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Darby C. Stapp
Journal of Northwest Anthropology
P.O. Box 1721
Richland, WA 99352-1721

telephone (509) 554-0441
e-mail dstapp@pocketinet.com
website www.northwestanthropology.com

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MODELING PRECONTACT LAND-USE IN THE DALLES: SITE TYPES, ASSEMBLAGE STRUCTURE, AND DATA ADEQUACY

Paul S. Solimano and Daniel M. Gilmour

ABSTRACT

After nearly a century of excavation around The Dalles, Oregon, archaeologists lack a basic understanding of the area's precontact chronology, settlement, subsistence or technological organization. In this article we compare quantitative and qualitative data from pre- and post-dam archaeological excavations to three dimensions of hunter-gather land-use: site function, subsistence, and lithic tool diversity. Results suggest before about 3,500 years ago, land-use was dominated by residential mobility and a generalized diet. After 3,500 years ago, land-use became more logistically organized. Substantial and temporary structures appear about 2,000 years ago at the earliest and possibly around 1,100 years ago. Subsistence remained diverse. Intensive occupations at 46-KL-26 between 1,100 and 500 years ago may mark the most logistically organized and hence socially complex precontact period in The Dalles area.

Introduction

The stretch of the Columbia River around The Dalles, Oregon, holds a special position in Pacific Northwest anthropology. Before twentieth-century hydropower development, the Columbia River was recognized as one of the greatest salmon-producing rivers in the world (Northwest Power Planning Council 2000; Butler and O'Connor 2004), with the ten-mile stretch between The Dalles and the mouth of the Deschutes River constituting a foremost precontact Native fishery (Netboy 1980; Butler and O'Connor 2004) (Fig. 1). Ethnographic and ethnohistoric accounts detail large, dense populations, villages, and complex seasonal movements (Wilkes 1844; DeSmet 1978; Moulton 1991; Stern 1998). Records show the area was the center of an extensive travel and trade network connecting people from as far away as the Pacific coast, Canada, California, and the Bitterroot Mountains (Anastasio 1972; Hayden and Schulting 1997; Stern 1998). Intensive fishing with complex systems of rights and access is also documented

(Spier and Sapir 1930; French 1961; Boyd 1996; French and French 1998). Ninety years of archaeological work, albeit with varying degrees of professionalism, has revealed numerous large, dense sites with deposits spanning the Holocene and containing some of the most extraordinary precontact material culture known on the Columbia Plateau (Minor 1988a, 1988b).

As a result, Northwest archaeologists have generally viewed The Dalles area as having some of the most complex cultural systems on the Plateau during the precontact period (Minor 1988b, Minor 1988c; Butler 1993; Hayden and Schulting 1997; Ames et al. 1998; Minor 2013). Minor (1988c:76) succinctly expresses the common view among archaeologists when he states:

If the assumption is accepted that elaboration in material culture in the form of wealth items, mortuary goods, and portable and [*sic*] rock art are intimately associated with social organization and ideological systems, then the level of cultural complexity in the Dalles-Deschutes area was higher than in any other area of the Columbia Plateau in prehistoric times, perhaps rivaling the classic cultures of the Northwest Coast.

Despite this special place in the region and a large number of recorded sites, numerous and sometimes vast excavations, and staggering numbers of collected artifacts, our understanding of precontact settlement and subsistence for The Dalles area remains nearly non-existent. Select archaeological information has been used for regional studies (e.g., Hayden and Schulting 1997;

