Schematic examples of work directions. **a,** Right to left. **b,** Left to right.

Figure 3.18: Diagram of coiled textile work direction. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

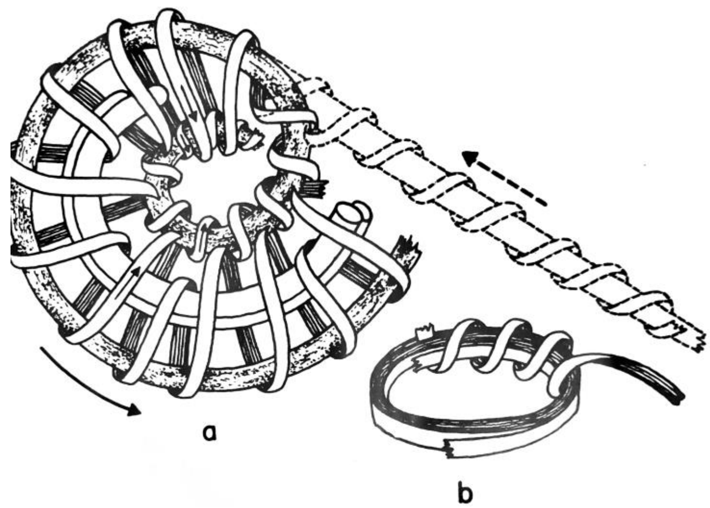

Fig. 93. Two variations of normal centers. **a,** The foundation element is wrapped with a stitch and then bent into a circle. **b,** The foundation element is wound like a clock spring.

Figure 3.19: Normal coiled textile center. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

There are four general types of coiled centers, but only one, the normal (or "continuous coil") center, is found in the textiles considered under this study, and thus is the only type discussed here. Normal centers are made when the foundation elements are bent into a circle and stitched together (Fig. 3.19); a reinforced normal center is a version where the wound foundation elements are encased entirely in a single row of stitches (Adovasio 2010:83-84). The rims of coiled textiles can be either self rims, which are sewn in the same manner as the walls of the basket (sometimes with the addition of wrapping stitches to form a "stitch and wrap" rim) (Fig. 3.20); false braid rims, where the stitches are sewn in figure-eights in many variations (Fig. 3.21); and combinations of the two (Adovasio 2010:88-89). Splices in coiled basketry are different from splices in twining but accomplish the same end. The fag or exhausted end of a stitch occurs on the work surface, and the moving end of a stitch on the non-work surfaces.

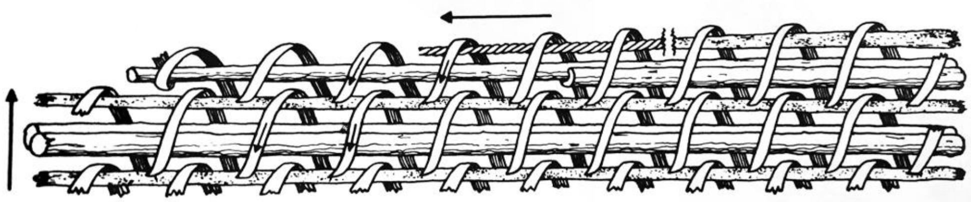

Fig. 102. Schematic example of a tapered self rim. The diameter of the additional coil has been reduced and a length of cordage has been substituted for the bundle as a terminal foundation element. This is not necessary for coil diameter reduction, but illustrates one method of approaching this problem.

Figure 3.20: Tapered self-rim on a coiled textile. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

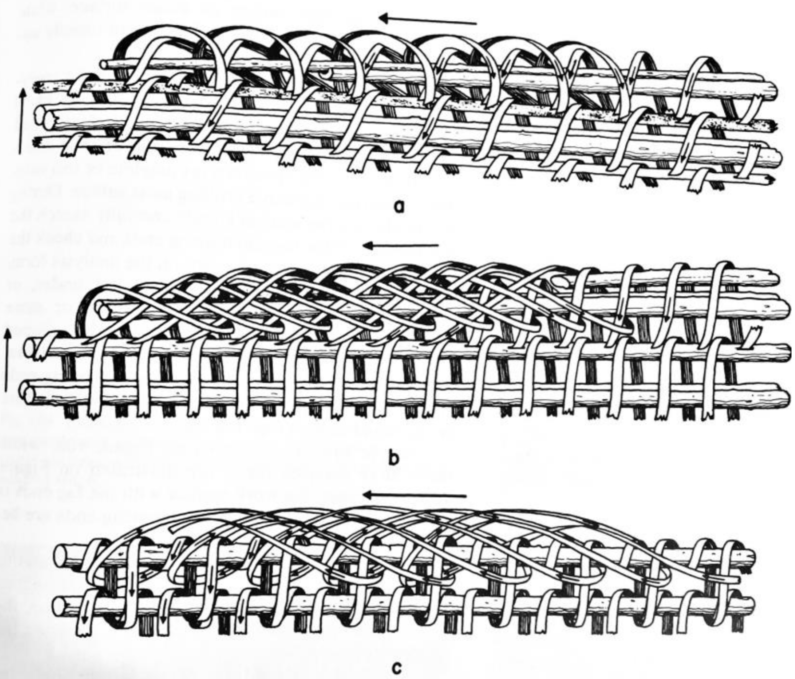

Fig. 104. Schematic examples of false braid rims. **a–b,** False braid rims on close coiled baskets sewn with non-interlocking stitches (**b** is also tapered). **c,** False braid rim on a close coiled basket sewn with interlocking stitch and wrap.

Figure 3.21: Examples of false braid rims on coiled textiles. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

Splicing methods may be different between the two surfaces so the distinction is important. Stitches may be clipped short or bound under other stitches with or against the direction of work, on either surface (Fig. 3.22). Foundation splices are predominantly laid-in and are invisible without the destruction of the basket (Adovasio 2010:90-94). As with twined basketry, coiled basketry decoration techniques will not be discussed.

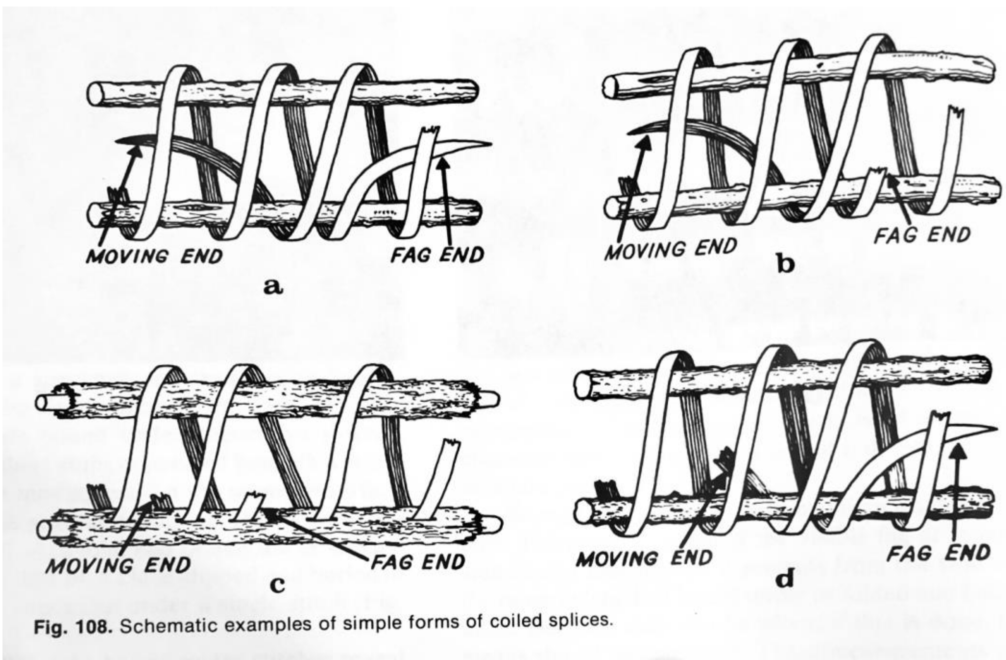

Figure 3.22: Examples of simple coiled textile splices. a) Moving and fag ends bound under stitches against the direction of work. b) Moving end bound under stitches against the direction of work, fag end clipped short. c) Moving and fag ends clipped short. d) Moving end clipped short, fag end bound under stitches against the direction of work. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

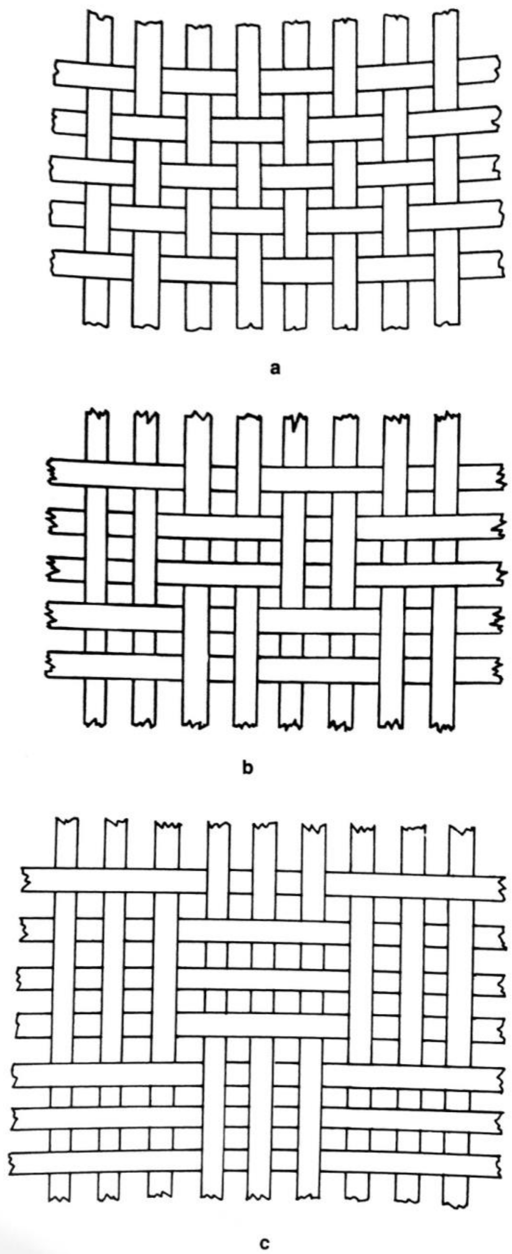

Fig. 117. Schematic examples of simple plaiting. **a,** 1/1 interval, one element per set. **b,** 1/1 interval, two elements per set. **c,** 1/1 interval, 3 elements per set.

Figure 3.23: Variations of simple plaiting. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

The third and final structural class of woven textiles, plaiting, is where all elements or groups of elements are active, with both horizontal and vertical elements moving over and under one another (Adovasio 2010:99). Plaited baskets may be differentiated by the intervals of element engagement, the types and frequencies of shifts in these intervals, the number of elements that form one unit, method of starting, selvages, splices, decoration, mending, form, material, and wear patterns or function. Plaited baskets come in either simple or twilled forms. Simple plaiting is when horizontal and vertical elements or units pass over each other in a 1/1 interval (Fig. 3.23); twilled plaiting is when the elements

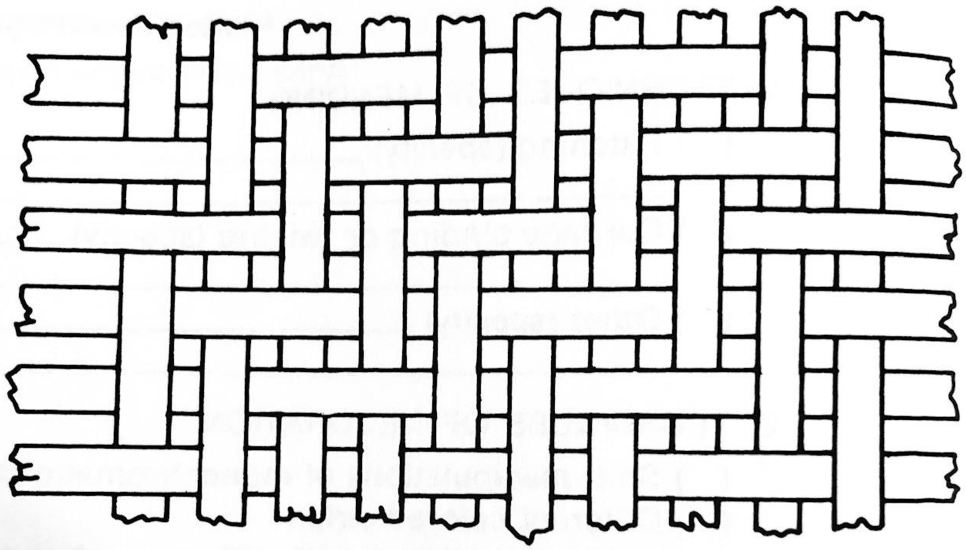

Fig. 118. Schematic example of twill plaiting, 2/2 interval.

Figure 3.24: Diagram of twill plaiting, 2/2 interval. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

pass over and under each other in any other interval, such as 2/2, 3/3, 2/1, etc (Fig. 3.24) (Adovasio 2010:99-105). Sometimes, plaited intervals on the basket may shift and change in order to create a pattern or to accommodate shaping. Because of this, many flexible plaited objects do not have a discernable “center”. Rigid plaited structures may have centers initiated with variants akin to that seen in twined centers, with rigid elements acting as pseudo-warps and flexible elements as pseudo-wefts (Adovasio 2010:106). In contrast, plaited baskets have a much greater variety of selvage types. Elements may be clipped after their final crossing, sometimes reinforced with a single row of weft twining (Fig. 3.25, 128) or whipping stitch (Fig. 3.25, 129); elements may engage in various forms of self selvage, wherein the terminal elements are folded and reinserted into the structure at different angles, sometimes in both directions and often with interval shifts near the edge (Fig. 3.26); and many other types outside the scope of this study (Adovasio 2010:110-117). Splices for flexible plaited elements are mostly laid-in, while rigid plaited splices come in the same varieties as twined warps (Adovasio 2010:120). Decorative plaiting techniques are not be covered here.

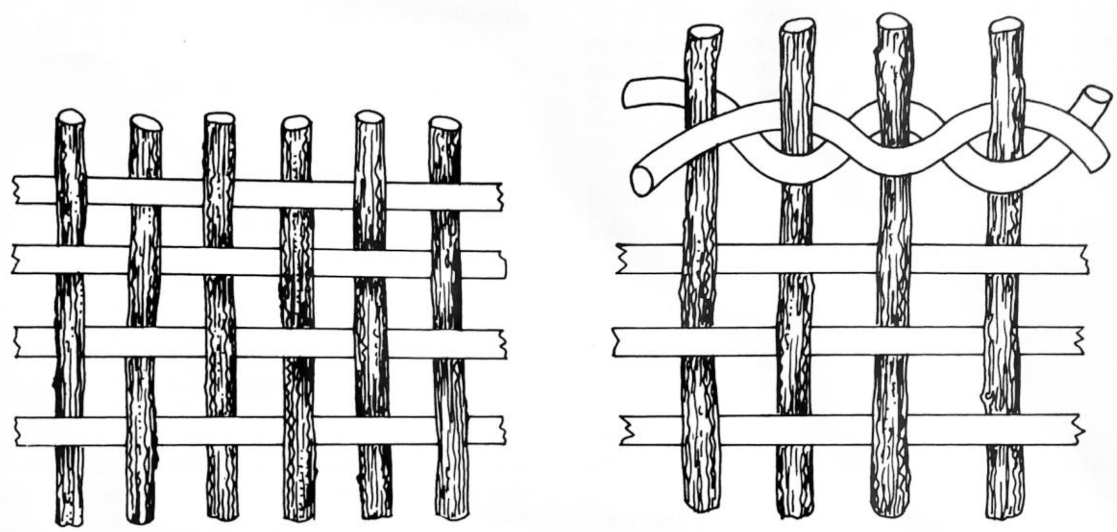

Fig. 128. Schematic example of a clipped selvage on a rigid simple plaited container.

Fig. 129. Schematic example of a clipped selvage on a rigid simple plaited container secured with a circuit of twining.

Figure 3.25: Two common plaited end selvages. 128: Clipped end selvage. 129: Clipped end selvage secured with one row of twining. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

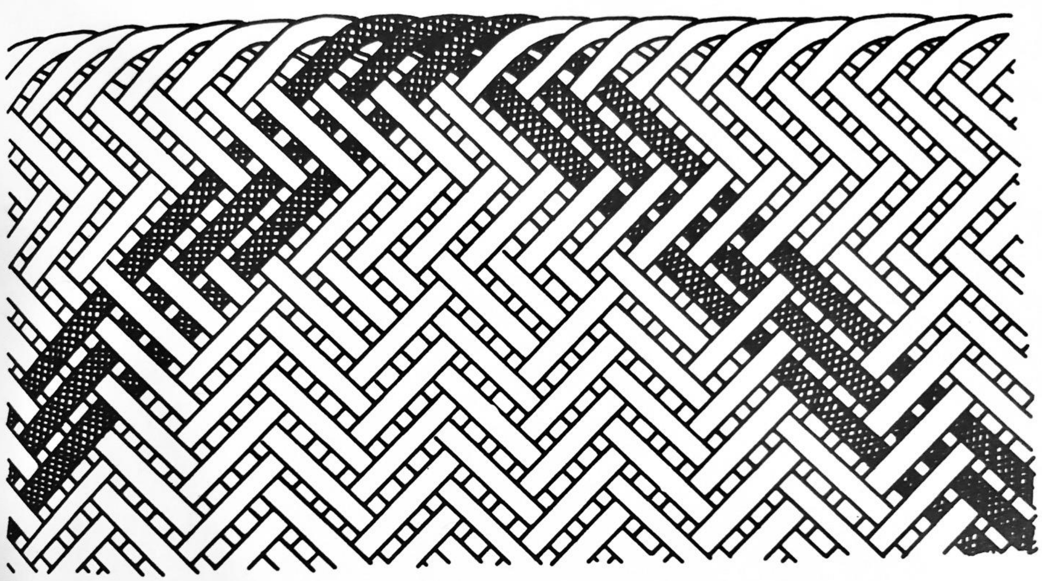

Fig. 130. Schematic example of a 90° self selvage.

Figure 3.26: Example of a plaited self selvage. Republished with permission of Taylor & Francis LLC, from *Basketry Technology: A Guide to Identification and Analysis, Updated Edition,* J. M. Adovasio, 1st Edition, 2010; permission conveyed through Copyright Clearance Center, Inc.

Data Collection

Data collection was conducted at three locations: the Museum of People and Cultures at Brigham Young University in Provo, UT, where artifacts collected from the University of Alberta's and Brigham Young University's recent excavations at the Promontory caves are housed; the Natural History Museum of Utah, which houses artifacts from Steward's (1937) original excavations; and the Canadian Museum of History, where a small sample of ethnographic fiber perishables from Subarctic Dene language-speaking groups was examined. Of the Promontory Caves artifacts, a total of 383 individual cords (some of which are tied together into a single construction), four plat sinnets, one net fragment, two fragments of netted fabrics, two possible netted game hoops, eleven bark fiber-wrapped hoops, one wrapped bark construction, 35 fiber bundles, 58 twined textiles, two sewn and twined textiles, 16 coiled textiles, three plaited textiles, and one lattice-like textile were examined. Some of the above fragments, textiles and cordage all, may be different fragments of the same structure. In addition, five cords or straps, 19 nets or netted bags, and one twined basket from the Canadian Museum of History's ethnographic collection were examined; however, not all attributes were recorded for these artifacts as due to preservation concerns, they could not be handled.

Depending on the protocols of the institution, either Nitrile or cloth gloves were worn while handling the artifacts. During analysis, artifacts were placed on acid-free tissue paper. Recorded attributes all reflect different steps in the process of making cordage and basketry, reflecting decisions influenced by the constraints of the material used, the object's intended function, and social ideologies, traditions, and expectations (Carr and Maslowski 1995). Measurements were taken with a soft measuring tape (cm) or a set of electronic calipers (mm). Averages were taken from a set of measurements according to the size of the individual specimen, generally from a set of five. Each form of a particular attribute corresponded to a numbered code recorded in a Microsoft Excel spreadsheet for both ease of recording and ease of later analysis.

Data on moccasin cordage was not collected, as cordage in these contexts is often sewn into the moccasin and thus length and number are obscured, making the metric data difficult to obtain (Erika Sutherland, personal communication 2020). Also of note is that while material is one of the attributes recorded, these determinations are tentative and based largely on what Steward himself (1937) attested as present, namely tule, shredded juniper bark, fur, feather, hide and/or sinew, and bast fiber from *Apocynum* and *Asclepias* sp. While I make no effort to determine specific plant species used (aside from more recognizable tule), the determination of bark versus bast fiber should still be taken with caution, as lighter-processed bast fibers can look like bark, and highly processed tule stems can look like bast fibers. Finally, not every artifact encountered fit into the categories outlined below; for these artifacts, the same general attributes were recorded but with modifications on a case by case basis. Recording of structural attributes follow analytical protocol for fiber perishable artifacts outlined and standardized in Adovasio (2010) and Jolie (2019). Recording of cordage ply formula follows Haas (2006) and Emery (2009). For speed of recording attributes, traits in data tables were assigned numbers (see Appendix I for code keys and lists of attributes recorded and Appendix II for data tables). Data analysis consisted of cross-cultural comparisons between what was found in the Promontory assemblage, the Hogup Cave fiber perishable assemblage, and what is known of Subarctic and Southwestern Dene fiber perishable traditions. Internal correlations in the Promontory assemblage were identified with the assistance of pivot tables in Microsoft Excel.

Chapter 4: Results

Before delving in to my findings, it is important to note that there are some discrepancies between the fiber perishables I analyzed from Steward's excavations and the fragments Steward described. There are also discrepancies between Steward's (1937) typology counts and typology counts for the basketry and textiles made by Adovasio (1979), Adovasio et al. (2002), and Adovasio and Illingworth (2014a). My own analysis contradicts both these numbers, although it is likely that Adovasio's numbers come from his own interpretations of Steward's analysis; further, Steward grouped artifacts based on presumed function rather than structure. Given that Steward's collection is old with both missing FS numbers and museum numbers for items that do not correlate with anything Steward described, for coherency's sake I present only my own analysis below. Following this, I summarize comparative data on fiber perishables recovered from the Fremont-era levels of Hogup Cave and data collected from fiber perishables in Dene ethnographic collections. Data presentation for basketry follows a blend of Adovasio (2010) and Webster and Jolie (2011, 2014).

Promontory Caves

Cordage

Hundreds of cords were recovered from the Promontory caves, with a total of 340 cordage structures analyzed under this study, 214 (63%) of which came from recent excavations by the University of Alberta and Brigham Young University and 126 (37%) from Steward's original excavations. My previous analysis of a sample of 95 cordage structures (Goldberg 2018), for which the data have been integrated into the present study, brings this total to 435. Of these, 155 (35.6%) are part of composite structures, where multiple cords are joined together through knots or loops. Data were gathered on each cord individually as it was often the case that cords joined together were twisted in different directions, had differing numbers of plies, and were made of different materials. In addition to the above 435, 43 cords were analyzed under this study that were stitched onto fragments of hide, bringing the total to 478, although many in this latter category are likely multiple cords that cannot be distinguished from one another. As the function of these cords—either as a tying or stitching material—is clear, these are considered separately, and any measurements should be considered averages for all cords used in the structure. Cordage associated with moccasins were not analyzed under this study but are worth study in the future as their function is known. While measurements for length, diameter, twists per cm, splicing, and tightness of twist were recorded, due to the absence of data for these traits from Fremont sites and in ethnographic collections these factors are not elaborated upon.

Unspun Cords. One hundred and forty unspun cords were analyzed under this study and an additional six were analyzed under a previous study (Goldberg 2018), bringing the total to 145 (see Table 4.2). The majority (90%) of unspun cords are made out of hide (n=130, see Table 4.3), with bast fiber as the second most common material (n=8 or 5.5%), followed by bark (n=4 or 2.7%), then tule (n=2 or 1.3%), and lastly a single unspun cord wrapped with strips of fur, likely with hide still attached, although not visible. Two other unspun cords are also wrapped, both made of hide and wrapped with porcupine quill. The fur wrapping of the former cord is secured in part with a 2zS twisted bast fiber cord.

Twisted Cords. The vast majority of cordage recovered from the Promontory Caves are twisted (n=283), with just under 60% (n=166) of these having a final S-twist (Table 4.2). The remainder (n=117) have a final Z-twist. Most twisted cords (n=208 or 73%) are two-ply, followed by single-ply (n=73 or 25%). There is a single six-ply cord (FS 669), made up of six s-spun cords Z-plied together. The cord whose final ply formula is unclear (FS 339) is a fragment of Z-twisted tule strands held together by an overhand knot. One S-twisted bast fiber cord (42BO1 10309b) is wrapped with another S-twisted bast fiber cord; the wraps have a Z-slant. The majority of twisted cords (n=203 or 72%) are made of bast fiber, followed by hide/sinew (n=41 or 14%). One artifact in this category was radiocarbon dated (see Table 4.1): 42BO1 9630 dates to 691 ± 27 radiocarbon years BP (cal. AD 1265-1390) (Ives et al. 2014).

Table 4.1 Fiber Perishable Dates from the Promontory Caves (Ives et al. 2014)

Lab #	Artifact	Material Dated	$\delta^{13}C$	^{14}C Date	Median Cal Date AD	cal AD (2σ)†
OxA-18158	42BO1:10513	Simple looping fragment	-22.20	706 ± 27		1260-1384
OxA-18460	42BO1:9630	2sZ twisted tule cord	-24.90	691 ± 27	1243	1265-1390
OxA-18461	42BO1:10547	Fiber game ring	-24.13	733 ± 27	1246	1225-1295
OxA-18462	42BO2:10409	Open simple twined mat fragment with Z-twist wefts	-23.10	699 ± 26		1264-1385
OxA-18463	42BO2:10490.1	Open diagonal twined winnowing basket fragment with S-twist wefts	-24.78	165 ± 25	1711	1660-1955
OxA-18464	42BO1:9659	Coiled basket fragment with half-rod and bundle foundation and non-interlocking stitches	-21.98	746 ± 27	1249	1225-1290
OxA-18465	42BO1: 9654	Close coiled basket fragment with half-rod foundation and interlocking stitches	-24.88	698 ± 26	1253	1260-1385
OxA-18466	42BO1:11604.2	Close coiled basket fragment with half-rod foundation split by interlocking stitches	-24.20	700 ± 26		1263-1385
OxA-18467	42BO1:10474a	Twined tule mat selvage with Z-twist wefts	-26.42	662 ± 26		1278-1391
OxA-28440	42BO1:FS981	Open simple twined tule mat fragment with Z-twist wefts	-23.44	748 ± 24	1265	1260-1286
OxA-28441	42BO1:FS1098	Close coiled basket fragment with half-rod and bundle stacked foundation and non-interlocking stitches	-23.33	694 ± 24	1302	1275-1385
OxA-28442	42BO1:FS1252	Open simple twined tule mat fragment with Z-twist wefts	-22.98	752 ± 24	1263	1256-1285
OxA-28443	42BO1:FS1300	Open simple twined tule mat fragment with Z-twist wefts	-24.73	734 ± 25	1272	1264-1294

Twenty-one twisted cords (7%) are made of bark, six (2%) of tule, six (2%) of fur, three (1%) of birdskin, and three (1%) of hair (Table 4.3). While the function of all cords is largely unknown, FS 75, a thick, Z-twisted cord made of tule, was likely part of a mat or bag selvage, given its size.

At 211 out of 275 (76%) total knots (Table 4.2), overhand knots are by far the most frequent knot type at the Promontory caves. Overhand loops make up the second most frequent at 47 (17%), followed by knotted buttonhole loops at six (2%). Granny, half-hitches, a cow hitch, a clove hitch, and a square knot are also present.

Interlaced Cords. Seven cords are braided (Table 4.2 and 4.3). Three (43%) of these (FS 101, 42BO1 9632, and 42BO1 9688) are three-strand braids. FS 101 is made of bast fiber, while the other two are made of tule. Parts of 42BO1 9632 are very loosely braided, suggesting that it may once have been part of a twined selvage. The remaining four (FS 1279e, 929, 1393, and 1579) are all two-strand box braids. FS 1279e, 929 and 1393 are both made of two strands of tule braided over a hide core (see Fig. 4.1, 4.2, and 4.3) while FS 1579 has one strand of tule and the other of hide. While their function is unknown, they may have been part of a clothing decoration.

There is also another type of interlaced cord present at the Promontory Caves, and due to its significance, the cords of this type are described here in detail, considered separately from the rest of the cordage assemblage. These two cords (FS 210 and 1197) bear a resemblance to structures described by Judy Thompson (2013:68, Fig. 2.26a-c) (see Fig. 4.4) as “band weaving,” although they are better described technologically as a kind of “plat sinnet” (see Ashley 1944, Fig. 2959, 2960, and 2961).[1] These two cords are made of three sets of elements: the first two are core cords or “warps” that are stationary. These run parallel to each other. For FS 210, the warp

[1] Special thanks to Dr. Penelope Ballard Drooker for assisting with this structural identification.

elements are made of 2sZ twisted bast fiber cord, while for FS 1197 they are thin strips of untwisted hide. The second element is the wrapping element, which tightly wraps the two warps together. The wraps are close enough together to hide the warps completely. FS 210 uses a basketry stitch material for its wrapping elements and FS 1197 uses porcupine quill. The third elements is the weft, which passes over and under the wrapping element and between the two warps. The weaving of the weft was done at the same time as the wrapping, beginning with the wrap going over the warps, followed by the weft passing over the wrap, and then passing over the wrap element again as it wraps around the reverse side, with the weft rising between the warps again ready to pass over the next wrap (see Fig. 4.4). Visually, this gives an effect like "beading" decoration on coiled basketry (Douglas 1940). If the weave was looser, the structure would look like 1/1 plaiting along its long axis. However, the weave is so tight that the wrapping elements are not visible between the wefts. FS 210 uses the same basketry stitching material as the wraps, but FS 1197, impressively, uses a very fine piece of sinew (see Fig. 4.5).

In the course of creating a replica to better understand how the unique weave was formed, Dr. Edward Jolie noticed that the slant of the active weft in his replica was opposite that of FS 210 and 1197 (personal communication 2020). The weft element in these two artifacts is slanted right-to-left, like most coiled basketry stitches in the Eastern Great Basin. Jolie's replica, however, is slanted left-to-right. This suggests that, like how stitch slant in coiled basketry correlates with coiling work direction, the slant of the active weft in these sinnet-like items may be useful in determining direction of work. In this case, the work direction appears to reflect whether the wrapping element moves over the passive warp elements from left to right or right to left, resulting in the active weft slanting in the same direction.

Table 4.2: Overview of Promontory Caves Cordage

Cordage Structural Class at the Promontory Caves

	Twisted	Unspun	Wrapped, Twisted	Wrapped, Unspun	Braided	**Total**
Number	282	142	1	3	7	**435**

Twisted Cordage Structural Form at the Promontory Caves

	S	Z	2zS	2sZ	2(2zS)Z	2(2sZ)Z	6sZ	Too fragmentary	**Total**
Number	44	29	125	80	2	1	1	1	**283**

Twisted Cordage Final Twist at the Promontory Caves

	S	Z	**Total**
Number	166	117	**283**

Cordage Material at the Promontory Caves

	Hide/sinew	Bast fiber	Bark	Fur	Tule	Hair	Birdskin	Hide and Tule	**Total**
Number	171	212	25	7	13	3	3	1	**435**

Knots at the Promontory Caves

	Overhand	Overhand Loop	Square	Knotted Buttonhole Loop	Granny	Half-hitch	Cow hitch	Clove hitch	**Total**
Number	211	47	1	6	4	4	1	1	**275**

Table 4.3: Cordage Material vs Final Twist at the Promontory Caves

Final Twist	Hide/sinew	Bast fiber	Bark	Fur	Tule	Hair	Birdskin	Hide and Tule	**Total**
S	25	130	6	4			1		**166**
Z	16	73	15	2	6	3	2		**117**
Braided		1			5			1	**7**
Unspun	130	8	4	1	2				**145**
Total	**171**	**212**	**26**	**7**	**12**	**3**	**3**	**1**	**435**

Another plat sinnet construction was found on the surface of Cave 1 by landowner Kumeroa Chournos (see Figure 4.6). Although it came from the surface of the site, Ives (personal communication 2020) has little doubt that it is a part of the Promontory Culture materials.

A possible fourth example of this plat sinnet construction is FS 1668 (see Figure 4.7), in which all elements are untwisted tule, but the wrapping element is spaced apart, giving the artifact the appearance of 1/1 plaiting. Another possible example was recovered by Steward (1937:34, 36, Fig. 13:d, e), but has no museum number and is currently missing.

Cordage in Hide Constructions. The majority of the cords (n=28 or 65%) used in hide constructions employ unspun stitching thread (see Table 4.4). Unspun stitching elements also correlate with the use of hide and sinew (in this case, sinew especially) as the primary raw material (n=25 or 58%). Twenty-one (49%) of the cords used in hide constructions were knotted, typically at the ends. All 21 had at least one overhand knot. Only one cord had anything other than an overhand knot, and that was a knotted overhand loop. Forty of the 43 cords (93%) in this category had an average diameter of <3 mm, suggesting that isolated hide and sinew cordage with a diameter under 3 mm in the above categories may have once been or were in preparation to be stitching thread.

Table 4.4: Cordage Material vs Ply Form in Hide Constructions at the Promontory Caves

Material	Z	2zS	2sZ	Unspun	**Total**
Hide/sinew	2		3	25	**30**
Bast fiber		5	5	3	**13**
Total	**2**	**5**	**8**	**28**	**43**

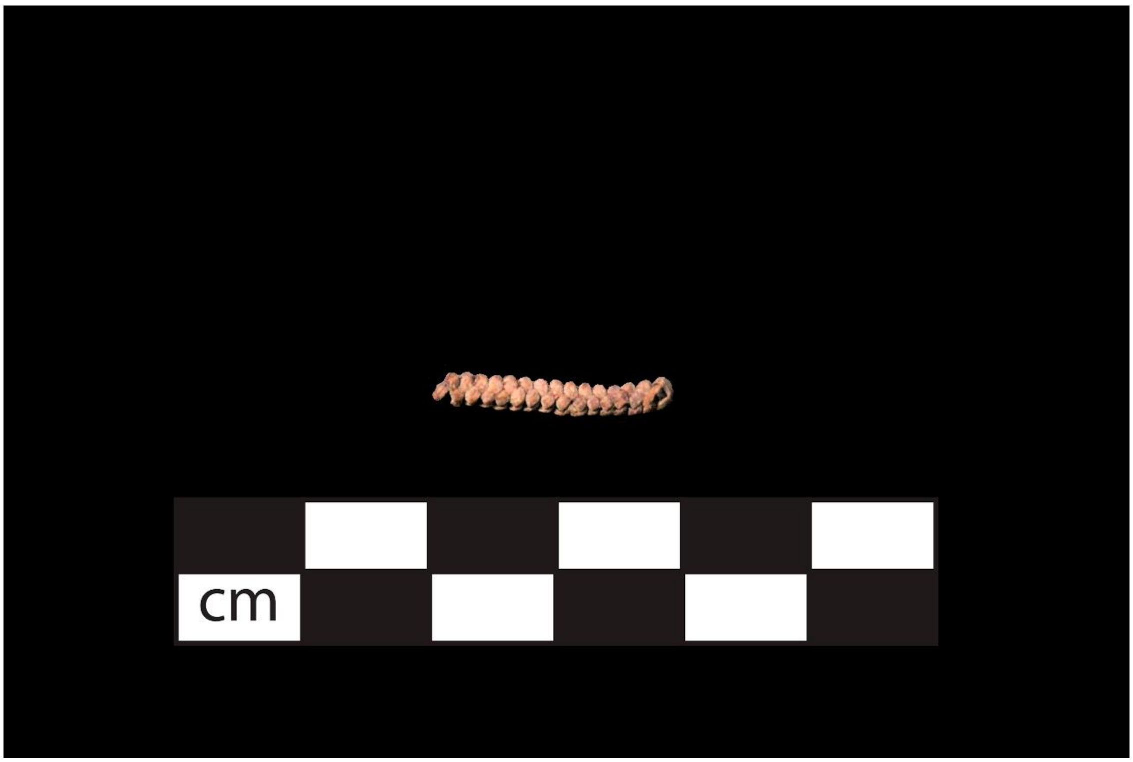

Figure 4.1: FS 1279e. Two-strand box braid around a hide core.

Figure 4.2: FS 929. Two-strand box braid around a hide core.

Figure 4.3: FS 1393. Two-strand box braid around a hide core.

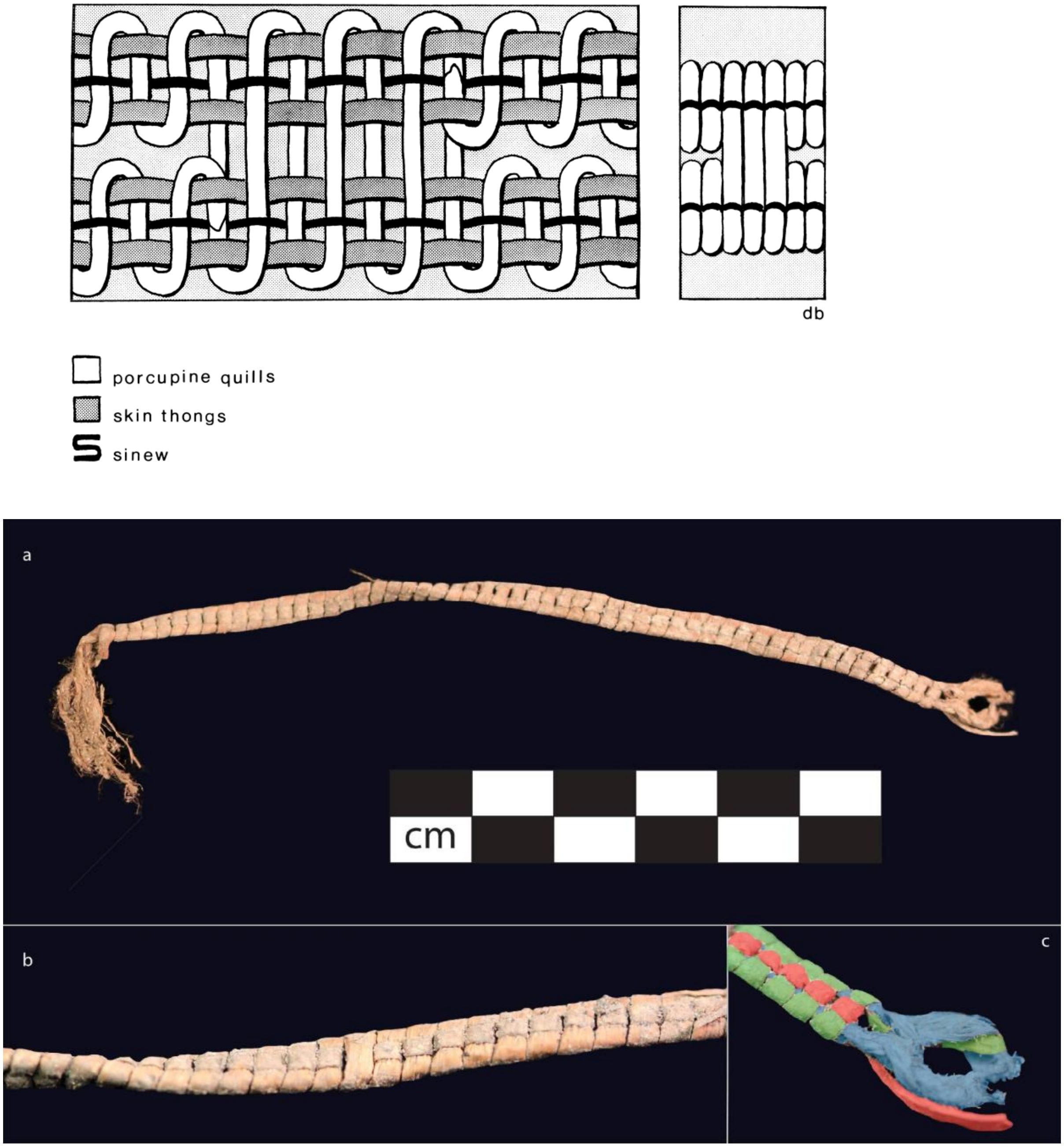

Figure 4.4: Top: Garter technique, trap or band weaving, drawing by Dorothy K. Burnham. Canadian Museum of History, IMG2012-0173-0018-Dm. Bottom: FS 210. Four-strand plat sinnet. In the bottom right, blue highlights the passive warp elements, green highlights the wrapping element, and red highlights the active weft element.

Figure 4.5: FS 1197. Four-strand plat sinnet. Top: Entire artifact. Bottom: Close-up of very fine sinew weft.

Figure 4.6: Four-strand plat sinnet. It is unclear if the sinnet portion and the braided portion are separate pieces.

Figure 4.7: FS 1668. Three-strand plat sinnet. Note how the spacing of the wrapping element gives the appearance of a single row of 1/1 plaiting.

Provenience. Of cordage with known provenience (n=334), the greatest number (n=139 or 42%) come from Unit 91N 99E, followed by Unit 90N 99E (n=96 or 29%) (see Fig. 2.2 for map of excavation units). Thirty-nine cords (12%) came from Unit 104N 91E, seventeen (5%) from Unit 95N 98E, thirteen (4%) from Unit 94N 98E, eleven (3%) from Unit 95N 99E, eight (2%) from Unit 98N 127E, four (1%) from Unit 93N 98E, four (1%) from Unit 95N 97E, and three (<1%) from Unit 97N 128E. There does not appear to be any correlation between provenience and other cordage attributes. Final twist direction, raw material, cordage diameter, degree of processing, and knot type do not pattern spatially in any meaningful way.

Nets and Netted Fabrics

Although there are many broken, knotted cordage fragments recovered from the Promontory caves, only one of these can be argued to possibly come from a net, in addition to two fragmentary netted fabrics. 42BO1 10513 is the most certain of these (see Fig. 4.8). Artifact 10513 was recovered from Cave 1 during Steward's excavations (1937:35) and was radiocarbon dated to 706 ± 27 radiocarbon years BP (cal. AD 1260-1384) (Ives et al. 2014). It is made up of tightly twisted 2zS cords in a close-worked simple or buttonhole looped structure crossed left-over-right (Emory 2009:31, Fig. 9, 10). The fragment is 26.1 cm by 2.7 cm, though it was likely once much larger, with an average mesh gauge of 2 mm and averaging 2.5 loops/cm. The cordage is made of highly processed bast fiber and averages 1.2 mm in diameter and 6 twists/cm. The net corner is a knotted overhand loops at one end. The fragment itself has been tied in an overhand knot, leaving both ends free, so it is highly likely that once its use-life as a net was over it was recycled for a different purpose. There are no visible looping elements splices. Steward (1937) originally interpreted 42BO1 10513 as part of a hairnet, but I find Adovasio et al.'s (2009) interpretation of FS 10513 as a bag or garment fragment far more likely. Babiche hunting bags made with the same simple looping technique are a distinctly Dene item (Marie and Thompson 2004), although simple looped netting is widely used across North America for the construction of bags and carrying nets (Driver and Massey 1957).

Another possible simple looping fragment is FS 1453.2 (see Fig. 4.9), which appears to have been part of a corner It is made out of unspun hide cords that average 1.47 mm in diameter and is approximately 8 x 4.63 cm in size. There is an overhand knot on each end. It was recovered from Promontory Cave 1 in Unit 90N 99E.

The single possible net fragment is FS 1672 f (see Fig. 4.10), a structure made up of four separate cords (fa, fb, fc, and fd). Each of these cords is made out of highly processed, tightly twisted bast fiber. One cord (fb) is tapered and has a 2zS twist, while the other three (fa, fb, and fd) are untapered with a 2sZ twist. Each cord averages 2.5 twists/cm, save fd, which averages 2 twists/cm. This structure's status as a potential net fragment is due to the frequency of sequentially spaced knots and the fact that these knots are approximately equidistant from each other. An overhand knot at the end of cord fa binds it to cord fb, a knotted buttonhole loop at the other end of cord fb binds it to cord fc, and then another overhand knot at the other end of cord fc binds it to cord fd. It is approximately 22 cm from the free end of cord fa to the first overhand knot, 21 cm from the first overhand knot to the knotted buttonhole loop, 3.5 cm from the knotted buttonhole loop to the second overhand knot, and 8.5 cm from the second overhand knot to the free end of cord fd. Part of cord fb is damaged in the center of the cord, almost fraying apart. There may have once been a knot tying another cord here as well. The other three cords are consistently highly worn across their entire length, such that at first glance they appear to be single-ply.

Figure 4.8: 42BO1 10513. Simple looping netted fabric fragment. Note self-engaging overhand knot at left.

Figure 4.9: FS 1453.2. Possible corner fragment from a simple looped netted fabric.

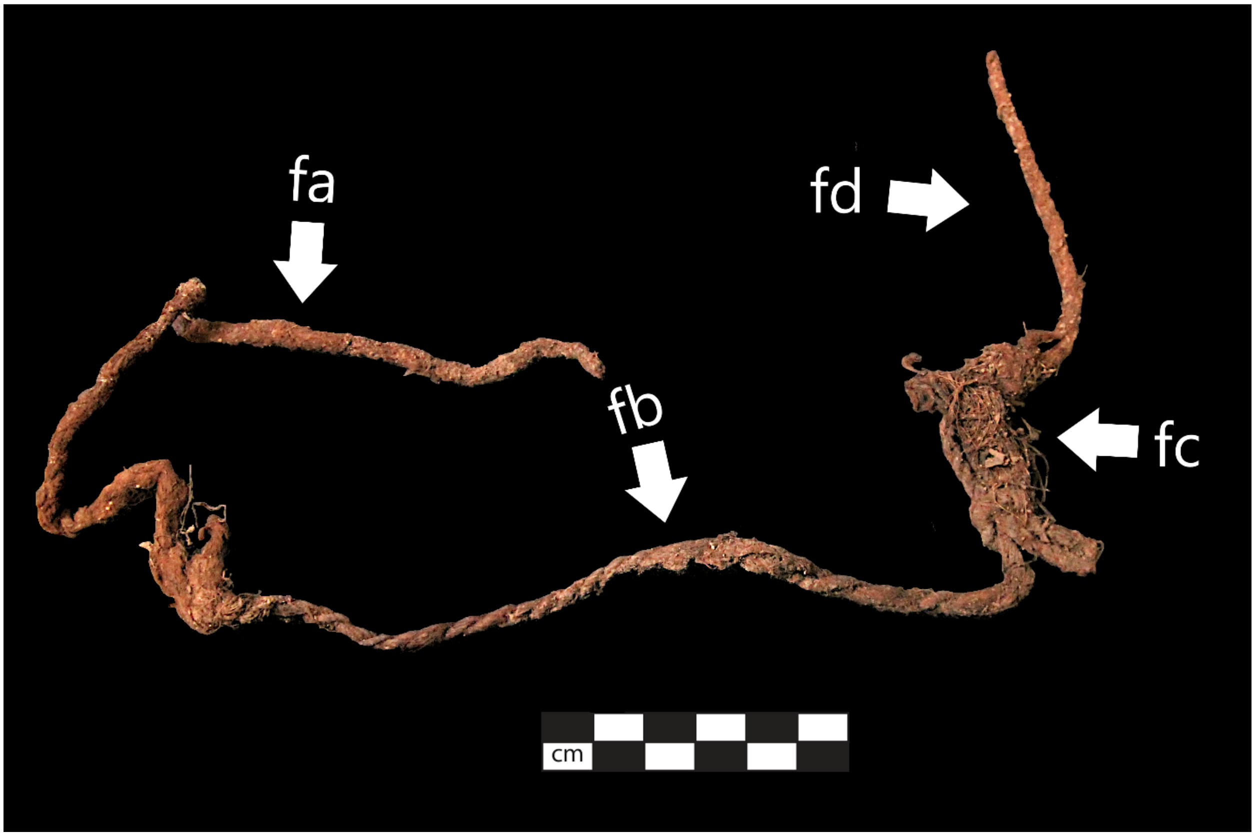

Figure 4.10: FS 1672f, knotted net fragment. Note the worn center just above the fb arrow.

Netted Game Hoops. Two possible netted game hoops were recovered from the Promontory Caves. 42BO1 10360 (see Fig. 4.11) consists of a whole bent sapling frame with partial sinew netting still intact, the sinew of which averages 1.62 mm in diameter. FS 856 (see Fig. 4.12) is a 10.9 cm long part of a bent sapling frame with some sinew wrapping, averaging 5.1 mm in diameter, recovered from Unit 90N 99E in Cave 1. Both have been identified as probable netted game hoops in Yanicki's (2019:390-391) dissertation on Southern Dene ethnogenesis at the Promontory caves. The sinew cordage wrapped around the frames are untwisted and highly processed, and in the case of 10360 is secured to the sapling frame with five overhand knots. Both are too fragmented to determine any other qualities of the net mesh, save for a single strand of S-twisted sinew on 42BO1 10360.

Figure 4.11: 42BO1 10360. Possible netted game hoop fragment. Close-up of S-twisted sinew.

Figure 4.12: FS 856. Possible netted game hoop fragment.

Bark-wrapped Hoops

Eleven bark fiber-wrapped hoops were recovered from Cave 1. One of these, 42BO1 10547, dates to 733 ± 27 radiocarbon years BP (cal. AD 1225-1295) (Ives et al. 2014). Steward (1937) initially interpreted these items as pot rests, but new research now suggests they were used as gaming rings (Yanicki 2019). FS 1342, the only specimen in this category with provenience data, was recovered from Unit 90N 99E.

Wrapped Bark Construction

42BO1 10566 (see Fig. 4.13) is a bundle of bark strips expediently wrapped with untwisted lengths of sinew. The length of sinew averages 1.98 mm in diameter. There are at least two separate sinew cords, with the ends of each ending in an overhand knot. The longer of the two cords tapers. The function of this structure is unknown; it was originally speculated to be part of another netted gaming hoop, but the knotted ends of the sinew and lack of scarfed joints rules this out (Gabriel Yanicki, 2020 personal communication).

Figure 4.13: 42BO1 10566. Sinew-wrapped bark.

Fiber Bundles

Thirty-nine fiber bundles recovered from the Promontory Caves were analyzed under this study, including four from a previous study (Goldberg 2018). These consist of processed or semi-processed materials that were likely to be used in the construction of cordage or basketry or, especially in the case of sinew, as a stitching material. Most (n=18) fiber bundles recovered are of bast fiber, although about a quarter (n=11) are bark. Seven are made of sinew, and only two are made of fur. Only one bundle is of tule. Of fiber bundles with known provenience (n=31), 12 came from Unit 90N 99E and nine from Unit 91N 99E, the same two units from which the majority of all artifact categories were recovered.

Twined Textiles

Fifty-eight twined artifact fragments were recovered from the Promontory caves. Eleven (19%) were recovered from the most recent excavations, with the remaining 47 (81%) recovered by Steward (1937).

Open Simple Twining, S-Twist Wefts

No. of Specimens: 6 (42BO2 10414; 42BO1 10474b, 10761, 9677; AR 4304, 4305).

Type of Forms Represented: Mats, 5; Travois bag, 1; unknown or indeterminate, 1.

Technique and Comments: Six twined fragments are open simple twined with S-twist wefts. Warps are of untwisted tule, three (42BO1 10474b, 10761, and AR 4305) with warps in groups of 1-2 elements and three (42BO1 9677, 42BO2 10414 and AR 4304) with warps in groups of 2-3 elements. All are lightly processed while the warps of 10761 are lightly to moderately processed. The wefts of 10474b are made of S-spun tule cord and the wefts of 11595 are of lightly processed, unspun hide. In all others, the wefts are of unspun tule. The tule wefts are lightly processed in four (42BO2 10414, 42BO1 10474, and AR 4304, 4305) and lightly to moderately processed in two (42BO1 9677, 10761). One fragment, FS 9677, has a single row of Z-twist twining. Weft rows are spaced wide apart. All fragments have a semi-flexible texture. Two fragments (42BO1 10474 and 10761) have end selvages where the warps are folded 180° and reinserted into adjacent warp rows (see Fig. 4.14). The warps are truncated after 1.4 cm in 10761 and after 3.1 cm in 10474. 10474 also has a side selvage where the weft is looped around the terminal warp element. 42BO1 9677 has side selvage but no end selvage; this side selvage alternates overhand knotted wefts with wefts looping around the terminal warp element. 10761 fragment has warp splices where new warps create new weft crossings; 9677 has new warps folded into V-shapes and inserted into pre-existing weft crossings. AR 4305 has visible laid-in weft splices. No fragment has any mending or decoration. All are worn on both surfaces, 10414 moderately; 9677 moderately to heavily; and 10474, 10761, AR 4304 and 4305 heavily, based on the degree of crushing of the tule warps. This is likely from use abrasion. All are possibly mat fragments, save 10474b, which is indeterminate but similar enough in structure to the rest to likely also be a mat fragment. All fragments are from Cave 1, save 10414 from Cave 2.

Figure 4.14: 42BO1 10761. Fragment of open simple twining with S-twist wefts. Note how the warps are folded and reinserted into adjacent warp rows along the upper selvage.

Unknown Twining, S-twist Wefts

No. of Specimens: 1 (FS 1691).

Technique and Comments: FS 1691, is a mat selvage fragment with a single row of S-twist twining and has warps of untwisted, moderately processed bark and wefts of untwisted, moderately to highly processed bark cord. 1691 is semi-flexible and has a selvage where the warps are folded 180° and reinserted into adjacent warp rows; there is also an overhand knotted side selvage. FS 1691 also has laid-in weft splices. The fragment is undecorated and unmended, was likely once part of a mat. FS 1691 was recovered from Cave 1 in F77, 95N98E, Level 4.

Open Simple Twining, Z-Twist Wefts

No. of Specimens: 32 (FS 981, 1045, 1054, 1055, 1056, 1252, 1300; 42BO1 10331, 10474a, 10553, 10554, 10656, 10764, 11603.3b, 11603.4, 11603.8, 9544, 9597, 9635, 9636, 9646, 9656, 9672, 9672a, 9672b, 9682, 9683, 9688; 42BO2 10409; AR 4303, 4306, 4307)

Technique and Comments: This category has the greatest internal diversity. Five specimens (FS 1045, 1054, 1055, 1056, and 981) have simple twining over single warps; 42BO1 9688 has warps in groups of 1-3; three (42BO1 10656, 11603.3b, and 9635) have warps in groups of 2; seven (42BO1 10553, 11603.8, 9544, 9636, 9672b, 9682, and AR 4307) have warps in groups of 2-3; five (42BO1 10764, 9597, 9672, 9672a, and AR 4306) warps in groups of 2-4; four (FS 1252 and 1300; 42BO1 11603.4; and AR 4303) have warps in groups of 2-5; two (42BO1 10331 and 9656) have warps in groups of 3; 42BO2 10409 has warps in groups of 3-4; 42BO1 10474 has warps in groups of 4; 42BO1 9646 has warps in groups of 4-5; 42BO1 9683 has warps in groups of 5-6; and 42BO1 10554 has warps in groups of 6-8. All warps are untwisted, and the majority (n=27) are of lightly processed tule, while four (42BO1 11603.3b, 11603.4, 9682, and AR 4307) are of lightly to moderately processed tule, and one (42BO1 9635) is of lightly processed whole plant stems.

The wefts of six fragments (42BO1 10331, 11603.8, 9635, 9646, 11603.3b, and 9688) are made of unspun cordage; one (42BO1 9656) has wefts made of Z-spun cordage; and the remaining 25 have wefts made of S-spun cords, one (FS 1252) of which also has a single weft row made of 2sZ twisted cordage beneath the selvage. Five fragments (FS 1054 and 981; 42BO1 9597, 9656, and 9688) have moderately processed bast fiber wefts, seven (FS 1045, 1055, 1056, and 1300; 42BO1 11603.4, 9636, and 9672a) moderately to highly processed, and 13 (FS 1252; 42BO1 10553, 10554, 10656, 10764, 9544, 9672, 9672b, 9682; 42BO2 10409; AR 4303, 4306, and 4307) highly processed; four fragments (42BO1 10331, 10474, 9646, and 9683) have lightly processed tule wefts, two (42BO1 11603.3b and 11603.8) lightly to moderately processed; and one fragment (42BO1 9635, Fig. 4.16) has wefts of whole woody plant stems with bark still intact.

Fourteen fragments have an end selvage: three (FS 1252, 1045, 1054) have warps truncated after 0.64, 1.55, and 2.53 cm respectively; two (42BO1 11603.3b, 9597) have warps folded 180° and truncated after 0.9 and 1.3 cm respectively; two (42BO1 10474, 9683) have warps folded 180° and reinserted into adjacent warp rows, one truncated after 4.9 cm (42BO1 10474); two have warps folded 45° and reinserted two warp rows after, truncated after 2.5 (42BO1 9688) and 3.5 cm (42BO1 9672); four have warps folded 180° and reinserted two warp rows over, three visibly truncated after 2 (FS 1056), 3.6 (42BO1 11603.4; see Fig. 4.21), and 4.1 cm (42BO1 10764); one (42BO1 9635) has warps folded 180° that then become weft elements in the terminal weft row (see Fig. 4.16). Two of the fragments with selvages are reinforced, one with an untwisted cord (42BO1 11603.3b; see Fig. 4.19) and the other with 2zS fiber cordage (42BO1 9597), both running between folded warp elements and above the final weft row.

Twenty fragments have side selvages: four (FS 1045, 1300; 42BO1 9656, 9672a) have wefts tied in overhand knots; two (42BO1 10474, 9688) have wefts looped around the terminal warp element; five (42BO1 10656, 11603.8, 9544, 9635, 9683) have continuous weft; one (42BO1 11603.4) has weft elements twisted into a 2sZ cord that doubles back on itself and is tied into an overhand knot, with an additional 2zS cord tied in an overhand knot around the former cord to form a loop; six (42BO1 10554, 11603.3b, 9636, 9672, 9672b, 9682) have alternating overhand knotted and continuous wefts where weft elements are twisted together, three (42BO1 10554, 9672, 9672b, and 9682) into 2sZ cord (10554 with Z-twisted terminal warps; see Fig. 4.18), one (42BO1 9597) into 2zS cord, one (42BO1 9636) into 2zZ cord, and one (42BO1 11603.3b) into Z cord; one (42BO1 9597) has a simple overhand knotted side selvage reinforced with Z-twisted terminal warps; and one (42BO1 10764) has weft elements twisted into 2sZ cord, splicing in extra plies with an overhand knot. After a few twists this cord is tied into a knotted overhand loop, after which the two plies are separated and one ply is tied into an overhand knot.

Ten fragments have visible warp splices. Seven (FS 1045, 1054, 981, 1300; 42BO1 10764, 11603.4, 9656) have new warps added into pre-existing weft crossings; two (42BO1 9544, AR 4307) have twisted-in warp splices; and one (42BO2 10409) has new warps initiating new weft crossings, twisted-in warp splices, and new warp elements folded around weft crossings with one end folded 180° into adjacent warp row. Twenty-four have visible weft splices, where twenty (FS 1045, 1300; 42BO1 10554, 10656, 10764, 11603.3b, 11603.4, 9544, 9597, 9636, 9656, 9672, 9672a, 9672b, 9682, 9683, 9688; AR 4306, 4307; 42BO2 10409) are laid-in wefts and four (FS 981, 1252; 42BO1 10553, 11603.8) are overhand knotted.

Five fragments are mended: one (AR 4307) with a 2zS cord tied onto the fragment with overhand knots and knotted overhand loops, to hold together areas where the wefts have worn away; one (42BO1 10764) with 2sZ cord tied into the fragment with overhand knots and knotted overhand loops, to hold together areas where the wefts have worn away; two (42BO1 9544, AR 4303) with tule stitching, though 9544's is to replace a worn selvage and also has a 2sZ cord mend knotted as above, and AR 4303's is to replace worn wefts; and 42BO1 9682, with hide stitches and a 2zS bast fiber cord tied to the 2sZ selvage cord and imitating Z twist twining where the wefts have worn away (see Fig. 4.17).

The lone bag (42BO1 11603.8) has antelope hide stitched around the bottom with sinew (see Fig. 4.20). Because of this, and the fact that the bag was so fragile, it was impossible to discern the start of the bag. It is unclear if the antelope hide is original or a mend, and because it encases the entire bottom of the bag, it could have been added to mitigate abrasive wear to the base of the bag or to mend an already worn base. The base of the bag does appear rather worn so the latter seems more likely.

All fragments are undecorated and worn on both surfaces based on the abraded tule warps, 42BO1 9597 lightly to moderately; FS 1252, 42BO1 11603.3b, 9544, and 9672a moderately; FS 1056, 1300, 981, 42BO1 10331, 10553, 10554, 10656, 10764, 11603.4, 9635, 9646, 9682, AR 4306, 42BO2 10409 moderately to heavily; and FS 1045, 1054, 1055, 42BO1 10474, 11603.8, 9636, 9656, 9672, 9672b, 9683, 9688, AR 4303, and AR 4307 heavily. The majority of fragments in this category are from mats save 42BO1 11603.8 (a bag) and two indeterminate specimens: 42BO1 9635, the rigid woody specimen, and FS 1056, which is a selvage fragment, although it is likely to have once been part of a mat based on its similarities to the rest of the mat fragments described here. All save 10409, which is from Cave 2, are from Cave 1. Seven fragments have a known provenience: FS 1045 and 1300 were recovered from Unit 90N 99E and FS 981, 1054, 1055, 1056, and 1252 were recovered from Unit 91N 99E. Five specimens were radiocarbon dated (Ives et al. 2014): FS 981 (see Fig. 4.15) dates to 748 ± 24 radiocarbon years BP (cal. AD 1260-1286); FS 1252 dates to 752 ± 24 radiocarbon years BP (cal. AD 1256-1285); FS 1300 dates to 734 ± 25 radiocarbon years BP (cal. AD 1264-1294); FS 10409 dates to 699 ± 26 radiocarbon years BP (cal. AD 1264-1385); and 10474a dates to 662 ± 26 radiocarbon years BP (cal. AD 1278-1391).

Figure 4.15: FS 981, an open simple twined mat fragment with Z-twist wefts that dates from cal. AD 1260-1286.

Figure 4.16: 42BO1 9635. Open simple twined fragment with Z-twist wefts. The end selvage has warps folded 180° and then reinserted into the terminal weft row, along with a continuous weft side selvage. It is unclear what sort of structure this once was a part of, but given it is the only twined fragment made of woody plant shoots it may be a flat openwork tray or perhaps a cradle.

Figure 4.17: Close-up of hide mend on 42BO1 9682, an open simple twined fragment with Z-twist wefts.

Figure 4.18: 42BO1 10554, open simple twining with Z-twist wefts. Note how on the left side the terminal warp bundle is Z-twist.

Figure 4.19: 42BO1 11603.3b, open simple twining with Z-twist wefts. Note the folded end selvage at top.

Figure 4.20: 42BO1 11603.8, open simple twining with Z-twist wefts. Tule bag with antelope hide stitched over the bottom.

Figure 4.21: Close-up of folded warp end selvage on 42BO1 11603.4, an open simple twined fragment with Z-twist wefts, where the warps are folded 180° and reinserted two warp rows over.

Open Diagonal Twining, Z-twist Wefts

No. of Specimens: 3 (42BO1 11603.5, 11603.7, 9582.6).

Technique and Comments: Three fragments have diagonal twining with Z-twist wefts over warps of lightly processed, untwisted tule in groups of 2-4 (42BO1 11603.7), 3-4 (42BO1 11603.5), and 5-7 (42BO1 9582.6). 42BO1 9582.6 has wefts 2zS bast fiber cordage; the other two fragments have wefts of untwisted, lightly processed tule. Weft rows are spaced apart, showing the warps. All three fragments are semi-flexible. The start of 42BO1 11603.7 has the initial warps folded into a U-shape, with the resulting two sets of warps becoming the parallel walls of the bag. The end selvage of 9582.6 has some warp elements truncated after approximately 1.6 cm, others spliced into a false braid interworked into the terminal weft row (see Fig. 4.22), with the weft elements making this selvage reminiscent of the plat sinnets (Fig. 4.4, 4.5, 4.6, and 4.7) described above. For the side selvage, the fragment has alternating overhand knotted and continuous weft treatments, where along the sides the weft elements have been Z-twisted together. No warp splices were observed. All three have laid-in weft splices. There is no decoration. None are mended. All three are worn on both surfaces based on the degree of crushing of the tule warps, 9582.6 moderately worn, 11603.7 moderately to heavily worn, and 11603.5 heavily worn. 42BO1 11603.7 is a bag, while 42BO1 11603.5 and 9582.6 are mat fragments. There is no provenience, save that all are from Cave 1.

Figure 4.22: Close-up of end selvage on 42BO1 9582.6, open diagonal twining with Z-twist wefts. Note how for the end selvage, some of the warp elements, instead of being truncated, are folded together into a false braid and held by the final weft row.

Unknown Twining, Z-twist Wefts

No. of Specimens: 4 (FS 692.8; 42BO1 11604, 9594?/10761?[2], 9660b).

Technique and Comments: Four fragments fall under this category. Only three fragments (FS 692.8, 42BO1 11604 and 9594?/10761?) have warps, and they are all of untwisted, lightly processed tule; in FS 692.8 they are grouped singly, in 42BO1 11604 in groups of 2-4, and in 42BO1 9594?/10761? in groups of 4-5. 42BO1 9660b and 9594?/10761? have wefts of moderately to highly processed, S-spun bark; 42BO1 11604 has wefts of untwisted, lightly processed tule. Only 9594?/10761? has an end selvage, where some warps are folded 180° into themselves and others are folded and reinserted two warp rows over and truncated after 4 cm. 9660b has an overhand knotted side selvage. There are no visible warp splices, but all four fragments with wefts have laid-in weft splices. All fragments are unmended. There is no decoration save for 9594?/10761?, where the folded warps give an appearance of a Z-twist cord. All are worn on both surfaces based on abrasion of the tule warps, 692.8 lightly to moderately, 9594?/10761? moderately to heavily, and 9660b and 11604 heavily. All are likely fragments of mats save 9660b, which is just a fragment of a weft and is thus of indeterminate form. FS 692.8 was found in Unit 90N 99E and is the only fragment in this category with provenience. FS 9660b was found stored with a plaited fragment of the same museum number.

Open Simple Three-Strand Braided Twining

No. of Specimens: 3 (42BO1 10333, 9520; 42BO2 10415).

Technique and Comments: These three fragments are unique in that their wefts are trebled or tripled and twine around the warps utilizing a three-strand braided 2/1 technique. In this

[2] The correct museum number for this specimen is unclear. Since there is another 10761, the correct number may be 9594, although the artifact labeled 10761 does not match Steward's (1937) brief description.

technique the wefts pass over two of the warps on one surface and behind one, creating what appears to be opposing weft twists on either surface (Fig. 3.6). 42BO1 10333, a bag fragment, has single warp elements (see Fig. 4.23), while the mats 42BO1 9520 and 42BO2 10415 have warps in groups of 2-3. All have untwisted tule warps, 9520 and 10333 lightly processed and 10415 lightly to moderately processed. The wefts of all three are made of untwisted, lightly processed tule; 10415 and 9520 have a terminal weft row of simple Z-twist twining made of highly processed, unspun bast fiber. The weft rows are spaced apart, revealing warps. All fragments are semi-flexible. Two (42BO1 9520 and 42BO2 10415) are possibly mat fragments. The bag fragment 10333 is begun by folding the initial warps into a U-shape, with the resulting two sets of warps becoming the parallel walls of the bag. The warps are truncated 3.4 cm above the terminal weft row; one mat fragment, 10415, has warps folded 45° and reinserted two warp rows over and truncated after 2 cm; 9520 has warps folded 180° and reinserted two warp rows over and truncated after 2.4 cm. The selvages of 10415 and 9520 are reinforced with the Z-twist weft row mentioned above. 9520 has an overhand knotted side selvage as well as warp splices, where new warps are inserted into new weft crossings. All three fragments have laid-in weft splices. The fragments are undecorated although the 3-strand braided weft rows, which are raised on one surface, could be interpreted as such; for 10333, the bag fragment, the raised surface is the outer surface. 10333 is mended with a small hide patch. 10333 and 10415 are moderately to heavily worn and 9520 heavily worn on both surfaces, based on the degree of crushing of the tule warps. There is no context, save that 9520 and 10333 are from Cave 1 and 10415 is from Cave 2.

Figure 4.23: 42BO1 10333, a bag fragment with simple 3-strand braided twining. Note how the braided twining leads to raised wefts on the outside surface.

Open Diagonal, S-Twist Weft Twining, and Simple Three-Strand Braided Twining

No. of Specimens: 1 (42BO1 10472).

Technique and Comments: 42BO1 10472 is a possible mat fragment that consists of five weft rows, beginning with three rows of diagonal S-twist twining (see Fig. 4.24, 4.25). Above the final diagonal S row are two rows of simple three-strand braided twining. Due to its fragmentary nature, it is uncertain if the original object was uniformly both twining techniques, or if one or the other was employed for decorative effect. The warps are of untwisted, lightly processed tule arranged in groups of 2-3; the wefts are also untwisted, lightly processed tule, and are spaced apart to reveal the warps. The fragment is semi-flexible, with no end or side selvage. There are laid-in weft splices with no visible warp splices. It is unmended as well as undecorated except, perhaps, for the 3-strand braided weft rows. It is moderately to heavily worn on both surfaces based on the degree of crushing of the tule warps and has no provenience save that it came from Cave 1.

Figure 4.24: 42BO1 10472, open diagonal S-twist twining with simple three-strand braided twining. Note that the raised top row is braided twining, while the other weft rows are S-twist twining.

Figure 4.25: 42BO1 10472, open diagonal S-twist twining with simple three-strand braided twining, reverse. Note how the three-strand braided twined rows appear to only be S-twist twining on the reverse side.

Open Diagonal Twining, S-twist Wefts

No. of Specimens: 1 (42BO2 10490.1).

Technique and Comments: 42BO2 10490.1 (see Figure 4.26), found in Cave 2, is a rim fragment of a close diagonally twined winnowing basket with S-twist wefts which post-dates the main Promontory caves occupation, at 165 ± 25 radiocarbon years BP (cal. AD 1660-1955) (Ives et al. 2014). It is charred along one broken edge of the rim rod, which suggests it is unrelated to use and may perhaps be related to cultural or post-depositional burning. Given that its form is identical to Great Basin winnowing baskets in the ethnographic present, and its later radiocarbon date, it is likely that 10490.1 is Shoshonean in origin.

Figure 4.26: 42BO2 10490.1, open diagonal twining with S-twist wefts. Note the charring on the right of the basket rim.

Sewn and Twined Textiles, Unknown Twined Type

No. of Specimens: 2 (42BO1 10322 and 42BO2 10394)

Technique and Comments: Two structures not included above are pieces of sewn and likely twined matting (42BO1 10322 and 42BO2 10394). These have semi-rigid tule warps pierced perpendicular to their long axes with twisted cordage. It is likely that the tule warps broke where pierced by subsequent wefts, and thus are of an open weave (see Fig. 4.27 and 4.28). The wefts of 42BO1 10322 are made of two highly processed 2sZ bast fiber cords joined together with an overhand knot. The wefts of 42BO2 10394 are comprised of paired highly processed 2zS bast fiber cord. 10394 was stored with an S-twist weft of lightly processed tule that has gaps between each full twist and that may have once been attached, although the latter cannot be said for certain. Pinching above and below the sewn warp elements in both structures also suggests that twining may once have been present.

Figure 4.27: 42BO1 10322. Piece of sewn and twined matting.

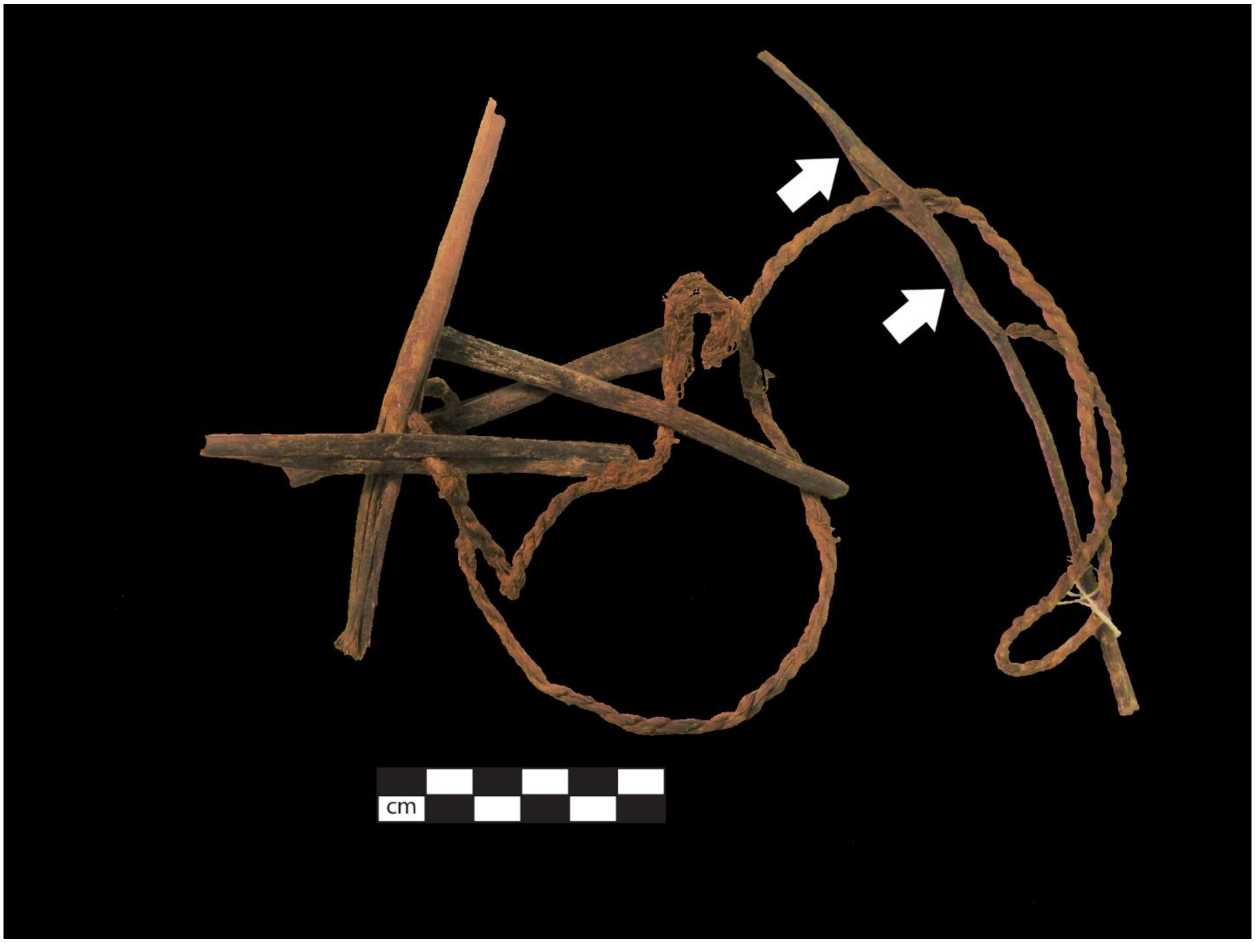

Figure 4.28: 42BO2 10394. Piece of sewn and twined matting. Note the pinching on the tule above and below where it is pierced by the weft.

Coiled Textiles

Sixteen coiled basketry fragments were recovered from the Promontory caves, from 13 separate constructions. Four (31%) of those constructions were recovered from the most recent excavations. The nine (69%) remaining constructions were recovered under Steward (1937).

Close Coiling, Half-Rod Foundation, Interlocking Stitch

No. of Specimens: 5 (42BO1 9654, 11604.2, 10609, 10377.1, AR 009).

Work Direction: left-to-right, 1; right-to-left, 4.

Technique and Comments: Five coiled fragments from the Promontory caves have a single half-rod foundation with flat side down (see Figs. 4.29, 4.30, 4.31, 4.32, and 4.33). They are sewn with interlocking stitches that pierce the foundation rod in three (11604.2, 9654, and AR 009) and simply encircle the foundation in two (10609 and 10377.1. The bark is left on all rods. All five fragments have stitches made of split and peeled woody shoot material, possibly willow. 11604.2 exhibits accidentally split stitches on both surfaces, and 10377.1, AR 009 and 9654 exhibit accidentally split stitches on only the non-work surface. 10609 has no accidental split stitches. 10377.1, 10609, and AR 009 have no gap between the stitches. The other two fragments have a stitch gap of <1 mm. 10609, 11604.2, 9654, and AR 009 have discernable, concave work surfaces; 10377.1 is too worn to determine work surface. All fragments have a rigid texture. The single base fragment, AR 009, is woven with a normal, continuous coil center with two reinforcing stitches that fill the central aperture, although there may be more that since broken. The single rim fragment, 42BO1 10609, has a self-rim with stitch and wrap in a 1/1 ratio. There is no decoration or signs of mending on any of the fragments. Two (11604.2 and 9654) have fag end splices bound under stitches with the direction of work; 9654 has clipped moving end splices and 11604.2 has the moving ends bound under stitches against the direction of work. A third fragment, 10377.1, has only moving end splices visible, and these ends are bound under stitches against the direction of work. Four fragments (10609, 11604.2, 9654, and AR 009) are moderately to heavily worn and the 10377.1 is heavily worn, based on the frequency of broken or missing stitches, which appears to be from abrasion. Since the wall curvature of the fragments suggests these came from trays or shallow bowls, and the lack of charring suggests they were not used for parching, the presence of abraded wear may be related to food preparation or perhaps even cooking (Ed Jolie personal communication 2020). 10609 is coated in a residue that may be food related, but many of the Promontory caves artifacts have residue related to deposition and whether this is also the case on 10609 is hard to say for certain. All fragments were recovered from Cave 1. Two fragments were radiocarbon dated (Ives et al. 2014): FS 9654 was dated to 698 ± 26 radiocarbon years BP (cal. AD 1260-1385); FS 11604.2 was dated to 700 ± 26 radiocarbon years BP (cal. AD 1263-1385).

Figure 4.29: 42BO1 11604.2. Close coiled basket fragment with half-rod foundation and interlocking stitches.

Figure 4.30: 42BO1 10609. Close coiled basket rim fragment with half-rod foundation and interlocking stitches.

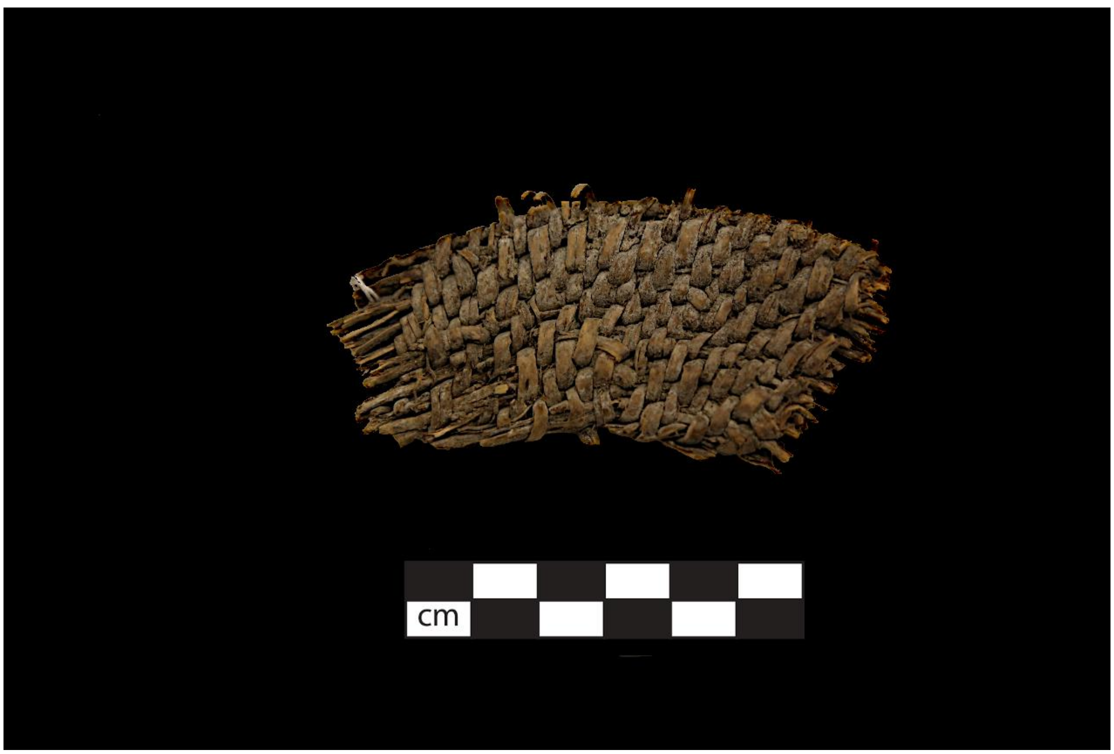

Figure 4.31: 42BO1 9654. Close coiled basket fragment with half-rod foundation and interlocking stitches.

Figure 4.32: 42BO1 10377.1. Close coiled basket fragment with half-rod foundation and interlocking stitches.

Figure 4.33: AR009. Close coiled basket center with half-rod foundation and interlocking stitches.

Close Coiling, Half-Rod and Bundle Stacked Foundation, Split Stitch

No. of Specimens: 1 (42BO2 11086).

Work Direction: right to left, 1.

Technique and Comments: One coiled fragment from the Promontory caves has a half-rod and bundle stacked foundation with intentionally split stitches (see Fig. 4.34). The half-rod is laid flat-side down and the stitches encircle the foundation without piercing it. Bark is left on the rods. The bundle material is highly processed bast fiber, likely *Apocynum* or *Asclepias* sp. The stitch material is of a peeled woody shoot, probably willow. The split stitching is visible on the non-work surface, but the work surface is too worn to ascertain intentionality. There is no stitch gap. The fragment is worked on its concave surface and has a rigid texture. The center is constructed via a normal, continuous coil with reinforcing stitches. The fragment is undecorated and no splicing is observed. The entire fragment is heavily worn but especially so on its concave surface, where nearly all of the stitches are broken. No mends or cultural residues are present.This fragment was recovered from Cave 2.

Figure 4.34: 42BO2 11086. Close coiled basket center with half-rod and bundle stacked foundation and intentionally split stitches on the non-work surface.

Close Coiling, Half-Rod and Bundle Stacked Foundation, Non-Interlocking Stitch

No. of Specimens: 9 (FS 1098, 1882, 1698; 42BO1 9659, 11604.4; and AR 008, 010, 011, 947).

Work Direction: right to left, 9.

Technique and Comments: Nine coiled fragments making up six individual coiled vessels are constructed with a half-rod and bundle stacked foundation with non-interlocking stitches that encircle the foundation; AR008, AR010, AR011, and AR947 are likely all from the same basket based on consistency across average coil and stitch measurements stitch gap, coils and stitches per cm, frequency of accidental split stitches, splice types, and state of preservation and appearance. All foundation rods in this category are arranged flat-side down, with bark left intact. The bundle portion is made of highly processed bast fiber while the stitches are made of a split woody material, likely willow. Three specimens (FS 1098, 42BO1 9659, and the four AR fragments) exhibit accidental split stitching on both surfaces, and 42BO1 11604.4 has accidentally split stitches solely on the non-work surface. All exhibit no stitch gap, save FS 1698, which is too fragmented to determine the presence or absence of a stitch gap. FS 1098 and 1882, 42BO1 9659, and the AR fragments have a concave work surface. The other two, 42BO1 11604.4 and FS 1698, are too fragmented to determine work surface. All forms have a rigid texture. The three rim fragments (42BO1 11604.4, 9659, and AR008), from three separate vessels, all have a self-rim (see Fig. 4.36, 4.37, and 4.38). 42BO1 1698, the only center, is heavily damaged, but appears to have been of the continuous coil variety (see Fig. 4.40). All fragments are undecorated. AR008 is mended with stitching of the same material as the rest of the stitches, but much wider and longer, presumably to mend a tear between two rows of coiling. Three forms have visible splicing: FS 1882 has clipped fag ends and moving ends bound under against the direction of work; 42BO1 9659 has moving ends clipped and fag ends bound under against the direction of work; and the AR fragments have both ends clipped. All specimens are worn on both surfaces, based on the frequency of broken or missing stitches: two are moderately worn, one is moderately to heavily worn, and three are heavily worn. FS 1882 is also charred on its work surface, indicating it was used for parching or cooking (see Fig. 4.39). Two fragments were radiocarbon dated: FS 1098 (see Fig. 4.35) dates to 694 ± 24 radiocarbon years BP (cal. AD 1275-1385) and 42BO1 9659 (Fig. 4.37) dates to 746 ± 27 radiocarbon years BP (cal. AD 1225-1290). All fragments were recovered from Cave 1. Three fragments have provenience: FS 1098 was recovered from Unit 90N 99E, FS 1698 from Unit 95N 98E, and FS 1882 from 91N 99E.

Figure 4.35: FS 1098. Close coiled basket fragment with half-rod and bundle stacked foundation and non-interlocking stitches, dated to cal. AD 1275-1385.

Figure 4.36: Close coiled basket fragments with half-rod and bundle stacked foundation and non-interlocking stitches. AR008 (top left, middle left), 010 (right), 011 (bottom), 947 (middle row, second from right). Note the large mending stitches on the two fragments of AR008.

Figure 4.37: 42BO1 9659, close coiled basket with half-rod and bundle stacked foundation and non-interlocking stitches. Fragment with a self-rim, dated to cal. AD 1225-1290.

Figure 4.38: 42BO1 11604.4, close coiled basket fragment with half-rod and bundle stacked foundation and non-interlocking stitches. Self rim fragment.

Figure 4.39: FS 1882, close coiled fragment with half-rod and bundle stacked foundation, non-interlocking stitch. Note the slight charring on the broken stitches.

Figure 4.40: FS 1698. Extremely worn center fragment with non-interlocking stitches. Only the bundle part of the foundation remains, but the looseness of the stitches suggests a rod was also once present.

Close Coiling, Foundation and Stitch Type Unknown

No. of Specimens: 1 (FS 93).

Work Direction: right to left, 1.

Technique and Comments: A single finished coiled center from the Promontory caves has an unknown type (see Fig. 4.41). The presence of back wrapping suggests the specimen is finished, but as it is clearly not a vessel, its function is unknown. As this fragment has only a single row of coiling, the type of stitch is indeterminate. The stitches wrap around the foundation rather than pierce through. There is no gap between stitches and the work surface is unclear. The specimen has a semi-flexible texture. The center is woven in a normal, continuous coil with reinforcing stitches. There is no decoration. On both surfaces, the specimen exhibits moderate to heavy wear, such that it is crushed and nearly flattened, obscuring the foundation. The specimen was recovered from Cave 2 in Unit 104N 91E.

Figure 4.41: FS 93. Finished coiled center with unknown foundation and stitch type.

Plaited Textiles

Three plaited artifacts were recovered from the Promontory caves under Steward's excavations in the 1930s.

Simple Plaiting, 1/1 Interval

No. of Specimens: 3 (42BO1 10555, 9660, 11603.3a).

Technique and Comments: 42BO1 10555, 9660, and 11603.3a were all recovered from Cave No. 1, lack an identifiable center, are constructed of 1/1 simple plaiting with one warp and one weft element per unit, and lack mending. FS 10555 and 11603.3a are similar enough in form and warp and weft measurements to have at one point served the same function, if not be pieces of the same artifact.

42BO1 9660 is a 16.6 x 4.5 cm plaited fragment that perhaps may once have been part of a strap or similar item, based on the presence of one end and two side selvages, indicating a narrow fabric (see Figure 4.42). It is moderately to heavily worn, based on the degree of fraying of the horizontal pseudo-warps and vertical pseudo-wefts. The pseudo-warp and pseudo-weft widths average 4.57 mm and 4.18 mm, respectively, with an average of two pseudo-warps and pseudo-wefts per cm. Both pseudo-warps and pseudo-wefts are made of moderately processed shredded bark fiber, which Steward (1937) identified as juniper. Pseudo-weft splices are laid-in alongside exhausted pseudo-wefts and the side selvage is continuous weft. The sole end selvage exhibits pseudo-warps folded 180° onto themselves that are then secured with a single row of Z-twist weft twining terminated with an overhand knot.

Figure 4.42: 42BO1 9660, simple plaiting, 1/1 interval fragment.

42BO1 10555 (see Figure 4.43) and 11603.3a (see Figure 4.44) are both moderately to heavily worn plaited fragments, based on the broken pseudo-warps. FS 10555 is 21.3 x 8 cm with an average warp width of 2.89 mm and an average weft width of 5.54 mm, and averages 4.5 warps and 1 weft per cm. FS 11603.3a is 25.5 x 8.7 cm, with average warp and weft diameters of 3.27 mm and 5.55 mm, respectively, and averages 4 warps and 1 weft per cm. The metric data are sufficiently similar enough to FS 10555 to suggest that they once came from the same object. This is further evidenced by both having split shoot pseudo-warps, likely of willow (Edward Jolie, personal communication 2020), highly processed pseudo-wefts that may be tule, and the same end selvage type, wherein the warps are folded 180° into themselves. The end selvage is reinforced with the terminal pseudo-wefts, tied into an overhand knot and S-twisted together into a cord, which is then used as a weft for a row of Z-twist twining. The side selvage is a continuous weft. 11603.3a's selvage is further reinforced with rigid whole rods, possibly of willow, over which the warps are folded. Steward (1937) also noted rod reinforcements for 10555 for both the warp and side selvage, but I did not see this, and these rods may now be missing. A highly processed 2sZ bast fiber cord tied with an overhand knot protrudes from the structure (likely the tail-end of the twined weft row, but where it originates is unclear). In the same container as 10555 but not attached was a bundle of bast fiber likewise tied in an overhand knot. Steward (1937) speculated that FS 10555 was the corner of a cradle or carrying mat, but the presence of continuous weft on both edges suggests that the finished structure was no wider than 8.7 cm, quite narrow to function as a cradle, but given its rigidity may have been used as a try or carrying frame.

Figure 4.43: 42BO1 10555, rigid simple 1/1 plaited fragment.

Figure 4.44: 42BO1 11603.3, rigid simple 1/1 plaiting fragment. Close-up of 180 degree folded warp end selvage with a single row of Z-twist twining as reinforcement.

Lattice-like Textiles

11595 is unique in that it is an expedient-looking structure made of approximately 15 hide strips (see Fig. 4.45). It was first described by Steward (1937: 51, 54, Fig. 24), although he did not ascribe a function. It has one row of S-twisted twining, but the warps and wefts meet each other at irregular angles, but portions are also interlaced and/or wrapped. The whole structure is reminiscent of lattice-work, and since no one weave dominates over another I have elected to move this artifact into its own category of "Lattice-like" textile.