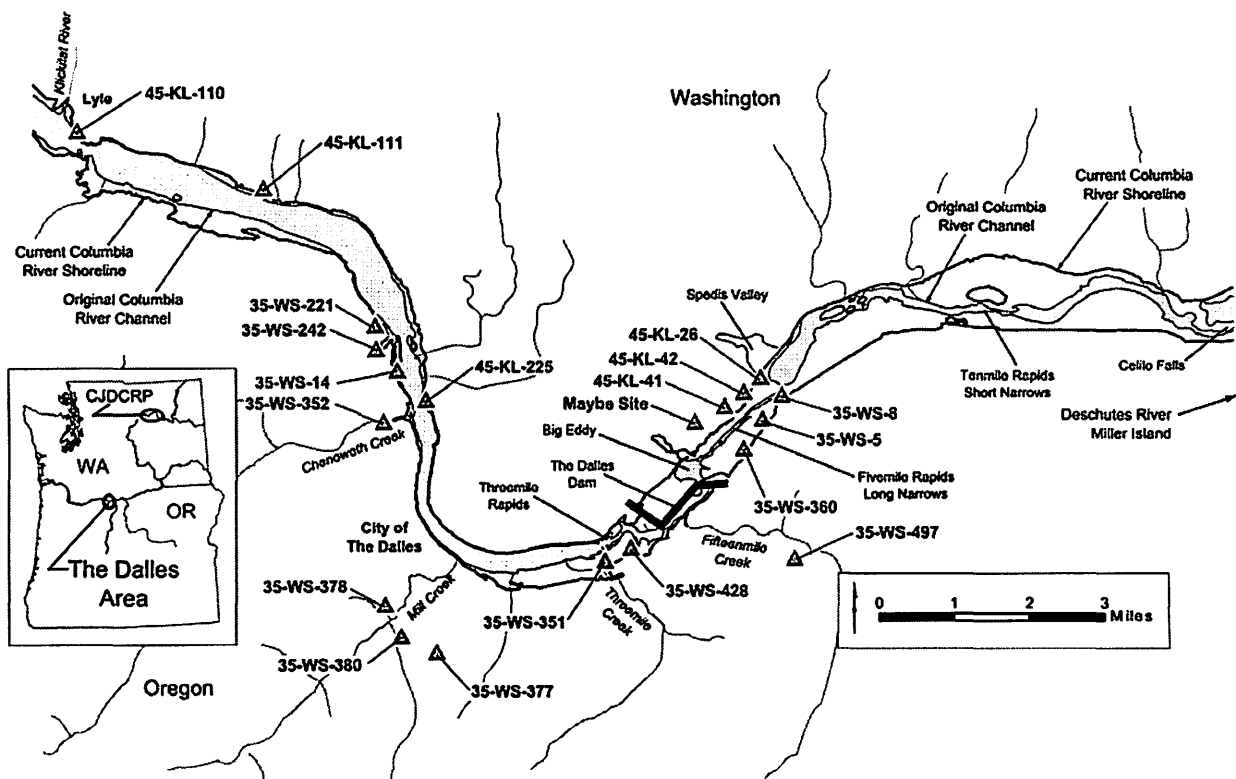


Fig. 1. Configuration of The Dalles area, showing site locations and areas discussed in the text.

Minor 2013), but archaeologists lack a usable, local chronological framework for the area. Descriptions of precontact mobility and social organization are unknown. Aside from evidence of fishing about 9,000 years ago and intensive fishing at contact, our grasp of precontact subsistence practices is superficial at best. Overall, archaeologists' knowledge of The Dalles area prehistory beyond the ethnographic period consists almost exclusively of information inferred from nearby areas (Schalk 1980; Dumond and Minor 1983; Endzweig 1994; Atwell et al. 1995; Schalk et al. 1995; Jenkins and Connolly 1996; Connolly 1999); combined with a few, disconnected (albeit important and fascinating), and often repeated particulars, linked by a broad web of conjecture and assumption.

Reasons for this ignorance are manifold. The quality of work prior to completion of The Dalles Dam in 1957 is a major factor, with coarse, inexact field methods and particularistic, highly selective reporting. Post-dam archaeological work, which is generally more rigorous, also has shortcomings, some of which result from the nature of compliance archaeology: limited-scale evaluative test excavations as opposed to larger-scale data recovery and work focused on smaller, sparser sites away from the Columbia mainstem. Despite these structural issues, two additional problems with more recent archaeological work are obvious. First, compliance archaeological work in The Dalles area lacks a coherent research framework. Pre-dam work suffered from a range of problems, but most was undertaken with certain aims in mind, while the archaeological goals of most compliance work are unclear. That is, much compliance work focuses on collecting and describing data, but displays little interest in how that data could be used. Second, pre- and post-dam archaeological work is not truly integrated. Rather, recent archaeological work relies almost entirely on highly generalized summaries of earlier work, with important facts culled and presented in isolation.

We maintain integrating pre- and post-dam archaeological work into some type of coherent research framework is paramount to actually beginning to understand the precontact period in The Dalles area beyond an intuitive level. In this article, we synthesize older and more recent work to organize what we currently know about The Dalles area archaeologically and provide a structure for future archaeological research. This article presents an analysis of quantitative and qualitative data from archaeological excavation projects in the area. The data are compared to three dimensions of hunter-gather land-use: site function, subsistence, and lithic tool diversity, and is used as the basis for a diachronic model of precontact land-use for The Dalles vicinity.