Two of the S-twisted twined wefts are made by folding 180° over the terminal warp element and doubling back. The terminal warp element has porcupine quills adhering to its surface, but they do not pierce the hide. The average diameter of the hide strips is 5.44 mm, with an average thickness of 2.75 mm. By this measure, one can infer that 11595 was meant to support or hold a significant amount of weight. The spacing of the warps—on average 16.83 mm—are too far apart to adequately serve as a container. Two possible explanations for 11595's function that would account both for the broad spacing of the hide warps and for the hide's thickness are either a portion of snowshoe webbing or part of a travois basket.[3]

The snowshoe explanation is based on the similarity between the "selvage" of 11595, where the hide "wefts" fold 180° around another hide strip at a right angle and then double back, and the bridge (or center) portion of snowshoe webbing. This part of the snowshoe is made of thicker pieces of babiche as it is directly beneath the foot of the wearer. However, as a whole, the distance between the hide strips seems too broad and too uneven for a snowshoe.

The second explanation, that 11595 is part of a dog travois basket, was suggested by Kathryn Latham (personal communication 2020). This is based primarily on Buffalo Bird

[3] Thank you to Kathryn Latham, Leslie Main Johnson, and Edward Jolie for their insights into the possible function of 11595.

Woman's account of how to make a Hidatsa dog travois basket in Wilson (1924), where a green ash pole is used for the basket hoop and scraped and soaked buffalo rawhide is cut into strips and woven in wrapped, concentric circles into the basket proper. These strips were "three-eighths of an inch wide" (Wilson 1924:219), or 9.5 mm, and spaced on average "one and one half inches" apart, or 38.1 mm. The entire basket would be roughly 93 x 61 cm.

Figure 4.46 shows Goodbird's (Wilson 1924:217) diagrams of the steps in making a dog travois basket. In the diagram of the completed basket, one can see how like in 11595, the rawhide strips intercept each other at angles that when viewed without the context of the finished product may appear to be irregular. As well, both items feature hide strips looping around another to make new crosspieces. While the average measurements given by Buffalo Bird Woman in Wilson (1924) are much larger than those of 11595, should 11595 indeed be part of a travois basket it seems most likely that it represents the outer edge, where the spacing between hide strips are much smaller and the number of strips present denser; 11595 could even possibly be a portion of the basket rim, as rawhide can be very rigid (the whole artifact itself is very stiff), and with the added wrapping of the hide strips over the edge strip, the rim would be made even sturdier.

Regardless of whether 11595 is a fragment of snowshoe webbing or a dog travois basket, its presence at the Promontory caves is intrusive. Snowshoes are described by Driver and Massey (1957) as ubiquitous in the Northern hemisphere, and coincident with places that received heavy snowfall. This includes the Great Basin; however, the style of snowshoe known there post-Contact is the oval or bear paw snowshoe (Driver and Massey 1957:277, Map 80), a type that extends northward along the Pacific coast into the Subarctic. Driver and Massey (1957) describe the dog travois as a largely Plains technology, although their map of its distribution (Driver and

Massey 1957:282, Map 84) shows the presence of dog travois and dog packing into the northeastern portion of the Great Basin, including the region of Promontory Caves, in the ethnographic present by the Shoshone. This is discussed further in the next chapter.

Missing Artifacts from Steward's Excavation

In addition to the missing possible plat sinnet weave described at the beginning of this chapter, Steward (1937:34-36, Fig. 13 f, g) described and illustrated a narrow band (FS 10512), 32 cm long and 2 cm wide, made of 14 2-ply cords with a final Z-twist that run parallel to each other, spaced 3 mm apart. The cords are made of "soft fiber" less than 1 mm in diameter and are joined by spaced overhand knots that Steward (1937:36) suggested were to give the band a decorative appearance.

Figure 4.45: 42BO1 11595, a lattice-like textile. Likely once part of a travois basket.

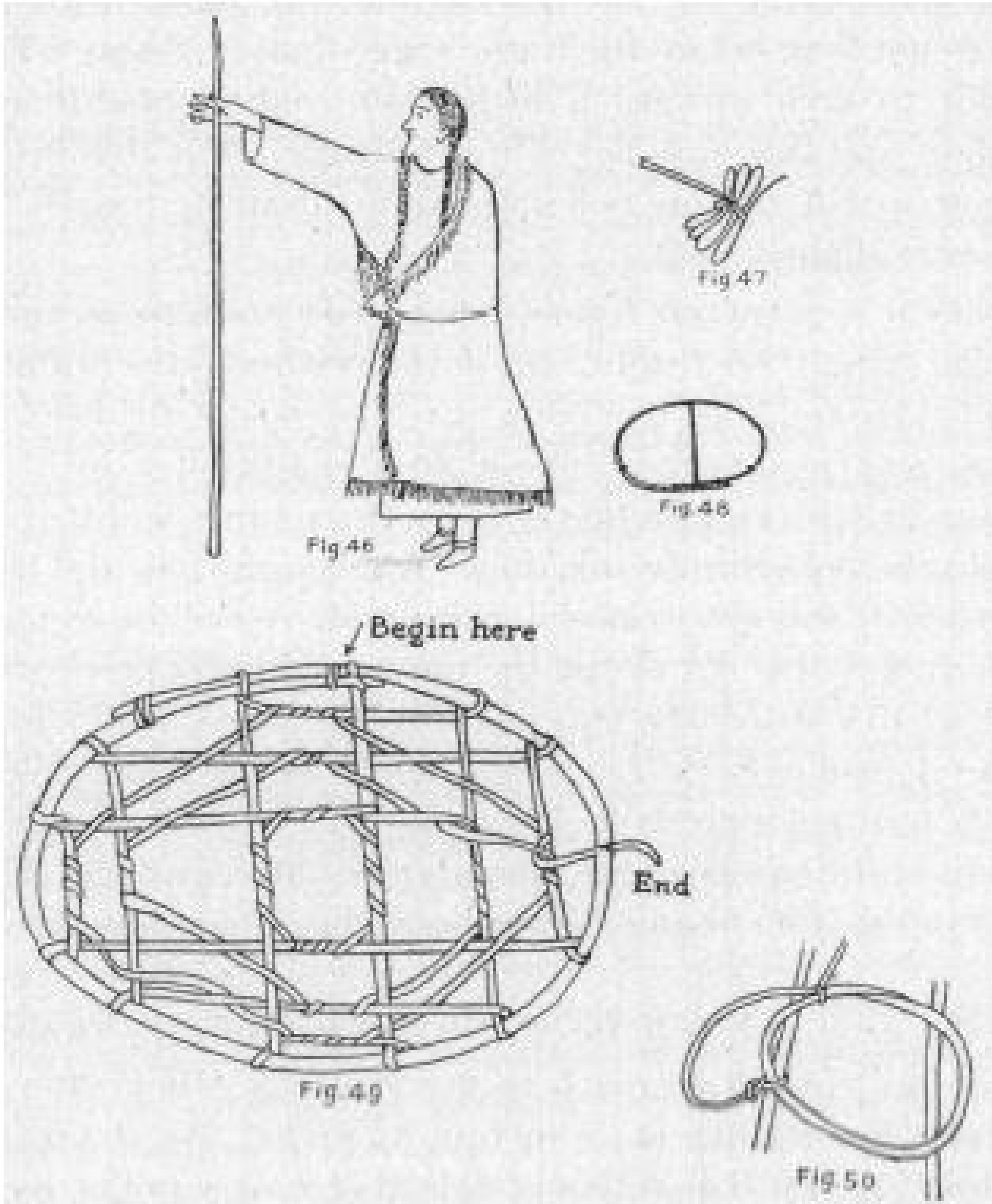

Figure 4.46: Buffalo Bird Woman's drawing of the steps in making a dog travois basket (Wilson 1924:219). Courtesy of the Division of Anthropology, American Museum of Natural History and the Minnesota Historical Society.

Hogup Cave

In order to determine where the Promontory caves' woven fiber perishable assemblage fits within the temporal and geospatial context of the 13th century Eastern Great Basin, it was compared to other Fremont-era perishables recovered in the eastern Great Basin, as well as woven fiber perishables from historic and contemporary Subarctic and Southwestern Dene communities. The primary archaeological assemblage used for comparison here is Hogup Cave (Aikens 1970), the closest site to the Promontory caves with Fremont-era deposits that include fiber perishables. It is located just ten miles west of the northwest shore of the Great Salt Lake and has a deeply stratified occupation history, allowing it to represent eastern Great Basin material culture across thousands of years, including what may be "typical" of Fremont material culture closest to the Promontory caves. Hogup Cave thus provides a good litmus test for whether the Promontory caves perishable assemblage is typical of the region or discontinuous. Recent radiocarbon dates and stratigraphic analysis by Martin et al. (2017) identify strata 12 through 16 as potential Fremont-era deposits. However, Martin and colleagues found the transition from Fremont to contemporary Numic-speakers difficult to parse out; thus, these data are used with the caution that artifacts from upper strata may not necessarily be Fremont in origin. For the purposes of this paper, the Fremont deposits of Hogup Cave serve as the primaru comparative dataset, but other sites are included where appropriate.

Cordage

Of the Fremont-era twisted plant fiber cords, 11 (14%) have a final Z-twist and 65 (86%) have a final S-twist; earlier strata had a greater number of final Z-twist cords that declined after stratum 8 to be superseded by final S-twist cordage. The counts of number of plies do not match with twist direction: two (3%) have a single-ply and 77 (97%) are two-ply (Aikens 1970). Eight cords are tapered, two are braided, four are tied with a loop at one end (knot type not described), and five are doubled-back, where two plies are made by a single ply folded in half and twisted on itself. There is also one two-strand box braid recovered from stratum 12, with three others from earlier or unknown strata (Adovasio 1970). No picture is provided, but this structure does sound similar to the box braids recovered from the Promontory caves. Goff (2010), in her analysis of cordage recovered from Mantle's Cave, CO—another site with Fremont deposits, although it stretches back to the Middle Archaic—similarly found that most (90.5%) twisted cords have a final S-twist, although final Z-twist is present as well.

There have been few extensive analyses of Fremont cordage, and those that exist are site-specific. Aikens (1970), in his analysis of the Hogup Cave assemblage, found 90 rabbit fur robe fragments, two "twisted skin strips", a 3Z-twisted sinew bowstring, four sinew cords, seven rawhide strips, six soft hide strips, 35 soft hide thongs, and 25 rawhide thongs from strata 12 through 16, for a total of three hide and sinew cords and 73 untwisted hide and sinew cords. Aside from the explicitly twisted fragments, these likely represent the Fremont-era untwisted cords from Hogup Cave, as Aikens reserves the term cordage specifically for twisted forms of plant fibers.

There are 18 Fremont-era fiber bundles from Hogup Cave (Aikens 1970:121-132). Thirteen (72%) are sagebrush bark bundles tied in an overhand knot, one is a wrapped sagebrush bark bundle, two (11%) are wrapped fiber bundles of unknown species, and two (11%) are wrapped reed bundles. Two more reed bundles from Fremont-era strata are tied together with an overhand knot. There is also a "braided reed object" from stratum 12, although no picture is given.

Nets. Hogup Cave yielded 138 net fragments along with many broken, knotted cords that may very well be net fragments themselves, and a single complete net (Aikens 1970). However, the majority of these net fragments come from deposits older than stratum 12, coincident with the most prolific deposits. Only four net fragments (3%) come from the potentially Fremont-era deposits of Hogup Cave, and the complete net is of unknown provenience (Aikens 1970; see also Adovasio et al. 2009).

Aikens (1970) does not differentiate the net fragments by stratum in his discussion, instead generalizing across all 138 fragments. Most are made of thin, two-ply twisted cord with meshes ranging between 4 to 5 cm^2. Adovasio et al. (2009:86) describes one net fragment from Hogup Cave as having a "very open mesh" with an average width of 64 mm, made up of rows of sheet bend knots with alternating faces. Adovasio et al. (2009) further note that the net fragment's cord is of small diameter, not unlike contemporary "mist" nets made for trapping bats. More detail is given to Hogup Cave's 140 by 4 ft complete net, which is made of 2zS cordage and has a 40-50 mm mesh. The net was found wrapped around two long sticks polished from use, doubled back and forth and then tied with a 2zS cord of shredded sagebrush bark, and was likely used to ensnare small game (Adovasio et al. 2009; Aikens 1970). Net knot types are not explicitly discussed, and though Aikens' monograph contains several photos of the net, the photos are not of high enough quality to ascertain its knot type(s), and the net remains in private hands.

Twined Textiles

By the time of the Fremont-era Great Basin, twined basketry had declined in abundance in favor of coiling (Adovasio 1986). There are four sites or site clusters in the eastern Great Basin with twining from Fremont-era deposits: Hogup Cave, UT; Etna Cave, NV; Yampa

Canyon, CO; and the Fremont River Area, UT (Adovasio 1970, 1979; Adovasio and Illingworth 2014a). Recent radiocarbon dating of the Hogup Cave material by Martin et al. (2017) allows a Fremont-era association to be made with more surety, resulting in discrepancies with Adovasio's (1979), Adovasio et al.'s (2002), and Adovaiso and Illingworth's (2014a) numbers. Hogup Cave has five twined fragments from Fremont-era deposits: two open simple Z that are semiflexible fragments likely from a carrying basket; two (possibly three) close diagonal Z, one coated with pitch, and all rigid basket wall fragments; and one open diagonal Z, another rigid basket wall fragment (Adovasio 1970). Material is discussed in general and not for specific fragments, but twined fragments were largely made of willow, *Apocynum* sp., *Asclepias* sp., *Artemisia* sp., and *Scirpus* sp. (Adovasio 1970). The Fremont River Area has four that are close simple S and one open simple Z; Yampa Canyon has two close simple S and uncounted close diagonal S, close simple Z, and open diagonal Z; Etna Canyon has four open simple S and one open diagonal S (Adovasio 1979; Adovasio and Illingworth 2014a). These numbers may change in the future as collections are re-examined. Disappointingly, no information is given on other twining traits, but Adovasio (1979) writes that at the majority of Fremont sites, twined artifacts have truncated selvages, save for the Promontory caves; side selvages are "invariably" continuous weft. Fremont twining exhibits no decoration unless one views their end selvage manipulations as such.

Coiled Textiles

There are 19 coiled basketry fragments recovered from Hogup Cave ascribable to Fremont-era deposits that fall into four coiled basketry technological subclasses, Subclass 13 (close coiling, one rod and bundle foundation), Subclass 15 (close coiling, three-rod bunched foundation), Subclass 12 (close coiling, half-rod and welt stacked foundation), and Subclass 11 (close coiling, one rod foundation) (Adovasio 1970; Adovasio and Illingworth 2014a). Nine (47%) of these come from Subclass 13, which includes 45 other fragments from earlier deposits, and consists of parching trays, carrying baskets, and water vessels among other forms. Subclass 13 consists of close coiled basketry with half-rod and bundle stacked foundation with three different stitch varieties: 14 fragments with non-interlocking stitches, 34 with split stitches on the non-work surface, and seven with split stitches on both surfaces. Unfortunately, no differentiation between stitch type and provenience is made for any of the Subclasses. Likely these fragments were all worked from right to left, as only one in this subclass is worked left to right.

Subclass 15 contains the second highest number of Fremont-era coiled basketry fragments, with five (26%) out of 15 total fragments recovered from Fremont-era deposits (Adovasio 1970; Adovasio and Illingworth 2014a). This subclass consists of close coiled basketry with a three whole rod bunched foundation, all worked from right to left. Fourteen of these fragments have split stitches on the non-work surface and one has split stitches on both surfaces. The stitches pierce through the top rod of the foundation.

Four (21%) Fremont-era coiled basketry fragments are from Subclass 12, which consists of close coiled basketry with a half-rod and welt stacked foundation (Adovasio 1970; Adovasio and Illingworth 2014a). There is great variation within this subclass in terms of work direction and stitch type, but unfortunately Adovasio (1970) only gives a general summary, making it impossible to determine from the text which traits correlate with the four Fremont-era coiled fragments. Lastly, one Fremont-era coiled basketry fragment is from Subclass 11, which consists of half- or whole-rod foundation with interlocking stitches. The single Fremont-era fragment is the sole example of a whole-rod foundation. Again, Adovasio’s (1970) general summary makes traits of specific fragments impossible to determine, so the work direction for this fragment is unknown.

For Hogup Cave as a whole, one rod and bundle foundation (Subclass 13), one rod and welt foundation (Subclass 12), and single rod foundation (Subclass 11) are the three most common, in that order (Adovasio 1970). The same three foundation types are also the most popular among Fremont sites across the Great Basin, although the sample sizes from many sites are small (Adovasio 1986; Adovasio et al. 2002). Other coiled varieties recovered from Fremont sites include three more foundations that are close coiled (bundle; two rod and bundle bunched; rod in bundle) and one open coiled variety with a whole rod foundation. (Adovasio et al. 2002; Adovasio and Illingworth 2014a). Prior to A.D. 1200, it is the single rod and one-rod and bundle (and multi-rod variants thereof) that dominate the eastern Great Basin. After this time, one rod and bundle foundation baskets disappear, as do single rod parching tray forms, although multi-rod foundations in other basket forms continue (Adovasio 1986). Non-interlocking stitches are the most common stitch type found at Fremont-era sites, with stitches split intentionally on the non-work surface and interlocking stitches also common, although the latter is found only in association with whole rod foundations. Rarer but still present are coiled baskets where the stitches are split on both surfaces and an intricate form of interlocking stitch seen on open coiling (Adovasio 1979; Adovasio et al. 2002). Fremont coiled baskets have normal, continuous coiled centers and are predominantly worked from right to left. Trays are worked on the concave surface while taller baskets are worked on the convex surface. The majority have self-rims, although some baskets utilize a false braid technique (Adovasio 1979; Adovasio et al. 2002). Splices are continuous from earlier coiled basketry in the region with three varieties: both fag and moving ends bound under; fag ends clipped, moving ends bound under; and both fag and moving ends clipped, although this last one is less common. Only two of all Fremont-era coiled baskets have any decoration, and the most common form is the flat tray, of which nearly all were used for parching (Adovasio 1979; Adovasio et al. 2002; Adovasio and Illingworth 2014a). Coiled baskets half-rod and bundle foundation, which are watertight, were likely used to store water (Adovasio 1970, 1979; Adovasio et al. 2002; Adovasio and Illingworth 2014a).

Plaited Textiles

No plaited artifacts were recovered from Hogup Cave or other Fremont-era Great Basin sites (Adovasio 1979, 1986; Adovasio et al. 2002; Adovasio and Illingworth 2014a).

Ethnographic Collections

The following section provides an overview of woven Dene items found in museum collections and described in ethnographic accounts. These are compared to the Promontory caves and Hogup Cave assemblages in the following chapter to provide a frame of reference of what is "typical" of the fiber perishables made by Dene language-speaking communities. Unfortunately, perishable archaeological material for early Dene populations is scant due to the acidic nature of boreal soils (Ives 1990:33, 2003), which limits the scope of this section to Dene fiber constructions from the past 200 or so years.

Cordage

There are hundreds of cords and objects with cordage in ethnographic collections (Albright 1984; American Museum of Natural History online collections; Andrews 2006; Canadian Museum of History online collections; Clark 1974a, 1974b; Cruikshank 1979; Duncan and Carney 1988; Emmons 1911; Hail and Duncan 1989; Hara 1980; Heine et al. 2007; Helm, Carterette, and Lurie 2000; Honigmann 1946, 1954; Jenness 1937; Jones and Luke 1985; Jones, Fall, and Leggett 2013; Kalifornsky 1991; Lamont 1977; Marie and Thompson 2004; Mason 1946; McClellan 2001; McKennan 1959; Nelson 1983a, 1983b; Nelson, Mautner, and Bane 1982; O'Brien 2011; Osgood 1933, 1936, 1966, 1970; Richmond 1972; Sullivan 1942; Thompson 2013; VanStone 1979, 1993a, 1993b, 1996; Yale Peabody Museum online collections). As such, only a broad overview will be presented here.

The vast majority of cordage seen across Subarctic and Southwestern Dene collections were untwisted cords made of hide or sinew. These were used as expedient ties and stitching material. While twisted cords of final S- and final Z-twist also occurred, they were mostly single-ply. Many sources simply referenced cords as "twisted" without further detail, save raw material source.

Structures similar in appearance to the four-strand plat sinnet weaves seen at the Promontory Caves ("band weaving" in Thompson's [2013] terms) are also a common Dene construction, used to make items such as mitten bands and moccasin garters (see Fig. 4.44, 4.45, and 4.46). I was able to personally view four such items at the Canadian Museum of History (VI-D-163, VI-N-114, VI-N-115, and VI-N-170), and can confirm that the weaving techniques are the same. Three are Dehcho in origin and the fourth came from the Dënesųłiné. A plat sinnet technique used in the weaving of some Dene birch bark handles, and one that I was able to observe (968.3.10, courtesy of University of Alberta Bryan-Gruhn Ethnographic Collection) used three strands instead of four. The stationary core or "warp" is a piece of birch bark split longitudinally down the middle to form two parallel strands. A single strand of spruce root is then used for both active elements (see Fig. 4.49). On the bottom surface, the handle appears to be like the "three-strand plat" sinnet depicted in Ashley's (1944:488, see Fig. 2961) compendium of knot types. Plat sinnet weaves are also seen among the Ahtna on a mitten cord (Thompson

2013:154, Fig. 4.15); among the Deg Hit'an on two moccasin-trouser garters (Thompson 2013:161-163, Fig. 4.21 and 4.22) and possibly three basket handles (VanStone 1996:34-39, Fig. 15a, 15b, and 23e); among the Dehcho on a headband, a moccasin garter, and a tapered band (Canadian Museum of History VI-N-170, VI-N-115, and VI-N-114) as well as three birch bark basket handles (Canadian Museum of History VI-N-53, VI-N-55; Richmond 1972; see also Clark 1974, Fig. 188); among the Dena'ina on three mitten cords (Jones, Fall, and Leggett 2013:201, Fig. 13.8 and 255, Fig. 15.38; Thompson 2013:75, Fig. 2.23b), seven moccasin-trouser garters (Jones, Fall, and Leggett 2013:295 and Fig. 4.5, 15.14b, 15.34, 15.38; Thompson 2013:82, Fig. 3.2a and 142, Fig. 4.5; for latter see also Jones, Fall, and Leggett 2013:200, Fig. 13.6) plus another possible instance on a moccasin-garter in a picture too small to see (Jones, Fall, and Leggett 2013: 242, Fig. 15.6, 15.10, and 15.13), and the band of a knife sheath (Jones, Fall, and Leggett 2013:295); among the Dënesųłiné on a bag strap (Fig. 4.47); among the Gwich'in on two knife sheath straps (Osgood 1936, Plate 7C; Thompson 1994:26, Fig. 32), two moccasin-garters (Thompson 2013, Fig. 3.1d and 4.45c), and two mitten straps (Clark 1974, Fig. 181; Thompson 2913:11, Fig. 1.4); among the Tagish on two moccasin-trouser garters (Thompson 2013:205-206, Fig. 4.60b and 4.62); among the Tahltan on two moccasin-trouser garters (Thompson 2013:209-212, Fig. 4.64c and 4.67) and a possible instance on a net selvage (Canadian Museum of History VI-O-97) (Fig. 4.48); among the Tanana on a moccasin-trouser garter (Thompson 2013:173, Fig. 4.34); and among the Tutchone on a moccasin-trouser garter (Thompson 2013:200, Fig. 4.56b).

Sinnet weaves appear to be absent among Dene language-speakers in the Southwest, as well as the region as a whole—save for perhaps a single Jicarilla coiled basket. A specimen at the Yale Peabody Museum (ANT 021330) has a basket handle that, from available photographs, resembles a three-strand sinnet birch bark basket handle. However, it may well be a 1/1 interval false braid treatment that only superficially resembles a plat sinnet.

Figure 4.47: CMH, VI-D-163, close-up of a Dënesųłiné strap using a four-strand plat sinnet weave. Courtesy of the Canadian Museum of History.

Figure 4.48: CMH, VI-O-97, Tahltan net selvage with a possible plat sinnet. Courtesy of the Canadian Museum of History.

Figure 4.49: 968.3.10, basket handle with a three-strand plat sinnet weave. Left: top. Right: underside. Note how the appearance of a four-strand sinnet weave is accomplished with only three strands. Courtesy of the Bryan-Gruhn Ethnographic Collection, Department of Anthropology, University of Alberta.

Nets. Tables 4.5 and 4.6 show the distribution of looped net and knotted net types and material across Subarctic Dene language-speakers (Albright 1984; American Museum of Natural History; Andrews 2006; Canadian Museum of History; Clark 1974a, 1974b; Cruikshank 1979; Duncan and Carney 1988; Emmons 1911; Hail and Duncan 1989; Hara 1980; Heine et al. 2007; Helm, Carterette, and Lurie 2000; Honigmann 1946, 1954; Jenness 1937; Jones and Luke 1985; Jones, Fall, and Leggett 2013; Kalifornsky 1991; Lamont 1977; Marie and Thompson 2004; Mason 1946; McClellan 2001; McKennan 1959; Nelson 1983a, 1983b; Nelson, Mautner, and Bane 1982; O'Brien 2011; Osgood 1933, 1936, 1966, 1970; Richmond 1972; Sullivan 1942; Thompson 2013; VanStone 1979, 1993a, 1993b, 1996; Yale Peabody Museum). However, it is important to bear in mind that just because a particular trait is not marked present does not mean that that group never utilized it; rather, it means that I never came across evidence of its presence in my research.

The most common net structure among Subarctic Dene language-speakers is simple looping (a type of so-called "knotless netting"), followed by nets made with overhand knots (Table 4.5). Simple looping is also the dominant structure for netted babiche game bags (see Figures 4.47, 4.48, and 4.49), attested for the Dakelh (Canadian Museum of History online collections VI-B-163); Dehcho (Andrews 2006:32-33; Canadian Museum of History online collections VI-N-108; Clark 1974; Marie and Thompson 2004:12, Fig. 7), Dënesųłiné (Canadian Museum of History online collections VI-D-25, VI-D-283, VI-Z-248, VI-D-147), Gwich'in (American Museum of Natural History online collections 50.2/4688, 50.2/4689, 50.2/4690; Osgood 1936:72), Hän Hwëch'in (Yale Peabody Museum online collections ANT 053033), K'asho Got'ine (Clark 1974:74, Fig. 92; Duncan and Carney 1988:52, Fig. 31; Marie and Thompson 2004:13, Fig. 8), Kaska Dena (American Museum of Natural History online collections 50/3994, 50/3993, 50/3992, 50/3991; Canadian Museum of History online collections VI-H-15), Sahtuot'ine (Canadian Museum of History online collections VI-G-25), Tagish (McClellan 2001:292), Tłįchǫ (Andrews 2006:34-35; Canadian Museum of History online collections VI-E-54, VI-E-34, VI-E-35, VI-E-36, VI-E-31; Duncan and Carney 1988:52, Fig. 32; Hail and Duncan 1989:217, 219, 278; Marie and Thompson 2004:5, Fig. 3 and 12, Fig. 6), Tsay Keh Dene (Canadian Museum of History online collections VI-M-32; Jenness 1937:40, Plate X), and Tutchone (Canadian Museum of History online collections VI-Q-2, VI-Q-3, VI-Q-57, VI-Q-61), although bags whose netted fabrics are made with overhand, square, or cow's hitch knots are not unknown in the Subarctic (Canadian Museum of History online collections VI-H-16, VI-M-27, VI-M-35, VI-O-6, VI-O-79).

There are sparse data, outside of raw material source, on the types of cordage Subarctic Dene language-speakers use to make nets. The Dehcho (Clark 1974; Marie and Thompson 2004; Thompson 2013), Dena'ina (Jones, Fall, and Leggett 2013), Kaska Dena (Honigmann 1954), Sahtuot'ine (Marie and Thompson 2004; Osgood 1933), Tahltan (Albright 1984; Emmons 1911), and Tsay Keh Dene (Clark 1974) are all said to use untwisted cords for this purpose. S-twisted cords are attested among the Deg Hit'an (Osgood 1970, VanStone 1996), Dehcho (Clark 1974), Tłı̨chǫ (Hail and Duncan 1989; Helm, Carterette, and Lurie 2000), and Tŝilhqot'in (Thompson 2013), with the latter two as the only groups known to make nets with Z-twisted cordage, at least in the ethnographic literature. Nets made of 2sZ-twisted cords are reported for the Dakelh (Canadian Museum of History online collections VI-B-349), Tłı̨chǫ (Hail and Duncan 1989; Helm, Carterette, and Lurie 2000) and 2zS-twisted cords for the Dane-zaa (American Museum of Natural History online collections 50.1/7673), Dehcho, Sahtuot'ine (Canadian Museum of History online collections VI-G-19), and Tahltan (American Museum of Natural History online collections 16.1/1126). Net selvage type is described for only five Subarctic Dene groups, with nets edged with extra backing attested for the Deg Hit'an (Osgood 1970), Dena'ina (Osgood 1966), K'asho Got'ine (Hara 1980), and Sahtuot'ine (Osgood 1933), and a possible single instance of a sinnet weave used as selvage among the Tahltan, described above (Fig. 4.45).

Figure 4.50: Babiche bag made with simple looping structure. Used with permission from the University of Alberta Museums Art Collection: "bag, date unknown; gut; hide; wool, felt; cotton; bead, glass; wool; knotted; netted; appliqued; dyed; handsewn; University of Alberta Museums Art Collection (1965.24.68); University of Alberta Museums."

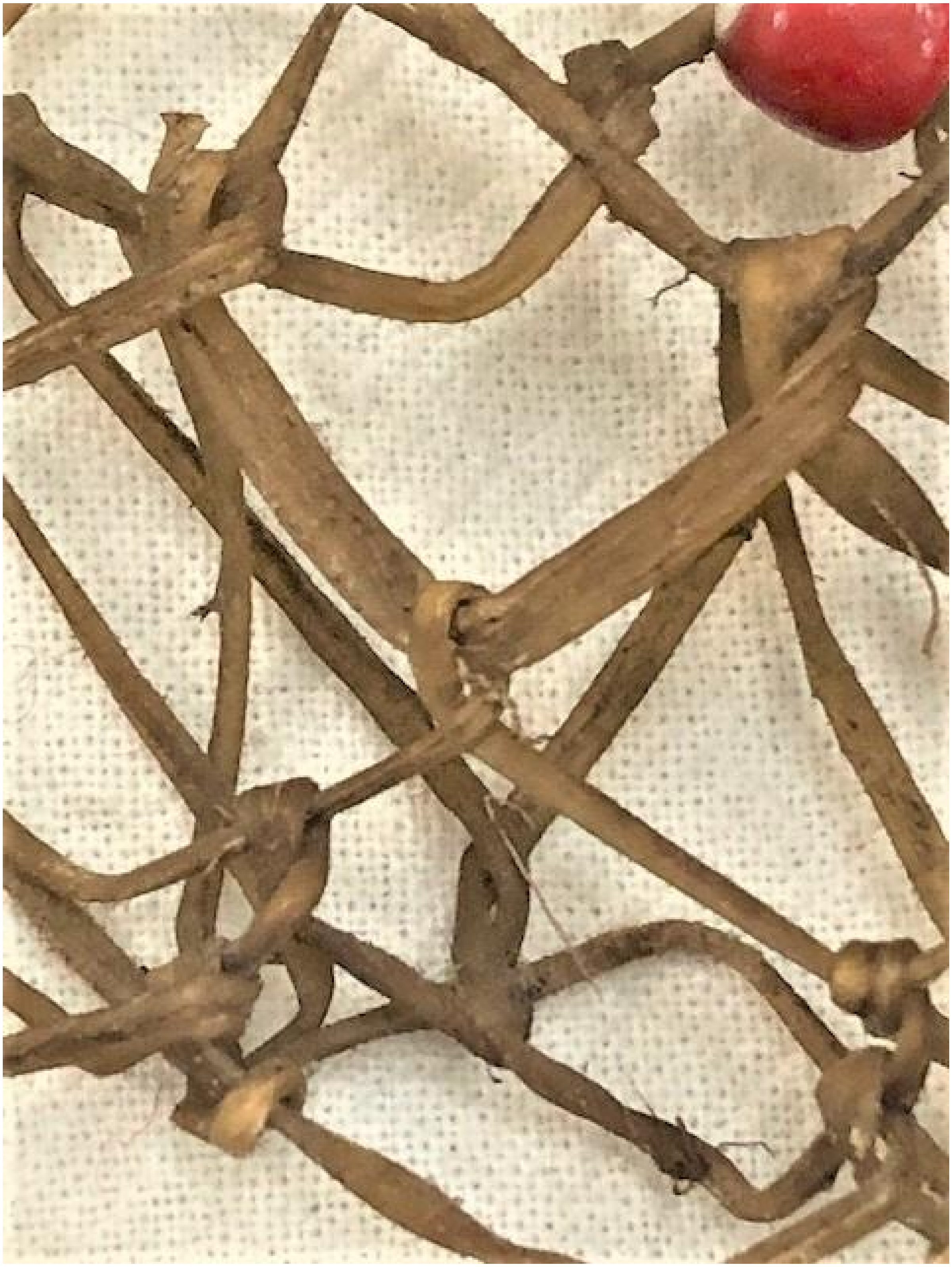

Figure 4.51: Close-up of VI-Q-61, a Tutchone babiche bag made with simple looping. Courtesy of the Candian Museum of History.

Figure 4.52: Close-up of VI-H-15, a Kaska Dena babiche bag made with simple looping. Courtesy of the Canadian Museum of History.

Table 4.5: Net Materials Among Subarctic Dene[4]

	Babiche	Hemp	Sinew	Spruce Root	Willow Bast	Willow Bark	Willow Root	Birch Bark	Nettle	Rabbitskin (robes, blankets)	Mountain Goat Wool
Dakelh	x	x	x								
Deg Hit’an	x		x		x	x		x	x		
Dehcho	x		x			x				x	
Dena’ina	x		x	x		x				x	
Dënesųłiné	x			x		x					
Gwich’in	x			x		x				x	
Hän Hwëch'in	x									x	
K'asho Got'ine	x				x					x	
Kaska Dena	x					x				x	
Koyukon			x			x				x	
Sahtuot’ine	x						x			x	
Shuhtagot’ine										x	
Tagish	x		x							x	
Tahltan	x		x			x				x	x
Tanana	x			x						x	
Tłįchǫ	x				x	x				x	
Tsay Keh Dene	x		x			x	x		x		
Tŝilhqot'in										x	x
Tutchone	x		x		x?	x?	x?			x	

[4] No data on net material was found for the Ahtna, Dane-zaa, Holikachuk, Upper Tanana, Tsuut’ina, and T’atsaot’ine.

Table 4.6: Net Knots Used Among Subarctic Dene[5]

	Simple Looping	Overhand	Knotted Buttonhole Loop	Square	Granny	Sheet Bend	Fishnet
Dakelh		x			x		
Deg Hit'an		x?	x	x		X	
Dehcho	x	x		x			x
Dena'ina	x	x					
Gwich'in	x						
Kaska Dena		x					
Sahtuot'ine							x
Tahltan	x			x			x
Tanana	x						
Tłįchǫ	x	x					
Tutchone	x						

Twined Textiles

Ethnographically, twined basketry is known among both Subarctic and Southwestern Dene language-speaking populations. Like with cordage, the seven different twining basket categories (open simple twining, open diagonal twining, open simple and diagonal twining, open wrapped twining, close simple twining, close diagonal twining, and open and close simple twining) I encountered over the course of this research—some from baskets found in museum collections, others only mentioned in ethnographies—are by no means exhaustive, but provide a good starting point for comparisons between the two regions and with the Promontory caves assemblage.

[5] No data on netting knot types or single element fabrics lacking knots were found for the Ahtna, Dane-zaa, Dënesųłiné, Hän Hwëch'in, Holikachuk, K'asho Got'ine, Koyukon, Upper Tanana, Shuhtagot'ine, Tagish, Tsay Keh Dene, Tŝilhqot'in, Tsuut'ina, and T'atsaot'ine.

Open simple twining is widely attested among the Deg Hit'an, with 16 examples with S-twist wefts (American Museum of Natural History online collections 60/4970, 60/4968, 60/4967, 60/4963, 50.2/4975, 60/5011, 60/4965, 60/4964, 50.2/4980; VanStone 1966: Fig. 17, 18a, 19e; Yale Peabody Museum online collections ANT 025442, 050167, 200187, 200186) and five with Z-twist wefts (American Museum of Natural History online collections 60/5002, 60/4973, 60/4972, 60/4971, 60/4969). A Tŝilhqot'in example with S-twist wefts (American Museum of History online collections 16/1384) and a Dena'ina example with Z-twist wefts (Jones, Fall, and Leggett 2013) are also known. End selvages include truncated warps and a variety of types of folded warps, including a Deg Hit'an bag where the folded warps are braided together (Yale Peabody Museum online collections 60/4970), and another Deg Hit'an bag where the warp elements are folded in opposite directions and then folded over and under other warps (American Museum of History online collections 60/4967). Where side selvages are present, all are continuous weft. Four Deg Hit'an bags with S-twist wefts are decorated with rows of cross-warp twining (American Museum of Natural History online collections 60/4970, 60/4967, 60/4963, 50.2/4975; Yale Peabody Museum online collections ANT 050167). The only mention of open simple twining made by Dene language-speakers in the American Southwest is for the Navajo, although there is no mention of weft twist direction (Kluckhhohn et al. 1971). The technique was used to create undecorated sleeping mats out of grass bundles twined with yucca or cliffrose bark, or in some cases juniper bark bundles twined with rabbit fur.

The only example of open diagonal twining in the ethnographic record is a basket with Z-twist wefts attributed to the Dena'ina. The end selvage of this basket has folded and truncated warps (Jones, Fall, and Leggett 2013). As with open simple twining, open diagonal twining is also described for Navajo sleeping mats, but with no mention of weft twist direction (Kluckhohn et al. 1971).

Four Deg Hit'an S-twist weft twined baskets are woven with a combination of open simple and diagonal twining (VanStone 1966). One basket has an open simple twined body that transitions to open diagonal twining near the rim as the basket constricts. The other three have simple twined centers and diagonally twined walls. Two have end selvages of overhand knotted warps. Another has warps folded 90° with a composite material braided around the rim. The fourth basket has warps folded into adjacent warps two rows over. Two baskets are decorated with cross-warps beneath the rim. A third is decorated with either dyed or imbricated wefts. The last basket is undecorated.

The solitary example of open wrapped twining has Z-twist wefts and is attributed to both the Dakelh and Tŝilhqot'in (Canadian Museum of History online collections VI-B-342). It is a cradle made by Jennie West, currently housed at the Canadian Museum of History. The end selvage has truncated warps, with the wefts wrapped around a whole rod rim.

Close simple twining is more prevalent among Dene language-speakers in the Southwest than open simple twining. Seven examples of close simple twining are baskets made with S-twist wefts; four are attributed to the Western Apache (Johnson and Reader 2001; Roberts 1929; Tanner 1968), two to the Dena'ina (Jones, Fall, and Leggett 2013), and one to the Deg Hit'an (VanStone 1996: Fig. 19c). The Deg Hit'an basket has an end selvage of braided warps. One Dena'ina basket has a truncated warp end selvage; the other does not have a visible end selvage. All four Western Apache baskets have a double-pseudo-coiled rim selvage.

Two examples of close simple twining have Z-twist wefts. Both are Deg Hit'an baskets. One of these baskets has a visible end selvage of a pseudo-coil with warps wrapped around a wood rod (American Museum of Natural History online collections 50.2/4973; VanStone 1996: Fig. 20b). Close simple twined baskets with Z-twist wefts are also mentioned for the Western Apache by Whiteford (1988), but no examples were seen in the museum collections looked at under this study.

A single example of close simple twining with Z- and S-twist wefts is a basket attributed to the Dakelh (Canadian Museum of History online collections VI-B-330). The weft twist for this basket alternates with each weft row. The end selvage is a possible false braid.

Four Western Apache baskets are made with close diagonal twining with S-twist wefts, consisting of a burden basket and three pitched water bottles. One water bottle has an end selvage of truncated warps; the other two and the burden basket have double-pseudo-coiled rims, one with a false braid. One of the water bottles has decorative bands were the diagonal twining captures four warp rows instead of two (Johnson and Reader 2001; Tanner 1968). While none were seen during this study, Whiteford (1988) describes Western Apache close diagonal twining with Z-twist weft rows as well as other vessels with S-twist weft rows. Roberts (1929) also mentions the use of 3-ply weft twining with this form to reinforce parts of the basket.

Two Western Apache baskets described by Roberts (1929) are made entirely of three-strand close diagonal twining. One of these baskets has a handle made of 2zS-twisted bast fiber cord (American Museum of History online collections). While none were observed during the present study, Hester (1962) describes Navajo water jars made of close diagonal twining with decorative bands of three-strand twining and false braid rim (end) selvages. Close diagonal twined burden baskets with warps wrapped around a single rim rod and decorated with rows of three-strand twining are also described for the Mescalero Apache (Tanner 1982; Whiteford 1988).

Four pairs of Deg Hit'an grass socks are made with open and close simple twining with S-twist wefts (VanStone 1996: Fig. 40a, 38a, 39b, and 39a). The soles of the socks are woven with close simple twining, while everything above are woven with open simple twining. Pairs of weft rows are used to transition between the two sections. Two pairs of socks have selvages of cloth stitched to the warps. One is decorated with false embroidered grass that appears to be effected with Z-twist wefts.

Two Dena'ina baskets are woven with open and close diagonal twining with Z-twist wefts. The end selvages are both bound over with red leather. The baskets have overlaid decorations of red, white, and green hair and black grass (Osgood 1966).

Coiled Textiles

Ethnographically, coiled basketry is known among Subarctic and Southwestern Dene language-speaking populations, with a greater variety of coiling found in the American Southwest, although this may be due to the high numbers of anthropologists who worked and collected in the region. As with the twining and cordage, the four different coiled basket structural types that I encountered over the course of this research is by no means exhaustive, but provides a good starting point for comparisons between the two regions and with the Promontory caves assemblage.

Six Deg Hit'an bowls and one tray are close coiled with a single rod foundation and interlocking stitch (Yale Peabody Museum online collections ANT 050191, 200189, 200190, 200199, 200191, 200192). All are worked on their convex surface save for the tray, which is worked on its concave surface. Likewise, all save the tray are worked right to left while the tray is worked left to right. All have a normal, continuous coil center and self-rim. Mason (1904) also describes a Navajo coiled basket of this subtype with a false braid rim, although it is unclear if this basket was made by the Navajo themselves or Ute neighbors. A variation using a single slat or split rod foundation is also described among the Mescalero Apache (Collings 1976; Mails 1974; Tanner 1968, 1982).

Close coiled baskets with a single rod foundation and non-interlocking stitch are seen more broadly among Dene language-speakers in the Subarctic, with two examples from the Dehcho (Marie and Thompson 2003: Fig. 5 and 6), one from the Dënesųłiné (Marie and Thompson 2003: Fig. 10), one from the Gwich'in (Osgood 1936: Plate 10C), and one from the Koyukon (Hail and Duncan 1989: Fig. 181). An example of this type from the archaeological record is attributed to the Navajo (Hester 1962; Vivian 1957). The Subarctic baskets are worked from left to right while the Navajo basket is worked from right to left. Due to the fact that all have a deep bowl form as opposed to a shallow tray, it is likely that all seven were worked on their convex surface. Four Subarctic baskets had centers visible in their photos, and all used a normal, continuous coil. All Subarctic baskets I examined had visible rims, of which there were two self-rims (Marie and Thompson 2003: Fig. 6 and 10), one self-rim with tapering stitches (Marie and Thompson 2003: Fig. 5), one self-rim using colored stitches (Hail and Duncan 1989: Fig. 181), and one self-rim with wrapping stitches (Osgood 1936: Plate 10C). Splicing was difficult to determine from photos, but in three of the Subarctic baskets the moving end could be seen bound under against the direction of work. The Navajo basket had a more complex splice: the moving end was laid-in next to the fag end on the concave surface of the basket, then wrapped around the bottom of the two rods being coiled, emerges on top of this rod on the convex surface and passes under again to go up on the concave surface, passes over the top of the two rods and comes down in a \. Normal sewing then continues (Vivian 1957).

Only one example of close coiling, single rod foundation with split stitches is seen in the Dene ethnographic record: a Deg Hit'an grass hat (VanStone 1966: Fig. 26b). The basket hat has split stitching on both surfaces and is worked on its convex surface. It has a normal, continuous coil center with a split reinforcing stitch only visible on its concave surface. A cloth lining obscures the selvage.

Adovasio and Illingworth (2014b) mention close coiled water bottles with two-rod stacked foundations and non-interlocking stitches for the Navajo from collections prior to AD 1880. These were worked from right-to-left, but no other details were described. Close coiling with four split-rod stacked foundations are known from three Dehcho examples, two with interlocking stitches and one with split stitches (Canadian Museum of History online collections VI-N-293, VI-N-294, VI-N-295). All three are worked left-to-right and have convex work surfaces with normal, continuous coil centers and self-rims. The basket with split stitching has fag ends bound under stitches against the direction of work.

Close coiled baskets with 3- or 5-rod bunched foundations and non-interlocking stitches are very common among Dene language-speakers in the Southwest, all worked right-to-left. Seven examples from the Jicarilla Apache and countless examples from the Western Apache are of the 3-rod bunched variety (American Museum of History online collections; Johnson and Reader 2001; Tanner 1982). While no photos of this subtype were seen that were attributed to the Navajo, Tschopik (1939) and Whiteford (1988) both describe Navajo baskets with this foundation and stitch type. Like the majority of coiled baskets, those from this subtype are worked on their convex surface if a bowl or bottle and concave surface if a tray. Only normal, continuous coil centers were seen in photos but knotted centers and normal reinforced centers are described among some Jicarilla baskets (Collings 1976; Mails 1974; Tanner 1968, 1982). The seven Jicarilla Apache baskets have 1/1 interval false braid rims. Tanner (1982) describes Western Apache rim selvages as predominantly self, although one has a false braid rim and 13 have overcast stitching. Splicing is known for Jicarilla Apache baskets from Whiteford (1988), where fag ends are bound under with the direction of work in older baskets, and in newer baskets the fag ends are pulled into a perforation in the coil and then clipped. The Western Apache mended coiled baskets of this subtype using long, rawhide or willow running stitches that are knotted in place (Tanner 1982). Weltfish (1932b) ascribes the 3-rod bunched foundation to the prehistoric Southwest, persisting in modern Jicarilla and Western Apache populations as well as the Havasupai and some Pueblos. Whiteford (1988) believes this foundation type came to the Apache from either the Pueblos or the Paiute. Bunched rod foundations are also known among the Tŝilhqot'in in British Columbia, but VanStone (1993) attributes this technique as having been learned from their Shuhswap neighbors. The 5-rod bunched variety is known solely from the Jicarilla Apache, for which they are well known. Tanner (1982) attributes this technique, as well as its commonly braided rim selvage, to contact with Puebloan peoples, due to the shared use of sumac as a material and similar designs and patterns. Although predominantly braided rim, some Apache baskets have a self-selvage. The same splicing and center techniques seen in 3-rod bunched foundation examples are attributed to this foundation variety as well (Collings 1976; Mails 1984; Tanner 1968, 1982; Whiteford 1988).

Three unattributed Subarctic Dene baskets are close coiled with a bundle foundation and non-interlocking stitches (Marie and Thompson 2003). They have a convex work surface and are worked from right to left with a normal, continuous coil center and self-rims, two with quillwork decoration.

Three Navajo close coiled baskets illustrated in Johnson and Reader (2001) have a 2-rod and bundle bunched foundation with non-interlocking stitches. This basket type is known widely as Navajo "wedding baskets," which are distinguishable from Puebloan baskets of the same construction by a break in their patterns of dyed stitching (Johnson and Reader 2001; Tanner 1968). These baskets are all worked from right to left with convex work surfaces, false braid rims and normal centers, and are decorated with dyed stitches. Foundation splices are laid-in, and the moving ends of stitches are bound under stitches against the direction of work while the fag ends are clipped (Franciscan Fathers 1910; Kluckhohn, Hill, and Kluckhohn 1971; Morris and Burgh 1941; Newman 1974; Tanner 1968; Tschopik 1940; Whiteford 1988). Prior researchers believed that this basketry type was adopted from Ancestral Pueblo peoples (Hester 1962; Morris and Burgh 1941; Vivian 1957). Navajo close coiled baskets with a 2-rod and bundle bunched foundation but with interlocking stitches were instead used to make water bottles (Hester 1962).

Coiled basketry among the Mescalero Apache are described as close coiled with either a slat and bundle foundation, 2-rod and bundle foundation, and 3-rod and bundle foundation, with interlocking stitches and worked right-to-left. Stitches may either pierce the foundation or wrap around it. These baskets begin with a normal, continuous coil venter and end with a self-rim (Collings 1976; Mails 1974; Tanner 1968, 1982; Whiteford 1988).

Plaited Textiles

Plaited artifacts are absent among Subarctic Dene language-speakers, save for a brief mention by Osgood (1966) of plaited mats used among the Dena'ina to cover doorways, though "plaiting" is often, incorrectly, used interchangeably with twining. Without an illustration it is impossible to determine if these mats were plaited or twined. Plaiting is, however, well-attested among the Navajo in the form of so-called "wicker" weavers where the warps and wefts are rigid, whole woody shoots. Vivian (1957; see also Adovasio and Illingworth 2014b) describes a close simple plaited, 1/1 interval wicker burden basket from a cache site dating approximately to the mid-late 18th c. and attributed to the Navajo based on associated ceramics and recent radiocarbon dating (Jolie, personal communication 2020).

In the ethnographic period, plaiting was used to make a wide variety of items, from fly swatters, to lightning mats, and even as a mask used in the Night Way chant (Kluckhohn et al. 1971). Plaiting was also used as an alternative to twining or coiling for sleeping mats, mats to cover hogan doorways, women's bast aprons, burden baskets, and basketry hats, as well as the center of some twined burden baskets (Kluckhohn et al. 1971). Selvages include folded warps pushed back into the weave of the basket wall for burden baskets, reinforcing rod or sewn bark bundle edges for doorway mats, wooden frame for fly swatters, knotted selvage for sleeping mats, continuous warp and weft for lightning mats, and folded warps reinforced with sewing for bast aprons (Kluckhohn et al. 1971). All of these structures were 1/1 simple plaited, save for some unspecified twill plaited sandals, and 2/2 twill plaiting for the Night Way mask. Plaiting materials among the Navajo include the following, alone or in combination with one another: willow, sumac, oak, cliffrose bark, juniper bark, yucca, rabbit skin, and grass (Franciscan Fathers 1910; Kluckhohn et al. 1971). Interestingly, Kluckhohn et al. (1971) specifies that the plaited basketry hats of the Ramah Navajo came to them from the Chiricahua Apache. I found no mention of plaited basketry among the Chiricahua Apache in the literature, but that does not mean that plaiting is wholly absent; rather, that in the sources I was able to find, plaiting was overlooked or simply not observed.

Braided and Sewn Baskets

In the course of my research into Dene fiber perishables in ethnographic collections, I came across a number of Deg Hit'an baskets made from a long line of 3- and 5-strand braided grass, wound around itself like the foundation of a coiled basket, and sewn together with modern cotton stitching thread. Baskets of similar make but made of braided rabbit skin instead of grass are also described (American Museum of Natural History online collections 50.2/4974; Osgood 1970; VanStone 1996; Yale Peabody Museum online collections ANT 200193). The Inuit also make these baskets (Myers 1980), and given that the technique appears to be absent among other Subarctic Dene groups, I believe the Inuit to be a likely origin for this technique among the Deg Hit'an. However, the reason I am discussing this here is because the Franciscan Fathers (1910:295) briefly mention that "In the early days [Navajo] baskets were woven of yucca braid." It is very likely that the Franciscan Fathers were referring to plaited basketry (as in the literature "braiding" is often used in place of "plaiting"), but it did give me pause upon first read, and I am curious to see if a more thorough investigation into basketry in ethnographic collections turn up any other sewn braided baskets, Navajo or otherwise.

Summary

Cordage and textiles in Dene ethnographic collections have a wide diversity of forms and types. Both Subarctic and Southwestern Dene language-speakers have a preference for hide and sinew cordage, often untwisted. Simple looping netted babiche bags are seen widely among Subarctic Dene, but not in the Southwest. Flexible, open twined structures appear to be more common among Dene language-speakers in the Subarctic, while more rigid, close twined structures are preferred among Dene language-speakers in the Southwest. Moreover, the end selvages seen on Subarctic Dene twining are much more diverse. Single rod coiled basket foundations are preferred by Subarctic Dene language-speakers, save for cases when they are influenced by the coiled basketry of their neighbors, as with the Tŝilhqot'in and their Shuhswap neighbors (VanStone 1993). Indeed, the wider range of coiled foundation types among Southwestern Dene is also likely a product of Puebloan influence (Ellis and Walpole 1959; Hester 1962; Morris and Burgh 1941; Vivian 1957). These comparisons are discussed in more depth in the following chapter.

Chapter 5: Discussion

The data presented in the previous chapter demonstrate important points of similarity and dissimilarity between the Promontory caves fiber perishable assemblage and Hogup Cave (a well-dated multicomponent site that can be representative of the wider Fremont-era Eastern Great Basin) as well as historic and contemporary woven fiber objects made by Dene language-speaking communities in both the Subarctic and Southwest. The presence of plat sinnets, simple looping netted fabrics, three-strand braided twining, sewn and twined basketry, plaited basketry, and a potential dog travois bag; distinctive moccasins; the relative absence of netting as a whole; the preference for twined over coiled basketry; and the diversity of end selvages in twined basketry at the Promontory Caves indicates not just a non-Fremont presence, but one wholly unlike the wider Great Basin and Southwest, with many of the above traits pointing to a Dene presence instead. In contrast to the above are more Fremont-like artifacts such as the coiled basketry, which point to contact and possibly intermarriage with Fremont neighbors, an interpretation also made for the similarly Uinta Fremont-like pottery assemblage (Yanicki 2019). The following chapter explores these intriguing comparisons in detail.

Internal Correlations

Steward (1937) classified the Promontory caves perishable artifacts by their presumed function rather than structure. This results in some discrepancies between his numbers, our numbers, and numbers listed by Adovasio et al. (2002; see also Adovasio and Illingworth 2014a). Steward (1937) reported 41 mats and three bags, which can roughly approximate as the twined and plaited assemblages described in the previous chapter here; Adovasio et al. (2002) and Adovasio and Illingworth (2014a) report the same numbers, although these are likely taken directly from Steward's report rather than an independent analysis. Steward (1937) does not describe whether artifacts are simple or diagonal twining, and he also conflates plaiting with twining. This likely leads to the discrepancies between the typological counts Adovasio et al. (2002; Adovasio and Illingworth 2014a) teased out from Steward's illustrations and descriptions and the numbers presented here. Adovasio et al. and Adovasio and Illingworth count two specimens of close diagonal twining with S-twist wefts, one of open diagonal twining with S-twist wefts, seven of open simple twining with Z-twist wefts, and 31 of open diagonal twining with Z-twist wefts. For this study, forty-four twined artifacts and three plaited artifacts from Steward's collection were examined, three more than Steward (1937) reported, and their subtypes are very different from what Adovasio et al. (2002) present. Under Adovasio et al. and Adovasio and Illingworth, open diagonal twining with Z-twist wefts is the largest category, but only three specimens of this subtype were found under this study. In contrast, 25 of the twined artifacts from Steward's collection are open simple twining with Z-twist wefts, with an additional seven recovered from the more recent excavations. Adovasio et al. (2002) and Adovasio and Illingworth (2014a) report no examples of open simple S-twist twining, a subtype that I identified seven specimens of from Steward's collection; in contrast, I found no examples of close twining at all, but three examples of open simple three-strand braided twining and one example of open diagonal S-twist weft twining with open simple three-strand braided twining. The only category in which our counts match is open diagonal twining with S-twist wefts, of which there is only example from Steward's collection.

Steward (1937) and Adovasio et al. (2002; see also Adovasio and Illingworth 2014a) report 12 specimens of coiled basketry, seven made with a half-rod and bundle stacked foundation and five made with a whole rod foundation. These numbers match my own, although I identified the “whole rods” in the whole rod foundation type as actually being half-rods.

The most confusing category to compare counts is that of cordage. This is because Steward (1937:37) did not count cordage “which formed parts of other specimens” and only included twisted cordage, whereas I also analyzed unspun cordage and included them in my total counts. Steward (1937) identified 76 cordage specimens made of twisted plant fiber and 13 made of fur or feathers. Thirty-six of the plant fiber cords were Z-twisted, from which we can assume the remaining 40 were S-twisted. In total, I examined 127 cords from Steward’s collection, not counting those that were part of other objects. Thirty-one of these were unspun, leaving me with 96 cords that Steward would have counted as cordage—seven more than he identified. Of these, 53 were S-twisted and 43 were Z-twisted.

Steward (1937), detailed as he was in his artifact descriptions, did not leave behind detailed provenience data. Many artifacts from his collection are simply described as from Trench A or Trench B, if given any provenience at all. Artifacts recovered from the renewed excavations have much better provenience, but the areas excavated are much more restricted, and thus it is difficult to tease out spatial patterns in their distribution. Across all perishable artifact categories, the majority came from two adjacent units: Unit 91N 99E and Unit 90N 99E (see Hallson 2017:26, Fig. 7). These units are from the front of Cave 1 in an area that was likely once a depression, that over time infilled with midden debris (John Ives, personal communication 2020). Lakevold (2017), in her study of how the Promontory caves inhabitants may have used space, posits both one-dwelling and two-dwelling models, in which either just the western space (Area A) or both the eastern (Area B) and western space are used as primary public spaces. Hallson’s (2017) thesis on artifact accumulation suggests a one-dwelling model, but the possible midden deposit and the fact that Area A has seen more excavation means that this could be a product of sampling bias (Lakevold 2017). Future excavations in other areas of the cave may yield more evidence for areas specific to a particular task.

Another aspect of the perishable assemblage to note is the consistency with which the tule warps of twined mats are crushed. This is attributed in Chapter 4 to use-related wear, but since many of the tule warps save for 42BO1 9582.6 (Fig. 4.22) and 9682 (Fig. 4.17) are processed to some degree—in some cases, such as FS 981 (Fig. 4.15), enough to initially be mistaken for bundles of bark fiber—it's possible that this "use-wear" is a deliberate part of the final product. Alternatively, the Promontory Phase inhabitants made use of their twined mats for as long as they could, evidenced by expedient mends such as the hide stitches on 9682 (Fig. 4.17).

External Correlations

Cordage

The Promontory caves has a higher incidence of hide or sinew cordage than Hogup Cave (39% vs 29% of the cordage assemblage), while Hogup Cave has more rabbitskin cords, numbering 90 to the Promontory caves' nine. This discrepancy in number is made even greater by the fact that Fremont-era deposits at Hogup Cave have a depth that ranges from 28 inches at its shallowest parts to 57 inches at its deepest (Aikens 1970), while the Promontory cultural material came from a deposit only 24 inches (2 feet) deep and covering a much smaller surface area (Hallson 2017; Steward 1937). With further excavations at Promontory, the number of hide and sinew cordage would grow much higher, and demonstrate even more clearly that the inhabitants at the Promontory caves had a much stronger preference for hide or sinew cordage than their Fremont neighbors at Hogup.

The proportion of site area excavated shows a similar discrepancy in both caves' cordage final twist preference. Although both Promontory and Hogup Caves share a preference for a final S-twist, Promontory has a greater incidence of final Z-twist cordage than Hogup Cave, and a greater incidence of twisted cordage overall. Hogup Cave has 65 cords with a final S-twist and only 11 with a final Z-twist (Aikens 1970), while the Promontory caves have 166 final S-twist cords and 117 final Z-twist cords—numbers that would be much higher extrapolated for the entire site area (Hallson 2017). In addition final Z-twist cordage accounts for approximately 41% of the Promontory twisted cord assemblage, while only making up 14% of the twisted cord assemblage at Hogup Cave (Aikens 1970).

The preference for a final S-twist at Hogup did not emerge until around 650 B.C. (Adovasio and Illingworth 2000; Aikens 1970; Goff 2010). Older strata demonstrated a preference for final Z-twisted cordage. Indeed, across the Eastern Great Basin, cordage twist preference varies both within the Fremont-era and without. Danger and Juke Box Caves shared roughly equal percentages of final S- and Z-twisted cordage across 10,000 years of occupation, with a slight preference for final Z-twist (Jennings 1957; see also Goff 2010). Goff's (2010) analysis of cordage from the Fremont site of Mantle's Cave, CO and Adovasio and Illingworth's (2000) counts of Lakeside Cave, UT cordage both show a preference for final S-twist cordage much like Promontory and Hogup. As such, it is difficult to say both what is "typical" of Fremont cordage as well as what is typical of the Eastern Great Basin. The Promontory caves preference for final S-twist cordage does seem consistent with Fremont-era cordage within the Uinta Basin, although the number of final Z-twisted cords is closer in number to final S-twist than at Hogup. This proportional difference may represent differences in the community of practice at either site but does little to contextualize Promontory within the greater Uinta Fremont world.

A possible similarity between Hogup and Promontory Caves is the presence of two-strand box braids. Several two-strand box braids were recovered at Hogup Cave, with one from a Fremont-era stratum (Adovasio 1970), but without a photo of the artifact in question this connection cannot be said with certainty. However, both caves share other kinds of artifacts, including Promontory-style pottery (Ives 2020; Yanicki 2019) and scored cane dice (Aikens 1970; Yanicki and Ives 2017), strengthening the possibility that there was some degree of interaction between the inhabitants of Promontory and Hogup caves.

However, there are significant discrepancies between the Promontory Caves and the Eastern Great Basin at large. Plat sinnet weaves (Fig. 4.4 and 4.5) do not appear in any other Great Basin site and suggest a Subarctic presence. Sinnet weaving is not Dene-specific, as a pair of moccasins housed at the National Museum of Scotland (A.UC.293 A) and attributed to the Algonkin appear to have sinnet-woven tassels. However, it is unclear just how widespread this technique is outside of the western Subarctic, and will need further research. Orchard (1971:45, Fig. 24) depicts the same technique and attributes it to the Tlingit and "some neighboring tribes, but not to a great extent" and states that in quillwork it is used for "covering broad surfaces" (1971:38); interestingly, he describes a similar quillwork structure that uses two active wefts instead of one among Puebloan peoples (1971:45-46, Fig. 25), although with two active wefts it is more like a single row of twining that yet achieves the same visual effect, although this may be an instance of copying error (Edward Jolie 2020, personal communication). One of the Promontory plat sinnets utilizes quillwork (Fig. 4.5), which is not common in the ethnographic

Great Basin but is widespread to the north and east (Driver and Massey 1957). It appears that plat sinnet constructions reflect a body of related techniques used across the Canadian Subarctic.

The Promontory moccasins also utilize a technology common across the Canadian Subarctic: Bata Shoe Museum (BSM) type 2(Bb) and 2(Ab) moccasin structure are found at the Promontory caves as well as in Algonquian and Mackenzie Basin Dene moccasins (Ives 2014). A genetic relationship between Algonquian and Dene language-speakers has long been known thanks to the blood protein Albumin Naskapi, which is found only in these two groups and dates back at least 4,000 years BP, older than the divergence of Dene languages (Smith et al. 2000). This is supported by more recent research demonstrating a northern/southern split in the founding population of North America (Llamas et al. 2016; Moreno-Mayar et al. 2018; Scheib et al. 2018); today's Haida, Tsimshian, Tlingit, Dene (Athapaskan), Algonquian, Salishan, and Kutenai language families or isolates are descendants of that northern lineage. With such a deep shared ancestry, especially between Tlingit, Dene, and Algonquian language-speakers, it is possible that technologies like plat sinnets and BSM 2(Bb) and 2(Ab) moccasins could reflect an ancient, widely shared cultural heritage that persisted into the present. The weaving of plat sinnets and the sewing of moccasins both require fine, repetitive motor skills that over time become automatic and thus resistant to change (Lockhart and Johnson 1970; see also Minar 2001). Unfortunately, by their very nature perishable artifacts are rare finds, and with the acidic soil conditions in the Subarctic (Ives 1990; Jones, Fall, and Leggett 2013) they are even rarer for the region. The number of perishable artifacts recovered from Subarctic archaeological contexts is therefore very small: a 350-400 year old Dena'ina birch bark basket was recovered from the coastal Alaskan site of Clam Gulch (Jones, Fall, and Leggett 2013:67-68, Fig. 4.8); fragments of birch bark vessels and a toy canoe from ancestral Dene sites along the Porcupine River that date to 1200-150 BP (LeBlanc 2009); more relevant to this study is the recovery of a BSM 2(Ba) moccasin from a retreating Yukon ice patch that has been AMS radiocarbon dated to 1430 ± 40 B.P. (cal A.D. 558-663) (Greer and Strand 2012; Hare et al. 2012; see also Ives et al. 2014). BSM 2(Ba), 2(Bb), and 2(Ab) are all minor variations of the same basic moccasin type, and its discovery exemplifies the persistence of weaving and sewing traditions.

While the antiquity of plat sinnets remains unknown, of all the cordage data that I have compiled here, its presence at the Promontory caves is the strongest indicator of a Subarctic presence in the Great Basin. The technique looks like nothing recovered from any other Great Basin site, Fremont or otherwise, and has a strong association with the Subarctic. All four examples at the Promontory Caves are well-made and utilize different materials. FS 1197 is particularly impressive in its use of incredibly fine, delicate sinew for the active weft element (Fig. 4.5). Whoever made them was intimately familiar and confident in the technique. While sinnet weaving is shared with Algonquian speakers, the Promontory caves are situated at a time and place between an ancestral Apachean dispersal from the Subarctic and an arrival in the Southwest. Given this context, the four examples of sinnet weaving from the Promontory caves are highly suggestive of weaving by a Dene language-speaker or someone who had come under their tutelage.

While the dominance of a final S-twist in Promontory Caves cordage is shared with Fremont neighbors, the presence of sinnet weaving is suggestive of a population separate from the wider Fremont milieu. Nets provide another clue that points to this difference.

Nets and Netted Fabrics

One overhand knotted net fragment and two fragments of simple looping netted fabric were recovered from the Promontory caves (Fig. 4.7, 4.8, and 4.9). In the contemporary Great

Basin, Shoshone and Paiute populations use nets to hunt small game, especially for jack rabbit, which was an important means of subsistence (Steward 1938). Rabbit net-hunting resulted in temporary surplus that allowed for feasting and for large gatherings of people (Adovasio et al. 2009). It is no surprise then to see an emphasis on small-game net hunting stretching back throughout Hogup Cave's entire thousands-years occupation, with 138 net fragments recovered in total. Rather, what is surprising is the Promontory caves' *lack* of definitive net fragments by comparison. Moreover, two of those fragments are made with simple looping, which while widely distributed across North America (Driver and Massey 1957), is a structural form seen nowhere else in the Great Basin save for a possible example from the Paisley Caves, dating to over 10,000 years ago (Connolly et al. 2016; Connolly et al. 2017).

Overhand knots dominate at the Promontory caves, accounting for 258 of 275 knots. The knotted net fragment FS 1672f is also made with overhand knots. This is in contrast both with knotted nets in the Eastern Great Basin and in the Great Basin as a whole. Aikens (1970) did not report on net knot types from Hogup Cave. Adovasio et al. (2009) described sheet bend knots on a mist net from Hogup Cave, as well as square, sheet bend, weaver's knots, and lark's head knots from Danger Cave, Cowboy Cave, and Etna Cave, with some possible overhand and slip knots from Cowboy Cave. Connolly et al. (2017) reported a preference for weaver's knots among archaeological nets in the Northern and Western Great Basin, alongside a handful of net fragments with sheetbend knots. It is telling then that the only ascertainable net fragments from the Promontory caves utilize overhand knots and simple looping, net techniques that are rare for the Great Basin as a whole.

Consistent with the wider Great Basin situation is the fact that FS 1672f and 42BO1 10513 are made with 2zS bast fiber cordage. 2zS cordage is used for nets recovered from Danger

Cave, Hogup Cave, Swallow Shelter, and Etna Cave (Adovasio et al. 2009) and is also the dominant net cordage type for archaeological nets in the Northern and Western Great Basin (Connolly et al. 2017). However, no archaeological nets described use untwisted hide for their construction, unlike the simple looping fragment FS 1453.2.

Function is another area where the Promontory net fragments stand apart. FS 1672f appears to have a mesh consistent with hunting nets elsewhere in the Eastern Great Basin (Adovasio et al. 2009). Moreover, 42BO1 10513 is tied on itself in an overhand knot, suggesting that its final use was not as a net at all. Coupled with the scarcity of distinguishable knotted net fragments is the fact that the site has a dearth of small-game animal remains (Johannson 2013). For a site that may contain roughly 1.5 to 1.7 million faunal (particularly bison) remains (cf. Hallson 2017), the absence of small-game animals is noticeable, and indicative that the people who inhabited the caves were sophisticated large game hunters rather than net-hunters as was the case with a wider range of Great Basin societies.

Unfortunately, data on Subarctic Dene nets are sparse. Raw material is the most noted trait among Subarctic Dene nets (Table 4.5), but it is an attribute constrained by location and by necessity will change based on what is available. As such, we cannot expect the Promontory caves net and netted fabrics, if the site is of Dene affiliation, to be made of the same materials as Subarctic Dene nets. Material preference, however, can inform to some degree on function. Many Subarctic Dene hunting nets were made of hide or sinew, while plant fibers were the preferred material for fishing nets. This is due to the fact that hide rots more quickly in water (Osgood 1936). Strips of rabbit (and, less commonly, ground squirrel) skins with the fur still on were used in the construction of warm fur robes, blankets, and children's clothing using simple looping or occasionally a knotted net technique. Robes and blankets made in this manner can be found across all peoples in the Canadian Subarctic (Driver and Massey 1957), but outside this region the only other group known to make blankets in this manner are the Yavapai, who, incidentally, lived alongside Apachean peoples on the San Carlos reservation. (Collings 1976; Tanner 1968; Whiteford 1988b). The coiled basketry of the two groups is virtually identical (discussed in detail under "Coiled Textiles"), so it would not be surprising if the knowledge of making rabbit skin robes of looped netting was also shared between them. Seven strips of rabbit fur "cordage" were found in the Promontory caves, many of which were knotted and may very well be fragments of netted blankets. There is the possibility, however, that they come from twined fur robes, common to the region (Leach 2018). In addition, while Driver and Massey (1957) note the presence of simple looped hide bags across North America, simple looped babiche hunting bags are considered by Marie and Thompson (2014) to be a distinctively Dene item.

The dominance of overhand knots and the dearth of knotted net fragments complement findings from the faunal assemblage that the inhabitants of the Promontory caves were not net hunters like their contemporaneous neighbors, who had a long history of such subsistence. Likewise, simple looped netted fabrics also point to a non-Fremont presence, a technique that adds to the possibility of ties to the Canadian Subarctic when considered alongside plat sinnet weaving and the basketry attributes outlined below.

Twined Textiles

The most prevalent twined textile technique found at the Promontory caves is open simple twining with Z-twisted wefts (see Table 5.1). This is also one of the most prevalent twined types at Hogup Cave, tied with close diagonal twining with Z-twist wefts. Although, open simple twining with Z-twist wefts is not the most common for Fremont sites as a whole and is far less in number at Hogup Cave, with two twined fragments representing this category to the Promontory caves' 32. Twined basketry, particularly close simple twining with S-twist wefts and open simple and diagonal twining with Z-twist wefts, dominated the Eastern Great Basin until around 4500 B.C., when coiling became popular (Adovasio 1986), although twining still continued without significant change through contact. A similar pattern played out in the rest of the Great Basin, although in the Western Great Basin Z-twist wefts were preferred for close and open simple twining (Adovasio 1986; Hattori and Fowler 2009). Adovasio (1986) also mentions the use of three-strand wefts in close twined artifacts from the Great Basin, but both archaeologically and in the ethnographic present this technique is limited to single rows for either decoration or structural reinforcement (Fowler and Dawson 1986). Ethnographically, open simple twining with S-twist wefts occurs the most in my sample of Subarctic Dene twining with 17 twined items, and is also found in all other categories, with six from the Promontory caves, four for the Fremont (tied for most with close simple S), and possibly among the Navajo (Kluckhohn et al. 1971), although no weft twist is mentioned for their open simple and open diagonal twined basketry.

Table 5.1: Frequency of Twined Textile Types

Type	Promontory Caves	Fremont	Subarctic Dene	Southwestern Dene
Open Simple S	6	4	17	?
Open Simple Z	32	3	6	?
Open Diagonal S	0	1	0	?
Open Diagonal Z	3	2+	1	?
Open Simple and Diagonal S	0	0	4	0
Open Wrapped Z	0	0	1	0
Close Simple S	0	4	3	4+?
Close Simple Z	0	1+	2	Mentioned
Close Simple S+Z	0	0	1	?
Close Diagonal S	0	1+	0	4
Close Diagonal Z	0	2 or 3	0	0
Close Diagonal 3-strand	0	0	0	2
Open Simple 3-strand Braided	3	0	0	0
Open Simple and Diagonal S and 3-strand Braided	1	0	0	0
Open and Close Simple S	0	0	4	0
Open and Close Diagonal Z	0	0	2	0

It is intriguing that the Promontory caves lack close twining entirely, while it occurs (although is not common) among the Fremont (Adovasio 1970, 1986; Adovasio et al. 2002; Hattori and Fowler 2009), Southwestern Dene, and Subarctic Dene (Canadian Museum of

History online collections VI-B-330; Johnson and Reader 2001:40, 46-47; Jones, Fall, and Leggett 2013:301 and Fig. 16.13; Osgood 1966:228, Pl. 10; Roberts 1929; Tanner 1968, Fig. 2.13; VanStone 1996, Fig. 19c, 20a, 38a, 39a and b; Whiteford 1988b, Fig. 43). It is entirely possible that, like many Tŝilhqot'in coiled baskets (VanStone 1993), close twining was picked up by Subarctic Dene language-speakers from non-Dene neighbors in more recent times. Indeed, the tendency for Dene groups to adopt the material culture of their neighbors is well-known (Ives 1990). In this scenario, close twining could have been introduced to ancestral Apacheans by the Fremont, among whom close twining occurs in roughly equal measure with open twining. More information on twined basketry among Subarctic Dene language-speakers is needed before this assertion can move beyond the realm of speculation.

The most interesting aspect of the Promontory caves' twined basketry is fourfold: the first is the contrast between the flexible twined mats and mat-based bags at the Promontory caves and more rigid twined constructions from Hogup Cave (Adovasio 1970), Danger Cave (Jennings 1957), and other Fremont assemblages (Adovasio 1986; Adovasio and Illingworth 2014a; Adovasio et al. 2002). This contrast suggests that the Promontory caves population was much more mobile, and thus more interested in light and expedient constructions than Fremont peoples who fabricated their rigid twined baskets from willow that was almost certainly tended and managed to achieve plentiful, straight young shoots.[6]

Second is the diversity of end selvages. Adovasio (1979; see also Adovasio et al. 2002) acknowledged the Promontory caves as the only "Fremont" site with twining end selvages that differ from simple truncated warps. At the Promontory caves, end selvages are folded into themselves and truncated, or folded and reinserted into adjacent warp rows, or folded and

[6] Thank you to Dr. Ed Jolie for pointing out this connection.

reinserted several warp rows down, or folded and braided. Some are reinforced with wefts of twisted cord or rods inserted between the folds of the warps. These end selvages are also common among Subarctic Dene instances of twining (American Museum of Natural History online collections 60/4973, 60/4972, 60/4971, 60/4970, 60/4969, 60/4968, 60/4967, 60/4963, 50.2/4975, 50.2/4973; Canadian Museum of History online collections VI-B-330; Jones, Fall, and Leggett 2013 Fig. 1.59; Osgood 1970:143; VanStone 1996: Fig. 17, 18a, 19c and e, 20a; Yale Peabody Museum online collections ANT 025442, 050167, 200187). Southwestern Dene appear to prefer end selvages of pseudo-coiled rims, likely picked up either from Puebloan neighbors or simply developed alongside a more diverse coiled basketry repertoire (Johnson and Reader 2001; Roberts 1929; Tanner 1968, 1982; Whiteford 1988b). The Promontory twined end selvages are clearly out of place in the Great Basin, although they may not necessarily be Subarctic in origin.

The third aspect of interest is the presence of three-strand braided twining. This twining technique is not found anywhere else in the Great Basin, nor is it seen in the Subarctic. To my knowledge as well, its presence at the Promontory caves has not been noted before this study—likely because three-strand braided twining can easily be confused with simple twining where adjacent weft rows alternate twist direction or plainer varieties of three-strand weft twining. While the three-strand *braided* twining is also not seen in the Southwest, it is intriguing that *three-strand* twining (Fig. 3.6) appears on two Western Apache baskets, and as a form of decoration for Western and Mescalero Apache and Navajo twined basketry (Hester 1962; Roberts 1929; Tanner 1982; Whiteford 1988b). Indeed, the three-strand braided twining seen at Promontory may have also served a decorative function, as the raised wefts create a textural difference from those of two strand twining—decoration that may be subtle but is also structural.

Three-strand twining is present in the Great Basin in older basketry from Lovelock Cave as well as basketry in the ethnographic present made by the Paiute, Havasupai, and Northern Shoshone (Fowler and Dawson 1986; Loud and Harrington 1929; Weltfish 1930; see also Fraser 1989). A possible example of three-strand braided twining was also recovered from Lovelock Cave (Loud and Harrington 1929, pl. 31c; Weltfish 1930), but without seeing both surfaces of the specimen the veracity of this claim is difficult to discern. Regardless, three-strand braided twining is out of place archaeologically for the region as a whole and also has no ethnographic analog in the Great Basin. Rather, it is seen in ethnographic basketry in the Great Lakes region of eastern North American and among groups on the Pacific coast, including the Tlingit—who border the Dene language-speaking Ahtna, Tutchone, Tagish, Tahltan, and Tsetsaut—and the Dene language-speaking Hupa (Fraser 1989), but much like three-strand twining in the Great Basin, three-strand braided twining in California is largely used for decorative effect or structural stability (Elsasser 1978; Mohr and Sample 1955). Regardless, to find an affinity for three-strand braided twining at the Promontory caves, we must look to the north and west. The possibility of western connections grows with the presence of 42BO1 11567, an abalone (*Haliotis* sp.) pendant (Steward 1937); abalone shells are also used for decoration on a possible Promontory-style moccasins from later deposits of Lovelock Cave (Loud and Harrington 1929). Indeed, shell bead trade between California and the Great Basin is well-known, but declined after ca. A.D. 700 (Bennyhoff and Hughes 1987). Navajo and Apache oral histories tell of Changing Woman, who leaves her ancestors to go to the west coast; when she grows lonely, she creates more people and sends them back east (Zolbrod 1984). The Navajo and Hupa also share the term *kinaaldá* (Hupa: *kyinahłda*) for elaborate female puberty ceremonies (Sapir and Golla 2001); California Dene languages also have strong linguistic ties with more western Subarctic Dene languages in Alaska and northern British Columbia (Snoek et al. in press), a region that saw great interaction between Tlingit, Inland Tlingit, and more inland Dene language-speaking kin following the White River Ash eruption ca. A.D. 846-848 that may have persisted after the initial influx of volcanic refugees (Kristensen 2020). When three-strand braided twining is considered alongside the abalone shells, oral histories, and linguistic connections, the possibility that ancestral Apacheans had contact with their Pacific Coast cousins grows deeper.

The fourth matter of Promontory caves twined basketry that warrants discussion is the presence of two fragments of sewn and twined matting (Fig. 4.26 and 4.27), which is absent at Hogup Cave and appears to be absent at Fremont sites as a whole, as well as the wider Great Basin, assuming that it has not previously gone unrecognized. Sewn and twined mats with tule warps like Promontory are seen across the Columbia Plateau beginning around 2000 BP and increasing after 1200 BP (Held 2006), as well as the Southern Plains, where an example from the site of Cascada Seca in northeastern New Mexico represents an early appearance of the technique in the region, dating to A.D. 1020-1230 (Jolie 2006). Six examples of sewn and twined matting are found in the Lower Pecos area of southwest Texas, with one radiocarbon dated to 570 ± 70 B.P. (McGregor 1991). Connections to the Columbia Plateau, Plains, and Southwest are also suggested by Promontory's gaming artifacts, in addition to the Subarctic (Yanicki and Ives 2017; Yanicki 2019); a Promontory-style moccasin as well as a gaming hoop were recovered from Spruce Tree House in Mesa Verde (Fewkes 1909: Fig. 36 and 37), strengthening Promontory's connection to the Southern Plains. While the origin of sewn and twined matting at the Promontory caves is unknown, it does appear to be more common both on the Columbia Plateau and in west Texas, and its presence speaks to connections outside of the Great Basin that is consistent with findings from other assemblages.

The twined assemblage at the Promontory caves is notable in both its size and diversity. A heavy preference for twined basketry at a time and place when coiled forms were more popular, coupled with a lack of rigid, close-twined specimens, suggests that the makers of the Promontory caves twining favored light and expedient forms, and as such were likely more mobile than their neighbors. A diverse array of end selvages not unlike those seen in Subarctic Dene twining, and the presence of three-strand braided twining and sewn and twined mats all point to inhabitants with connections to the north and west, particularly to the Columbia Plateau, Northwest Coast, and Northern Plains. However, the coiled assemblage is more typical of the Great Basin.

Coiled Textiles

The two coiled foundation types recovered from the Promontory caves—single rod and half-rod and bundle stacked—all have Fremont counterparts with matching stitch types. The single rod foundation is used at the Promontory caves and at Fremont sites in conjunction with interlocking stitches, and for half-rod and bundle stacked foundations only interlocking stitches are associated. Half rods are consistently used for the Promontory caves foundations, but it is unclear if this is also true for Fremont coiled basket foundations, as they are often just reported as single rod. The half-rod and bundle stacked foundation type is associated with non-interlocking and split stitches at the Promontory caves as with Fremont sites as a whole, and has been in use in the region since at least 6,600 BC (Adovasio 1986; Adovasio et al. 2002; Webster and Jolie 2011, 2014). Varieties of this type including three rod bunched and two rod and bundle foundations are seen at other Fremont sites in the Eastern Great Basin, although largely from sites bordering on the Southwest; Adovasio (1970) believed these multi-rod varieties developed from the earlier half-rod and bundle form (see also Adovasio 1986; Webster and Jolie 2011, 2014). However, it is important to keep in mind that the "Fremont" are for the most part an archaeological construct, defined by broad similarities in material culture that is still internally variable (Aikens 1966; Adovasio et al. 2002; Goff 2010; Yanicki 2019). As such attempting to define what is typical of "Fremont" coiled basketry will vary based on where specifically in the Great Basin one looks. This is why priority is given to Hogup Cave as a comparator to Promontory, in that it is both temporally and geographically proximal. Regardless, the Promontory caves half-rod and bundle stacked foundations are rather late occurrences at AD 1263-1385 (42BO1 11604.2) and AD 1225-1290 (42BO1 9659) (Ives et al. 2014). Late hold-outs in the 12th and 13th centuries of whole- or half-rod and bundle stacked can be seen in small numbers at Mesa Verde (Osborne 2004) and Aztec Ruins (Jolie 2006, 2018; Webster and Jolie 2011, 2014), both significantly southeast of Promontory and bordering on the Southwest.

Other coiled basketry traits can also be used for comparison. Self-rims are the only selvage present at the Promontory caves and are the most common Fremont selvage type (Adovasio 1986; Adovasio et al. 2002). A second coiled basket selvage used by the Fremont would be self-braid rims, which are absent at the Promontory caves. Another point of similarity between the Promontory caves coiled basketry and that of the Fremont-era Great Basin is work direction. Ten out of 11 coiled fragments from the Promontory caves with a distinguishable work direction are worked right-to-left, the other left-to-right. Fremont coiled basketry has an 80/20 split between work directions, favoring right-to-left (Adovasio 1986; Adovasio et al. 2002).

All coiled baskets examined in this study with a visible center begin with a continuous coil. However, all Promontory Caves base fragments have their centers reinforced, a trait that is conspicuously absent in Fremont coiled basketry (Adovasio 1970; Adovasio 1986; Adovasio et al. 2002). Splice types can also be used to distinguish affiliation among basketry examples, but not much space will be spent on it here, as it is not discussed in general overviews of Great Basin basketry and for many coiled baskets in ethnographic collections I was only able to observe one surface in photographs. Three out of four of the splice categories found at the Promontory caves—both ends bound under, both ends clipped, and fag ends clipped with moving ends bound under—are also common to Fremont basketry (Adovasio 1970; Adovasio et al. 2002). The fourth Promontory splice category, moving ends clipped and fag ends bound under, is only seen on one coiled fragment.

The single rod foundation is also known among the Subarctic Deg Hit'an with both interlocking and split stitches, although whether the rods are whole or halved is unknown (American Museum of History online collections 50.2/4972AB, 50.24970, 50.2/4969, 50.2/4969, 50.2/4968, 50.2/4967, 50.2/4966; Yale Peabody Museum online collections ANT 050191, 200189, 200190, 200188, 200191, 200192). Single rod foundations with interlocking stitches are also described for older Navajo and Mescalero Apache baskets (Collings 1976; Mails 1974; Mason 1904; Tanner 1968, 1982). Other single rod foundations with non-interlocking stitches are seen more broadly across the Subarctic and in an archaeological specimen of Navajo basketry (Clark 1974; Hail and Duncan 1989; Hester 1962; Marie and Thompson 2003; Osgood 1936; Vivian 1957). However, the usage of single rod foundation coiling is widespread and thus not reliable in determining affiliations on its own (Edward Jolie 2020, personal communication). A Great Basin connection has been proposed before for older Navajo basketry (Vivian 1957) but similarly strong connections to Pueblo coiled basketry also exist and complicate the picture (Ellis and Walpole 1959). The variable nature of Navajo coiled basketry makes it difficult to pin down its origins, but this would fit with a broader tendency for Dene language-speakers to adopt the material culture of their neighbors (Ives 1990).

While the half-rod and bundle stacked foundation is not found among Southwestern Dene language-speakers, multi-rod and rod and bundle bunched variations are seen in Mescalero Apache and Navajo basketry (Adovasio and Illingworth 2014b; Johnson and Reader 2001; Tanner 1982; Tschopik 1939; Whiteford 1988b). While the Navajo do use non-interlocking stitches with this foundation type much like the Fremont and Promontory caves artifacts, the Mescalero Apache use interlocking stitches with this foundation, as do the Navajo for their water bottles (Collings 1976; Hester 1962; Mails 1974; Tanner 1968, 1982; Whiteford 1988b). It seems likely then that given the absence of this foundation type in the Subarctic that ancestral Apachean populations learned this technique by incorporating neighboring Fremont populations (especially women) during their stay in the eastern Great Basin, including the later multi-rod elaborations, and continued developing the technique with later Puebloan influence. The influence of Puebloan peoples in rod(s)-and-bundle foundation coiled basketry has long been suspected (Ellis and Walpole 1959; Hester 1962; Morris and Burgh 1941; Vivian 1957), but a deeper Great Basin connection has been often overlooked (Adovasio et al. 2002; Adovasio and Illingworth 2014b). Not found at the Promontory caves, but used in later Fremont occupations and continuing into the Southwest, are multi-rod bunched foundations with non-interlocking stitches (Adovasio 1986; American Museum of History online collections 50.1/3104, 50.1/3100; Johnson and Reader 2001; Tanner 1982; Tschopik 1939; Whiteford 1988b). Among Southwestern Dene language-speakers, this type is known among the Navajo, Jicarilla Apache, and Western Apache, and was possibly adopted sometime after the Promontory caves occupation but prior to the ethnographic present.

Self-rims are used in Subarctic Dene coiled baskets (American Museum of Natural History online collections, 60/5002, 50.2/4972AB, 50.2/4971, 50.2/4970, 50.2/4969, 50.2/4968, 50.2/4967, 50.2/4966, 50.2/4965; Andrews 2006:46-47; Canadian Museum of History online collections VI-N-293, VI-N-294; Clark 1974, Fig. 193; Hail and Duncan 1989: Fig. 181; Idiens 1979:11; Marie and Thompson 2003: Fig. 4-7, 10; Nelson 1983:18; Osgood 1936: Plate 10c; Prince of Wales Northern Heritage Center online collections 996.8.82, 996.8.83; Yale Peabody Museum online collections 015833, 050191, 200189, 200190, 200188, 200191, 200192), much like at the Promontory caves. Both assemblages also lack false braid rim selvages, which are prevalent in the Southwest, including among Dene language-speakers (Johnson and Reader 2001; Tanner 1968, 1982). Thus it is likely that Southwestern Dene language-speakers adopted false braid rims from the Pueblos. It is unfortunate that the only archaeological example of Navajo coiled basketry is missing its selvage (Vivian 1957: Fig. 1).

Coiled basketry among Dene language-speakers in the Southwest favors right-to-left work direction (Adovasio and Illingworth 2014b; Hester 1962; Johnson and Reader 2001; Tanner 1968, 1982; Vivian 1957), much like at the Promontory caves and among the Fremont. Among Subarctic Dene language-speakers, the divide appears to be 50/50 with ten examples of each, although the sample size is small and seven of the ten baskets worked right-to-left are attributed to the Deg Hit'an (American Museum of History online collections 60/5002, 50.2/4971, 50.2/4970, 50.2/4969, 50.2/4968, 50.2/4967, 50.2/4966; Canadian Museum of History online collections; Clark 1974; Hail and Duncan 1989; Marie and Thompson 2003; Nelson 1983:18; Yale Peabody Museum online collections 050191, 200190, 200188, 200191, 200192). Given this, it would seem that the dominance of right-to-left work direction comes from a Fremont or wider regional influence.

As already mentioned, all coiled baskets with visible centers examined in the course of this research have a continuous coil center, although a knotted center in some Jicarilla Apache baskets is not unknown (Tanner 1968, 1982). Reinforced centers are seen in some Jicarilla Apache and Navajo coiled baskets (Collings 1976; Mails 1974; Tanner 1968, 1982), but are not present in Subarctic Dene baskets save for two examples on Deg Hit'an coiled baskets (American Museum of History online collections 50.2/4971; VanStone 1966: Fig. 26b). While reinforced centers are not reported for Fremont coiled baskets, they are a widespread technique and unlikely to be significant here (Edward Jolie, personal communication 2020).

All of the archaeological coiled baskets discussed here lack decoration. Ethnographic Dene baskets have some decoration, but many of these baskets are also made for sale as opposed to use. In this way, Promontory coiled basketry is also similar to that of their Fremont neighbors; Fremont coiled baskets with decoration, while not unusual if not outright common in the Northern and Western Great Basin, is rare for the Eastern Great Basin (Adovasio 1986). In this sense, the Promontory coiled baskets are also similar to that of their neighbors.