This article does not completely review archaeological work in The Dalles area. The reader is directed to Minor 1988a and 1988b for comprehensive and invaluable reviews of local archaeological work. This article also does not make use of the area's rich ethnographic record (e.g., Boyd 1996). There are two reasons for this. First, a primary goal of this effort is to focus on and maximize the use of an underused and underexplored data set: the area's archaeological record. Second, archaeological and ethnographic information can be complimentary, but are in fact different types of data (Ames 1991; Campbell 1991; Dewar and McBride 1992). As such, ethnohistoric and archaeological data can often most profitably focus on different types of questions, at different scales. Concentrating solely on archaeological data likely obscures some precontact variability, but archaeology should provide unique insights into the past that are unobtainable from other sources.

This article is tightly focused on a ca. 15-mile long, 2-mile wide section of the Columbia mainstem and touches only briefly on the broader Columbia Plateau. This study area is a tactical unit, delineated pragmatically based on where archaeological work has occurred around The Dalles combined with the desire to incorporate information from less well-known sites and pry more specific information from the better known excavations. The archaeological materials discussed are clearly parts of substantially larger cultural systems described by others (Schalk

1980; Endzweig 1994; Jenkins and Connolly 1994; Schalk et al. 1995; Jenkins and Connolly 1996; Ames et al. 1998), but as this study necessitated collecting and collating vast amounts of often ignored data of varying quality and completeness, we focused on what is widely thought by archaeologists to be the pivotal area in this region because of the importance of The Dalles fishery.

Local Archaeological Research

Our knowledge of The Dalles area's precontact period is based almost exclusively on work done before completion of The Dalles Dam in 1957. This work, however, has extensive shortcomings. Archaeologists focused on the more visible sites along the river, displaying little interest in sites without houses, thick deposits, or burials. Financial support was inadequate and field time limited before rising reservoirs inundated sites. Moreover, archaeologists regularly competed with local looters to find and dig sites, often with little success (R. Butler 1958, 1959; V. L. Butler 2007). Many site descriptions are based on brief site visits by professionals, examination of looter pits or amateur excavations, discussions with collectors and cursory study of their collections (Butler 1959). Reporting of professional archaeological excavations are also sporadic and vague. Excavations are often inadequately mapped, stratigraphic profiles not clearly illustrated and material culture described in a highly selective manner. Poor reporting was a result of insufficient funding, but also represents the ethos of much early archaeological work (Lohse and Sprague 1998; Butler 2007). As a result, most of what is known about the area's prehistory is based on nominal scale descriptions of highly select material culture categories from a small number of large, residential sites or burial/cremation sites.

Also problematic is basic research oriented around a straightforward connection seen between ethnicity and archaeology. That is, these early archaeologists generally accepted the notion that most facets of material culture are closely tied to the vague and imprecise concept of ethnicity or more commonly ethnolinguistic groups (Hughes 1992, 1994). A simplistic use of diffusion and migration as the dominant explanatory framework (e.g., Butler 1959; Nelson 1969) combined with a view of the Plateau as a receiver of culture from surrounding areas (e.g., Ray 1939) and a perceived short time depth for human occupation of the area, severely limited investigation into the *in situ* development of cultural forms (Schalk 1983).

Poor dating is one of the dominant problems for The Dalles area archaeology, impacting nearly every other aspect of archaeological research. Chronological frameworks have been proposed to structure local archaeology (Butler 1959; Cressman 1960; Minor 1988b) but overly broad time periods and loose temporal control limit their usefulness except as very general organizational constructs. Cressman's (1960) Late Period, for example, covers the last 6,000 years of prehistory. Minor's (1988b) synthesis uses generalized temporal periods common for the region; but suffers from a lack of temporal resolution. Most sites lack firm chronological control and many are simply not dated at all. Radiocarbon dates are rare, although the known dates span much of the Holocene. Obsidian hydration has been used at local sites (e.g., Ogle et al. 2007; Dryden 2010a, 2010b), although local hydration rates have not been widely tested. No projectile point chronology exists specifically for The Dalles area. Recent work has usually relied on the Wildcat Canyon typology (Dumond and Minor 1983), which—while well done—is site-specific and has not been tested or refined over a larger area. A minority of recent work has used Pettigrew et al.'s (1995) point typology for north-central Oregon, or Lohse's (1985) for the Middle Columbia, but many archaeologists simply ignore projectile point types all together.