Unlike twined textiles recovered from the Promontory caves, the coiled assemblage is much more typical of the Eastern Great Basin for the time period, although representing late occurrences of the half-rod and bundle foundation with non-interlocking stitch subtype. Work direction, rim finish, and splice types also all match with what is expected of Fremont basketry in the Eastern Great Basin. This suggests not just a copying of this technique from Fremont neighbors, but an incorporation of Fremont (and later, Puebloan) women into ancestral Apachean society.

Plaited Textiles

The three artifacts of plaiting recovered from the Promontory caves are unique for the Great Basin. There are no known specimens of Fremont plaiting (Adovasio 1979, 1986; Adovasio and Illingworth 2014a), although in Adovasio's summaries of Fremont basketry the

Promontory caves is included as a Fremont site without mention of the three plaited specimens recovered by Steward (1937). The only archaeological plaited artifacts in the Great Basin come from the western half, including 1) the much more ancient Spirit Cave 1/1 plaited mats that date to 9,415 radiocarbon years BP (Hattori and Fowler 2009); 2) a type of rigid 1/1 plaiting first identified at Lovelock Cave and thence named “Lovelock Wickerware”, found throughout western Nevada from about 1,200 to 3,300 years ago (Adovasio 1986; Loud and Harrington 1929; Tuohy and Hattori 1996; Weltfish 1930, 1932b); and 3) a scrap of cotton cloth from the Paisley Caves dating to 1060 ± 40 radiocarbon years BP (cal. AD 950-1040), likely imported from the Southwest (Jenkins et al. 2013). Discontinuities in both time and construction make these unlikely antecedents to the Promontory caves plaiting.

Plaited basketry is also absent among Subarctic Dene. If not a technology brought from the Subarctic, where then did the Promontory caves people learn to plait? Plaiting is a common technique in eastern and southeastern regions of North America, and to a lesser extent is used among the Kwakwaka’wakw and their neighbors on the Northwest Coast, among Pueblo and Pima peoples in the American Southwest, and among the Mandan, Hidatsa, and other Caddoan peoples on the Plains (Driver and Massey 1957; Jolie 2006; Weltfish 1930). Plaiting is also known from two dated tule mats from Cedar Cave on the Columbian Plateau, dating to 1,916 ± 40 radiocarbon years BP (cal. 16 BC-AD 218) and 2,296 ± 36 radiocarbon years BP (cal. 407-210 BC), respectively, as well as nine undated specimens from McGregor and Squirt Caves, but are altogether a minority weave structure used for mats or mat-based containers (Held 2006). These plaited mats are expedient and largely made of tule and utilize 3/3 or 3/2 intervals. Following how sewn and twined mats similarly point to a Plateau connection, it seems likely that the Promontory caves inhabitants picked up plaiting from connections there, as well as a proclivity for tule as a mat or mat-based container material. A less likely scenario is some knowledge of plaiting obtained from Dene peoples who near the Northwest Coast, such as the Tŝilhqot'in. Plaiting techniques used by the Navajo for burden baskets however are more likely to have come from contact and trade with Puebloan peoples (Whiteford 1988a) then became more commonplace among the Navajo through trade with and incorporation of Puebloan peoples.

Lattice-Like Textiles

The construction of 42BO1 11595, an expediently-made item of inconsistently twined, interlaced, and wrapped hide strips, has no dominant weave structure but is lattice-like in its appearance and thus merits its own category. 11595 is likely part of a dog travois basket (Katherine Lathem 2020, personal communication), which could have been used for carrying moccasins, butchered meat, pottery, and particularly fresh water, given that the nearest source is approximately 4 km away at Chournos Springs (John Ives 2020, personal communication); all of these loads have been reported for travois ethnographically, alongside children and lodge coverings (Ewers 1955; Wilson 1924). Wilson (1924), in his report on Hidatsa horse and dog culture, recorded Buffalo Bird Woman's description of how to make a dog travois bag. The illustration (Wilson 1924:217, Fig. 49; see Fig. 4.46 in the previous chapter) is strikingly similar in construction to the Promontory caves specimen. Travois technology with horses is well-attested across the Great Plains in the ethnographic present, including among the Dene language-speaking Tsuut'ina (Ewers 1955:109, 111). The Apache also kept dogs as pack animals (Eiselt, in press). Since travois are made entirely of wood and hide, their presence is scant in the archaeological record, and as such it is difficult to estimate just when and where dog travois technology first appear. Worn wooden poles that may be from travois have been recovered from the Turk Burial site in the Missouri Basin (Grey 1963) and Horned Owl Cave in Wyoming (Gebhard et al. 1964), neither of which have radiocarbon dates, but the former is estimated to date to within the past 300 years and the latter is estimated to the Late Middle and Late Prehistoric phases of the northern Great Plains. Welker and Byers' (2019) analysis of canid remains from Birch Creek Valley sites in Idaho demonstrate that dogs in the Intermountain West were of adequate size to carry loads comparable to those in ethnographic records as early as 3,000 years ago. Lupo and Janetski (1994, Table 2) show a slight uptick in canid remains in Utah around the same time Promontory was inhabited. Ethnographically, the dog travois is known in the northern Great Basin among Shoshone and Gosiute peoples (Steward 1941, 1943), but it is unclear whether the technology was adopted before or after contact with the Plains world. Regardless of whether the possible dog travois basket is Dene, Shoshone, or other, to identify the origin of out-of-place Promontory caves technologies, one must look to the north and west.

The fiber perishable assemblage from the Promontory caves bears similarities to that of local Fremont in some respects, but in many others points to other regions. A focus on light and expedient twined mats and mat-based bags over more rigid coiled baskets and a dearth of knotted nets suggest that the subsistence economies and lifeways of the Promontory caves inhabitants were very unlike those of their Fremont neighbors; a lack of decoration save for the raised wefts of three-strand braided twining and one quill-worked plat sinnet (Fig. 4.5) also suggests a mobile population. Technologies such as plaiting, sewn and twined mats, three-strand braided twining, and a possible dog travois basket direct our attention north and west for from whence the inhabitants of Promontory caves came. Some, such as plaiting and sewn and twined mats, may have been adopted and adapted from technologies present on the Columbian Plateau either through copying or intermarriage. Others, such as three-strand braided twining, bring us even further north and west to the Pacific coast. Similarly, the out-of-place nature of plat sinnets and simple looping netted fabrics also direct our attention north, this time to Subarctic Dene language-speakers. In contrast, the coiled assemblage at the Promontory caves is identical to Fremont coiling, and coiled basketry made by present-day Navajo and Apache communities bears ties both to their Pueblo neighbors as well as deeper Great Basin similarities, suggesting an incorporation of Fremont peoples at the Promontory caves as well as more recent intermarriage with Puebloan peoples. These assertions fit well with previous research of artifacts from the Promontory caves that point to highly-mobile inhabitants with connections both far-flung and local (Hallson 2017; Ives 2014; Ives et al. 2014; Johansson 2013; Yanicki and Ives 2017; Yanicki 2019).

Chapter 6: Conclusion

The high degree of preservation at the Promontory caves has resulted in an extensive collection of perishable artifacts, including a large assemblage of cordage and woven textiles. These latter two classes are widely attested to be useful indicators of cultural affinity because of the number of minute traits in their construction and the level of skill it takes to make them. This shared history of learning and teaching in turn produces degrees of similarity in construction attributes over time through both learners emulating the process of more skilled weavers and the automization of fine, practiced motor skills honed through extensive repetition (Adovasio 2010; Adovasio, Pedler, and Illingworth 2002; Carr and Maslowski 1995; Jolie 2014; Maslowski 1984; McBrinn and Smith 2006; Minar 2000, 2001; Reilly 2015). The objective of this research was to analyze and categorize the very large perishable assemblage at the Promontory caves, and from these categories, to extrapolate the likely origins and relationships of the caves' inhabitants.

Summary of Research

A total of 383 cordage, four plat sinnets, one net fragment, two fragments of netted fabrics, two possible netted game hoops, eleven bark fiber-wrapped hoops, one wrapped bark construction, 35 fiber bundles, 58 twined textiles, two sewn and twined textiles, 16 coiled textiles, three plaited textiles, and one lattice-like textile were analyzed under this study, for a total of 519 artifacts. An additional 96 cordage specimens were analyzed under a previous study (Goldberg 2018), bringing the total sample to 615 artifacts. From them, a pattern begins to emerge that suggests ties north and west of the Promontory caves.

The four plat sinnets are perhaps the most striking artifacts to show this pattern, particularly so with the fine sinew weft of FS 1197 (Fig. 4.5). Plat sinnet weaving is seen across the Canadian Subarctic in the form of mitten cords (Jones, Fall, and Leggett 2013:201, Fig. 13.8

and 255, Fig. 15.38; Thompson 2013:75, Fig. 2.23b and 154, Fig. 4.15), moccasin-trouser garters (Canadian Museum of History VI-N-115; Jones, Fall, and Leggett 2013:295, Fig. 4.5, 15.14b, 15.34, 15.38; Thompson 2013:82, Fig. 3.2a and 142, Fig. 4.5 and 161-163, Fig. 4.21 and 4.22 and 173, Fig. 4.34, and 200, 4.56b and 205-206, Fig. 4.60b and 4.62 and 209-212, Fig. 4.64c and 4.67), basket handles (Canadian Musem of History VI-N-53, VI-N-55; Richmond 1972; VanStone 1996:34-39, Fig. 15a-b and 23e; see also Clark 1974, Fig. 188), bag straps (Canadian Museum of History VI-D-163), headbands (Canadian Museum of History VI-N-170), knife sheath bands (Jones Fall and Leggett 2013:295; Osgood 1936, Plate 7c; Thompson 1994:26, Fig. 32), other band-like objects (Canadian Museum of History VI-N-114), and possibly even on a net selvage (Canadian Museum of History VI-O-97; see also Fig. 4.45). The technique is absent in the Great Basin and the Southwest, but a Jicarilla coiled basket may have a plat sinnet weave on its handle (Yale Peabody Museum ANT 021330). Other Subarctic connections are seen in two fragments of simple looping netted fabrics (Fig. 4.7 and 4.8), which while used for bags across North America (Driver and Massey 1957), are noticeably absent in the archaeological record of the Eastern Great Basin as well as the wider region (Adovasio et al. 2009), and are considered by Marie and Thompson (2014) to be a distinctively Dene item. The diverse end selvages of Promontory's twined assemblage are also more suggestive of the Subarctic, where a similarly diverse array of end selvage techniques can be seen (American Museum of Natural History online collections 60/4973, 60/4972, 60/4971, 60/4970, 60/4969, 60/4968, 60/4967, 60/4963, 50.2/4975, 50.2/4973; Canadian Museum of History online collections VI-B-330; Jones, Fall, and Leggett 2013 Fig. 1.59; Osgood 1970:143; VanStone 1996: Fig. 17, 18a, 19c and e, 20a; Yale Peabody Museum online collections ANT 025442, 050167, 200187), in contrast to neighboring Fremont populations who preferred their twined basketry to simply have truncated warps (Adovasio 1986; Adovasio et al. 2002). Plat sinnet weaves, simple looping netted fabrics, and a diversity of twined end selvages fit with previous research of the Promontory moccasins, which are made in a style common across the Canadian Subarctic (Hatt 1916; Ives 2014, 2020; Ives et al. 2014; Steward 1937).

Other artifacts, such as three-strand braided twining, turn our attention to the Pacific Coast. Four twined textiles from the Promontory caves feature three-strand braided twining (Fig. 4.23 and 4.24), a technique not seen in the Great Basin save for a possible fragment from Lovelock Cave (Loud and Harrington 1929, pl. 31c; Weltfish 1930). Rather, Fraser (1989) attributes the technique in North America to the Great Lakes region as well as the Pacific coast, including the Tlingit—who border the Dene language-speaking Ahtna, Tutchone, Tagish, Tahltan, and Tsetsaut—and the Dene language-speaking Hupa. An abalone (*Haliotis* sp.) pendant from the Promontory caves (Steward 1937) also points to ties with peoples on the Pacific coast, as do Navajo oral histories (Zolbrod 1984) and a shared term for female puberty ceremonies between the Navajo and Hupa (Sapir and Golla 2001). California Dene have linguistic ties to Subarctic Dene languages in Alaska and British Columbia (Snoek et al. in press), a region that saw increased interaction between Tlingit, Inland Tlingit, and Dene kin following the catastrophic White River Ash eruption ca. A.D. 846-848 (Kristensen 2020).

To the north and west, and between the Pacific and Promontory, lies the Columbia Plateau. Sewn and twined mats from the Promontory caves are unknown for the Great Basin outside of Promontory, but are known (if uncommonly) from the Columbia Plateau (Held 2006). Sewn and twined mats begin to appear in the Southern Plains around the same time Promontory was inhabited (Jolie 2006). Both these connections are supported by research into the Promontory caves' gaming assemblage, which contains a wide array of gaming implements found also in the Columbia Plateau, Plains, and Southwest (Yanicki and Ives 2017; Yanicki 2019), as well as the moccasins: a Promontory-style moccasin was recovered from Spruce Tree House in Mesa Verde, along with a gaming hoop (Fewkes 1909: Fig. 36 and 37). A connection to the Great Plains is also seen in the possible dog travois basket (Fig. 4.14). Travois technology with horses is well-attested in the ethnographic present on the Great Plains, including among the Dene language-speaking Tsuut'ina (Ewers 1955:109, 111). While the presence of the travois is difficult to identify in the archaeological record, canid remains in the Intermountain West were of large enough size to pull travois 3,000 years ago (Welker and Byers 2019), and an uptick in canid remains in Utah around the same time Promontory was inhabited (Lupo and Janetski 1994, Table 2) shows that the possibility for travois use is present. In his culture element research for Kroeber, Steward (1941, 1943) did report dog travois use among Shoshone and Gosiute peoples. It is unclear, however, whether the technology was adopted by them prior to or after extensive northern Shoshone contact with the Plains world.

Plaited technology, while present very early in the Great Basin (Adovasio 1986; Hattori and Fowler 2009; Jenkins et al. 2013; Loud and Harrington 1929; Tuohy and Hattori 1996; Weltfish 1930, 1932b), is unknown from Fremont sites (Adovasio 1979, 1986; Adovasio and Illingworth 2014a; Adovasio et al. 2002). It is, however, found in the Southwest and Great Plains regions (Driver and Massey 1957; Jolie 2006; Weltfish 1930) as well as the Columbia Plateau (Held 2006), much like sewn and twined basketry. The Columbia Plateau plaited mats in particular are made of tule, a material favored at the Promontory caves in the form of expedient open twined basketry over the more rigid materials favored by their Fremont neighbors, such as willow, and may account for why Apachean groups so readily adopted rigid basketry from their

Puebloan neighbors despite not having a strong tradition of it (Ed Jolie, personal communication 2020).

A subsistence style different from their Fremont neighbors is suggested at the Promontory caves in more ways than just an expedient basketry technology based around mats and mat-based bags. There is a significant lack at the Promontory caves of hunting nets. Only one artifact can be definitively interpreted as a net fragment (Fig. 4.9), whereas the neighboring site of Hogup Cave has 138 net fragments, albeit sampled from a much larger excavation. Moreover, knotted cords at Promontory (which may be net fragments too small to be definitive) have an overwhelming majority of overhand knots, accounting for 258 of 275 knots. Knotted nets in the Eastern Great Basin favor square, sheet bend, weaver's knots, and lark's head knots, and were used in the hunting of small game (Adovasio et al. 2009; Connolly et al. 2017). These discrepancies over favored knot type and number of net fragments suggests that the inhabitants of the Promontory caves relied on other subsistence methods than their Fremont neighbors. This supports conclusions from previous findings that the Promontory caves has a dearth of small-game animal remains in Steward's collections and the more than 30,000 faunal remains recovered in more recent excavations (Johannson 2013).

In contrast to the above, the coiled basketry assemblage at the Promontory caves is very much like that of their Fremont neighbors. Both groups utilized close coiled basketry with single rod foundations and interlocking stitches and half-rod and bundle stacked foundations with non-interlocking stitches, and both have a deep history in the Great Basin (Adovasio 1986; Adovasio et al. 2002; Webster and Jolie 2011, 2014). In addition, Promontory coiled textiles as well as those from the wider Eastern Great Basin share a preference for right-to-left work direction, continuous coil centers, self-rims, and a lack of decoration. Pottery at the Promontory caves is also much like that seen from Uinta Basin Fremont sites (Yanicki 2019), suggesting some degree of contact, perhaps even intermarriage, between the two groups.

My research into the fiber perishable assemblage at Promontory supports previous studies of other Promontory Caves assemblages that suggest the site's inhabitants were 1) not from the Great Basin (Hallson 2017; Reilly 2015; Yanicki and Ives 2017; Yanicki 2019), but who 2) have ties to the Subarctic, particularly Dene (Ives 2014, 2020; Ives et al. 2014; Steward 1937), and 3) likely incorporated people, but especially women, from surrounding Fremont communities (Yanicki and Ives 2017; Yanicki 2019).

Future Research

Many questions beyond the scope of this thesis are fertile ground for future research projects. There have been few detailed studies into Subarctic Dene fiber perishable technology, and as such this thesis lacks metric comparative data. A systematic review of Subarctic Dene cordage and textiles in museum collections may reveal more technological connections to the Promontory caves, as well as flesh out the relationship between Subarctic Dene textiles and that of their neighbors. Plat sinnets, for instance, may be a more widespread Subarctic technology than presented here, and would benefit from a more in-depth review of museum collections. Such a review could also flesh out the relationship between Pacific Coast Dene and Subarctic Dene technologies.

I also did not examine cordage used in moccasins, due to the sheer number of Promontory moccasins, and the fact that one moccasin may utilize multiple forms of cordage. Since moccasin cordage is often sewn into the moccasin, getting metric data may be difficult because their length and number can be obscured by the hide matrix (Erika Sutherland, personal communication 2020). Since the function of these cords is clear, however, these data may help in identifying the function of isolated cords in the wider cordage assemblage.

Concluding Remarks

Perishable artifacts are by their very nature rare in the archaeological record. Yet, the ethnographic record and as well as results from rarer, well-preserved archaeological sites show that organic technologies often make up a significant majority of artifacts recovered (e.g., Adovasio 2010; LeBlanc 2009; Osgood 1970). The knowledge of raw material preparation, familiarity with requisite patterns, and the execution of repetitive, fine motor skills involved in weaving a basket, sewing a moccasin, or twisting a cord are resistant to change and thus are useful in determining cultural affiliation of a site's inhabitants (Adovasio 2010; Adovasio and Illingworth 2014b; Carr and Maslowski 1995; Held 2006; Jolie 2006, 2014; Lockhart and Johnson 1970; Maslowski 1984; McBrinn and Smith 2006; Minar 2000, 2001; Webster and Jolie 2011, 2014). The Promontory caves perishable assemblage is no exception; the presence of plat sinnets, simple looping netted fabrics, and diverse twined end selvages point to a people of Subarctic descent. Other technologies, such as three-strand braided twining, sewn and twined mats, plaited textiles, a possible dog travois basket, and even simply the preference for twined mats and mat-based bags over coiled baskets point to connections outside of the Great Basin, specifically to the Pacific Coast, Columbia Plateau, and Great Plains. The skill with which these objects were made—FS 1197 (Fig. 4.5) in particular is striking with its very fine sinew weft—suggest that these items were not merely copied from objects seen in the hands of neighbors, but were made by someone intimately familiar with the technology. Still other artifacts (or in the case of nets, the lack thereof) weave an image of a people with an entirely different subsistence technology from their Fremont neighbors. The Promontory Culture inhabitants of Caves 1 and 2 preferred large game hunting of bison and antelope over small game net hunting, while favoring more expedient open twined textiles made of tule than more time-consuming coiled basketry. These conclusions fit neatly with previous research done with other Promontory Caves artifacts (Billinger and Ives 2015; Goldberg 2018; Hallson 2017; Ives 2014, 2020; Ives et al. 2014; Johansson 2013; Reilly 2015; Steward 1937; Yanicki 2019; Yanicki and Ives 2017) as well as to more recent research into Dene migration and the people they may have met and incorporated along the way (Ives 2014; Kristensen 2020; Snoek et al. in press; Yanicki 2019; Yanicki and Ives 2017). Interwoven with these findings is evidence of extended contact with and likely incorporation of Fremont neighbors in the form of stylistically comparable coiled basketry technology, consistent with previous findings in the ceramic assemblage (Yanicki 2019). The Promontory caves fiber perishable assemblage, while in some ways similar to contemporaneous Fremont sites, is in many more ways representative of a people entirely new to the Great Basin, with connections stretching from the Pacific Coast to the Great Plains and northward into the Subarctic. That the site is situated in a time and place where one expects to see Apachean ancestors further supports the hypothesis that the Promontory caves were inhabited by a proto-Apachean people.

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Appendix I

Attribute Table Codes

Cordage and Netting Attribute Codes[7]

Construction Form (Cordage)

1 = Isolated Cord

2 = Composite Cord

3 = Wrapped Cord

4 = Fiber Bundle

5 = Unidentifiable Object

6 = Plat Sinnet

Construction Form (Netting)

1 = Looped

2 = Knotted

Construction Form (Gaming Hoops) (Yanicki 2019)

1 = Netted/wood hoops

2 = Bark-wrapped hoops

Loop/Knot Type (Netting)

1 = Simple looping

2 = Square

3 = Cow hitch/lark's head

4 = Fishnet knot

5 = Overhand

Wear

[7] Includes fiber bundles, hoops, netted fabrics, plat sinnets, wrapped bark construction, and travois bag.

1 = Light

2 = Light to moderate

3 = Moderate

4 = Moderate to heavy

5 = Heavy

Taper

1 = Absent

2 = Present

Structural Class

1 = Twisted

2 = Unspun

3 = Wrapped

4 = Braided

5 = Sinnet

Ply Formula

1 = S

2 = Z

3 = 2zS

4 = 2sZ

5 = 2(2sZ)Z

6 = 2Z

7 = S and Z

8 = 2(2zS)Z

9 = 2S

10 = 2zZ

Final Twist

1 = S

2 = Z

3 = S and Z

4 = Braided

Initial Spin

1 = S

2 = Z

3 = S and Z

Tightness of Twist

1 = Loose

2 = Medium

3 = Tight

Splices

1 = Double-bind

2 = Laid-in strands

3 = Knotted

4 = Bound under successive loops

Residue

1 = Organic

2 = Inorganic

3 = Organic and inorganic

Raw Material

1 = Bast fibre

2 = Hide/sinew

3 = Bark

4 = Fur/hair

5 = Bird skin

6 = Quill

7 = Whole plant stem

8 = Tule

Degree of Processing

1 = Lightly

2 = Lightly to moderately

3 = Moderately

4 = Moderately to highly

5 = Highly

Net Selvage Type

1 = Knotted overhand loop

2 = Cow hitch/lark's head stitched into hide band

3 = Simple looping stitched into hide band

4 = 2sZ cord

5 = Bandweaving?

6 = Reinforced with 2zS fiber cord

Knot

1 = Overhand

2 = Overhand loop

3 = Square

4 = Knotted buttonhole loop

5 = Granny knot

6 = Knotless loop/half-hitch

7 = Cow hitch/lark’s head

8 = Clove hitch/two half-hitches

Wrapping

1 = Porcupine quill

2 = Feather

3 = Hide/sinew

4 = Bark

5 = Tule

6 = Fur

7 = Twisted cord

Warp, Weft, or Selvage (in Twined Constructions)

1 = Warp

2 = Weft

3 = Selvage

4 = Side selvage

5 = Mend

Twined Construction Attribute Codes

Construction Form

1 = Matting

2 = Basket

3 = Bag

4 = Unclear

Wear

1 = Light

2 = Light to moderate

3 = Moderate

4 = Moderate to heavy

5 = Heavy

Open vs Close

1 = Open twining

2 = Close twining

3 = Open and close twining

Simple vs Diagonal

1 = Simple twining

2 = Diagonal twining

3 = Simple and diagonal twining

4 = Cross warp twining

5 = Wrapped twining

Weft Twist Direction

1 = S

2 = Z

3 = 3-strand braid

4 = 3-strand braid and S-twining

5 = S with one row of Z

Splice Type

1 = Addition of new warps into pre-existing weft crossing

2 = Addition of new warps creating new weft crossings

3 = New warps folded into V-shape and inserted into pre-existing weft crossings

4 = Twisted in warp splices

5 = Warp element folded around weft crossing with one end folded 180 degrees into adjacent warp

Weft Splice Type

1 = New wefts laid-in alongside exhausted wefts

2 = New wefts knotted to exhausted wefts

Knots Used in Splicing

(see cordage attribute code)

Residue

1 = Organic

2 = Inorganic

3 = Organic and inorganic

Raw Material (Warp and Weft)

1 = Bast fibre

2 = Hide/skin

3 = Bark

4 = Fur

5 = Tule

6 = Whole plant stem

7 = Split plant stem

Degree of Processing (Warp and Weft)

1 = Lightly

2 = Lightly to moderately

3 = Moderately

4 = Moderately to highly

5 = Highly

Method of Starting

1 = Warps arranged end-to-end

2 = Warps crossed in pairs

3 = Warps crossed in sets of four

4 = Warps arranged in series of non-intersecting V's

5 = Warps arranged in series of non-intersecting arcs

6 = Crossed and uncrossed warp elements

Selvage Type

1 = Simple

2 = Complex

Selvage

1 = Truncated warps

2 = Knotted warps

3 = Adjacent warps twisted together and knotted

4 = Adjacent warps braided together and knotted

5 = Warps folded 180° into themselves

6 = Warps folded 180° and reinserted into adjacent warp rows

7 = Warps folded 45° and reinserted 2 warp rows over

8 = Warps folded 180° and reinserted 2 warp rows over

9 = Some warp elements truncated, others spliced into a three-strand braid held by final weft row

10 = Warps folded 180 degrees and become part of terminal weft row

11 = Whole rod rim wrapped with extra stitching of weft material

Selvage Reinforcment

1 = Untwisted line running between warp elements and above final weft

2 = 2zS cord running between warp elements and above final weft

3 = Single row of Z-twisted twining along edge

4 = Single row of S-twisted twining along edge

Side Selvage

1 = Knotted wefts

2 = Weft looped around terminal warp element

3 = Continuous weft

4 = Weft elements twisted together into 2sZ cord, that doubles back on itself and tied in an overhand knot; additional 2zS cord tied in an overhand knot around 2sZ cord to form a loop (Complex 1)

5 = Knotted and continuous weft, where along the sides the weft elements have been twisted together

6 = Weft elements twisted together into 2sZ cord, splicing in the extra ply with an overhand knot; the 2sZ cord, after a few twists is tied in a knotted overhand loop; the two plies than untwist, with one knotting under the first overhand in a second overhand; similar to 4 (Complex 2)

Side Selvage Reinforcement

1 = Z-twisted terminal warp

Mending

1 = Present

2 = Absent

Decoration

1 = Raised part of 3-strand braid weft on outside/top surface

2 = 3-strand braid warp selvage

3 = Folded warp selvage has appearance of Z-twisted cord

Coiled Construction Attribute Codes

Wear

1 = Light

2 = Light to moderate

3 = Moderate

4 = Moderate to heavy

5 = Heavy

Open vs Close

1 = Open coiling

2 = Close coiling

3 = Open and close coiling

Coil Foundation Elements

1 = Whole rod

2 = Half rod, flat side down

3 = Bundle

4 = Half-rod and bundle, flat-side down

5 = Welt/splint

6 = 2 rod and bundle

7 = Half rod, flat side down and flat side up

Coil Foundation Arrangement

1 = Single element foundation

2 = Horizontal foundation

3 = Stacked foundation

4 = Bunched foundation

Stitch Type

1 = Simple stitch

2 = Intricate stitch

3 = Wrapping stitch

Interlocking vs Non-interlocking

1 = Interlocking stitch

2 = Non-interlocking stitch

3 = Split stitch

Stitch Slant

1 = S

2 = Z

Foundation Split by Stitches?

1 = Yes

2 = No

Work Surface

1 = Concave

2 = Convex

Fag Splice Type

1 = Stitch clipped

2 = Stitch bound under bulging stitch against work direction

3 = Stitch bound under bulging stitch with work direction

Moving Splice Type

1 = Stitch clipped

2 = Stitch bound under bulging stitch against work direction

3 = Stitch bound under bulging stitch with work direction

Residue

1 = Organic

2 = Inorganic

3 = Organic and inorganic

Raw Material (Coil and Stitch)

1 = Bast fibre

2 = Hide/skin

3 = Bark/wood

4 = Fur

5 = Tule

Degree of Processing (Coil and Stitch)

1 = Lightly

2 = Lightly to moderately

3 = Moderately

4 = Moderately to highly

5 = Highly

Foundation Splice

1 = Laid-in

Method of Starting

1 = Normal/continuous coil center

2 = Oval center

3 = Plaited center

4 = Overhand knot center

5 = Other

Reinforcing Stitches?

1 = Yes

2 = No

Rim

1 = Self rim

2 = Self rim with stitch modification—stitch and wrap, 1/1 ratio

3 = Self rim with stitch modification—back wrapping

4 = False braid rim

5 = Combination rim

Mending

1 = Present

2 = Absent

Mend Type

1 = Large stitch

2 = Hide patch

Charring

1 = Present

2 = Absent

Plaited Construction Attribute Codes

Construction Form

1 = Matting

2 = Basket

3 = Inconclusive

Wear

1 = Light

2 = Light to moderate

3 = Moderate

4 = Moderate to heavy

5 = Heavy

Simple vs Twill

1 = Simple Plaiting (1/1)

2 = Twill Plaiting

Twill Plaiting Interval

1 = 2/2

Shifts

1 = Unintentional

2 = Intentional

Splice Type

1 = Addition of new warps into pre-existing weft crossing

2 = Addition of new warps creating new weft crossings

3 = New warps folded into V-shape and inserted into pre-existing weft crossings

4 = New wefts laid-in alongside exhausted wefts

5 = New wefts knotted to exhausted wefts

Knots Used in Splicing

(see cordage attribute code)

Residue

1 = Organic

2 = Inorganic

3 = Organic and inorganic

Raw Material (Warp and Weft)

1 = Bast fibre

2 = Hide/skin

3 = Bark

4 = Fur

5 = Tule

Degree of Processing (Warp and Weft)

1 = Lightly

2 = Lightly to moderately

3 = Moderately

4 = Moderately to highly

5 = Highly

Identifiable Center

1 = Absent

2 = Present

Selvage

1 = Truncated warps

2 = Warps folded 180° into themselves

3 = Warps folded 180° into immediately adjacent weft rows

4 = Coiled selvages (expand later if encountered)

Selvage Reinforcement Type

1 = Flexible wefts near edge tied together in an overhand knot and S-twisted to become a row of Z-twisted twining

2 = Warps fold

Side Selvage

1 = Continuous weft

Mending

1 = Present

2 = Absent

Appendix II

Attribute Tables

Cordage

FS #	NHMU #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #	Northing	Easting	Meters Below Datum	Context Comments	Excav. Date	Construction Form	Wear	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)	Avg. Element Thickness (mm)	Avg. Twists per cm	Splice Type	Residue	Raw Material	Munsell Code	Color Description	Degree of Processing	Knot 1	Knot 2	Knot 3	Knot 4	Knot 5	Distance Between Knots and Ends (cm)	Wrapping	Wrapping Twist Direction	Avg. Wraps per cm	Avg. Wrap Element Width (mm)	Free Ends #	Notes	Knot 6	Knot 7	Knot 8
1586			Promontory Cave 1	42BO1	1	Promontory	F62	F3	91/90	99	2.69-2.95		5/15/2014	2	2	2	2	1	NA	NA	NA	NA	approx. radius 0.7	0.44	NA		NA	NA	2	3	10YR 5/2	grayish brown	3											1				
1272	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/16/2013	2	1	1	2	1	NA	NA	NA	NA	approx. radius 0.8	0.34	NA		NA	NA	3	2	2.5Y 5/2	grayish brown	3											0				
1361	A.2015.12	a	Promontory Cave 1	42BO1	3	Promontory	F53	F3	91	99	2.31-2.42		5/11/2014	2	3	1	1	2	4	2	1	2	24.30	2.70	1.36		2.50	2	3	1	10YR 5/4	yellowish brown	4	1					22.9, 1.0					2				
1361	A.2015.12	b	Promontory Cave 1	42BO1	3	Promontory	F53	F3	91	99	2.31-2.42		5/11/2014	2	4	1	1	2	4	2	1	2	24.80	3.00	1.50		1.50	2	3	1	10YR 5/4	yellowish brown	4	1					21.9, 2.5					2				
1361	A.2015.12	c	Promontory Cave 1	42BO1	3	Promontory	F53	F3	91	99	2.31-2.42		5/11/2014	2	4	1	1	2	4	2	1	3	15.80	2.38	1.12		2.50	2	3	1	10YR 5/4	yellowish brown	4	1					12.9, 2.4					2				
1191	A.2013.8	a	Promontory Cave 1	42BO1	2	Promontory	F47	F3	90	99	2.13-2.25		5/13/2013	1	4	2	1	2	3	1	2	3	19.40	3.16	1.64		2.50	2	3	1	10YR 5/4	yellowish brown	5											2				
1191	A.2013.8	b	Promontory Cave 1	42BO1	2	Promontory	F47	F3	90	99	2.13-2.25		5/13/2013	1	5	1	1	1	1	1	1	NA	12.70	2.34	NA		NA	2	3	1	10YR 4/4	dark yellowish brown	3											2				
1707			Promontory Cave 1	42BO1	1	Promontory	F58	F3	90	99	2.56-2.65		5/13/2014	2	3	1	2	1	NA	NA	NA	NA	18.80	1.66	NA		NA	NA	3	2	10YR 5/3	brown	3											2				
1273	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99			5/14/2013	2	2	1	2	1	NA	NA	NA	NA	4.00	0.10	NA		NA	NA	3	3	10YR 5/3	brown	4	1					0					0				
1421.1	A.2015.12		Promontory Cave 1	42BO1	3	Promontory	F57	F3	91	99	2.33-2.58		5/12/2014	1	4	1	1	2	4	2	1	3	44.00	2.52	1.32		2.50	1, 2	3	1	10YR 4/3	brown	4	1	1				0					0				
1421.2	A.2015.12		Promontory Cave 1	42BO1	3	Promontory	F57	F3	91	99	2.33-2.58		5/12/2014	1	4	1	1	2	4	2	1	3	26.10	2.86	1.70		2.50	2	3	1	10YR 5/4	yellowish brown	4	1	1				12.1, 14.0; 25.0, 1.1					2				
1421.3	A.2015.12		Promontory Cave 1	42BO1	3	Promontory	F57	F3	91	99	2.33-2.58		5/12/2014	1	5	1	1	2	4	2	1	1	9.80	5.26	2.26		0.50	NA	3	1	10YR 5/3	brown	3	1					8.8, 0					1				
1310	A.2013.8	aa	Promontory Cave 1	42BO1	2	Promontory	F48	F3	90	99	2.29-2.37		5/16/2013	2	3	1	1	2	3	1	2	2	28.00	2.84	1.32		2.00	2	2	1	10YR 5/4	yellowish brown	4	2	2				0					0				
1310	A.2013.8	ab	Promontory Cave 1	42BO1	2	Promontory	F48	F3	90	99	2.29-2.37		5/16/2013	2	3	1	2	1	NA	NA	NA	NA	9.80	4.94	NA		NA	NA	2	1	7.5YR 4/4	brown	2											0				
1310	A.2013.8	b	Promontory Cave 1	42BO1	1	Promontory	F48	F3	90	99	2.29-2.37		5/16/2013	1	3	2	1	2	3	1	2	3	10.60	1.92	1.26		4.50	NA	2	1	10YR 5/4	yellowish brown	4	1	1				0, 9.8					1				
1310	A.2013.8	c	Promontory Cave 1	42BO1	1	Promontory	F48	F3	90	99	2.29-2.37		5/16/2013	1	2	2	1	2	3	1	2	3	16.10	0.64	0.28		4.50	NA	2	1	10YR 5/3	brown	4											2				
1279	A.2013.8	a	Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	3	1	1	1	2	2	2	NA	29.80	3.32	NA		NA	2	1	2	10YR 4/2	dark grayish brown	2											2				
1279	A.2013.8	b	Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	3	1	1	1	1	1	1	NA	16.10	1.96	NA		NA	NA	1	2	10YR 4/2	dark grayish brown	2											2				
1279	A.2013.8	c	Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	2	2	1	1	1	1	1	NA	9.10	0.98	NA		NA	NA	2	2	7.5YR 5/4	brown	4	1	1				3.3, 5.8; 6.9, 2.2					2				
1279	A.2013.8	d	Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	1	1	1	1	2	2	2	NA	4.60	0.68	NA		NA	2	NA	1	7.5YR 3/2	dark brown	3											2				
1279	A.2013.8	e	Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	1	1	4	2	NA	4	NA	NA	1.80	2.32	0.22		NA	NA	NA	8	10YR 4/3	brown	3											1	untwisted hide core			
1279	A.2013.8	f	Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	4	2	1	2	4	2	1	2	18.60	3.50	1.30		1.50	2	3	1	10YR 5/4	yellowish brown	4	1					1.9, 16.4					1				
1279	A.2013.8	g	Promontory Cave 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	4	1	1	1	1	1	1	NA	30.20	2.44	NA		NA	2	3	1	10YR 5/4	yellowish brown	4											2				
1279	A.2013.8	h	Promontory Cave 1	42BO1	2	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	4	1	1	1	2	2	2	NA	26.9*	0.72	NA		NA	NA	3	1	10YR 5/3	brown	3											>2				
1279	A.2013.8	i	Promontory Cave 1	42BO1	2	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	4	2	1	1	2	2	2	NA	9.30	1.72	NA		NA	NA	3	1	10YR 5/3	brown	3											2				
1472	A.2015.12		Promontory Cave 1	42BO1	1	Promontory	F57, F53, and F48	F3	91	99	2.42-2.48		5/12/2014	1	3	1	2	NA	NA	NA	NA	NA	12.80	1.44	NA		NA	NA	2	2	10YR 7/2	light gray	3	1					12.8					1				
875	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F21	F3	90	99	1.87-1.94		5/8/2014	1	4	1	1	2	4	2	1	2	16.70	2.76	1.48		2.00	2	3	1	10YR 4/4	dark yellowish brown	4											2				
993	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F31	F28 in F27	98.55	127.83	3.51-3.63		5/9/2013	1	4	1	1	2	3	1	2	3	20.60	3.46	1.88		2.50	2	3	1	10YR 5/3	brown	5	1	1	2			Knot 1 and end: 0; Knot 1 and Knot 2: 11.1 cm; Knot 2 and Knot 3: 3.5cm; Knot 3 and end: 5.5cm					1				
1029	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F35	F28 in F27	98.55	127.83	3.58-3.80		5/10/2013	1	3	1	1	2	4	2	1	2	35.2*	1.22	0.42		3.50	2	3	1	10YR 5/3	brown	4	2	4	1			Knot 1 and ends: 24.4, 10.8; Knot 1 and 2: 7.6; Knot 2 and 3: 6.1; Knot 2 and ends: 6.9, 28.3; Knot 1 and 3: 13.7; Knot 3 and ends: 0.8, 34.4					2				
14	A.2011.18	a	Promontory Cave 1	42BO1	1	Promontory	F3		91	99	0-20		4/11/2011	2	3	1	1	2	3	1	2	3	10.60	1.98	1.10		3.00	2	3	1	10YR 6/4	light yellowish brown	5	1					0					1				
14	A.2011.18	b	Promontory Cave 1	42BO1	1	Promontory	F3		91	99	0-20		4/11/2011	2	4	1	1	2	3	1	2	3	24.20	2.36	1.32		2.00	2	3	1	10YR 5/4	yellowish brown	5	1					0					0				
325	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F3		91	99	0-20	NE 1/4	4/11/2011	1	2	1	1	2	4	2	1	3	7.20	0.80	0.22		8.00	NA	3	1	2.5Y 4/2	dark grayish brown	5	1					3.9, 3.1					2				
19	A.2011.18		Promontory Cave 1	42BO1	2	Promontory	F3		91	99	0-20	Lvl. 1	4/12/2011	2	3	1	1	2	5	2	1	2	44.00	4.58	2.58		2.00	2, 3	3	1	2.5Y 4/3	light olive brown	5	1					21.6, 17.8					2				
617	A.2013.8	a	Promontory Cave 2	42BO2	3	Promontory	F5	F3	104	91	1.03-1.14		5/7/2013	1	3	1	1	2	3	1	2	3	13.30	0.88	0.36		6.00	NA	2	1	2.5Y 5/3	light olive brown	4											2				
617	A.2013.8	b	Promontory Cave 2	42BO2	3	Promontory	F5	F3	104	91	1.03-1.14		5/7/2013	1	3	2	1	2	4	2	1	2	2.70	0.54	<0.1		8.00	NA	2	1	10YR 5/4	yellowish brown	5	1	1				Knot 1: 0; Knot 1 and Knot 2/Knot 2 and end: 0.7; Knot 2 and end: 2					2				
617	A.2013.8	c	Promontory Cave 2	42BO2	3	Promontory	F5	F3	104	91	1.03-1.14		5/7/2013	1	3	1	1	2	4	2	1	3	2.10	1.97	0.64		4.00	NA	2	1	10YR 6/3	pale brown	5											2				
738	A.2013.8		Promontory Cave 2	42BO2	1	Promontory	F38	F3	104	91	2.07-2.19		5/10/2013	1	3	1	2	NA	NA	NA	NA	NA	1.10	NA	NA		NA	NA	2	1	10YR 3/3	dark brown	3	1					NA					NA				
700	A.2013.8	a	Promontory Cave 2	42BO2	2	Promontory	F7	F3	104	91	1.82-1.92		5/9/2013	1	2	1	1	2	3	1	2	3	6.40	1.82	0.92		4.00	NA	1	1	10YR 4/6	dark yellowish brown	4											2				
700	A.2013.8	b	Promontory Cave 2	42BO2	2	Promontory	F7	F3	104	91	1.82-1.92		5/9/2013	1	2	1	1	2	3	1	2	3	14.3*	1.88	0.76		4.50	2	3	1	10YR 4/3	brown	4	1	5				Knot 1 and ends: 0, 14.3; Knot 1 and Knot 2: 1.1; Knot 2 and ends: 0, 1.1					0				
718	A.2013.8	a	Promontory Cave 2	42BO2	2	Promontory	F20	F3	104	91	1.94-2.05		5/9/2013	1	3	1	1	2	3	1	2	3	4.90	1.64	0.86		5.00	2	2	1	10YR 6/3	pale brown	4															
718	A.2013.8	b	Promontory Cave 2	42BO2	2	Promontory	F20	F3	104	91	1.94-2.05		5/9/2013	1	4	1	1	2	3	1	2	3	25.2*	1.56	0.60		5.00	2	3	1	10YR 6/3	pale brown	5	4					0					0				
621	A.2013.8	a	Promontory Cave 2	42BO2	2	Promontory	F5	F3	104	91	1.38-1.45		5/7/2013	2	3	1	2	NA	NA	NA	NA	NA	16.4*	16.92	NA		NA	NA	3	1	7.5 YR 5/4	brown	1	1										3				
621	A.2013.8	b	Promontory Cave 2	42BO2	2	Promontory	F5	F3	104	91	1.38-1.45		5/7/2013	2	3	1	1	2	3	1	2	3	7.3*	1.94	1.38		2.00	2	3	1	10YR 5/4	yellowish brown	5	2					0, 7.3					1				