Research Framework

A prominent trend on the Columbia Plateau over the past 25 years is a focus on explicitly describing and explaining temporal and spatial variability in hunter-gatherer land-use systems (e.g., Campbell 1985; Ames 1988; Endzweig 1994; Prentiss et al. 2005). Land-use is an organizing concept describing a cultural system's strategies for interacting with its physical and cultural environment (Draper 1988; Schalk et al. 1994; Schalk et al. 1995; Bettinger 2001). Importantly land-use studies recognize mobility as a dominant constraint in the strategies employed in those systems (Shott 1986; Ames 1988; Nelson 1991; Kelly 1992; Schalk et al. 1994; Ames 2000). At its most basic level, mobility is related to the frequency a group's primary residence is moved and can be heuristically divided into two types: residential and logistical (Binford 1980; Schalk et al. 1994). In residentially mobile, highly mobile or forager systems, the primary residence moves regularly, resources are procured as needed and little evidence for storage or structures are found. In low mobility, logistically organized or collector systems, the primary residence is not moved or moved infrequently. Rather, movement is logistical. That is, the primary residence site is relatively permanent and usually occupied by some segment of the group. Subsets or task groups move temporarily to specific locales, where resources may be procured and processed and returned to the residence site. Resource use is more targeted and structures more common. Storage is of paramount importance.

At its simplest, Northwest archaeological research focuses on the change from small and relatively sparse populations practicing a residentially mobile foraging strategy in the Early Holocene to large, densely packed, sedentary and logistically organized, socially complex communities with extensive food storage, found in the Late Holocene (Ames and Marshall 1980; Schalk 1980; Schalk and Cleveland 1983; Campbell 1985; Chatters 1987; Meate 1990; Ames 1991; Endzweig 1994; Schalk et al. 1994; Atwell et al. 1995; Chatters 1995; Schalk et al. 1995; Jenkins and Connolly 1996; Ames et al. 1998; Burtchard and Hamilton 1998; Ames 2000; Prentiss and Chatters 2003; Prentiss et al. 2005). Research examines how both residential and logistically mobile systems operated and organized themselves, but also focuses on how and why contemporaneous systems differed across space. That is, extensive variation is found among land-use systems that are broadly similar (e.g., residentially mobile).

For example, on the Middle Columbia, researchers found generalized diets and lithic assemblages strongly reminiscent of residential mobility between 5,100 and 4,000 years ago in association with semi-subterranean pithouses, which are usually associated with more sedentary, logistically mobile groups (Campbell 1985). Additionally, while sedentary or semi-sedentary, logistically organized systems appear over most of the Plateau after about 3,800 years ago, these systems differ in dramatic, if poorly understood ways (Schalk et al. 1983; Endzweig 1994; Schalk et al. 1994; Jenkins and Connolly 1996; Ames et al. 1998; Prentiss et al. 2005). Sites with dozens of house depressions are found on the Columbia mainstem (Schalk et al. 1983), but also are present 50 miles up tributary rivers (Jenkins and Connolly 1996). Ames (2012) suggests that many large, Late Holocene villages may have been occupied for much shorter durations than suspected, positing more episodes of population aggregation and dispersal than previously thought. Subsistence, especially during the Later Holocene is particularly variable. Some systems are heavily reliant on fish, while others may be more dependent on roots (Ames and Marshall 1980; Endzweig 1994; Jenkins and Connolly 1996) or terrestrial animals, while others use a fairly wide range of food resources (Butler and Campbell 2004).

Archaeologists approach this variation by organizing the study of land-use into dimensions or sub-strategies (Chatters 1987). These dimensions are discriminated by differences in modes of

archaeological materials and commonly include demography/houses (number of sites, components, presence of houses and size, shape, construction, and occupation history of houses), functional differentiation among sites (site types), subsistence (diet breadth, seasonality), storage, and technological organization (tool diversity, tool types, reduction sequences) (Chatters 1986, 1987; Schalk et al. 1994; Prentiss et al. 2005). Dimensions are highly interdependent with variation in one dimension influencing aspects of another dimension, but for analytical purposes are treated discreetly. Our review of the archaeological data for The Dalles area suggests the dimensions of site type, houses, subsistence, and technological organization can be investigated with the available data. For this study, site types and houses are treated together. The potential archaeological signatures or modes expected for these land-use dimensions are presented in Table 1 and discussed below. These modes are derived from a wide range of regional literature (Campbell 1985; Chatters 1987; Ames 1988; Ames 1994; Schalk et al. 1994; Chatters 1995; Burtchard and Hamilton 1998; Bevill et al. 1999).

TABLE 1. POTENTIAL MODES FOR THE LAND-USE DIMENSIONS USED IN THIS STUDY.

Dimension		Modes	Type of Mobility Associated
Site Types	Functional Type	Sites will be highly variable, but little functional patterning evident among sites.	Residential
		Sites will exhibit well-defined functional patterning among sites.	Logistical
	Presence	Absent or rare.	Residential
		Common.	Logistical
	Houses	Lightweight construction (e.g., mat lodges).	Both
		Substantial construction (e.g., plankhouse, pithouse).	Both
	Re-use	Little re-use or reoccupation.	Residential
		High re-use or reoccupation.	Logistical
Subsistence	Generalized diet (richer more even).	Residential	
	Specialized/focal diet (less rich, more uneven).	Logistical	
Technology	Assemblages do not separate into types.	Residential	
	Assemblages separate into types.	Logistical	
	Content (types and proportions of different tool classes).	N/A	

Data Collection

We reviewed archaeological reports for sites along the Columbia River, between the Klickitat River and Tenmile Rapids (see Fig. 1). The goals of the review were to determine if (1) some type of excavation had occurred; (2) the excavations were large enough in scale to warrant

inclusion in this analysis, and (3) the excavation data were reported sufficiently. Excavations were considered large enough if units larger than simple shovel probes had been excavated. A total of 20 sites were identified where excavations were both sufficiently large and reported. From these 20 sites, 25 vertically or horizontally discrete assemblages were defined. The basic suite of data collected for each assemblage is shown in the header of Table 2. Many excavation reports lacked quantitative data or presented data in a manner that was simply too difficult to tabulate in a meaningful manner. In these cases, information was collected in ordinal terms such as “many” or “small” (Table 2). Data were usually recorded as reported by the original researchers. Volume and area excavated were estimated (if possible) using maps and stratigraphic profiles when the information was not reported clearly by the original researcher.

Assemblage age as reported by the original researcher was recorded, but often the provided ages were confusing and unclear. Ages were checked, when possible, by examining excavation profiles and radiocarbon dates. When the original researchers dated an assemblage by projectile points, these ages were recorded, but if the points were illustrated, point type assignments were checked using Pettigrew et al. (1995). Overall, assemblage ages used here are the best estimation based on reported and retyped projectile point styles, radiocarbon dates or stratigraphic position.

Of the 25 discrete assemblages identified for this project, only 16 could be placed within relatively narrow temporal periods (Table 2). The remaining assemblages have no chronological data or only evidence for very broad time spans (e.g., 7,500 to 1,500 years ago). To identify meaningful patterns in the data, assemblages that could be placed into relatively discrete time periods were also grouped into two temporal analytical units: assemblages that likely date to before about 3,500 years ago and those that date to after approximately 3,500 years ago. The ca. 3,500 separation is largely driven by projectile point styles. Note that most Post-3,500 B.P. assemblages probably post-date 2,000 years ago. While it was not our intent, this temporal framework equates roughly to those recently employed by Minor (2013) in his investigation of exotic obsidian in The Dalles area.

All data were entered into Excel for organization and basic structuring, and then exported to SPSS, Version 17, for analysis.

Assigning Site Types

The distribution of functionally classified sites and the presence of houses can provide insight into the structure of a land-use system. Residentially mobile systems will exhibit less patterning or functional differentiation among sites. Sites will be residential in character, but because sites are positioned to obtain locally or seasonally available resources, site content can be highly variable depending on the targeted resources. As residential mobility decreases and is replaced by logistical mobility, functional differentiation among sites should increase, with residential and task-specific sites found. As logistical mobility and occupational redundancy increases, site function may become even more consistently differentiated, with clearly special purposed sites appearing.

Houses can range along a continuum from lightweight construction (e.g., mat lodges) to more substantial construction (e.g., plankhouse, pithouse, semi-subterranean). Archaeologists have generally viewed the level of construction as a proxy for occupation permanence, with longer occupation at a site allowing for increased investment in construction and hence more substantial houses. Sites in residentially mobile systems are generally occupied for shorter durations, thus when found, houses will probably represent temporary dwellings with limited evidence for reuse. As residential mobility decreases and is replaced by logistical mobility, primary residence locales become more permanent elements of the land-use system, occupied for longer periods of time.

TABLE 2. ARCHAEOLOGICAL SITES INCLUDED IN THE STUDY.