736	A.2013.8		Promontory Cave 2	42BO2	1	Promontory	F14	F3	104	91	2.08-2.22		5/10/2013	1	5	1	1	2	4	2	1	3	5.80	3.04	1.32		2.00	2	3	1	10YR 5/4	yellowish brown	5											2
693	A.2013.8		Promontory Cave 2	42BO2	1	Promontory	F20	F3	104	91	1.92-1.94		5/9/2013	1	5	2	1	2	3	1	2	1	13.10	3.02	1.48		1.00	2	3	1	10YR 6/4	light yellowish brown	4	1	1				Knots and ends: 1.7; Knot 1 and Knot 2: 8.6					0
802	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F16	F15	~93	98	0.35	Slit trench	11/5/2011	1	4	1	1	1	1	1	1	NA	15.60	1.78	NA		NA	NA	3	1	10YR 4/2	dark grayish brown	3											2
805	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F16	F15	~93	98	0.30-0.45	NP slit trench	11/5/2011	1	5	2	1	1	1	1	1	NA	14.20	1.84	NA		NA	NA	3	1	10YR 4/3	brown	3											2
829	A.2011.18	a	Promontory Cave 1	42BO1	2	Promontory	F16	F15	~93	98	0.45-0.50		11/5/2011	1	3	1	1	2	4	2	1	2	7.70	1.44	0.66		4.00	1	3	1	10YR 4/3	brown	4	1					0					1
829	A.2011.18	b	Promontory Cave 1	42BO1	2	Promontory	F16	F15	~93	98	0.45-0.50		11/5/2011	1	3	1	1	2	3	1	2	3	7.10	0.86	0.32		7.00	2	3	1	10YR 5/3	brown	5											1
468	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F14	F3	104	91	2.15-2.32	S 1/2; from FS 119	4/14/2011	1	4	1	1	2	4	2	1	3	3.80	1.50	1.13		NA	NA	3	1	10YR 7/6	yellow	5	1					0					1
106	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F14	F3	104	91	2.13-2.16	N 1/2	4/14/2011	1	4	1	1	2	3	1	2	3	7.1*	1.52	1.16		5.00	2	1	1	10YR 5/4	yellowish brown	5	1					0.4, 1.0					2
75	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F7	F3	104	91	1.72		4/13/2011	1	1	1	1	2	2	2	N/A	2	21.30	12.66	9.72		0.50	NA	2	8	10YR 5/4	yellowish brown	1											2
452	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F14	F3	104	91	2.16-2.31	N 1/2; from FS 114	4/14/2011	1	4	1	1	2	4	2	1	3	3.90	1.76	0.80		5.00	2	3	1	10YR 5/4	yellowish brown	5											2
76.1	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F7	F3	104	91	1.84		4/13/2011	1	3	1	1	1	1	1	1	NA	21.60	4.32	NA		0.50	NA	2	1	7.5YR 3/2	dark brown	1											2
76.2	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F7	F3	104	91	1.84		4/13/2011	1	3	1	1	1	1	1	1	NA	20.70	4.68	NA		0.50	NA	2	1	7.5YR 3/2	dark brown	1											2
76.3	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F7	F3	104	91	1.84		4/13/2011	1	3	2	2	1	NA	NA	NA	NA	24.80	1.28	NA		NA	NA	2	1	7.5YR 5/3	brown	1											2
69	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F16	F3	104	91	1.72-1.74	N 1/2	4/13/2011	1	4	1	1	1	1	1	1	NA	11.80	1.76	NA		NA	2	1	1	2.5Y 5/3	light olive brown	4											2
237	A.2011.18		Promontory Cave 2	42BO2	2	Promontory	F5	F3	104	91	1.27-1.36	N 1/2; from FS 14	7/15/2014	2	4	1	1	2	3	1	2	3	16.60	2.02	1.28		3.00	2	2	1	2.5Y 5/3	light olive brown	5											1
237	A.2011.18		Promontory Cave 2	42BO2	2	Promontory	F5	F3	104	91	1.27-1.36	N 1/2; from FS 14	7/15/2014	2	5	2	1	2	4	2	1	3	9.40	1.84	1.26		3.00	2	2	1	10YR 5/4	yellowish brown	5	1					16.6 to a end; 9.4 to b end					1
116	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F14	F3	104	91	2.03-2.14		4/14/2011	1	4	1	1	2	3	1	2	3	7.90	1.38	0.74		5.00	2	3	1	2.5Y 5/3	light olive brown	5	1					0					1
438	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F14	F3	104	91	2.03-2.14	S 1/2; from FS 105	4/14/2011	1	3	1	1	2	4	2	1	2	7.10	1.14	0.48		5.50	2	3	1	10YR 5/4	yellowish brown	3	1					0.9, 5.9					2
124	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F7		104	91	1.81	S 1/2	4/14/2011	1	3	1	1	2	4	2	1	1	23.50	5.32	2.82		1.00	NA	2	8	10YR 5/4	yellowish brown	1	1					20.1, 1.9					1
113	A.2011.18	a	Promontory Cave 2	42BO2	3	Promontory	F14	F3	104	91	2.21	S 1/2	4/14/2011	1	5	1	1	2	4	2	1	3	11.60	3.10	1.66		2.00	2	3	1	10YR 5/4	yellowish brown	5											2
113	A.2011.18	b	Promontory Cave 2	42BO2	3	Promontory	F14	F3	104	91	2.21	S 1/2	4/14/2011	1	4	1	1	2	4	2	1	3	7.40	3.26	2.76		1.50	2	3	1	10YR 4/4	dark yellowish brown	5											2
113	A.2011.18	c	Promontory Cave 2	42BO2	3	Promontory	F14	F3	104	91	2.21	S 1/2	4/14/2011	1	5	2	1	2	4	2	1	3	14.20	3.18	1.82		2.50	2	3	1	10YR 5/4	yellowish brown	5											2
1383	A.2015.12		Promontory Cave 1	42BO1	1	Promontory	F56	F55 in F54	95	97	2.19	Level 2, 5-10cm	5/11/2014	1	4	2	1	2	4	2	1	2	16.40	1.58	0.70		3.00	2	3	1	10YR 4/3	brown	4											2
1629	A.2015.12	a	Promontory Cave 1	42BO1	6	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3. SW	5/14/2014	1	4	2	1	2	4	2	1	2	47.60	12.60	7.04		0.50	2	1	3	7.5YR 3/2	dark brown	2	1					0					1
1629	A.2015.12	b	Promontory Cave 1	42BO1	6	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3. SW	5/14/2014	1	4	1	2	1	NA	NA	NA	NA	41.50	8.78	NA		NA	2	1	1	7.5 YR 5/6	strong brown	1	2					7.4					1
1629	A.2015.12	c	Promontory Cave 1	42BO1	6	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3. SW	5/14/2014	1	3	2	1	1	2	2	2	NA	14.10	1.48	NA		NA	2	3	1	10YR 5/6	yellowish brown	5											2
1629	A.2015.12	d	Promontory Cave 1	42BO1	6	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3. SW	5/14/2014	1	4	2	1	2	3	1	2	3	14.90	1.94	1.02		3.50	2	3	1	10YR 4/3	brown	4	1					0					1
1629	A.2015.12	e	Promontory Cave 1	42BO1	6	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3. SW	5/14/2014	1	4	1	2	1	NA	NA	NA	NA	15.50	3.80	NA		NA	NA	3	2	2.5Y 5/2	grayish brown	3	1					0					1
1672	A.2015.12	a	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	1	5	1	1	2	3	1	2	3	29.10	2.24	1.24		2.00	2	3	1	2.5Y 5/3	light olive brown	5											2
1672	A.2015.12	b	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	1	4	1	2	1	NA	NA	NA	NA	33.60	1.02	NA		NA	NA	3	2	10YR 5/3	brown	3											2
1672	A.2015.12	c	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	1	3	1	1	2	3	1	2	2	21.50	3.12	1.76		2.00	2	3	3	10YR 4/2	dark grayish brown	3	1					0					1
1672	A.2015.12	d	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	1	3	1	1	2	3	1	2	2	6.80	1.68	0.84		3.00	2	3	1	10YR 4/4	dark yellowish brown	3	1					0					1
1672	A.2015.12	e	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	1	2	1	1	2	3	1	2	3	34.1*	1.24	0.50		6.00	2	3	1	5YR 5/6	yellowish red	5	1	4	4	4		Knot 1 and ends: 0.6, 33.5; Knot 1 and 2, 3, 4: 2.1					2
1672	A.2015.12	g	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	1	2	1	2	1	NA	NA	NA	NA	3.60	11.20	NA		NA	NA	2	3	10YR 5/3	brown	1	1					0					0
1439	A.2015.12	a	Promontory Cave 1	42BO1	2	Promontory	F56	F55 in F54	95	98	2.26	Level 2, 2.06-2.27 mbd	5/12/2014	1	3	1	2	1	NA	NA	NA	NA	22.50	1.82	NA		NA	NA	2	1	2.5Y 4/2	dark grayish brown	2											2
1573	A.2015.12	a	Promontory Cave 1	42BO1	4	Promontory	F56	F55 in F54	95	98	2.26-2.33	Level 3. SW	5/14/2014	1	3	1	1	1	1	1	1	NA	26.70	2.10	NA		NA	2	3	4	10YR 5/8	yellowish brown	5											2
1573	A.2015.12	b	Promontory Cave 1	42BO1	4	Promontory	F56	F55 in F54	95	98	2.26-2.33	Level 3. SW	5/14/2014	1	4	1	1	2	3	2	1	3	9.50	1.52	0.70		4.00	2	3	1	10YR 5/3	brown	5											2
1573	A.2015.12	c	Promontory Cave 1	42BO1	4	Promontory	F56	F55 in F54	95	98	2.26-2.33	Level 3. SW	5/14/2014	1	3	2	1	2	3	2	1	2	48.20	1.70	1.16		2.00	2	1	1	10YR 5/3	brown	2											2
1573	A.2015.12	d	Promontory Cave 1	42BO1	4	Promontory	F56	F55 in F54	95	98	2.26-2.33	Level 3. SW	5/14/2014	1	3	1	1	2	3	2	1	3	2.30	1.83	0.73		4.00	NA	NA	1	10YR 8/2	very pale browm	5											2
1698	A.2015.12	a	Promontory Cave 1	42BO1	4	Promontory	F77	F55 in F54	95	98	2.33-2.85	Level 4	5/16/2014	3	4	1	2, 3	1	NA	NA	NA	NA	11.60	11.42	2.08		NA	NA	3	2	10YR 5/4	yellowish brown	3							6		NA	NA	4
1698	A.2015.12	ca	Promontory Cave 1	42BO1	4	Promontory	F77	F55 in F54	95	98	2.33-2.85	Level 4	5/16/2014	2	4	1	1	2	3	1	2	2	13.20	1.88	1.02		3.00	2	3	1	10YR 4/2	dark grayish brown	3	1					0					1
1698	A.2015.12	cb	Promontory Cave 1	42BO1	4	Promontory	F77	F55 in F54	95	98	2.33-2.85	Level 4	5/16/2014	2	4	1	1	1	2	2	2	NA	8.20	1.44	NA		NA	NA	3	1	10YR 4/3	brown	3	1					0					1
1698	A.2015.12	d	Promontory Cave 1	42BO1	4	Promontory	F77	F55 in F54	95	98	2.33-2.85	Level 4	5/16/2014	1	4	1	1	1	1	1	1	NA	7.60	4.18	NA		NA	NA	3	1	2.5Y 5/4	light olive brown	4	1					0					1
897	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F27					Bottom of N 1/2 of Steward's Trench B	5/8/2013	1	3	1	1	2	3	1	2	3	7.60	2.66	1.24		4.50	2	2	1	2.5Y 7/4	pale yellow	5											2
1044	A.2013.8	a	Promontory Cave 1	42BO1	2	Promontory	F37	F28 in F27	98.55	127.83	3.82	Freed from mineralized matrix	5/10/2013	1	4	1	1	2	4	2	1	3	17.20	2.94	1.36		3.00	2	3	1	2.5Y 5/2	grayish brown	5											2
1044	A.2013.8	b	Promontory Cave 1	42BO1	2	Promontory	F37	F28 in F27	98.55	127.83	3.82	Freed from mineralized matrix	5/10/2013	1	4	1	1	2	4	2	1	3	32.10	3.48	2.70		2.00	2	3	1	2.5Y 6/2	light brownish gray	5											1
1119	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F35	F28 in F27	98.55	127.83	3.73		5/12/2013	1	4	1	1	2	3	1	2	3	9.70	1.78	1.32		1.50	2	3	1	10YR 4/4	dark yellowish brown	5											2
1214	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F44	F28 in F27	97.88	128.23	3.27-3.45		5/14/2013	1	3	1	1	2	4	2	1	3	15.90	2.90	2.78		2.00	2	3	1	10YR 5/3	brown	4											2
1155	A.2013.8	aa	Promontory Cave 1	42BO1	2	Promontory	F10, F11, F12, F13, F34, F39	F3				Profile scraping	5/12/2013	2	4	2	1	2	3	1	2	3	22.60	1.80	0.90		2.50	2	3	1	10YR 6/3	pale brown	5	1					2.6, 20					2
1155	A.2013.8	ab	Promontory Cave 1	42BO1	2	Promontory	F10, F11, F12, F13, F34, F39	F3				Profile scraping	5/12/2013	2	5	1	1	2	3	1	2	3	28.90	2.54	1.68		3.00	2	3	1	10YR 5/3	brown	5						14.4, 14.5					2
1155	A.2013.8	b	Promontory Cave 1	42BO1	2	Promontory	F10, F11, F12, F13, F34, F39	F3				Profile scraping	5/12/2013	1	4	1	2	1	NA	NA	NA	NA	11.20	1.02	NA		NA	NA	3	2	10YR 4/3	brown	3											2
1468	A.2015.12	a	Promontory Cave 1	42BO1	2	Promontory	All F's	F3	90	99		Profile scraping	5/12/2014	1	3	1	1	2	3	1	2	2	40.70	1.50	0.68		3.00	2	3	1	10YR 4/4	dark yellowish brown	3											2
1468	A.2015.12	ba	Promontory Cave 1	42BO1	2	Promontory	All F's	F3	90	99		Profile scraping	5/12/2014	2	4	1	1	2	3	1	2	2	21.70	2.36	1.92		2.00	2	3	1	10YR 4/3	brown	3	1					0					1

1468	A.2015.12	bb	Promontory Cave 1	42BO1	2	Promontory	All F's	F3	90	99		Profile scraping	5/12/2014	2	5	1	1	2	3	1	2	3	6.60	2.50	1.57	2.00	2	3	1	10YR 4/3	brown	3					0				1	
929	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F19, F21, F25, F26	F3	90	99		Profile cleaning	5/9/2013	1	3	1	4	2	NA	4	NA	NA	2.90	3.04	0.76	NA	2	2	8	10YR 4/6	dark yellowish brown	2									2	untwisted hide cord
1132	A.2013.8	a	Promontory Cave 1	42BO1	3	Promontory			90	99		Profile	5/12/2013	1	3	1	1	2	3	1	2	3	16.10	1.02	0.60	5.00	2	3	1	10YR 5/3	brown	5									2	
1132	A.2013.8	b	Promontory Cave 1	42BO1	3	Promontory			90	99		Profile	5/12/2013	1	4	1	1	2	3	1	2	3	18.30	2.24	0.86	2.00	2	3	1	10YR 5/4	yellowish brown	5									2	
1132	A.2013.8	ca	Promontory Cave 1	42BO1	3	Promontory			90	99		Profile	5/12/2013	2	5	1	1	2	4	2	1	3	18.60	2.24	1.64	2.50	2	3	1	10YR 5/4	yellowish brown	5	1				17.4, 1.2				2	
1132	A.2013.8	cb	Promontory Cave 1	42BO1	3	Promontory			90	99		Profile	5/12/2013	2	5	1	1	1	1	1	1	NA	17.00	0.70	NA	NA	2	3	1	10YR 5/4	yellowish brown	5					0				1	
684	A.2013.8		Promontory Cave 2	42BO2	1	Promontory	F49	F3	104	91	1.59-1.74		5/8/2013	1	3	1	2	3	NA	NA	NA	NA	4.20	0.97	NA	NA	NA	2	2	10YR 7/4	very pale brown	4									2	
613	A.2013.8		Promontory Cave 2	42BO2	1	Promontory	F5	F3	104	91	1.28-1.38		5/7/2013	1	3	1	2	1	NA	NA	NA	NA	8.70	2.34	NA	NA	NA	3	2	10YR 5/2	grayish brown	1	1				0, 7.6				2	
698	A.2013.8		Promontory Cave 2	42BO2	1	Promontory	F7	F3	104	91	1.82-1.92		5/9/2013	1	4	1	2	1	NA	NA	NA	NA	23.60	1.54	NA	NA	NA	3	1	10YR 6/3	pale brown	3									2	
339	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F7	F3	104	91	1.74-1.84	S 1/2, from FS 70	4/13/2011	1	1	1	1	f?	too fragmentary	2	unclear	unclear	12.20	5.76	2.50	NA	NA	2	8	10YR 5/6	yellowish brown	1	1				8.5, 2.9				2	
4	A.2011.18	b	Promontory Cave 1	42BO1	2	Promontory			91	99	0-20	NW 1/2	4/11/2011	1	4	1	2	1	NA	NA	NA	NA	11.7*	1.50	NA	NA	NA	3	2	7.5YR 4/6	strong brown	3									2	red ochre
83	A.2011.18	a	Promontory Cave 1	42BO1	2	Promontory	F7	F3	91	99	1.42-1.52	20-30cm bmgs	4/13/2011	2	4	1	1	1	1	1	1	NA	15.10	6.44	NA	NA	NA	3	2	10YR 5/4	yellowish brown	4									2	
83	A.2011.18	b	Promontory Cave 1	42BO1	2	Promontory	F7	F3	91	99	1.42-1.52	20-30cm bmgs	4/13/2011	2	3	1	2	1	NA	NA	NA	NA	15.1*	1.00	NA	NA	NA	3	2	10YR 5/3	brown	3									0	
189	A.2011.18	a	Promontory Cave 1	42BO1	4	Promontory	F11	F3	91	99	1.72-1.82		4/13/2011	2	3	1	2	1	NA	NA	NA	NA	24.90	3.34	NA	NA	NA	3	2	2.5Y 4/3	olive brown	4	2	1	1	1	0				1	
189	A.2011.18	b	Promontory Cave 1	42BO1	4	Promontory	F11	F3	91	99	1.72-1.82		4/13/2011	1	4	1	2	1	NA	NA	NA	NA	12.80	7.76	NA	NA	NA	3	2	2.5Y 4/4	olive brown	3									2	
189	A.2011.18	c	Promontory Cave 1	42BO1	4	Promontory	F11	F3	91	99	1.72-1.82		4/13/2011	1	4	1	2	1	NA	NA	NA	NA	14.00	2.46	NA	NA	NA	3	2	2.5Y 4/4	olive brown	2									2	
189	A.2011.18	d	Promontory Cave 1	42BO1	4	Promontory	F11	F3	91	99	1.72-1.82		4/13/2011	1	3	1	2	1	NA	NA	NA	NA	6.10	3.07	NA	NA	NA	3	1	10YR 4/3	brown	3									1	
66	A.2011.18	a	Promontory Cave 1	42BO1	6	Promontory	F7	F3	91	99	1.32-1.42	10-20cm bgms	4/13/2011	1	4	1	2	1	NA	NA	NA	NA	8.40	5.63	NA	NA	NA	3	2	10YR 5/3	brown	4	1				0.7, 6.5				2	
66	A.2011.18	b	Promontory Cave 1	42BO1	6	Promontory	F7	F3	91	99	1.32-1.42	10-20cm bgms	4/13/2011	1	4	1	2	1	NA	NA	NA	NA	13.30	7.40	NA	NA	NA	3	2	10YR 5/4	yellowish brown	4									2	red ochre
66	A.2011.18	c	Promontory Cave 1	42BO1	6	Promontory	F7	F3	91	99	1.32-1.42	10-20cm bgms	4/13/2011	1	4	1	2	1	NA	NA	NA	NA	8.20	4.60	NA	NA	NA	3	2	10YR 5/3	brown	4									2	
122	A.2011.18	a	Promontory Cave 1	42BO1	4	Promontory	F7	F3	91	99	1.12-1.72		4/14/2011	1	4	1	2	1	NA	NA	NA	NA	8.20	3.26	NA	NA	NA	3	2	10YR 5/3	brown	4	1				1.1, 6.7				2	
122	A.2011.18	b	Promontory Cave 1	42BO1	4	Promontory	F7	F3	91	99	1.12-1.72		4/14/2011	1	4	1	2, 3	1	NA	NA	NA	NA	12.50	3.16	NA	NA	NA	3	2	10YR 5/3	brown	4						1	NA	0.85	2	
122	A.2011.18	c	Promontory Cave 1	42BO1	4	Promontory	F7	F3	91	99	1.12-1.72		4/14/2011	1	2	1	2	1	NA	NA	NA	NA	6.4*	0.26	NA	NA	NA	2	2	10YR 6/3	pale brown	5									2	
23	A.2011.18	a	Promontory Cave 1	42BO1	3	Promontory	F3		91	99	20-30	N 1/2, Lvl 2	4/12/2011	1	4	1	2	1	NA	NA	NA	NA	10.00	7.52	NA	NA	NA	3	2	10YR 5/3	brown	4									2	
23	A.2011.18	b	Promontory Cave 1	42BO1	3	Promontory	F3		91	99	20-30	N 1/2. Lvl 2	4/12/2011	1	4	1	2	1	NA	NA	NA	NA	29.90	8.44	NA	NA	NA	3	2	10YR 4/3	brown	4									2	
7	A.2011.18	a	Promontory Cave 1	42BO1	2	Promontory			91	99	0-20	NE 1/4	4/11/2011	1	4	1	2	1	NA	NA	NA	NA	30.80	6.66	NA	NA	NA	3	2	10YR 5/3	brown	4									2	
7	A.2011.18	b	Promontory Cave 1	42BO1	2	Promontory			91	99	0-20	NE 1/4	4/11/2011	1	4	1	2	1	NA	NA	NA	NA	17.60	10.40	NA	NA	NA	3	2	10YR 5/6	yellowish brown	2									2	
102	A.2011.18	a	Promontory Cave 1	42BO1	3	Promontory	F7	F3	91	99	1.52-1.62		4/13/2011	1	4	1	2	1	NA	NA	NA	NA	15.40	2.42	NA	NA	NA	3	2	10YR 5/3	brown	3									2	
102	A.2011.18	b	Promontory Cave 1	42BO1	3	Promontory	F7	F3	91	99	1.52-1.62		4/13/2011	1	4	1	2	1	NA	NA	NA	NA	13.70	2.22	NA	NA	NA	3	2	10YR 5/3	brown	3									2	
102	A.2011.18	ca	Promontory Cave 1	42BO1	3	Promontory	F7	F3	91	99	1.52-1.62		4/13/2011	2	4	1	2	1	NA	NA	NA	NA	22.90	19.38	NA	NA	NA	3	4	10YR 4/4	dark yellowish brown	3						6	NA	NA	2	
102	A.2011.18	cb	Promontory Cave 1	42BO1	3	Promontory	F7	F3	91	99	1.52-1.62		4/13/2011	2	3	1	1	2	3	1	2	3	8.6*	1.22	0.64	5.00	NA	3	1	10YR 5/4	yellowish brown	4	1	2	1		0, 1.5, 0				0	
181	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F10	F3	91	99	1.72-1.82		4/13/2011	1	4	1	1	1	1	1	1	NA	25.00	5.62	NA	0.50	NA	3	2	10YR 5/3	brown	2									2	
85	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F7	F3	91	99	1.32-1.42		4/13/2011	2	5	1	2	1	NA	NA	NA	NA	NA	1.18	NA	NA	NA	2	2	10YR 5/3	brown	4									0	
208	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F11	F3	91	99	1.72-1.82		4/15/2011	2	3	1	2	1	NA	NA	NA	NA	NA	0.23	NA	NA	NA	2	2	10YR 5/3	brown	5									2	
214	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F7	F3	90	99	1.42-1.52		4/15/2011	2	5	1	2	1	NA	NA	NA	NA	NA	0.40	NA	NA	NA	3	2	10YR 4/3	brown	5									0	
185	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F10	F3	91	99	1.72-1.82		4/15/2011	2	4	1	2	1	NA	NA	NA	NA	NA	1.12	NA	NA	NA	3	2	10YR 5/2	grayish brown	4									0	
272	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F12	F3	91	99	1.88-1.93		4/16/2011	2	4	1	2	1	NA	NA	NA	NA	NA	0.94	NA	NA	NA	3	2	10YR 4/3	brown	4									1	
494	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F3		91	99		20-30cmbgs, from FS 21	4/12/2011	2	3	1	2	1	NA	NA	NA	NA	NA	0.92	NA	NA	NA	2	2	10YR 6/3	pale brown	4									0	
512	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F6	F3	91	99	0-10	S 1/2, from FS 55	4/12/2011	2	5	1	2	1	NA	NA	NA	NA	NA	1.16	NA	NA	NA	2	2	10YR 6/3	pale brown	3	1	6			NA				0	
562.1	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F13	F3	91	99	1.93-2.04	From FS 274	4/16/2011	2	3	1	2	1	NA	NA	NA	NA	NA	0.16	NA	NA	NA	2	2	10YR 5/4	yellowish brown	5									0	
562.2	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F13	F3	91	99	1.93-2.04	From FS 274	4/16/2011	2	5	1	2	1	NA	NA	NA	NA	NA	1.48	NA	NA	NA	3	2	10YR 5/3	brown	3									0	
763	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F7	F3	90	99	1.52-1.62	From FS 248	4/16/2011	2	5	1	2	1	NA	NA	NA	NA	0.70	1.20	NA	NA	NA	2	2	10YR 6/4	light yellowish brown	3									0	
89.6	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F7	F3	91	99	1.42-1.52	S 1/2	4/11/2011	2	3	1	2	1	NA	NA	NA	NA	NA	0.86	NA	NA	NA	2	2	2.5Y 3/2	very dark grayish brown	3									1	
100.6	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	91	99	1.52-1.62	S 1/2	4/13/2011	2	3	1	2	1	NA	NA	NA	NA	NA	0.70	NA	NA	NA	2	2	10YR 5/2	grayish brown	3									0	
152	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	91	99	1.62-1.72		4/14/2011	2	3	1	2	1	NA	NA	NA	NA	NA	1.10	NA	NA	NA	2	2	10YR 5/2	grayish brown	3									0	
429	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	91	99	30-40	N 1/2, from FS 44	4/12/2011	2	4	1	2	1	NA	NA	NA	NA	NA	2.27	NA	NA	NA	3	2	10YR 6/3	pale brown	2									0	
478	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F3		91	99	0-20	NW 1/2, from FS 03	4/11/2011	2	3	1	2	1	NA	NA	NA	NA	NA	0.80	NA	NA	NA	3	2	10YR 5/2	grayish brown	3									0	
678	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F12	F3	91	99	1.88-1.93	From FS 273	4/16/2011	2	3	1	2	1	NA	NA	NA	NA	NA	0.73	NA	NA	NA	2	2	10YR 5/2	grayish brown	3									0	
419	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	91	99	1.52-1.62	N 1/2, from FS 40	4/12/2011	1	2	1	2	1	NA	NA	NA	NA	11.50	2.90	NA	NA	NA	2	8	10YR 5/4	yellowish brown	1	2				0				0	
692.12	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	90	99	1.62-1.72	From FS 278	4/16/2011	1	3	1	2	1	NA	NA	NA	NA	8.20	5.94	NA	NA	NA	2	8	10YR 6/6	brownish yellow	1	3				0				4	
708.1	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	90	99	1.70-1.91	From FS 285	4/16/2011	2	4	1	2	1	NA	NA	NA	NA	NA	2.73	NA	NA	NA	3	2	10YR 4/2	dark grayish brown	2									0	
443	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	91	99	30-40	From FS 80	4/12/2011	1	3	1	2	1	NA	NA	NA	NA	5.60	0.87	NA	NA	NA	2	2	2.5Y 6/3	light yellowish brown	3									2	
256	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	90	99	1.52-1.62		4/15/2011	1	3	1	2	1	NA	NA	NA	NA	6.20	2.66	NA	NA	NA	3	2	10YR 4/4	dark yellowish brown	3									2	red ochre, black ochre
217	A.2011.18	a	Promontory Caves 1	42BO1	2	Promontory	F7	F3	90	99	1.42-1.52		4/15/2011	2	4	1	1	1	1	1	1	NA	25.20	4.24	NA	NA	NA	3	4	10YR 5/3	brown	3	5				7.9, 13.3				2	
217	A.2011.18	b	Promontory Caves 1	42BO1	2	Promontory	F7	F3	90	99	1.42-1.52		4/15/2011	2	4	1	1	1	1	1	1	NA	7.00	2.63	NA	NA	NA	2	4	10YR 5/3	brown	3									2	

635	A.2011.18	a	Promontory Caves 1	42BO1	2	Promontory	F7	F3	90	99	1.42-1.52	North edge, from FS 229	4/15/2011	1	3	1	2	1	NA	NA	NA	NA	NA	0.63	NA	NA	NA	3	2	2.5Y 5/3	light olive brown	5			2	
635	A.2011.18	b	Promontory Caves 1	42BO1	2	Promontory	F7	F3	90	99	1.42-1.52	North edge, from FS 229	4/15/2011	1	5	2	2	1	NA	NA	NA	NA	9.10	2.70	NA	NA	NA	3	2	10YR 4/3	brown	4			2	
424	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	91	99	4.52-1.62	N 1/2, from FS 40	4/12/2011	1	4	1	2	1	NA	NA	NA	NA	9.60	4.53	NA	NA	NA	3	2	2.5Y 5/3	light olive brown	3			2	
532	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	91	99	1.32-1.42	S 1/2, from FS 64	4/13/2011	1	3	1	2	1	NA	NA	NA	NA	6.00	3.63	NA	NA	NA	2	2	10YR 4/6	dark yellowish brown	3			2	red ochre
396	A.2011.18	a	Promontory Caves 1	42BO1	2	Promontory	F7	F3	91	99		N 1/2, from FS 29	4/12/2011	1	3	1	2	1	NA	NA	NA	NA	16.4*	2.02	NA	NA	NA	3	2	2.5Y 4/2	dark grayish brown	3			2	
396	A.2011.18	b	Promontory Caves 1	42BO1	2	Promontory	F7	F3	91	99		N 1/2, from FS 29	4/12/2011	1	3	1	2	1	NA	NA	NA	NA	6.20	0.40	NA	NA	NA	3	2	7.5YR 5/6	strong brown	5			2	red ochre
1898	A.2011.18	a	Promontory Caves 1	42BO1	2	Promontory	F3		91	99	1.22-1.42	NW	4/11/2011	1	4	1	2	1	NA	NA	NA	NA	4.10	1.27	NA	NA	NA	2	2	7.5YR 4/6	strong brown	5			2	red ochre
1898	A.2011.18	b	Promontory Caves 1	42BO1	2	Promontory	F3		91	99	1.22-1.42	NW	4/11/2011	2	4	1	2	1	NA	NA	NA	NA	7.2*	2.47	NA	NA	NA	2	2	10YR 6/2	light brownish gray	3			1	
515	A.2011.18	a	Promontory Caves 1	42BO1	4	Promontory	F6	F3	91	99	0-10	S 1/2, from FS 55	4/12/2011	1	4	1	2	1	NA	NA	NA	NA	26.60	0.94	NA	NA	NA	3	2	2.5Y 7/4	pale yellow	3			2	
515	A.2011.18	b	Promontory Caves 1	42BO1	4	Promontory	F6	F3	91	99	0-10	S 1/2, from FS 55	4/12/2011	2	3	1	2	1	NA	NA	NA	NA	1.90	1.40	NA	NA	NA	2	2	10YR 5/3	brown	4	2	2.1, 1.4	2	
515	A.2011.18	c	Promontory Caves 1	42BO1	4	Promontory	F6	F3	91	99	0-10	S 1/2, from FS 55	4/12/2011	1	3	1	2	1	NA	NA	NA	NA	1.80	0.50	NA	NA	NA	2	2	10YR 4/3	brown	4	2	0.6, 1	2	
663	A.2011.18	a	Promontory Caves 1	42BO1	3	Promontory	F10	F3	91	99	1.72-1.?	From FS 177	4/15/2011	1	3	1	1	1	1	1	1	NA	11.80	3.10	NA	NA	NA	2	2	10YR 4/3	brown	4			2	
663	A.2011.18	b	Promontory Caves 1	42BO1	3	Promontory	F10	F3	91	99	1.72-1.?	From FS 177	4/15/2011	1	5	2	2	1	NA	NA	NA	NA	7.10	2.38	NA	NA	NA	3	2	10YR 5/4	yellowish brown	4			2	
687	A.2011.18	a	Promontory Caves 1	42BO1	4	Promontory	F7	F3	90	99	1.61-1.72	From FS 278	4/16/2011	1	2	1	2	1	NA	NA	NA	NA	37.80	0.58	NA	NA	NA	2	2	10YR 6/3	pale brown	5			2	
687	A.2011.18	b	Promontory Caves 1	42BO1	4	Promontory	F7	F3	90	99	1.61-1.72	From FS 278	4/16/2011	1	4	1	2	1	NA	NA	NA	NA	12.50	1.64	NA	NA	NA	3	2	10YR 5/3	brown	4	1	1.3, 11.1	3	
687	A.2011.18	c	Promontory Caves 1	42BO1	4	Promontory	F7	F3	90	99	1.61-1.72	From FS 278	4/16/2011	1	4	1	2	1	NA	NA	NA	NA	11.90	6.40	NA	NA	NA	3	2	10YR 6/3	pale brown	3	1	5, 6	2	red ochre
207	A.2011.18	a	Promontory Caves 1	42BO1	2	Promontory	F7	F3	90	99	1.42-1.52		4/15/2011	1	4	1	2	1	NA	NA	NA	NA	14.90	5.22	NA	NA	NA	2	2	7.5YR 4/6	strong brown	3			2	red ochre
207	A.2011.18	b	Promontory Caves 1	42BO1	2	Promontory	F7	F3	90	99	1.42-1.52		4/15/2011	1	3	1	2	1	NA	NA	NA	NA	5.40	3.50	NA	NA	NA	2	2	10YR 3/3	dark brown	3			2	
248	A.2011.18	a	Promontory Caves 1	42BO1	2	Promontory	F7	F3	90	99	1.52-1.62		4/15/2011	1	5	1	2	1	NA	NA	NA	NA	33.20	2.96	NA	NA	NA	3	2	10YR 5/3	brown	4	2	6.2, 27	2	
248	A.2011.18	b	Promontory Caves 1	42BO1	2	Promontory	F7	F3	90	99	1.52-1.62		4/15/2011	1	4	1	2	1	NA	NA	NA	NA	14.10	5.72	NA	NA	NA	3	2	2.5Y 4/3	olive brown	3			2	
1283	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	4	1	1	1	2	2	2	NA	29.40	11.68	NA	NA	NA	3	4	10YR 5/6	yellowish brown	3			2	
1163	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F10/11/12/13 /34/39	F3	91	99		Profile scraping	5/12/2013	2	4	1	2	1	NA	NA	NA	NA	NA	2.43	NA	NA	NA	2	2	10YR 4/3	brown	2			0	
1026	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F35	F28 in F27	98.55	127.83	3.58-3.80		5/10/2013	2	3	1	2	1	NA	NA	NA	NA	NA	0.82	NA	NA	NA	3	2	10YR 5/3	brown	5			0	
1059	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F37	F28 in F27	98.55	127.83	3.65-3.98		5/10/2013	2	5	1	2	1	NA	NA	NA	NA	NA	2.70	NA	NA	NA	3	2	10YR 6/3	pale brown	2			0	
1198.1	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F4	F27					5/14/2013	2	3	1	2	1	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	2	2	10YR 6/4	light yellowish brown	5			0	
1224	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F48	F3	91.72	99.2	2.25		5/15/2013	2	3	1	2	1	NA	NA	NA	NA	NA	2.06	NA	NA	NA	3	2	2,5Y 3/3	dark olive brown	2			0	
1143	A.2013.8		Promontory Caves 1	42BO1	1	Promontory			90	99		Profile scraping	5/12/2013	2	4	1	2	1	NA	NA	NA	NA	NA	1.40	NA	NA	NA	3	2	10YR 4/3	brown	3			0	
1088	A.2013.8	a	Promontory Caves 1	42BO1	1	Promontory	F34	F3	91	99	1.99-2.15		5/11/2013	2	3	1	2	1	NA	NA	NA	NA	NA	1.07	NA	NA	NA	2	2	10YR 4/2	dark grayish brown	3			0	
1088	A.2013.8	b	Promontory Caves 1	42BO1	1	Promontory	F34	F3	91	99	1.99-2.15		5/11/2013	2	3	1	2	1	NA	NA	NA	NA	NA	0.23	NA	NA	NA	2	2	10YR 4/2	dark grayish brown	4			0	
840	A.2013.8	a	Promontory Caves 1	42BO1	2	Promontory						North of Steward's trench	5/5/2013	2	3	1	2	1	NA	NA	NA	NA	29.30	1.50	NA	NA	NA	3	2	2.5YR 4/8	red	3	1	25.6, 3.7	2	red ochre
840	A.2013.8	b	Promontory Caves 1	42BO1	2	Promontory						North of Steward's trench	5/5/2013	2	3	1	2	1	NA	NA	NA	NA	18.10	2.04	NA	NA	NA	2	2	5YR 4/6	yellowish red	3		12.4, 6.7	2	red ochre
1037	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F35	F28 in F27	98.55	127.35	3.58-3.8	mbd F4	5/10/2013	1	3	1	2	1	NA	NA	NA	NA	10.90	2.93	NA	NA	NA	2	2	2.5Y 5/2	grayish brown	3			2	
1225	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F44	F28 in F27	97.88	128.23	3.27-3.45	mbd F4	5/14/2013	1	4	1	2	1	NA	NA	NA	NA	15.50	5.30	1.70	NA	NA	3	2	10YR 6/3	pale brown	3			2	
851	A.2013.8	a	Promontory Caves 1	42BO1	3	Promontory	F19	F3	90	99	1.81		5/7/2013	1	3	1	1	1	2	2	2	NA	12.10	3.28	NA	NA	NA	2	2	10YR 4/2	dark grayish brown	4			2	
851	A.2013.8	c	Promontory Caves 1	42BO1	3	Promontory	F19	F3	90	99	1.81		5/7/2013	1	4	1	2	1	NA	NA	NA	NA	12.40	4.00	NA	NA	NA	2	2	10YR 5/3	brown	3			2	
850	A.2013.8	aa	Promontory Caves 1	42BO1	3	Promontory	F19	F3	90	99	1.81		5/7/2013	2	4	1	1	1	2	2	2	NA	48.20	9.74	NA	NA	NA	3	2	10YR 4/3	brown	2	1	0	1	
850	A.2013.8	ab	Promontory Caves 1	42BO1	3	Promontory	F19	F3	90	99	1.81		5/7/2013	2	4	1	1	1	1	1	1	NA	40.40	8.32	NA	NA	NA	3	2	10YR 4/3	brown	2		0	1	
850	A.2013.8	b	Promontory Caves 1	42BO1	3	Promontory	F19	F3	90	99	1.81		5/7/2013	1	5	1	2	1	NA	NA	NA	NA	21.60	5.87	NA	NA	NA	3	2	10YR 4/6	dark yellowish brown	3			2	red ochre
1262	A.2013.8	a	Promontory Caves 1	42BO1	2	Promontory	F48	F3	90	99	2.15-2.34	found around "bisa shell"(?)	5/14/2013	2	4	1	1	1	2	2	2	NA	20.90	3.92	NA	NA	NA	3	2	2.5Y 4/4	olive brown	4	1	10.4, 8.1	2	
1262	A.2013.8	b	Promontory Caves 1	42BO1	2	Promontory	F48	F3	90	99	2.15-2.34	found around "bisa shell"(?)	5/14/2013	2	5	1	1	1	2	2	2	NA	9.30	5.27	NA	NA	NA	3	2	2.5Y 4/4	olive brown	4		5.2, 1.9	2	
1267	A.2013.8	a	Promontory Caves 1	42BO1	3	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	4	1	2	1	NA	NA	NA	NA	6.90	3.30	NA	NA	NA	3	2	7.5YR 4/6	strong brown	3			2	red ochre
1267	A.2013.8	b	Promontory Caves 1	42BO1	3	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	1	3	1	2	1	NA	NA	NA	NA	8.30	5.23	NA	NA	NA	3	2	10YR 4/3	brown	3			2	red ochre
1396			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	97	2.24-2.29	Level 3, 10-15cm	5/12/2014	2	2	1	2	1	NA	NA	NA	NA	NA	1.20	NA	NA	NA	2	2	10YR 4/2	dark grayish brown	3			0	
1646			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	94	98	2.144-2.244		5/15/2014	2	4	1	2	1	NA	NA	NA	NA	NA	0.60	NA	NA	NA	2	2	10YR 5/4	yellowish brown	4			0	
1478			Promontory Caves 1	42BO1	1	Promontory	F58	F3	90	99	2.48		5/12/2014	2	5	1	2	1	NA	NA	NA	NA	NA	2.07	NA	NA	NA	3	2	10YR 4/2	dark grayish brown	2			0	
1880	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	98	2.06-2.27	From FS 1442	5/12/2014	2	5	1	2	1	NA	NA	NA	NA	NA	0.38	NA	NA	NA	2	2	10YR 6/3	pale brown	4			0	
1622			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	99	2.173-2.362	2.173 (SW), Level 3	5/15/2014	2	4	1	2	1	NA	NA	NA	NA	NA	1.43	NA	NA	NA	2	2	2.5Y 4/2	dark grayish brown	3			0	
1674.3			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	94	98	2.244-2.416		5/5/2014	2	4	1	2	1	NA	NA	NA	NA	NA	0.30	NA	NA	NA	2	2	10YR 5/3	brown	4			0	
1674.4			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	94	98	2.244-2.416		5/5/2014	2	3	1	2	1	NA	NA	NA	NA	NA	1.37	NA	NA	NA	3	2	10YR 4/2	dark grayish brown	3			0	
1674.5			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	94	98	2.244-2.416		5/5/2014	2	3	1	2	1	NA	NA	NA	NA	NA	0.63	NA	NA	NA	2	2	10YR 4/3	brown	3			0	
1674.6			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	94	98	2.244-2.416		5/5/2014	2	3	1	2	1	NA	NA	NA	NA	NA	0.70	NA	NA	NA	2	2	10YR 4/3	brown	3			0	
1830	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	98	2.26-2.33		5/14/2014	1	2	1	1	2	4	2	1	2	15.90	12.84	7.12	1.00	2	3	3	10YR 4/4	dark yellowish brown	3			2	
1393			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	97	2.24-2.29	Level 3, 10-15cm	5/12/2014	1	2	1	4	2	NA	4	NA	NA	4.50	2.23	0.57	NA	NA	2	8	10YR 4/3	brown	4			1	untwisted hide core
1579			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	98	2.260-2.33	Level 3, SW	5/14/2014	1	3	1	4	2	NA	4	NA	NA	2.10	3.07	1.03	NA	NA	2	2, 8	10YR 6/4	light yellowish brown	3			2	reed stitched into untwisted hide