Site		Excavation			Lithics			Features ^b			Age ^c		Faunal		References
No.	Name	Work Type ^a	Area (m ²)	Volume (m ³)	Total Tools	Total Classes	Points Cnt	Non-Res	Res	Site Type	Age	TU	Non-fish Faunal	Fish	
35-WS-377		Eval	1	1	0	0	0	No	No	3	Precontact		No	No	Wilt et al. 2004, Finley et al. 2003
35-WS-378		Eval	2	2	2	2	0	No	No	3	Precontact		No	No	Wilt et al. 2004, Finley et al. 2003
35-WS-380		Eval	1	1	2	2	0	No	No	3	Precontact		No	No	Wilt et al. 2004, Finley et al. 2003
35-WS-352	Chenoweth Creek	DR	6	4	4	3	2	No	No	3	5,000 to 4,000	Pre	Yes	No	Ozbun and Fagan 2003
45-KL-225	Old Building	Eval	4	12	4	3	2	Yes	Yes	1	2,000-0	Post	Yes	Yes	Cole 1974
35-WS-360	None	Eval	4	2	13	4	3	No	No	3	8,000 to 3,500	Pre	Yes	No	Winterhoff and Cabebe 2006
35-WS-242		DA	0	0	15	6	2	No	No	3	2,000-0	Post	Yes	Yes	Minor 2003; Minor and Beckham 1991
35-WS-497	Byers	Eval	3	4	15	6	6	No	No	3	8,000 to 3,500	Pre	No	No	Dryden 2010a, 2010b
45-KL-111 (MH)	Friendly Village	Eval	4	4	23	5	1	No	No	3	8,000 to 3,500	Pre		No	Juell 2000
35-WS-14 (Str A)	The Bad Place	Eval	8	15	24	9	6	No	No	3	3,500-0	Post	Yes	Yes	Minor 1992
35-WS-428		Eval	1	1	33	7	1	No	No	3	Precontact		Yes	No	Ogle et al. 2007
45-KL-111 (LH)	Friendly Village	Eval	16	14	41	6	10	Yes	No	2	2,000-0	Post	Yes	Yes	Cole 1974; Schalk et al. 1997
35-WS-221 (Area D)		DA	0	0	47	8	10	No	No	3	Precontact		Yes	Yes	Minor 2003; Minor and Beckham 1991; Minor and Hemphill 1990
35-WS-14 (Str B)	The Bad Place	Eval	6	3	129	11	39	Yes	No	2	3,500-0	Post	Yes	Yes	Minor 1992
45-KL-110	Lyle	Eval	3	5	146	10	5	No	No	2	8,000 to 3,500	Pre	No	No	Cole 1974
35-WS-351		Eval	6	5	716	10	129	Yes	No	2	Post 5,000 BP	Pre	Yes	No	Ogle et al. 2007
35-WS-5		Large	58	100	1300	11	800	Yes	No	2	2,000-0	Post	Yes	Yes	Shiner 1953
35-WS-1 / 8	Fivemile Rapid/Roadcut	Large	Large	Large	Many	Many	Unk	Yes	No	2	9,000-6,000	Pre	Yes	Yes	Cressman 1960

TABLE 2. ARCHAEOLOGICAL SITES INCLUDED IN THE STUDY (CONT.).

Site		Excavation			Lithics			Features ^b			Age ^c		Faunal		References
No.	Name	Work Type ^a	Area (m2)	Volume (m3)	Total Tools	Total Classes	Points Cnt	Non-Res	Res	Site Type	Age	TU	Non-fish Faunal	Fish	
45-KL-26	Wakemap	Large	Large	Large	Many	Many	Unk	Yes	Yes	1	2,000-0	Post	Yes	Yes	Strong, Schenck and Steward 1930; Caldwell 1956; Butler 1958
45-KL-41 (I)	Congdon	Amat	Large	Large	Many	Many	Unk	Unk	Unk	2	7,500-1,500		No	No	Butler 1959
45-KL-41 (II)	Congdon	Amat	Large	Large	Many	Many	Unk	Unk	No	2	7,500-1,500		No	No	Butler 1959
45-KL-42 (I)	Indian Well	Amat	Large	Large	Many	Many	Unk	No	No	3	8,000 to 3,500	Pre	No	No	Butler 1959
45-KL-42 (II)	Indian Well	Amat	Large	Large	Many	Many	Unk	No	No	3	2,000-0	Post	No	No	Butler 1959
Maybe Site (I)	Maybe	Amat	Large	Large	Many	Many	Unk	Unk	No	2	7,500-1,500		No	No	Butler 1959
Maybe Site (II)	Maybe	Amat	Large	Large	Many	Many	Unk	Unk	No	2	7,500-1,500		No	No	Butler 1959

^a Work Type: Eval = Evaluative testing; DR = Data recovery; DA = Damage assessment; Large = Large-scale research excavation; Amat = Amateur excavations.

^b Features: Non-Res = Non-residential features; Res = Residential features; Site Type = See methods section.

^c Age: Age = Years B.P.; TU (Temporal Unit): Pre and Post-3,500 B.P.

Houses at these primary residence sites will have more substantial construction and possibly be semi-subterranean. They may also have evidence for reuse. As increased logistical mobility can result in functional differentiation among sites, short-term residential occupation away from the primary residence can also occur. As the occupation is temporary, seasonal or task-specific, limited investment in houses (if any) will result in structures of more lightweight construction and limited reuse.

Assemblages used in this study were classified based on the presence of different types of features (Table 3). Classifying assemblages based on features is preferred for The Dalles area, as features are the best, most consistently mentioned archaeological phenomena in the reviewed reports. Features are usually not quantified or described in detail but the range of feature types (e.g., houses, hearths, basins) are nearly always at least indicated. The two groups of features considered here are residential and non-residential features. Residential features are houses and include substantial, often semi-subterranean houses or somewhat more ephemeral mat lodges. Non-residential features are all other features such as hearths, ovens, and pits or basins. There is considerable variation in what archaeologists have reported as a "surface." As such, reported surfaces were excluded as features unless there was reasonably strong evidence the surfaces were house floors.

TABLE 3. DEFINITIONS FOR SITE TYPES USED IN THIS ANALYSIS.

Site Type	Definition
1	Evidence for some type of residential feature, such as housepit, is found. Other non-house features can also be present.
2	No evidence for a residential feature, but other types of features such as hearths, ovens, pits, and lenses are found.
3	No evidence for residential or non-residential features, only artifacts.

All site assemblages included in our study (see Table 2) could be typed, with two sites having residential structures (Type 1) and ten sites with no structures, but other features (Type 2). Thirteen sites had no features and consisted only of lithic artifacts (Type 3) (see Table 2). Only 16 of the 25 assemblages could be placed cleanly into the Pre- and Post-3,500 B.P. periods, however. The temporal affiliation of the remaining assemblages was either unknown or spanned most of the Holocene. As the likelihood of identifying features at an archaeological site increases as excavation size increases (Lyman 1991), then classifying sites based on features could simply reflect differences in the amount excavated at different sites. To examine the influence of excavation size on site type assignment, the area and volume excavated for sites that could be placed into either the Pre- or Post-3,500 B.P. periods were tabulated. As suggested in Table 4, identifying features may be, at least in part, a function of excavation size. For sites where area and volume excavated was known, an average of 25 m² was excavated from Type 2 sites, while only an average of 5 m² was excavated from Type 3 sites. However, removing 35-WS-5, a particularly large excavation, lowers the average for Type 2 sites to 8 m².

TABLE 4. SITE TYPE SUMMARIES AND EXCAVATION DATA FOR SITES THAT CAN BE DATED TO BEFORE OR AFTER 3,500 YEARS AGO.

Site Type	Site		Excavation Size		Features		Age ^a	
	Smithsonian No.	Name	Area (m ²)	Vol (m ³)	Residential Features	Non-residential Features	Years	TU
1	45-KL-26		Large	Large	Yes	Yes	2,000-0	Post
	45-KL-225	Old Building	4	12	Yes	Yes	2,000-0	Post
2	35-WS-5		58	100	No	Yes	2,000-0	Post
	45-KL-111 (LH)	Friendly Village	10	10	No	Yes	2,000-0	Post
	35-WS-14 (Stra B)	The Bad Place	6	3	No	Yes	3,500-0	Post
	35-WS-8		Large	Large	No	Yes	9,000-6,000	Pre
3	35-WS-14 (Stra A)	The Bad Place	8	15	No	No	3,500-0	Post
	45-KL-42 (II)	Indian Well	Large	Large	No	No	2,000-0	Post
	35-WS-242		Small	Small	No	No	2,000-0	Post
	35-WS-352	Chenoweth Creek	6	4	No	No	5,000 to 4,000	Pre
	35-WS-360		4	2	No	No	8,000 to 3,500	Pre
	35-WS-497	Byers	3	4	No	No	8,000 to 3,500	Pre
	45-KL-110	Lyle	3	5	No	No	8,000 to 3,500	Pre
	45-KL-42 (I)	Indian Well	Large	Large	No	No	8,000 to 3,500	Pre
	45-KL-111 (MH)	Friendly Village	4	4	No	No	8,000 to 3,500	Pre

^a Age: Years = Years BP; TU (Temporal Unit): Pre- and Post-3,500 B.P.