1616			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3, SW	5/14/2014	1	3	1	2	1	NA	NA	NA	NA	38.70	13.12	NA	NA	2	2	3	10YR 4/3	brown	1	2					9.5, 9.5	2	
1688			Promontory Caves 1	42BO1	1	Promontory	F77	F55 in F54	95	98	2.33-2.85	Level 4	5/16/2014	1	4	2	1	2	4	2	1	2	34.80	11.54	8.26	1.00	2	3	3	10YR 4/3	brown	2	1					0	0	
1547			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	97	2.29-2.35	Level 4, SW	5/13/2014	1	2	1	2	2	NA	NA	NA	NA	17.70	1.26	NA	NA	NA	3	2	10YR 6/6	brownish yellow	5							2	
1632			Promontory Caves 1	42BO1	2	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3, SW	5/14/2014	1	3	1	2	1	NA	NA	NA	NA	14.70	1.07	NA	NA	NA	2	2	10YR 4/4	dark yellowish brown	4							2	
1632			Promontory Caves 1	42BO1	2	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3, SW	5/14/2014	2	4	1	2	1	NA	NA	NA	NA	9.83*	2.77	NA	NA	NA	2	2	10YR 4/2	dark grayish brown	2							0	
1696	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	F77	F55 in F54	94/95	98	2.327-3.85		5/16/2014	1	2	1	2	1	NA	NA	NA	NA	6.20	5.30	NA	NA	NA	3	2	10YR 5/3	brown	2	1					0	1	red ochre
1453	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	All F's	F3	90	99			5/12/2014	1	3	1	2	2	NA	NA	NA	NA	11.30	3.23	NA	NA	NA	3	2	10YR 5/3	brown	2	1					5.3, 6	2	
1595	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	98	2.26	Level 3, SW	5/14/2014	1	4	1	1	2	3	1	2	2	7.10	1.03	0.37	4.00	2	3	1	10YR 3/3	dark brown	5							2	
1595	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	98	2.26	Level 3, SW	5/14/2014	1	4	1	2	1	NA	NA	NA	NA	9.60	2.13	NA	NA	NA	3	2	10YR 6/3	pale brown	4							2	
9580	CM.58399		Promontory Caves 1	42BO1	1	Promontory						Near surface		1	2	1	1	2	3	1	2	3	8.90	2.03	1.49	4.50	2	3	1	10YR 5/3	brown	4							2	
10558	CM.51330	aa	Promontory Caves 1	42BO1	3	Promontory						North side		2	3	1	1	2	3	1	2	3	37.10	2.87	1.74	3.50	2	2	1	10YR 5/3	brown	4	1					9.4, 22.9	2	
10558	CM.51330	ab	Promontory Caves 1	42BO1	3	Promontory						North side		2	3	1	1	2	3	1	2	3	48.20	3.00	2.63	3.00	2	2	1	10YR 5/3	brown	4	1					6.5, 36.9	2	
10558	CM.51330	b	Promontory Caves 1	42BO1	3	Promontory						North side		2	3	1	1	1	1	1	1	NA	33.40	2.32	NA	NA	NA	2	2	10YR 7/6	yellow	3							2	tuft of rabbit fur at one end
10324			Promontory Caves 1	42BO1	6	Promontory						Under first floor level		2	5	1	1	2	4	2	1	2	12.20	2.76	1.79	NA	2	3	1	7.5YR 3/4	dark brown	4	1					0	1	
10324			Promontory Caves 1	42BO1	6	Promontory						Under first floor level		2	3	1	1	2	3	1	2	3	94.20	3.19	2.41	1.50	2	3	1	10YR 4/3	brown	5	1					1.7, 10.9	0	
10324			Promontory Caves 1	42BO1	6	Promontory						Under first floor level		2	4	1	1	2	4	2	1	3	7.10	2.24	1.53	2.00	2	3	1	7.5YR 2.5/3	very dark brown	5	1					0	1	
10324			Promontory Caves 1	42BO1	6	Promontory						Under first floor level		2	4	2	1	2	3	1	2	3	25.70	3.32	2.60	2.00	2	3	1	10YR 4/3	brown	5	1					0	1	
10324			Promontory Caves 1	42BO1	6	Promontory						Under first floor level		2	3	1	2	1	NA	NA	NA	NA	12.40	7.49	NA	NA	NA	2	2	10YR 5/2	grayish brown	2	1					0	1	
10324			Promontory Caves 1	42BO1	6	Promontory						Under first floor level		1	3	1	1	2	3	1	2	2	29.90	2.28	1.77	2.50	2	3	1	10YR 4/3	brown	4	1					0	2	
10468	CM.12199		Promontory Caves 1	42BO1	5	Promontory								2	4	1	1	2	4	2	1	3	46.10	4.36	3.34	1.50	2	3	3	7.5YR 4/3	brown	3	1					0	1	
10468	CM.12199		Promontory Caves 1	42BO1	5	Promontory								1	4	1	1	2	3	1	2	3	50.40	3.34	2.18	2.00	2	3	2	10YR 5/3	brown	5	1					35.9, 14.5	2	
10468	CM.12199		Promontory Caves 1	42BO1	5	Promontory								1	4	1	1	2	3	1	2	3	35.80	3.24	2.18	2.00	2	3	2	10YR 5/3	brown	5							2	
10468	CM.12199		Promontory Caves 1	42BO1	5	Promontory								1	4	2	1	2	4	2	1	2	24.80	3.38	2.21	2.00	2	3	3	7.5YR 4/3	brown	3	1					0	1	
10468	CM.12199		Promontory Caves 1	42BO1	5	Promontory								1	5	1	1	2	4	2	1	1	22.20	3.81	2.29	2.00	2	3	3	7.5YR 4/3	brown	3							2	
10574	CM.110486		Promontory Caves 1	42BO1	1	Promontory						North side		1	3	1	1	2	4	2	1	2	96.40	8.60	5.89	0.50	2	3	3	7.5YR 4/2	brown	2							2	
9604	CM.135987		Promontory Caves 1	42BO1	1	Promontory						Near surface		1	2	1	1	2	4	2	1	1	38.60	20.12	13.60	<0.5	2	2	8	10YR 7/4	very pale brown	1							2	
9630	CM.53754		Promontory Caves 1	42BO1	1	Promontory						Surface and "one foot south side"		1	1	1	1	2	4	2	1	1	57.50	18.45	11.35	<0.5	NA	2	8	10YR 6/4	light yellowish brown	1							2	
9690	CM.18788	a	Promontory Caves 1	42BO1	1	Promontory						Surface and two feet		1	2	1	1	2	3	1	2	3	15.10	2.23	2.12	3.00	2	2	1	10YR 3/4		5							2	
9690	CM.18788	b	Promontory Caves 1	42BO1	1	Promontory						Surface and two feet		1	2	2	1	2	3	1	2	3	20.10	1.73	1.55	3.00	2	2	1	10YR 4/4		5							2	
9690	CM.18788	ca	Promontory Caves 1	42BO1	2	Promontory						Surface and two feet		2	4	1	1	2	3	1	2	2	21.40	3.23	2.35	2.50	2	3	2	7.5YR 6/2		2							1	red ochre
9690	CM.18788	cb	Promontory Caves 1	42BO1	2	Promontory						Surface and two feet		2	5	2	1	2	4	2	1	1	14.50	1.76	1.21	3.00	2	3	2	7.5YR 6/2		2	1	1	1	2	2	1.6, 12.9 ; knots 2 and 3 right after 1; 4.3, 4.2	2	red ochre
9603	CM.140992	aa	Promontory Caves 1	42BO1	2	Promontory						Near surface		2	3	1	1	2	3	1	2	2	35.20	3.72	2.17	1.50	2	3	3	7.5YR 4/2		4	2					9.1, 24.1	2	
9603	CM.140992	ab	Promontory Caves 1	42BO1	2	Promontory						Near surface		2	4	1	1	2	3	1	2	2	47.70	3.07	2.12	2.00	2	3	3	7.5YR 4/2		4							2	
9603	CM.140992	b	Promontory Caves 1	42BO1	1	Promontory						Near surface		1	4	1	1	2	8	2	2	3	45.20	3.35	1.91	1.50	3	3	1	10YR 4/4		5	1					8.9, 24.5	2	
9603	CM.140992	c	Promontory Caves 1	42BO1	1	Promontory						Near surface		1	3	1	1	2	3	1	2	2	55.40	1.92	1.56	3.00	2	3	1	10YR 4/3		5							2	
9603	CM.140992	d	Promontory Caves 1	42BO1	1	Promontory						Near surface		1	5	1	1	2	4	2	1	1	36.70	2.02	1.19	2.00	2	3	1	10YR 5/4		5							2	
9674	CM.118739	aa	Promontory Caves 1	42BO1	3	Promontory						Surface to two feet south side		2	3	1	1	2	3	1	2	3	3.70	2.07	1.63	3.50	2	3	1	10YR 4/3		5	1					0		
9674	CM.118739	ab	Promontory Caves 1	42BO1	3	Promontory						Surface to two feet south side		2	3	1	1	2	3	1	2	3	27.60	2.35	1.60	3.00	2	3	1	10YR 4/4		5	1	1				2.2. 25.1 ; 0		
9674	CM.118739	ac	Promontory Caves 1	42BO1	3	Promontory						Surface to two feet south side		2	3	1	1	2	3	1	2	3	32.50	2.38	1.79	3.50	2	3	1	10YR 4/3		5								
9674	CM.118739	b	Promontory Caves 1	42BO1	1	Promontory						Surface to two feet south side		2	4	1	1	2	4	2	1	2	28.30	2.36	1.68	2.00	2	3	3	7.5YR 4/1		5	1	1						
9687	CM.102004	a	Promontory Caves 1	42BO1	1	Promontory						Surface to two feet		1	4	1	1	2	3	1	2	3	60.90	2.91	2.27	2.00	2	3	1	10YR 5/4		5	1	1				0	0	
9687	CM.102004	b	Promontory Caves 1	42BO1	1	Promontory						Surface to two feet		1	2	1	1	2	3	1	2	3	54.40	1.76	1.27	4.00	2, 3	3	1	10YR 5/3		5	1					5.4, 49	2	
9633	CM.65314	aa	Promontory Caves 1	42BO1	2	Promontory								2	4	1	1	2	4	2	1	3	34.10	3.07	2.34	2.00	2	3	1	10YR 6/3		5								
9633	CM.65314	ab	Promontory Caves 1	42BO1	2	Promontory								2	4	1	1	2	3	1	2	3	15.90	2.97	1.97	3.00	2	3	1	10YR 5/3		5	1	1				0, 5.2, 10.7		
9633	CM.65314	b	Promontory Caves 1	42BO1	1	Promontory								1	5	1	1	2	3	1	2	3	49.70	3.40	2.39	2.50	2	3	1	10YR 4/4		5	1					10.5, 39.2		
11554	CM.37767		Promontory Caves 1	42BO1	1	Promontory								2	3	1	1	2	4	2	1	2	71.20	13.16	6.86	<0.5	2	3	3	7.5YR 4/3		2							2	
9556			Promontory Caves 1	42BO1	1	Promontory						Between surface and one foot		1	2	2	1	2	2	2	2	3	33.90	23.66	NA	NA	NA	1	5	2.5Y 8/2		3							2	
9663		a	Promontory Caves 1	42BO1	2	Promontory						Surface and one foot south side		2	2	2	1	2	4	2	1	3	45.90	17.09	11.26	0.50	2, 3	3	4	7.5YR 2.5/2		1	1					5, 41.9	1	
9663		b	Promontory Caves 1	42BO1	2	Promontory						Surface and one foot south side		2	2	1	2	1	NA	NA	NA	NA	5.00	2.21	NA	NA	NA	2	2	10YR 6/2		2	1					0	0	
9688	CM.39470		Promontory Caves 1	42BO1	1	Promontory						Surface to two feet south side		1	3	1	4	3	NA	4	NA	3	35.20	7.74	5.75	NA	NA	2	8	10YR 5/4		1							2	

9632	CM.145513		Promontory Caves 1	42BO1	3	Promontory	Surface and one foot south side	1	5	1	4	3	NA	4	NA	1	44.30	5.67	2.66	NA	2	2	8	7.5YR 4/2		2								2	
9647	CM.66016		Promontory Caves 1	42BO1	1	Promontory	Surface and one foot south side	1	5	1	1	2	4	2	1	2	37.20	6.14	3.69	1.50	2	3	3	7.5YR 2.5/2		3	1		0					1	
9657	CM.25789		Promontory Caves 1	42BO1	1	Promontory	Surface and one foot south side	1	5	1	1	2	4	2	1	3	34.60	18.68	10.93	0.50	2	3	3	7.5YR 4/3		2								2	
10469	CM.81647		Promontory Caves 1	42BO1	1	Promontory		1	3	1	1	2	2	2	2	1	33.40	8.56	5.79	0.50	2	2	8	7.5YR 4/2		1								2	
10309	CM.131428	a	Promontory Caves 1	42BO1	2	Promontory		1	4	1	1	2	4	2	1	1	30.70	4.09	2.37	1.50	2	3	3	7.5YR 4/3		4	1	1	0					0	
10309	CM.131428	b	Promontory Caves 1	42BO1	2	Promontory		3	5	1	1, 3	1	1	1	1	NA	6.50	4.87	NA	NA	3	3	3	7.5YR 4/3		3	1		2.5, 4	7	1	2.5	2.12	2	
9602	CM.112735		Promontory Caves 1	42BO1	1	Promontory	Near surface	1	4	1	1	2	3	1	2	2	30.60	3.05	1.90	2.00	2	2	1	7.5YR 4/4		5	1	1	0; 4.2, 6					1	
9611	CM.90019	a	Promontory Caves 1	42BO1	2	Promontory	South, near surface	2	4	1	2	1	NA	NA	NA	NA	38.90	7.15	NA	NA	NA	2	2	2.5YR 4/6		2	1		0					1	
9611	CM.90019	b	Promontory Caves 1	42BO1	2	Promontory	South, near surface	2	3	1	2	NA	NA	NA	NA	NA	20.60	2.80	NA	NA	NA	3	2	10YR 8/3		3								2	
10467	CM.51175	a	Promontory Caves 1	42BO1	1	Promontory		1	3	1	2	NA	NA	NA	NA	NA	38.10	2.51	NA	NA	NA	2	2	10YR 6/3		2								2	
10467	CM.51175	b	Promontory Caves 1	42BO1	1	Promontory		1	4	1	1	1	1	1	1	NA	37.60	2.73	NA	NA	NA	2	2	10YR 7/3		3								2	
10467	CM.51175	ca	Promontory Caves 1	42BO1	2	Promontory		1	4	1	1	1	2	2	2	NA	32.40	2.80	NA	NA	NA	2	2	10YR 5/3		3								2	
10467	CM.51175	cb	Promontory Caves 1	42BO1	2	Promontory		1	5	1	1	1	2	2	2	NA	11.50	3.52	NA	NA	NA	2	2	10YR 5/3		3	7		5.3, 3.3					2	
9610	CM.25085	a	Promontory Caves 1	42BO1	1	Promontory	South, near surface	1	5	1	1	2	4	2	1	3	53.90	2.31	1.81	2.00	2	3	1	10YR 3/6		5								2	
9610	CM.25085	b	Promontory Caves 1	42BO1	1	Promontory	South, near surface	1	5	1	1	2	3	1	2	3	82.60	3.64	2.51	2.00	2	3	1	10YR 4/4		5	1		0					1	
9610	CM.25085	c	Promontory Caves 1	42BO1	1	Promontory	South, near surface	1	4	1	1	2	3	1	2	3	35.80	3.21	2.32	2.00	2	3	1	10YR 3/6		5	1		0					0	
9610	CM.25085	d	Promontory Caves 1	42BO1	1	Promontory	South, near surface	1	5	1	1	2	8	2	2	1	33.60	3.99	1.69	1.00	2	3	1	10YR 4/4		4	1		0					1	
10310	CM.121089	a	Promontory Caves 1	42BO1	2	Promontory		2	3	1	1	1	1	1	1	NA	15.50	3.25	NA	NA	NA	2	2	10YR 5/3		3								2	
10310	CM.121089	b	Promontory Caves 1	42BO1	2	Promontory		2	3	1	2	1	NA	NA	NA	NA	17.70	5.87	NA	NA	NA	2	2	10YR 4/2		2	1		1.9, 15.8					2	
10406	CM.41617	a	Promontory Caves 1	42BO1	2	Promontory		2	4	1	1	1	1	1	1	NA	20.20	3.95	NA	NA	NA	3	2	10YR 5/2		2								2	
10406	CM.41617	b	Promontory Caves 1	42BO1	2	Promontory		2	4	1	1	2	3	1	2	3	0.80	1.70	1.25	NA	NA	3	1	2.5YR 3/6		5	2	1	0					1	red ochre
9552	CM.89569		Promontory Caves 1	42BO1	1	Promontory	Between surface and one foot	1	4	1	2	1	NA	NA	NA	NA	107.90	8.99	NA	NA	NA	3	2	10YR 4/2		1	1		7.2, 100.7					2	
9702	CM.122799	aa	Promontory Caves 1	42BO1	3	Promontory	South side, surface to two feet	2	3	1	1	1	1	1	1	NA	20.00	2.97	NA	NA	NA	2	2	10YR 5/3		2								1	
9702	CM.122799	ab	Promontory Caves 1	42BO1	3	Promontory	South side, surface to two feet	2	4	1	1	2	3	1	2	3	1.60	2.05	NA	NA	NA	3	1	10YR 4/3		5	1		0					0	
9702	CM.122799	ac	Promontory Caves 1	42BO1	3	Promontory	South side, surface to two feet	2	5	1	1	1	1	1	1	NA	4.80	3.35	NA	NA	NA	2	2	10YR 5/3		2								2	
9702	CM.122799	b	Promontory Caves 1	42BO1	1	Promontory	South side, surface to two feet	1	3	1	1	1	1	1	1	NA	13.80	2.60	NA	NA	NA	2	2	10YR 7/3		2								2	
9702	CM.122799	c	Promontory Caves 1	42BO1	1	Promontory	South side, surface to two feet	1	5	1	1	1	2	2	2	NA	12.50	2.69	NA	NA	NA	2	2	10YR 6/3		2								2	
9681	CM.106313		Promontory Caves 1	42BO1	1	Promontory	South side, surface to two feet	1	4	1	1	1	1	1	1	NA	41.20	4.37	NA	NA	NA	2	2	10YR 6/4		2								2	
10548	CM.136755	a	Promontory Caves 1	42BO1	3	Promontory	North side	2	3	1	2	1	NA	NA	NA	NA	11.70	7.82	NA	NA	NA	3	2	10YR 4/3		2	5		0					1	
10548	CM.136755	b	Promontory Caves 1	42BO1	3	Promontory	North side	2	3	1	2	1	NA	NA	NA	NA	72.50	9.04	NA	NA	NA	3	2	10YR 4/3		2								2	
10548	CM.136755	c	Promontory Caves 1	42BO1	3	Promontory	North side	2	3	1	2	1	NA	NA	NA	NA	27.30	5.61	NA	NA	NA	3	2	10YR 4/3		2								2	
11589			Promontory Caves 1	42BO1	1	Promontory		1	3	1	2	1	NA	NA	NA	NA	6.80	14.00	NA	NA	NA	2	2	10YR 5/3		1	1		0					1	
9700			Promontory Caves 1	42BO1	1	Promontory	South side, surface to two feet	2	5	1	1	2	3	1	2	1	4.50	1.63	1.19	NA	NA	3	2	10YR 4/2		5	2	2	0					0	
9701		a	Promontory Caves 1	42BO1	3	Promontory	South side, surface to two feet	2	4	1	2	1	NA	NA	NA	NA	12.50	3.27	NA	NA	NA	2	2	10YR 4/2		3								2	
9701		b	Promontory Caves 1	42BO1	3	Promontory	South side, surface to two feet	2	4	1	2	1	NA	NA	NA	NA	4.80	3.32	NA	NA	NA	2	2	10YR 4/2		3	1		3.2, 1.6					2	
9701		c	Promontory Caves 1	42BO1	3	Promontory	South side, surface to two feet	2	4	1	2	1	NA	NA	NA	NA	48.10	2.61	NA	NA	NA	2	2	10YR 4/2		3								2	
9703			Promontory Caves 1	42BO1	7	Promontory	South side, surface to two feet	2	3	1	2	7	NA	NA	NA	NA	17.90	2.70	NA	NA	NA	2	2	7.5YR 5/2		3								7	red ochre
AR 4216			Promontory Caves 1	42BO1	1	Promontory		1	4	1	1	1	2	2	2	NA	40.00	2.37	NA	NA	NA	2	2	10YR 5/4		3								2	
9554	CM.131009		Promontory Caves 1	42BO1	1	Promontory	U33-- Between surface and one foot	1	4	2	1	2	2	2	2	1	49.10	1.62	1.09	2.50	NA	2	2	10YR 4/3		2								2	
10171	CM.2740	a	Promontory Caves 1	42BO1	2	Promontory	U33	2	3	1	2	1	NA	NA	NA	NA	26.40	33.04	NA	NA	NA	2	2	10YR 4/2		1								1	
10171	CM.2740	b	Promontory Caves 1	42BO1	2	Promontory	U33	2	4	1	2	1	NA	NA	NA	NA	15.20	15.12	NA	NA	NA	2	2	10YR 4/2		1	1		0					1	
10312	CM.32347	a	Promontory Caves 1	42BO1	3	Promontory	U33	2	3	1	2	1	NA	NA	NA	NA	31.50	14.42	NA	NA	NA	2	2	7.5YR 5/2 and 10YR 7/3		1	6		4.1, 17					2	
10312	CM.32347	b	Promontory Caves 1	42BO1	3	Promontory	U33	2	4	1	2	1	NA	NA	NA	NA	37.70	14.00	NA	NA	NA	2	2	7.5YR 5/2 and 10YR 7/3		1								2	
10312	CM.32347	c	Promontory Caves 1	42BO1	3	Promontory	U33	2	4	1	2	1	NA	NA	NA	NA	9.50	10.96	NA	NA	NA	2	2	7.5YR 5/2 and 10YR 7/3		1								2	
9627	CM.137346	a	Promontory Caves 1	42BO1	2	Promontory	U33- Surface to one foot south side	2	3	1	2	1	NA	NA	NA	NA	13.80	6.36	NA	NA	NA	2	2	10YR 4/3		1	8		5, 2.2					2	
9627	CM.137346	b	Promontory Caves 1	42BO1	2	Promontory	U33- Surface to one foot south side	2	4	1	2	1	NA	NA	NA	NA	54.80	13.13	NA	NA	NA	2	2	10YR 4/3		1			18.4, 34.4					2	
10766	CM.23942		Promontory Caves 1	42BO1	1	Promontory	U33	1	5	1	1	1	1	1	1	NA	52.80	1.24	NA	NA	NA	3	2	10YR 7/2										2	
11567.1 and 11567.2	CM.74348 and CM.9413	a	Promontory Caves 1	42BO1	1	Promontory		1	1	1	2	1	NA	NA	NA	NA	2.80	0.46	NA	NA	NA	2	2	10YR 7/2	light gray	5	1		0					0	

11567.1 and 11567.2	CM.74348 and CM.9413	b	Promontory Caves 1	42BO1	1	Promontory		1	4	1	1	1	1	1	1	NA	6.00	1.34	NA	NA	NA	2	2	10YR 4/4	dark yellowish brown	2							2				
10385	CM.115886	a	Promontory Caves 1	42BO1	1	Promontory	U33	2	4	1	1	2	4	2	1	2	17.00	4.66	3.36	0.50	NA	3	4*	10YR 2/1	black	1	2					9.6, 7.4	2	Human hair?			
10385	CM.115886	b	Promontory Caves 1	42BO1	1	Promontory	U33	2	4	1	1	2	4	2	1	2	9.00	4.93	2.84	0.50	NA	3	4*	10YR 2/1	black	1						9, 0	1	Human hair?			
11591	CM.54487		Promontory Caves 1	42BO1	1	Promontory	U33	1	4	1	1	2	4	2	1	2	33.10	6.97	3.80	0.50	NA	3	4*	10YR 2/1	black	1	1					21, 12.1	2	Human hair?			
10573	CM.111622	b	Promontory Caves 1	42BO1	10	Promontory	U33	2	5	1	1	1	2	2	2	NA	NA	5.19	NA	NA	NA	3	5	10YR 5/3	brown	2	1	1	1	1	1	Avg. 15.66; loops at ends			2	2	2
10175	CM.26204	a	Promontory Caves 1	42BO1	1	Promontory	U33	2	3	1	2	1	NA	NA	NA	NA	17.00	9.93	NA	NA	NA	2	2	10YR 4/3	brown	1	5					5.5, 0	2				
10175	CM.26204	b	Promontory Caves 1	42BO1	1	Promontory	U33	2	3	1	2	1	NA	NA	NA	NA	42.00	11.56	NA	NA	NA	2	2	10YR 4/3	brown	1						27.5, 3	2				
11607.6	CM.17549		Promontory Caves 1	42BO1	1	Promontory	U53	1	4	1	2	1	NA	NA	NA	NA	133.70	16.45	NA	NA	NA	3	2	10YR 3/4		1	1					11.5, 5.4	2				
9658	CM.68977		Promontory Caves 1	42BO1	1	Promontory	U53-- Surface and one foot south side	1	5	1	1	2	4	2	1	2	64.10	16.89	8.84	0.50	2	3	3	2.5Y 3/2		2							2				
10552	CM.121592		Promontory Caves 1	42BO1	1	Promontory	U53-- North side	1	4	1	1	2	3	1	2	3	18.40	3.61	2.45	3.00	2	3	1	10YR 4/4		5	1	1				0; 3.1, 15.3	1				
9689	CM.117397		Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to two feet south side	1	3	1	1	2	3	1	2	3	~39.9	2.14	1.61	3.00	2	3	1	10YR 4/4		5							2				
10544	CM.103146		Promontory Caves 1	42BO1	1	Promontory	U53-- Below two feet	1	4	1	1	2	3	1	2	3	33.80	2.87	1.94	3.00	2	3	1	10YR 6/4		5							2				
9669	CM.15103	a	Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to two feet south side	1	5	1	1	2	3	1	2	3	47.10	3.26	2.14	2.00	2	3	1	2.5Y 6/2		5							2				
9669	CM.15103	ba	Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to two feet south side	2	5	1	1	2	3	1	2	2	5.20	5.12	3.13	2.00	2	3	1	2.5Y 6/4		5	1					2.2, 2.2	2				
9669	CM.15103	bb	Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to two feet south side	2	5	1	1	2	4	2	1	2	13.50	3.74	2.24	1.00	2	3	1	2.5Y 6/4		5						0	2				
10101		a	Promontory Caves 1	42BO1	1	Promontory		1	5	1	1	2	4	2	1	3	80.50	18.32	14.41	0.50	2	3	3	10YR 4/2		1	1					0	0				
10101		b	Promontory Caves 1	42BO1	1	Promontory		1	5	1	1	2	4	2	1	2	62.70	6.29	4.48	0.50	2	3	3	10YR 3/2		1							2				
10614			Promontory Caves 1	42BO1	1	Promontory	U53	2	3	1	2	1	NA	NA	NA	NA	1.8 cm diameter	6.44	NA	NA	NA	2	2	10YR 7/4		1							0				
10203	CM.89630		Promontory Caves 2	42BO2	1	Promontory	Surface to one foot south side	1	4	2	1	2	3	1	2	2	22.50	6.85	3.68	0.50	2	3	3	7.5YR 4/4		3							2	sage			
10387	CM.77924	a	Promontory Caves 2	42BO2	1	Promontory		1	5	1	1	1	1	1	1	NA	18.10	0.60	NA	NA	2	3	1	10YR 6/3		5							2				
10387	CM.79924	ba	Promontory Caves 2	42BO2	1	Promontory		2	4	1	2	1	NA	NA	NA	NA	3.50	3.45	NA	NA	NA	2	2	10YR 6/4		2	1					0	2				
10387	CM.79924	bb	Promontory Caves 2	42BO2	1	Promontory		2	5	1	1	2	3	1	2	3	33.10	2.69	2.35	2.50	2	3	1	10YR 3/4		5	1	1				0; 0	0				
10387	CM.79924	bc	Promontory Caves 2	42BO2	1	Promontory		2	5	1	1	2	3	1	2	3	38.70	1.87	1.45	3.00	2	3	1	10YR 4/3		5	1	1				0; 7	0				
10387	CM.79924	bd	Promontory Caves 2	42BO2	1	Promontory		2	5	1	1	2	3	1	2	3	11.10	2.25	1.76	3.00	2	3	1	10YR 4/3		5	1					0	0				
10387	CM.79924	c	Promontory Caves 2	42BO2	1	Promontory		1	3	1	1	2	4	2	1	3	66.00	3.38	2.57	1.00	2	3	1	10YR 6/3		5							2				
10405	CM.96158	a	Promontory Caves 2	42BO2	1	Promontory		1	4	1	1	2	3	1	2	3	47.20	3.09	2.05	2.00	2	3	1	10YR 4/3		5							2				
10405	CM.96158	b	Promontory Caves 2	42BO2	1	Promontory		1	5	1	1	2	4	2	1	3	46.10	1.87	1.35	1.50	2	3	1	10YR 5/3		5							2				
10405	CM.96158	c	Promontory Caves 2	42BO2	1	Promontory		1	3	1	1	2	4	2	1	3	97.60	2.21	1.66	2.00	2	3	1	10YR 3/4		4							2				
10411	CM.116802	a	Promontory Caves 2	42BO2	1	Promontory		2	5	1	1	2	4	2	1	1	22.20	2.00	1.43	1.00	2	3	1	10YR 3/2		4	2	1	1	1		0; 0; 0; 0	0				
10411	CM.116802	b	Promontory Caves 2	42BO2	1	Promontory		1	5	1	1	2	4	2	1	3	61.20	1.76	1.28	1.50	2	3	1	10YR 4/4	dark yellowish brown	5							2				
10489			Promontory Caves 1	42BO1	1	Promontory		1	3	1	1	1	1	1	1	NA	8.60	2.79	NA	NA	NA	2	2	10YR 4/4	dark yellowish brown	3							2				
11607.3			Promontory Caves 1	42BO1	1	Promontory		1	3	1	2	1	NA	NA	NA	NA	73.80	15.53	NA	NA	NA	3	2	10YR 4/2	dark grayish brown	1	2					17; 25.7	2				
10398		a	Promontory Caves 1	42BO1	1	Promontory		1	5	1	1	2	3	1	2	3	65.90	2.08	1.63		2	3	1	10YR 4/3	brown	5	1					0	1				
10398		b	Promontory Caves 1	42BO1	1	Promontory		1	5	1	1	1	1	1	1	NA	27.00	2.40	NA	NA	NA	2	2	10YR 6/3	pale brown	2							2				
10398		c	Promontory Caves 1	42BO1	1	Promontory		1	5	1	1	2	4	2	1	3	33.00	1.82	1.48		2	3	1	10YR 4/3	brown	5	1	1				0; 0	0				
10398		d	Promontory Caves 1	42BO1	1	Promontory		1	5	1	1	2	3	1	2	3	54.10	1.19	0.92		2	3	1	10YR 3/4	dark yellowish brown	4							2				
10398		e	Promontory Caves 1	42BO1	1	Promontory		1	5	1	1	2	4	2	1	3	67.70	3.34	1.38		2	3	1	10YR 6/3	pale brown	5							2	Overtwisted, tangled with sinew			

Cordage in Hide Constructions

FS #	NHMU#	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #	Northing	Easting	Meters Below Datum	Context Comments	Excav. Date	Construction Form	Wear	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)
1117	A.2013.8	a	Promontory Caves 1	42BO1	4*	Promontory	F43	F3	90.31	99.37			5/12/2013	2	5	1	2	1	NA	NA	NA	NA	4.3*	1.50	NA
1117	A.2013.8	b	Promontory Caves 1	42BO1	4*	Promontory	F43	F3	90.31	99.37			5/12/2013	2	5	1	2	1	NA	NA	NA	NA	3.3*	1.37	NA
1117	A.2013.8	c	Promontory Caves 1	42BO1	4*	Promontory	F43	F3	90.31	99.37			5/12/2013	2	5	1	2	1	NA	NA	NA	NA	8.1*	0.86	NA
1117*	A.2013.8	d*	Promontory Caves 1	42BO1	4*	Promontory	F43	F3	90.31	99.37			5/12/2013	2	5	1	1	2	2	2	2	NA	0.7*	1.10	NA
654	A.2013.8		Promontory Caves 2	42BO2	1	Promontory	F6	F3	104	91	1.45-1.53		5/8/2013	2	5	1	2	1	NA	NA	NA	NA	8.9*	0.78	NA
24	A.2011.18	a	Promontory Caves 2	42BO2	6	Promontory	F5	F3	104	91	1.27-1.36	S 1/2	4/12/2011	2	3	1	1	2	4	2	1	3	5.40	1.86	1.06
24	A.2011.18	b	Promontory Caves 2	42BO2	6	Promontory	F5	F3	104	91	1.27-1.36	S 1/2	4/12/2011	2	4	1	1	2	4	2	1	3	1.2*	2.57	1.80
24	A.2011.18	c	Promontory Caves 2	42BO2	6	Promontory	F5	F3	104	91	1.27-1.36	S 1/2	4/12/2011	2	4	1	NA	NA	NA	NA	NA	NA	0.20	NA	NA
24	A.2011.18	d	Promontory Caves 2	42BO2	6	Promontory	F5	F3	104	91	1.27-1.36	S 1/2	4/12/2011	2	3	1	1	2	4	2	1	3	1.10	2.20	1.40
24	A.2011.18	e	Promontory Caves 2	42BO2	6	Promontory	F5	F3	104	91	1.27-1.36	S 1/2	4/12/2011	2	4	1	NA	NA	NA	NA	NA	NA	0.60	NA	NA
24	A.2011.18	f	Promontory Caves 2	42BO2	6	Promontory	F5	F3	104	91	1.27-1.36	S 1/2	4/12/2011	2	3	1	1	2	4	2	1	3	0.80	4.20	NA
4	A.2011.18	a	Promontory Caves 1	42BO1	2	Promontory			91	99	0-20	NW 1/2	4/11/2011	2	4	1	2	1	NA	NA	NA	NA	4.7*	1.54	NA
155	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	90	99	1.32-1.42		4/14/2011	2	3	1	2	1	NA	NA	NA	NA	3.7*	0.86	NA
122	A.2011.18	d	Promontory Cave 1	42BO1	4	Promontory	F7	F3	91	99	1.12-1.72		4/14/2011	2	4	1	2	1	NA	NA	NA	NA	4.7*	0.54	NA
23	A.2011.18	c	Promontory Caves 1	42BO1	3	Promontory	F3		91	99	20-30	N 1/2, Lvl 2	4/12/2011	2	4	1	2	1	NA	NA	NA	NA	2.3*	1.20	NA
1896	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F10	F3	90	99	1.72-1.82	From FS 753	4/16/2011	2	4	1	2	1	NA	NA	NA	NA	4.8*	0.85	NA
220	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	90	99	1.42-1.52		4/15/2011	2	3	1	2	1	NA	NA	NA	NA	9.4*	1.30	NA
348	A.2011.18	a	Promontory Caves 1	42BO1	2	Promontory	F3		91	99	0-20	From FS 18	4/12/2011	2	4	1	2	1	NA	NA	NA	NA	13.80	1.24	NA
348	A.2011.18	b	Promontory Caves 1	42BO1	2	Promontory	F3		91	99	0-20	From FS 18	4/12/2011	2	4	1	2	1	NA	NA	NA	NA	1.7*	1.10	NA
687	A.2011.18	d	Promontory Caves 1	42BO1	4	Promontory	F7	F3	90	99	1.61-1.72	From FS 278	4/16/2011	2	4	1	2	1	NA	NA	NA	NA	4.3*	0.73	NA
1307	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F48	F3	90	99	2.29-2.37		5/16/2013	2	5	1	2	1	NA	NA	NA	NA	3.00	0.90	NA
1207	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F29	F28 in F27	97.88	128.23	3.24-3.27	mbd F4	5/14/2013	2	5	1	2	1	NA	NA	NA	NA	3.60	0.60	NA
1267	A.2013.8	c	Promontory Caves 1	42BO1	3	Promontory	F48	F3	91	99	2.07-2.36		5/14/2013	2	5	1	2	1	NA	NA	NA	NA	5.60	2.27	NA
1640	A.2015.12	a	Promontory Caves 1	42BO1	2	Promontory	F56	F55 in F54	94	98	2.144-2.244		5/15/2014	2	5	1	2	1	NA	NA	NA	NA	3.1*	<0.1	NA
1640	A.2015.12	b	Promontory Caves 1	42BO1	2	Promontory	F56	F55 in F54	94	98	2.144-2.244		5/15/2014	2	3	1	2	1	NA	NA	NA	NA	2.8*	0.55	NA
1453.1	A.2015.12	a	Promontory Caves 1	42BO1	2	Promontory	all F#s	F3	90	99			5/12/2014	2	4	1	1	2	3	1	2	3	6.80	1.73	1.23
1453.1	A.2015.12	b	Promontory Caves 1	42BO1	2	Promontory	all F#s	F3	90	99			5/12/2014	2	4	1	2	1	NA	NA	NA	NA	1.1*	0.90	NA
1625	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	99	2.17-2.36		5/14/2014	2	4	1	2	1	NA	NA	NA	NA	7.1*	1.02	NA
1511	A.2015.12	aa	Promontory Caves 1	42BO1	3	Promontory	F58	F3	91	99	2.56-2.65		5/13/2014	2	4	1	1	2	4	2	1	1	2.20	0.87	<0.1
1511	A.2015.12	ab	Promontory Caves 1	42BO1	3	Promontory	F58	F3	91	99	2.56-2.65		5/13/2014	2	5	1	2	1	NA	NA	NA	NA	4.4*	0.83	NA
1511	A.2015.12	b	Promontory Caves 1	42BO1	3	Promontory	F58	F3	91	99	2.56-2.65		5/13/2014	2	5	1	2	1	NA	NA	NA	NA	7.2*	0.30	NA
AR4203		a	Promontory Caves 1	42BO1	3	Promontory								2	2	1	1	2	3	1	2	3	17.40	2.29	1.97
AR4203		b	Promontory Caves 1	42BO1	3	Promontory								2	3	1	1	2	3	1	2	3	17.20	2.31	1.64
AR4203		b	Promontory Caves 1	42BO1	3	Promontory								2	4	1	1	2	3	1	2	2	15.10	1.60	1.22
10128		a	Promontory Caves 1	42BO1	2	Promontory						South side		2	4	1	1	2	4	2	1	2	4.90	1.06	0.63
10128		b	Promontory Caves 1	42BO1	2	Promontory						South side		2	5	1	2	1	NA	NA	NA	NA	10.30	1.73	NA
10181		a	Promontory Caves 1	42BO1	2	Promontory								2	5	1	2	1	NA	NA	NA	NA	16.40	0.95	NA
10181		b	Promontory Caves 1	42BO1	2	Promontory								2	5	1	1	2	4	2	1	3	17.10	0.82	NA
10573	CM.111622	a	Promontory Caves 1	42BO1	1	Promontory						U33		2	5	1	1	2	3	1	2	3	27.70	2.88	1.63
1439	A.2015.12	b	Promontory Cave 1	42BO1	2	Promontory	F56	F55 in F54	95	98	2.26	Level 2, 2.06-2.27 mbd	5/12/2014	2	4	2	3	2	4	2	1	3	18.60	0.76	0.40
1629	A.2015.12	f	Promontory Cave 1	42BO1	6	Promontory	F56	F55 in F54	95	99	2.173-2.362	Level 3. SW	5/14/2014	2	3	1	2, 3	1	NA	NA	NA	NA	3.50	5.50	NA
515	A.2011.18	d	Promontory Caves 1	42BO1	4	Promontory	F6	F3	91	99	0-10	S 1/2, from FS 55	4/12/2011	2	5	1	1, 3	1	2	2	2	NA	5.50	1.63	NA
487	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F3		91	99	0-20	NW 1/2	4/11/2011	2	3	1	2		NA	NA	NA	NA	7.70	6.00	1.58

Avg. Twists per cm	Splice Type	Residue	Raw Material	Munsell Code	Color Description	Degree of Processing	Knot 1	Knot 2	Knot 3	Knot 4	Distance Between Knots and Ends (cm)	Free Ends #
NA	NA	3	2	10YR 6/2	light brownish gray	4	1				0	0
NA	NA	3	2	10YR 7/2	light gray	4	1				0	0
NA	NA	3	2	7.5YR 5/2	brown	4						0
NA	NA	2	2	10YR 4/3	brown	4						0
NA	NA	3	2	10YR 4/2	dark grayish brown	3						2
5	NA	3	1	10YR 4/3	brown	4	1				0	1
NA	NA	3	1	10YR 4/3	brown	4	1				0	0
NA	NA	3	1	10YR 4/3	brown	4						0
NA	NA	3	1	10YR 4/3	brown	4						0
NA	NA	3	1	10YR 4/3	brown	4						0
NA	NA	3	1	10YR 4/3	brown	4	1				0	1
NA	NA	3	2	2.5Y 4/4	olive brown	2						0
NA	NA	3	1	10YR 4/4	dark yellowish brown	4						0
NA	NA	3	2	10YR 5/2	grayish brown	5						0
NA	NA	3	2	10YR 4/3	brown	5	1				0	0
NA	NA	3	2	10YR 5/3	brown	5	1	1			0	0
NA	NA	3	2	10YR 4/2	dark grayish brown	4						0
NA	NA	3	2	10YR 4/3	brown	4	1				1.6, 12.2	2
NA	NA	3	2	10YR 4/3	brown	4						0
NA	NA	3	2	2.5Y 4/3	olive brown	4						1
NA	NA	3	2	2.5Y 5/2	grayish brown	4						0
NA	NA	3	2	2.5Y 6/2	light brownish gray	4						0
NA	NA	2	2	10YR 4/3	brown	3	1				0	1
NA	NA	2	2	2.5Y 4/3	olive brown	5						0
NA	NA	2	2	10YR 5/3	brown	4	1				0	0
3.5	2	3	1	10YR 5/4	yellowish brown	5	1				0	0
NA	NA	3	2	10YR 4/2	dark grayish brown	4						0
NA	NA	3	2	2.5Y 4/2	dark grayish brown	4	1				0	0
6	2	2	2	10YR 4/3	brown	5						1
NA	NA	2	2	10YR 4/2	dark grayish brown	4						0
NA	NA	2	2	10YR 5/3	brown	4						0
4	2	3	1	10YR 3/3		5	1	1			0	1
3	2	3	1	10YR 3/3		5	1	1	2		0; 0; 8.8, 7.5	1
3	2	3	1	10YR3/3		5	1	1			0; 12.4, 2.7	2
8	NA	3	2	7.5YR 5/2		5	1				0	1
NA	NA	3	2	7.5YR 2.5/1		3						0
NA	NA	3	2	10YR 6/3		5						0
NA	NA	3	2	10YR 6/3		5	1				0	0
4	2	3	1	10YR 4/3	brown	5	1				0	1
4.5	1, 2	3	1	2.5Y 6/3	light yellowish brown	5	1				16.3, 2.3	2
	NA	3	2	10YR 4/2	dark grayish brown	3	1				0	1
	NA	3	2	7.5YR 4/6	strong brown	5	1				0	2
	NA	3	2	7.5YR 4/4	brown	3						2

Cordage in Twined Constructions

FS #	UMNH #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Context Comments	Excav. Date	Warp, Weft, or Selvage	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Avg. Twists per cm	Free Ends #	Notes
1252	A.2013.8	a	Promontory Caves 1	42BO1	2	Promontory		5/15/2013	2	1	1	1	1	1	1	NA	NA	2	
1252	A.2013.8	b	Promontory Caves 1	42BO1	2	Promontory		5/15/2013	2	1	1	2	4	2	1	1	4	2	
1300	A.2013.8		Promontory Caves 1	42BO1	1	Promontory		5/17/2013	2	1	1	1	1	1	1	NA	NA	1	
1045	A.2013.8		Promontory Caves 1	42BO1	1	Promontory		5/11/2013	2	1	1	1	1	1	1	NA	NA	1	
981	A.2013.8		Promontory Caves 1	42BO1	1	Promontory		5/9/2013	2	1	1	1	1	1	1	NA	NA	2	
1054	A.2013.8		Promontory Caves 1	42BO1	1	Promontory		5/11/2013	2	1	1	1	1	1	1	NA	NA	2	
1055	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	West Wall	5/11/2013	2	1	1	1	1	1	1	NA	NA	2	
692.8	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	From FS 278	4/16/2011	2	1	1	1	1	1	1	NA	NA	2	
1056	A.2013.8		Promontory Caves 1	42BO1	1	Promontory		5/11/2013	2	1	1	1	1	1	1	NA	NA	2	
1691		a	Promontory Caves 1	42BO1	1	Promontory	Level 4	5/16/2014	2	1	1	1	2	2	2	NA	NA	1	
9656	CM.80326		Promontory Caves 1	42BO1	1	Promontory	Surface one foot south side		2	1	1	1	2	2	2	NA	NA	1	
10333	CM.60134		Promontory Caves 1	42BO1	4	Promontory	Center of main trench-- two feet		2	1	4	3	NA	NA	NA	NA	NA	0	
11603.4	CM.90121	a	Promontory Caves 1	42BO1	5	Promontory			2	1	1	1	1	1	1	NA	NA	2	
11603.4	CM.90121	b	Promontory Caves 1	42BO1	1	Promontory			4	1	1	2	4	2	1	2	1	0	
11603.4	CM.90121	c	Promontory Caves 1	42BO1	1	Promontory			4	1	1	2	3	1	2	3	5	1	Tied in an overhand knot around 2sZ selvage cord; made of bast fibre instead of bark
10474	CM.67745	b	Promontory Caves 1	42BO1	1	Promontory			2	1	1	1	1	1	1	NA	NA	2	
9582.6	CM.133569	a	Promontory Caves 1	42BO1	4	Promontory	Near surface		2	1	1	2	3	1	2	3	2	0	
9582.6	CM.133569	b	Promontory Caves 1	42BO1	1	Promontory	Near surface		4	1	1	2	8	2	1	3	1	0	
9660	CM.48202	b	Promontory Caves 1	42BO1	1	Promontory	Surface and one foot south side		2	1	1	1	1	1	1	NA	NA	1	
11603.3b	CM.106222		Promontory Caves 1	42BO1	1	Promontory			4	1	1	2	2	2	2	2	2	0	
9594? 10761?	CM.128099		Promontory Caves 1	42BO1	1	Promontory			2	1	1	1	1	1	1	NA	NA	2	
10554	CM.47780	a	Promontory Caves 1	42BO1	1	Promontory	North side		2	1	1	1	1	1	1	NA	NA	0	
10554	CM.47780	b	Promontory Caves 1	42BO1	1	Promontory	North side		4	1	1	2	4	2	1	3	3	0	
10554	CM.47780	c	Promontory Caves 1	42BO1	1	Promontory	North side		1	1	1	1	2	2	2	2	1.5	1	
9683	CM.57468	a	Promontory Caves 1	42BO1	1	Promontory	Surface to two feet		2	1	1	1	1	1	1	NA	NA	0	
9683	CM.57468	b	Promontory Caves 1	42BO1	1	Promontory	Surface to two feet		4	1	1	2	4	2	1	1	<0.5	0	
9682	CM.100412	a	Promontory Caves 1	42BO1	1	Promontory	Surface to two feet south side		2	1	1	1	1	1	1	NA	NA	0	
9682	CM.100412	b	Promontory Caves 1	42BO1	1	Promontory	Surface to two feet south side		4	1	1	2	4	2	1	3	2.5	0	
9682	CM.100412	c	Promontory Caves 1	42BO1	1	Promontory	Surface to two feet south side		2. 4	1	1	2	3	1	2	3	2	0	
9682	CM.100412	d	Promontory Caves 1	42BO1	1	Promontory	Surface to two feet south side		5	1	2	1	NA	NA	NA	NA	NA	0	
9597	CM.25999	a	Promontory Caves 1	42BO1	1	Promontory	Near surface		2	1	1	1	1	1	1	NA	NA	0	
9597	CM.25999	b	Promontory Caves 1	42BO1	1	Promontory	Near surface		3	1	1	1	2	2	2	NA	NA	0	
9597	CM.25999	c	Promontory Caves 1	42BO1	2	Promontory	Near surface		4	1	1	2	3	1	2	3	NA	0	
9636	CM.56887	a	Promontory Caves 1	42BO1	1	Promontory	Surface and one foot south side		2	1	1	1	1	1	1	NA	NA	0	
9636	CM.56887	b	Promontory Caves 1	42BO1	1	Promontory	Surface and one foot south side		4	1	1	2	4	2	1	2	2	0	
10656	CM.52446	a	Promontory Caves 1	42BO1	1	Promontory			2	1	1	1	1	1	1	NA	NA	0	
10656	CM.52446	b	Promontory Caves 1	42BO1	1	Promontory			4	1	1	2	4	2	1	2	2	0	
AR 4306			Promontory Caves 1	42BO1	4	Promontory			2	1	1	1	1	1	1	NA	NA	0	
10553	CM.112387		Promontory Caves 1	42BO1	4	Promontory	North side		2	1	1	1	1	1	1	NA	NA	0	
9635	CM.30731		Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to one foot south side		4	1	1	2	6	2	2	2	1.5	0	
10764	CM.60780	a	Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to two feet south side		2	1	1	1	1	1	1	NA	NA	0	
10764	CM.60780	b	Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to two feet south side		4. 5	1	1	2	4	2	1	3	3	0	
AR4303	CM.53316		Promontory Caves 1	42BO1	1	Promontory	U53		2	1	1	1	1	1	1	NA	NA	0	
AR4307	CM.134898	a	Promontory Caves 1	42BO1	1	Promontory	U53		2	1	1	1	1	1	1	NA	NA	0	
AR4307	CM.134898	b	Promontory Caves 1	42BO1	1	Promontory	U53		5	1	1	2	3	1	2	3	3.5	0	
9544	CM.117500		Promontory Caves 1	42BO1	1	Promontory	U53		2, 4	1	1	1	1	1	1	NA	NA	0	
9672	CM.62509	a	Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to two feet south side		2	1	1	1	1	1	1	NA	NA	0	
9672	CM.62509	b	Promontory Caves 1	42BO1	1	Promontory	U53-- Surface to two feet south side		4	1	1	2	3	1	2	2	1.5	0	
9672a			Promontory Caves 1	42BO1	1	Promontory			2	1	1	1	1	1	1	NA	NA	2	
9672b		a	Promontory Caves 1	42BO1	1	Promontory			2	1	1	1	1	1	1	NA	NA	0	
9672b		b	Promontory Caves 1	42BO1	1	Promontory			4	1	1	2	10	2	2	3	2	0	
10409	CM.74342		Promontory Caves 2	42BO2	1	Promontory			2	1	1	1	1	1	1	NA	NA	0	

Cordage in Plaited Constructions

FS #	UMNH #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Context Comments	Warp, Weft, or Selvage	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Avg. Twists per cm	Knots	Free Ends #
10555	CM.43350		Promontory Caves 1	42BO1	1	Promontory	North side	3	1	1	1	1	1	NA	NA	NA	1	1
11603.3a	CM.27687	a	Promontory Caves 1	42BO1	1	Promontory		3	1	1	1	1	1	NA	NA	NA		0
11603.3a	CM.27687	b	Promontory Caves 1	42BO1	1	Promontory		3	1	1	2	4	2	1	2	2	1	1

Fiber Bundles

FS #	NHMU #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #	Northing	Easting	Meters Below Datum	Context Comments	Excav. Date	Construction Form	Wear	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)	Avg. Twists per cm	Splice Type	Residue	Raw Material	Munsell Code	Degree of Processing	Knot 1	Knot 2	Distance Between Knots and Ends (cm)	Free Ends #
175	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F7	F3	90	99	1.32-1.42		########	4	3	1	2	NA	NA	NA	NA	NA	12.10	10.80	NA	NA	NA	2	3	10YR 4/4	2	1		0	NA
1102	A.2013.8	a	Promontory Cave 1	42BO1	2	Promontory	F38	F28 in F27	98.55	122.83	3.75-4.13		########	4	2	1	2	1	NA	NA	NA	NA	4.90	1.58	NA	NA	NA	2	1	10YR 6/6	5				2
1102	A.2013.8	b	Promontory Cave 1	42BO1	2	Promontory	F38	F28 in F27	98.55	122.83	3.75-4.13		########	4	2	1	2	1	NA	NA	NA	NA	2.10	1.60	NA	NA	NA	NA	1	10YR 6/8	5				2
853	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F5	F3	104	91	1.27-1.36	From FS 242, N 1/2	########	4	2	1	2	1	NA	NA	NA	NA	4.60	9.30	NA	NA	NA	2	1	10YR 4/4	4	1		2.5	1
854	A.2011.18		Promontory Cave 2	42BO2	1	Promontory	F5	F3	104	91	1.16-1.22	From FS 227	########	4	3	1	2	1	NA	NA	NA	NA	26.20	3.76	NA	NA	NA	2	3	10YR 3/3	3	1		5.4, 19	2
66	A.2011.18	d	Promontory Cave 1	42BO1	6	Promontory	F7	F3	91	99	1.32-1.42	10-20cm bgms	########	4	3	1	2	NA	NA	NA	NA	NA	3.77	2.87	NA	NA	NA	2	2	10YR 6/4	4				0
66	A.2011.18	e	Promontory Cave 1	42BO1	6	Promontory	F7	F3	91	99	1.32-1.42	10-20cm bgms	########	4	3	1	2	NA	NA	NA	NA	NA	17.9*	3.72	NA	NA	NA	3	2	10YR 4/3	2				2
66	A.2011.18	f	Promontory Cave 1	42BO1	6	Promontory	F7	F3	91	99	1.32-1.42	10-20cm bgms	########	4	3	1	2	NA	NA	NA	NA	NA	20.7*	8.02	NA	NA	NA	3	1	10YR 4/4	2				2
663	A.2011.18	c	Promontory Caves 1	42BO1	3	Promontory	F10	F3	91	99	1.72-1.?	From FS 177	########	4	4	1	2	1	NA	NA	NA	NA	16.10	1.04	NA	NA	NA	3	2	10YR 5/4	4				2
1182	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F46	F3	90	99	2.15-2.21		########	4	3	1	2	1	NA	NA	NA	NA	12.30	13.60	NA	NA	NA	3	1	10YR 4/4	2	1		0	0
1028	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F35	F28 in F27	98.55	137.83	3.58-3.82	mbd F4	########	4	2	1	2	1	NA	NA	NA	NA	7.60	3.23	NA	NA	NA	3	4	10YR 5/6	3	1	1	0	0
1277	A.2013.8	a	Promontory Caves 1	42BO1	3	Promontory	F48	F3	91	99	2.07-2.36		########	4	2	1	2	1	NA	NA	NA	NA	NA	1.62	NA	NA	NA	3	1	10YR 4/4	3				1
1277	A.2013.8	b	Promontory Caves 1	42BO1	3	Promontory	F48	F3	91	99	2.07-2.36		########	4	3	1	2	1	NA	NA	NA	NA	21.60	24.66	NA	NA	NA	3	1	10YR 4/4	2	1		11.6, 8.2	0
1277	A.2013.8	c	Promontory Caves 1	42BO1	3	Promontory	F48	F3	91	99	2.07-2.36		########	4	2	1	2	1	NA	NA	NA	NA	11.90	17.86	NA	NA	NA	3	1	10YR 4/4	3	2		0	1
862	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F19	F3	90	99	1.81		5/7/2013	4	3	1	2	1	NA	NA	NA	NA	17.50	11.83	NA	NA	NA	3	1	10YR 4/3	2	1		3.1, 11.5	2
1131	A.2013.8		Promontory Caves 1	42BO1	1	Promontory			90	99		Profile scraping	########	4	3	1	2	1	NA	NA	NA	NA	20.10	6.93	NA	NA	NA	3	1	10YR 4/4	2	2		0	0
971	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F32	F3	90	99	1.98-2.06		5/9/2013	4	1	1	2	1	NA	NA	NA	NA	17.90	3.06	NA	NA	NA	2	1	10YR 2/2	5				2
994	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F31	F28 in F27	98.55	127.83	3.51-3.63		5/9/2013	4	3	1	2	1	NA	NA	NA	NA	11.10	4.83	NA	NA	NA	2	1	10YR 4/3	3	1		0	1
1015	A.2013.8	a	Promontory Caves 1	42BO1	2	Promontory	F34	F3	90	99	1.99-2.12	Level 7	5/9/2013	4	4	1	2	1	NA	NA	NA	NA	21.10	18.86	NA	NA	NA	2	3	10YR 4/4	1	2		0	1
1015	A.2013.8	b	Promontory Caves 1	42BO1	2	Promontory	F34	F3	90	99	1.99-2.12	Level 7	5/9/2013	4	4	1	2	1	NA	NA	NA	NA	20.10	6.03	NA	NA	NA	2	3	10YR 4/4	1	2		0	1
1046	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F7/19/21/25/26/28/33/34	F3	90	99		Eastern profile	########	4	2	1	2	1	NA	NA	NA	NA	4.60	3.97	NA	NA	NA	3	4	10YR 4/4	2	1		1.5, 1.5	2
851	A.2013.8	b	Promontory Caves 1	42BO1	3	Promontory	F19	F3	90	99	1.81		5/7/2013	4	5	1	2	1	NA	NA	NA	NA	11.00	0.90	NA	NA	NA	2	2	10YR 6/3	3				2
1545	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	97	2.29-2.35	SW	########	4	2	1	2	1	NA	NA	NA	NA	36.60	7.12	NA	NA	NA	1	3	10YR 3/3	1	2		6.1, 4.5	2
1381			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	97	2.19mbd	Level 2, 5-10cm	########	4	3	1	2	1	NA	NA	NA	NA	12.10	13.53	NA	NA	NA	1	3	10YR 4/4	2	1		8.5, 3.6	2
1404.1			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	98	2.17-2.27	Level 1, 0-10cm; SW	########	4	3	1	2	1	NA	NA	NA	NA	40.80	9.17	NA	NA	NA	1	3	10YR 3/3	2	2		18.1, 11.3	2
1399			Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	95	98	2.17-2.27	Level 1, 0-10cm; SW	########	4	4	1	2	1	NA	NA	NA	NA	17.2*	1.07	NA	NA	NA	3	2	2.5Y 7/4	3				2
1413	A.2015.12		Promontory Caves 1	42BO1	1	Promontory	F57	F3	91	99	2.33-2.58		########	4	4	1	2	1	NA	NA	NA	NA	12.3*	2.26	NA	NA	NA	3	2	10YR 4/3	2				2
10765			Promontory Caves 1	42BO1	1	Promontory						Surface to two feet south side		4	4	1	2	2	NA	NA	NA	NA	33.50	12.28	NA	NA	NA	3	3	7.5YR 2.5/2	1	1		11.2, 22.3, 13.7	3
11603.6	CM.115986		Promontory Caves 1	42BO1	1	Promontory								4	2	1	2	NA	NA	NA	NA	NA	6.70	NA	NA	NA	NA	2	1	10YR 4/2	1	1			0
9704			Promontory Caves 1	42BO1	1	Promontory								4	1	1	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	3	10YR 2.5/2	1				
10369	CM.129508		Promontory Caves 1	42BO1	1	Promontory						Under first floor to about one foot		4	2	1	2	NA	NA	NA	NA	NA	11.90	8.16	NA	NA	NA	2	3	7.5YR 5/2	1				
11603.3b	CM.156694		Promontory Caves 1	42BO1	1	Promontory								4	4	1	2	NA	NA	NA	NA	NA	9.80	NA	NA	NA	NA	2	1	7.5YR 4/4	3	1			0
9705	CM.54120		Promontory Caves 1	42BO1	1	Promontory						Surface to two feet		4	3	1	2	1	NA	NA	NA	NA	9.80	4.01	NA	NA	NA	3	2	10YR 4/2	2				0
9689	CM.57710		Promontory Caves 1	42BO1	1	Promontory						U53-- South side, surface to two feet		4	2	1	2	NA	NA	NA	NA	NA	16.00	4.21	NA	NA	NA	2	8	10YR 6/6	1	6	6		
AR4318			Promontory Caves 1	42BO1	1	Promontory								4	3	1	2	1	NA	NA	NA	NA	21.70	10.05	NA	NA	NA	3	3	7.5YR 4/3	1				0

Hoops

FS #	NHMU #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #
856	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F19	F3
1342			Promontory Cave 1	42BO1	1	Promontory	F53	F3
10570	CM.46558		Promontory Caves 1	42BO1	1	Promontory		
9666			Promontory Caves 1	42BO1	1	Promontory		
9631			Promontory Caves 1	42BO1	1	Promontory		
10332			Promontory Caves 1	42BO1	1	Promontory		
9709			Promontory Caves 1	42BO1	1	Promontory		
10547			Promontory Caves 1	42BO1	1	Promontory		
AR810			Promontory Caves ?	42BO?	1	Promontory		
AR808			Promontory Caves ?	42BO?	1	Promontory		
AR809			Promontory Caves ?	42BO?	1	Promontory		
10360	CM.144721		Promontory Caves 1	42BO1	1	Promontory		
837	A.2013.8		Promontory Caves 1	42BO1	1	Promontory		

Northing	Easting	Meters Below Datum	Context Comments	Excav. Date	Construction Form	Wear
90	99	1.81-?		5/7/2013	1	5
90	99	2.28-2.42		5/11/2014	2	3
			U53		2	4
					2	4
					2	3
					2	4
			U53-- Surface to two feet south side		2	4
			U53-- North side		2	3
					2	3
					2	4
					2	5
			Under first floor-- about one foot		1	5
			North of F3	5/5/2013	2	3

Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist
1	3	1	NA	NA	NA	NA
1	2, 3	NA	NA	NA	NA	NA
1	2, 3	NA	NA	NA	NA	NA
1	2	1	NA	NA	NA	NA
1	2, 3	1	NA	NA	NA	NA
1	2, 3	1	NA	NA	NA	NA
1	1, 3	1	2	2	2	NA
1	2, 3	NA	NA	NA	NA	NA
1	2, 3	1	NA	NA	NA	NA
1	2, 3	1	NA	NA	NA	NA
1	2, 3	1	NA	NA	NA	NA
1	2	1	NA	NA	NA	NA
1	3	1	NA	NA	NA	NA

Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)	Avg. Element Thickness (mm)	Avg. Twists per cm
10.9	5.1	NA		NA
23.40	19.60	NA		NA
6.7 by 4.9	NA	NA		NA
9.9 by 6.8	23.39	NA		NA
6.9 by 5.5	11.50	NA		NA
7.8 by 6.1	19.07	NA		NA
35.20	20.42	NA		NA
12.6 by 10.6	35.93	NA		NA
11 by 8.2	16.54	NA		NA
9 by 7.5	22.00	NA		NA
9 by 7.5	26.97	NA		NA
NA	1.62	NA		NA
24.3	4.42	NA		NA

Splice Type	Residue	Raw Material	Munsell Code	Color Description	Degree of Processing	Knot 1
2, 4	3	2	10YR 5/4	yellowish brown	5	
NA	3	3	10YR 4/4	dark yellowish brown	2	1
NA	3	3	10YR 4/4		3, 5	1
NA	3	3	10YR 3/4		1	2
NA	3	3	10YR 3/4		1	
NA	3	3	10YR 3/2		1	1
2	2	3	7.5YR 4/2		2	
NA	2	3	10YR 4/2		2	
NA	2	3	10YR 3/6	dark yellowish brown	2	
NA	2	3	7.5YR 3/2	dark brown	2	
NA	2	3	10YR 4/3	brown	2	
NA	2	2	10YR 4/3		3	1
2	2	1	10YR 7/3	very pale brown	1	1

Knot 2	Knot 3	Knot 4	Knot 5	Distance Between Knots and Ends (cm)	Wrapping
					3
				4.7	4
1	1	1	1	NA	7
				NA	
					4
				NA	4
					4
					4
					4
					4
					4
1	1	1	1	0	
				0	1

Wrapping Twist Direction	Avg. Wraps per cm	Avg. Wrap Element Width (mm)	Free Ends #	Notes
	4	0.56	0	
	1.5	7.72	1	
3	2	2.78	0	Pot rest, knots for cord wrapping
			0	Pot rest
	1	6.6	0	
	1.5	6.55	0	
	2.5	3.44	2	
	0.5	9.62	0	
	1	9.42	0	
	0.5	8.7	0	
	0.5	8.03	0	
			0	
	2	3.33	0	

Possible Net Fragments

FS #	NHMU #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #	Northing	Easting	Meters Below Datum	Context Comments	Excav. Date	Construction Form	Wear	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)	Avg. Twists per cm	Splice Type	Residue	Raw Material	Munsell Code	Degree of Processing	Knot 1	Distance Between Knots and Ends (cm)	Free Ends #
1672	A.2015.12	fa	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	2	5	1	1	2	4	2	1	3	22.70	2.68	1.08	2.50	2	3	1	10YR 3/4	5	1	Knot 1 and 3: 22.4	1
1672	A.2015.12	fb	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	2	5	2	1	2	3	1	2	3	21.00	2.40	1.68	2.50	2	3	1	10YR 3/6	5	4	Knot 1 and Knot 2: 21	1
1672	A.2015.12	fc	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	2	4	1	1	2	4	2	1	3	3.40	2.40	1.40	2.50	2	3	1	10YR 3/3	5			0
1672	A.2015.12	fd	Promontory Cave 1	42BO1	7	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	2	5	1	1	2	4	2	1	3	8.40	2.26	1.80	2.00	2	3	1	7.5YR 4/4	5	1	Knot 2 and Knot 3: 3.4	1

Netted Fabrics

FS #	UMNH #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #	Northing	Easting	Context Comments	Excav. Date	Construction Form	Loop/Knot Type	Wear	Cord Type	# of Cord Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Net Length (cm)	Net Width (cm)	Avg. Net Gauge (mm)	Avg. Net Loops per cm	Avg. Cord Dia. (mm)	Avg. Cord Twists per cm	Splice Type	Residue	Raw Material	Munsell Code	Degree of Processing	Net Selvage Type	Free Ends #	Notes
10513	CM.130272	Promontory Caves 1	42BO1	1	Promontory					South side, upper two feet		1	1	4	1	2	3	1	2	3	26.1	2.7	2	2.5	1.2	6	NA	3	1	10YR 4/3	5	1	2	Likely reused as a cord; knotted on itself in an overhand knot
1453	A.2015.12	Promontory Caves 1	42BO1	1	Promontory	All F's	F3	90	99		5/12/2014	1	1	3	2	1					8	4.63			1.47			2	2	10YR 4/4	3		0	red ochre; likely part of a looped fabric; two overhand knots, one on each end

Plat Sinnets

FS #	NHMU #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #	Northing	Easting	Meters Below Datum	Context Comments	Excav. Date	Construction Form	Wear	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)	Avg. Twists per cm	Splice Type	Residue	Raw Material	Munsell Code	Color Description	Degree of Processing	Wrapping	Avg. Wraps per cm	Avg. Wrap Element Width (mm)	Free Ends #	Notes
210	A.2011.18	Promontory Cave 1	42BO1	1	Promontory	F11	F3	91	99	1.82-1.92		4/15/2011	6	3	1	5	4	4	2	1	3	2.80	0.70	0.40	3.00	NA	2	1	2.5Y 3/4	dark olive brown	5	5	6	1.22	2	
1197	A.2013.8	Promontory Caves 1	42BO1	1	Promontory	F28	F29	91.88	128.23	3.39		5/14/2013	6	3	1	5	4	NA	NA	NA	NA	55.10	3.26	<0.1	NA	2	3	2	10YR 4/2	dark grayish brown	5	1	13	0.38	2	
1668		Promontory Caves 1	42BO1	1	Promontory	F56	F55 in F54	94	98	2.244-2.416	Level 2	5/15/2014	6?	3	1	5	3	NA	NA	NA	NA	3.7	1.5	3.56			2	5	10YR 7/6	yellow	1	5	1	3.56	1	Looser than others, looks like single row of 1/1 plaiting

Wrapped Bark Construction

FS #	NHMU #	Site Name	Site Number	Qty	Cultural Affiliation	Context Comments	Construction Form	Wear	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)	Avg. Twists per cm	Splice Type	Residue	Raw Material	Munsell Code	Degree of Processing	Knot 1	Knot 2	Knot 3	Knot 4	Distance Between Knots and Ends (cm)	Avg. Wraps per cm	Free Ends #
10566	CM.108726	Promontory Caves 1	42BO1	1	Promontory	North side	2	4	1	2	1	NA	NA	NA	NA	25.4*	1.98	NA	NA	NA	2	2	10YR 6/2	1	1	1	1	1	0	2.5	0

Travois Bag

FS #	NHMU #	Site Name	Site Number	Qty	Cultural Affiliation	Context Comments	Construction Form	Wear	Taper	Structural Class	# of Plies	Ply Formula	Final Twist	Initial Spin	Tightness Twist	Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)	Avg. Element Thickness (mm)	Avg. Twists per cm	Splice Type	Residue	Raw Material	Munsell Code	Color Description	Degree of Processing	Knot 1	Knot 2	Distance Between Knots and Ends (cm)	Wrapping	Wrapping Twist Direction	Avg. Wraps per cm	Avg. Wrap Element Width (mm)	Free Ends #	Notes
11595	CM.60263	Promontory Caves 1	42BO1	1	Promontory	U33	5	3	1	1, 2, 3	1, 2	9	1	1	2	16.3 by 22.3	5.44	NA	2.75	1.00	NA	3	2	10YR 4/2	dark grayish brown	2	1	2	8.5, 7.8	3	NA	1.5	NA	30	Avg. gap between elements: 16.83 mm

Twined Textiles

FS #	NHMU #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #	Northing	Easting	Meters Below Datum	Context Comments	Excav. Date	Construction Form	Wear	Open vs Close	Simple vs Diagonal	Weft Twist Direction	Number of Warp Elements in One Unit	Number of Weft Elements in One Unit	Length (following warps) (cm)	Width (following wefts) (cm)	Avg. Warp Dia. (mm)	Avg. Weft Dia. (mm)	Avg. Warps per cm	Avg. Wefts per cm	Splice Type	Weft Splice Type
1252	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F48	F3	91.37	99.57	2.32		5/15/2013	1	3	1	1	2	2 thru 5	2	12.3	16.8	4.5	1.34	2	1	NA	2
1300	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F48	F3	90.98	99.33	2.34		5/17/2013	1	4	1	1	2	2 thru 5	2	13.4	50.7	4.58	1.62	2	1	1	1
1045	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F34	F3	90	99	2.04-2.12		5/11/2013	1	5	1	1	2	1	2	39.3	11.1	5.82	1.68	1.5	1	1	1
981	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F34/F17	F3	91	90	2.11-2.13		5/9/2013	1	4	1	1	2	1	2	28.8	51.1	6.5	1.54	1.5	1	1	2
1054	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F34	F3	91	99	1.99		5/11/2012	1	5	1	1	2	1	2	17.5	3.8	3.98	1.78	2	1	1	NA
1055	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F34	F3	91	99	1.99	West Wall	5/11/2013	1	5	1	1	2	1	2	21.1	6.9	5.54	1.88	1.5	1	NA	NA
242	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F11	F3	91	99	1.82-1.88		4/15/2011	1	2	NA	NA	NA	1	NA	6	NA	10.97	NA	NA	1	NA	NA
692.8	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	90	99	1.62-1.72	From FS 278	4/16/2011	1	2	NA	NA	2	1	NA	8.6	NA	8.28	NA	NA	1	NA	NA
708.4	A.2011.18		Promontory Caves 1	42BO1	1	Promontory	F7	F3	90	99	1.70-1.91	From FS 285	4/16/2011	1	2	NA	NA	NA	1	NA	6.4	NA	8.9	NA	NA	1	NA	NA
1056	A.2013.8		Promontory Caves 1	42BO1	1	Promontory	F34	F3	91	99	1.99-2.15		5/11/2013	1	4	1	1	2	1	2	7	6.1	6.1	2.93	1	NA	NA	NA
1691			Promontory Caves 1	42BO1	2	Promontory	F77	F55 in F54	95	98		Level 4	5/16/2014	1	5	NA	1	1	1	2	2.2	21.6	2.4	1.18	3.5	NA	NA	1
9656	CM.80326		Promontory Caves 1	42BO1	1	Promontory						Surface one foot south side		1	5	1	1	2	3	2	13.3	19	9.43	3.07	1	1	1	1
10333	CM.60134		Promontory Caves 1	42BO1	1	Promontory						Middle of trench-- two feet		3	4	1	1	3	1	3	8.8	16.6	3.44	3.35	2.5	1	NA	1
11603.4	CM.90121		Promontory Caves 1	42BO1	1	Promontory								1	4	1	1	2	2 thru 5	2	19.7	20.6	7.02	2.52	1.5	1	1	1
11603.5	CM.27422		Promontory Caves 1	42BO1	1	Promontory								1	5	1	2	2	3 thru 4	2	13.8	22.2	8.82	7.01	1	1	NA	1
10474	CM.67745	a	Promontory Caves 1	42BO1	2	Promontory								4	5	1	1	2	4	2		6.9	5.51	3.18	2	1	NA	NA
10474	CM.67745	b	Promontory Caves 1	42BO1	2	Promontory								4	5	1	1	1	1 thru 2	2		22.4	4.68	1.68	2	1	NA	NA
9582.6	CM.133569		Promontory Caves 1	42BO1	1	Promontory						Near surface		1	3	1	2	2	5 thru 7	2	15.7	21.8	10.35	2.06	1	1	NA	1
9660	CM.48202	b	Promontory Caves 1	42BO1	1	Promontory						Surface and one foot south side		4	5	NA	NA	2	NA	2		17		2.45			NA	1
11603.3b	CM.106222		Promontory Caves 1	42BO1	1	Promontory								1	3	1	1	2	2	2	11.5	12.1	4.53	2.39	2.5	1	NA	1
9594? 10761?	CM.128099		Promontory Caves 1	42BO1	1	Promontory								1	4	NA	NA	2	4 thru 5	2		17.2	6.16	2.43	1.5		NA	1
10554	CM.47780		Promontory Caves 1	42BO1	1	Promontory						North side		1	4	1	1	2	6 thru 8	2	18.3	7.2	11.32	1.86	1	1	NA	1
9646	CM.8405		Promontory Caves 1	42BO1	1	Promontory						Surface and one foot south side		1	4	1	1	2	4 thru 5	2	11.8	12.9	15.18	9.5	0.5	0.5	NA	NA
11603.7	CM.88592		Promontory Caves 1	42BO1	1	Promontory								3	4	1	2	2	2 thru 4	2	13.1	20.5	8.46	5.36	1.5	1	NA	1
9683	CM.57468		Promontory Caves 1	42BO1	1	Promontory						Surface to two feet		1	5	1	1	2	5 thru 6	2	37.5	27.6	15.81	14.43	0.5	0.5	NA	1
11604	CM.21048		Promontory Caves 1	42BO1	1	Promontory								1	5	NA	NA	2	2 thru 4	2	3.7	25.1	9.6	11.58	1		NA	1
10331	CM.86726		Promontory Caves 1	42BO1	1	Promontory						Center of main trench, two feet		1	4	1	1	2	3	2	15.5	6.4	4.24	3.03	2	1	NA	NA
9687	CM.100412		Promontory Caves 1	42BO1	1	Promontory						Surface to two feet south side		1	4	1	1	2	2 thru 3	2	33.8	37.2	5.21	1.78	1.5	1	NA	1
9597	CM.25999		Promontory Caves 1	42BO1	1	Promontory						Near surface		1	2	1	1	2	2 thru 4	2	38.7	29.6	5.26	1.57	2	1	NA	1
9636	CM.56887		Promontory Caves 1	42BO1	1	Promontory						Surface and one foot south side		1	5	1	1	2	2 thru 3	2	18.9	3.5	5.98	2.33	1.5	1	NA	1
10472	CM.48968		Promontory Caves 1	42BO1	1	Promontory								1	4	1	3	4	2 thru 3	2 and 3	11.9	13.4	7.3	5.33	1	1	NA	1
10656	CM.52446		Promontory Caves 1	42BO1	1	Promontory								1	4	1	1	2	2	2	16.2	9.8	6.05	1.71	1.5	1	NA	1
AR4305			Promontory Caves 1	42BO1	1	Promontory								1	5	1	1	1	1 thru 2	2	6.6	8.1	4.51	4.24	1.5	1	NA	1
AR4306			Promontory Caves 1	42BO1	1	Promontory								1	4	1	1	2	2 thru 4	2	15.4	13.8	6.6	2.15	1.5	1	NA	1
9520	CM.99851		Promontory Caves 1	42BO1	1	Promontory								1	5	1	1	3	2 thru 3	3	10.2	18.8	4.16	2.41	2	1	2	1
10553	CM.112387		Promontory Caves 1	42BO1	1	Promontory						North side		1	4	1	1	2	2 thru 3	2	15.4	14.4	4.01	2.07	2.5	1	NA	2
11603.8	CM.133735		Promontory Caves 1	42BO1	1	Promontory						U53		3	5	1	1	2	2 thru 3	2	12	24.5	4.93	2.19	2	1	NA	2
9688	CM.53382		Promontory Caves 1	42BO1	1	Promontory						U53-- Surface to two feet		1	5	1	1	2	1 thru 3	2	4.7	10	6.58	2.12	1.5	1	NA	1
9635	CM.30731		Promontory Caves 1	42BO1	1	Promontory						U53-- Surface to two feet, south side		4	4	1	1	2	2	2	12.6	10.8	7.12	2.96	1.5	1	NA	NA
10761	CM.66921		Promontory Caves 1	42BO1	1	Promontory						U53-- Surface to two feet, south side		1	5	1	1	1	1 thru 2	2	6.9	10.8	4.81	3.74	2	1	2	NA
10764	CM.60780		Promontory Caves 1	42BO1	1	Promontory						U53-- Surface to two feet, south side		1	4	1	1	2	2 thru 4	2	39.7	33.4	7.1	1.66	1.5	1	1	1
AR4303	CM.53316		Promontory Caves 1	42BO1	1	Promontory						U53		1	5	1	1	2	2 thru 5	2	12.2	5.1	5.96	0.91	1.5	1	NA	NA
AR4307	CM.134898		Promontory Caves 1	42BO1	1	Promontory						U53		1	5	1	1	2	2 thru 3	2	8.3	53.3	6.4	2.01	1.5	1	4	1
9677	CM.142270		Promontory Caves 1	42BO1	1	Promontory						U53		1	4	1	1	5	2 thru 3	2	49.4	8.9	4.15	2.06	2.5	1	3	NA
9544	CM.117500		Promontory Caves 1	42BO1	1	Promontory						U53		1	3	1	1	2	2 thru 3	2	42.2	22.3	6.15	1.51	2	1	4	1
9672	CM.62509		Promontory Caves 1	42BO1	1	Promontory						U53-- Surface and two feet, south side		1	5	1	1	2	2 thru 4	2	20.1	42.8	8.65	3.96	1	1	NA	1
9672a			Promontory Caves 1	42BO1	1	Promontory								1	3	1	1	2	2 thru 4	2	6.9	25.6	5.06	1.89	2	1	NA	1
9672b			Promontory Caves 1	42BO1	1	Promontory								1	5	1	1	2	2 thru 3	2	21.7	15	7.12	2	2	1	NA	1
10490.1	CM.149830		Promontory Caves 1	42BO1	1	Promontory						U53-- Misc. surface		2	5	2	2	1	2	2	22.4	5.3	6.85	3.47	1.5	2	NA	NA
10409	CM.74342		Promontory Caves 2	42BO2	1	Promontory								1	4	1	1	2	3 thru 4	2	17	9.6	5.22	1.81	1.5	1	2, 4, 5	1
10394	CM.136387		Promontory Caves 2	42BO2	1	Promontory								4	5	NA	NA	1	NA	2	NA	4.7	NA	3.5	NA	NA	NA	NA
10414			Promontory Caves 1	42BO1	1	Promontory								1	3	1	1	1	2 thru 3	2	15.6	17.1	5.96	4.01	1.5	1	NA	NA
10415	CM.118334		Promontory Caves 2	42BO2	1	Promontory								1	4	1	1	3	2 thru 3	3	10.8	19.1	4.67	3.51	2	1	NA	1
AR 4304			Promontory Caves 1	42BO1	1	Promontory								1	5	1	1	1	2 thru 3	2	11	8	6.44	3.69	1.5	1	NA	NA

Knots used in Splicing	# of Splicing Knots Visible	Residue	Raw Warp Material	Raw Weft Material	Munsell Code (Warp)	Munsell Code (Weft)	Degree of Processing (Warp)	Degree of Processing (Weft)	Method of Starting	Selvage Type	Selvage	Length of Warp Truncation (cm)	Selvage Reinforcement	Side Selvage Type	Side Selvage	Knots Used in Side Selvage	Side Selvage Reinforcement	Mending	Knots used in Mending	Decoration	Notes
1	2	3	5	1	7.5YR 3/2	10YR 4/4	1	5		1	1	0.64						2			
		3	5	1	7.5YR 3/2	10YR 7/3	1	4							1	1		2			Possibly from 1252
		3	5	1	10YR 3/4	10YR 4/3	1	4		1	1	1.55			1	1		2			
1	3	3	5	1	10YR 4/4	10YR 6/3	1	3										2			
NA	NA	3	5	1	10YR 3/3	10YR 4/3	1	3		1	1	2.53						2			
NA	NA	3	5	1	2.5Y 3/3	2.5Y 3/3	1	4										2			
NA	NA	2	5	NA	10YR 5/6	NA	1	NA										2			
NA	NA	2	5	NA	10YR 4/4	NA	1	NA										2			
NA	NA	2	5	NA	10YR 4/4	NA	1	NA										2			
NA	NA	3	5	1	10YR 4/3	10YR 5/4	1	4		1	8	2						2			
NA	NA	3	3	3	10YR 3/2	10YR 3/2	3	4		1	6			1	1	1		2			
NA	NA	3	5	1	10YR 6/4	10YR 3/3	1	3						1	1	1		2			
NA	NA	3	5	5	10YR 4/2	10YR 4/2	1	4	5	1	1	3.4						1		1	
NA	NA	3	5	1	10YR 4/3	10YR 4/3	2	4		1	8	3.6		2	4	1		2			
NA	NA	3	5	5	10YR 4/3	10YR 4/3	1	1										2			
NA	NA	3	5	5	7.5YR 4/2	7.5YR 4/2	1	1		1	6	4.9		1	2						Since only truncated warps are present, length hasn't been recorded
NA	NA	3	5	5	7.5YR 4/1	7.5YR 4/2	1	1		1	6	3.1		1	2						Since only truncated warps are present, length hasn't been recorded
NA	NA	3	5	1	10YR?	10YR 6/4	1	5		1	9	1.6		1	5	1				2	
		3	NA	3		7.5YR 2.5/2		4						1	1	1					
NA	NA	2	5	5	7.5YR 5/8	7.5YR 5/8	2	2		1	5	0.9	1	1	5	1					
NA	NA	3	5	3	7.5YR 5/6	7.5YR 4/3	1	4		1	5, 8	4								3	Since only truncated warps are present, length hasn't been recorded
NA	NA	3	5	1	10YR 4/3	10YR 4/3	1	5		1	8	Not visible		2	5	1	1				
NA	NA	2	5	5	10YR 6/4	10YR 6/4	1	1													
NA	NA	3	5	5	10YR 4/3	10YR 4/3	1	1	5					1	3						
NA	NA	2	5	5	7.5YR 5/6	7.5YR 5/6	1	1		1	6	Too fragmented		1	3						
NA	NA	2	5	5	7.5YR 4/3	7.5YR 4/3	1	1													
NA	NA	2	5	5	7.5YR 4/2	7.5YR 4/2	1	1													
NA	NA	3	5	1	10YR 6/4	10YR 5/4	2	5						1	5	1		1	1, 2		Mending of stitched hide strips and an expedient weft of 2zS cord
NA	NA	2	5	1	10YR 7/8	10YR 7/4	1	3		1	5	1.3	2	1	1	1	1				
NA	NA	3	5	1	7.5YR 4/2	7.5YR 4/3	1	4						1	5	1					
NA	NA	2	5	5	7.5YR 5/4	7.5YR 5/4	1	1												1	
NA	NA	2	5	1	7.5YR 4/3	10YR 3/6	1	5						1	3						
NA	NA	2	5	5	10YR 4/2	10YR 4/2	1	1													
NA	NA	3	5	1	10YR 5/2	7.5YR 4/4	1	5													
NA	NA	3	5	5	7.5YR 4/2	7.5YR 4/2	1	2		1	8	2.4	3	1	1	1					Bast fibre row of weft twining at the end selvage
1	1	3	5	1	10YR 4/3	10YR 4/3	1	5													
1	5	3	5	5	10YR 4/3	10YR 4/3	1	2						1	3			1			Bottom encased in antelope hide stitched with sinew thread ending in an overhand knot
NA	NA	3	5	1	10YR 5/6	10YR 4/3	1	3		1	7	2.5		1	2						
NA	NA	2	6	6	7.5YR 2/4	7.5YR 2/4	1	1		1	10			1	3						Final warp on side opposite continuous weft loops around terminal weft
NA	NA	2	5	5	10YR 4/2	10YR 4/2	2	2		1	6	1.4									
NA	NA	3	5	1	10YR 3/4	10YR 4/4	1	5		1	8	4.1		2	6	1, 2		1	1, 2		
NA	NA	2	5	1	10YR 5/6	10YR 4/2	1	5										1			Mending done with stitched tule
NA	NA	3	5	1	10YR 3/2	10YR 5/4	2	5										1	1, 2		
NA	NA	2	5	5	10YR 3/2	10YR 3/2	1	2						1	1, 2	1					
NA	NA	3	5	1	10YR 5/6	10YR 4/4	1	5						1	3			1			Mending done with stitched tule
NA	NA	3	5	1	10YR 3/2	10YR 4/4	1	5		1	7	3.5		1	5	1					
NA	NA	2	5	1	10YR 6/6	10YR 6/4	1	4						1	1	1					
NA	NA	2	5	1	10YR 4/2	10YR 4/2	1	5						1	5	1					
NA	NA	3	6	7	2.5Y 8/4	2.5Y 8/4	1	2		2	11			1	2						Burned at one end
NA	NA	3	5	1	10YR 3/4	10YR 3/4	1	5													
NA	NA	2	NA	5		10YR 4/2		1													Found with sewn mat fragment, unclear if part of selvage or mend
NA	NA	2	5	5	10YR 4/2	10YR 4/2	1	1													
NA	NA	3	5	5, 1	10YR 4/2	10YR 4/2, 2.5Y 6/2	2	2, 5		1	7	2	4								Terminal, reinforcing weft of bast fibre
NA	NA	2	5	5	10YR 4/2	10YR 4/2	1	1													

Sewn and Twined Textiles

FS #	NHMU #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation
10322	CM.148300	a	Promontory Caves 1	42BO1	1	Promontory
10322	CM.148300	b	Promontory Caves 1	42BO1	1	Promontory
10394	CM.136387	b	Promontory Caves 2	42BO2	1	Promontory

Context Comments	Construction Form	Wear	Taper	Structural Class	# of Plies	Ply Formula
Under 1st floor level	2	4	1	1	2	4
Under 1st floor level	2	4	1	1	2	4
	2	4	1	1	2	3

Final Twist	Initial Spin	Tightness Twist	Length (cm)	Avg. Cord Dia. (mm)	Avg. Strand Dia. (mm)
2	1	3	27.6	3.29	2.25
2	1	3	15.1	3.76	2.23
1	2	3	65	2.37	1.76

Warp Length (cm)	Avg. Warp Dia. (mm)	Avg. Twists per cm	Splice Type	Residue
		2	2	3
		1.5	2	3
7.8	5.62	2	2	2

Raw Warp Material	Raw Material	Munsell Code	Degree of Processing	Knot 1
8	1	10YR 4/4	5, 1	1
8	1	10YR 4/4	5, 1	
8	1	10YR 4/4, 10YR 2/1	5, 1	1

Distance Between Knots and Ends (cm)	Distance between warps and ends (cm)	Free Ends #
10.8, 16.8		2
0		1
0	2.5; 8.2; 1; 1.8; 28.5; 30.9	2

Coiled Textiles

FS #	UMNH #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Feat. #	in Feat. #	Northing	Easting	Meters Below Datum	Context Comments	Excav. Date	Wear
1098	A.2013.8		Promontory Cave 1	42BO1	1	Promontory	F43	F3	90.28	99.5	2.05		5/11/2013	3
1882	A.2011.18		Promontory Cave 1	42BO1	1	Promontory	F7	F3	91	99	1.42-1.52	N 1/2, from FS 26	4/12/2011	5
1698	A.2015.12	b	Promontory Cave 1	42BO1	4	Promontory	F77	F55 in F54	95	98	2.33-2.85	Level 4	5/16/2014	5
9659	CM.56581		Promontory Cave 1	42BO1	1	Promontory						U53-- Surface and one foot south side		3
9654	CM.4144		Promontory Cave 1	42BO1	1	Promontory						U53-- Surface and one foot south side		4
11604.2	CM.104227		Promontory Cave 1	42BO1	1	Promontory						U53		4
AR008	CM.36551		Promontory Cave 1	42BO1	1	Promontory						U53		4
10609	CM.141969		Promontory Cave 1	42BO1	1	Promontory								4
11604.4	CM.14140		Promontory Cave 1	42BO1	1	Promontory								5
10377.1	CM.84003		Promontory Cave 1	42BO1	1	Promontory								5
11086	CM.59409		Promontory Cave 2	42BO2	1	Promontory								5
AR009	CM.99364		Promontory Cave 2	42BO1	1	Promontory								4
93			Promontory Cave 3	42BO2	1	Promontory	F20	F3	104	91	1.94-1.97		4/14/2011	4

Open vs Close	Coil Foundation Elements	Coil Foundation Arrangement	Stitch Type	Interlocking vs Non-interlocking	Stitch Slant	Foundation Split by Stitches?	Work Surface	Length (cm)	Width (cm)	Avg. Coil Dia. (mm)
2	4	3	1	2	2		1	1.8	15.8	4.00
2	4	3	1	2	2		1	5.4	NA	8.13
	3*	3	1	2	2		NA	9.4	NA	NA
2	4	3	1	2	2	2	1	5	9.5	3.47
2	2	1	1	1	2	1	1	3.8	8.2	2.73
2	7	1	1	1	2	1	1	3.4	5	2.52
2	4	3	1	2	2	2	1	38cm diameter	NA	3.74
2	2	1	1	1	2	2	1	3.2	7.3	2.37
2	4	3	1	2	2	2	NA	1.4	6.4	4.08
2	2	1	1	1	2	2	NA	1.6	10.4	3.06
2	4	3	1	3	2	2	1	7.5	7.5	3.90
2	2	1	1	1	1	1	1	3.7	3.7	2.17
2	3?	1	1	NA	2		NA	5.6		7.08

Avg. Stitch Dia. (mm)	Avg. Coils per cm	Avg. Stitches per cm	Avg. Stitch Gap (mm)	Avg. Frequency of Accidental Split Stitches per 5 cm of coil (Work Surface)	Avg. Frequency of Accidental Split Stitches per 5 cm of coil (Non-work Surface)	Fag Splice Type	Moving Splice Type	Residue	Raw Coil Material	Raw Stitch Material
1.62	2.50	5.00	0.00	0.50	3.50			3	3, 1	1
2.26	NA	3.00	0.00	NA	NA	1	2	3	3, 1	1
5.50	NA	NA	NA	NA	NA			3	1	1
2.46	3.00	3.50	0.00	4.50	4.00	2	1	2	3, 1	1
2.68	4.00	4.00	0.60	0.00	1.00	3	1	3	3	1
2.55	3.00	3.50	0.77	0.50	1.00	3	2	2	3	1
2.12	2.50	4.00	0.00	2.00	4.00	1	1	3	3, 1	1
2.48	4.00	4.00	0.00	0.00	0.00			3	3	1
2.91	2.00	3.00	0.00	0.00	3.00			3	3, 1	1
2.98	3.00	3.00	0.00	0.00	2.00		2	3	3	1
2.55	2.00	3.00	0.00	NA (all broken stitches)	8.00			3	3	1
2.62	3.50	3.50	0.00	0.00	0.00			3	3	1
1.18	NA	3.50	0.00	NA	NA			3	1	5

Munsell Code (Coil)	Munsell Code (Stitch)	Degree of Processing (Coil)	Degree of Processing (Stitch)	Foundation Splice	Method of Starting	Reinforcing Stitches?	Rim	Mending	Mend Type	Charring	Notes
2.5Y 5/4 and 2.5Y 4/3	2.5Y 4/3	1, 5	3					1	1		
2.5Y 7/4 and 10YR 5/2	10YR 5/2	1, 5	3					2		1	
	10YR 5/3	5	3								foundation all but disappeared, bundle is left but gap suggests presence of rod or half-rod
10YR 3/4 and 10YR 4/4	10YR 4/4	1, 5	3				1				
10YR 3/2	10YR 5/4	2	3	1							
10YR 6/4	10YR 6/4	2	3								
10YR 3/2 and 10YR 3/4	10YR 3/4	1, 5	3				1	1	1		Bison hair, salts, other fibres matted to surface
10YR 4/2	10YR 4/2	1	3				2				Lots of residue on concave surface
10YR 4/2	10YR 6/4	1, 5	3				1				
10YR 5/4	10YR 6/4	1	3								Lots of salt deposits on one surface, heavily worn as if for grinding
10YR 3/2	10YR 3/2	1	3	1	1	1					Center reinforcing stitches S-slanted
10YR 5/4	10YR 5/4	1	3		1	1					
NA	10YR 6/3	NA	2		1	1		1	2		Possible coiled basket center, reinforcing stitches S-slanted

Plaited Textiles

FS #	UMNH #	PAL #	Site Name	Site Number	Qty	Cultural Affiliation	Context Comments	Construction Form	Wear	Simple vs Twilled	Number of Warp Elements in One Unit	Number of Weft Elements in One Unit	Length (following warps) (cm)	Width (following wefts) (cm)	Avg. Warp Dia. (mm)	Avg. Weft Dia. (mm)	Avg. Warps per cm	Avg. Wefts per cm	Warp Splice Type	Weft Splice Type	Knots used in Splicing	# of Splicing Knots Visible	Residue	Raw Warp Material	Raw Weft Material	Munsell Code (Warp)	Munsell Code (Weft)	Degree of Processing (Warp)	Degree of Processing (Weft)	Identifiable Center	Selvage	Selvage Reinforcement Type	Side Selvage	Mendin g
10555	CM.43350		Promontory Caves 1	42BO1	1	Promontory	North side	3	4	1	1	1	21.3	8	2.89	5.54	4.5	1	NA	NA	NA	NA	3	3	1	10YR 4/3	10YR 4/3	3	5	1	2	1	1	2
9660	CM.48202	a	Promontory Caves 1	42BO1	1	Promontory	Surface and one foot south side	3	4	1	1	1	16.6	4.5	4.57	4.18	2	2	NA	4	NA	NA	2	3	3	10YR 4/3	10YR 4/3	3	3	1	2	1	1	2
11603.3a	CM.27687		Promontory Caves 1	42BO1	1	Promontory		3	4	1	1	1	25.5	8.7	3.27	5.55	4	1	NA	NA	NA	NA	3	3	1	10YR 4/3	10YR 4/3	3	5	1	2	1	1	2