Reconstructing Subsistence

The relationship between subsistence and land-use involves complex interplay among human behaviors, resource availability and abundance, as well as the preservation of archaeological faunal materials. Teasing apart this complexity is difficult and not straightforward or easily summarized. Here, a simplified subsistence model is used to begin organizing the study of precontact subsistence in the area. This model generally follows Butler and Campbell (2004), who recognized that a common implication of many models of Northwest precontact subsistence theoretically involves a narrowing of the diet breadth or development of a focal economy as logistical organization increases (based upon relative comparisons across functional site types over time). In general, we would expect residually mobile systems to employ an encounter system, obtaining resources as found for immediate consumption. Diets will be generalized, with resources procured reflecting their return and local abundance. The resulting faunal assemblages will reflect a resource's rank or overall caloric return and local abundance, hence taxonomically rich. More logistically organized systems will have a more specialized diet, focused on a narrower range of resources and hence be taxonomically less rich and uneven.

Archaeologists commonly use two different means for measuring prey diversity. The first tracks the expansion of diet breadth by comparing the number of taxa (NTAXA) by time period (Broughton and Grayson 1993; Grayson and Delpech 1998). Richness, as measured by NTAXA, provides a measure of changes in diet breadth because it can count the maximum number of prey types used (Nagaoka 2001). A more-diversified, generalized diet breadth should show an increase in NTAXA. The second measure of prey diversity is evenness. By quantifying the proportional relationships among species, rather than focusing simply on the number of taxa present, evenness tracks the relative importance of specific taxa through time. Evenness is a more-sophisticated measure than NTAXA as it reflects the contribution of individual taxa to the entire assemblage, but it requires strict quantitative data on the number of taxa present.

Given this weakness, the NTAXA of all reported faunal assemblages was considered regardless of sample size (Table 5). While this allows us to search for diachronic trends in subsistence, it also precludes us from stringently statistically analyzing the data. As the reports are sometimes challenging to make sense of, control of the quality of the interpretation of the assemblage character was maintained by using two measures of richness. First, the "Reported Richness," which is a raw count of the number of different taxonomic categories that archaeologists reported was tallied. For example, an assemblage composed of deer, small mammals, and medium-large mammals would be tallied as a reported richness score of 3. This likely leads to inflation of NTAXA. As such, we also considered the "Interpreted Richness" of each assemblage. Using the previous example, we would condense the richness to a score of 2 if the authors stated in their methods that deer would be an example of a medium-large sized mammal. We present both measures, but compute our analysis with the Interpreted Richness in order to prevent over inflating richness.

Organizing Data on Lithic Toolkits

Similar to subsistence, lithic tool diversity is dependent on a range of factors, including availability of raw materials, resources targeted, and site function (Torrance 1983; Shott 1986; Kelly 1988; Nelson 1991). Again, a relatively simple model of the organization of lithic technology used here allows for a basic structure of precontact land-use to be elucidated. Lithic toolkits associated with residually mobile land-use strategies should be portable and multifunctional; hence the

TABLE 5. SUMMARY OF FAUNAL DATA.

Assemblage	TU ^a	Site Type	NISP ^b	Interpreted Richness	Reported Richness	Fish Present?
35-WS-8	Pre	2	Unknown (but vast)	37	37	Yes
35-WS-351	Pre	2	211	4	6	No
35-WS-352	Pre	3	11	1	1	No
35-WS-360	Pre	3	2	2	2	No
35-WS-5	Post	2	Sparse	2	2	Yes
35-WS-14 (Stra A)	Post	3	59	8	10	Yes
35-WS-14 (Stra B)	Post	2	222	7	10	Yes
35-WS-242	Post	3	62	3	4	Yes
45-KL-26	Post	1	Unknown	3	3	Yes
45-KL-111 (LH)	Post	2	Unknown ("several hundred")	13	15	Yes
45-KL-225	Post	1	Unknown	3	3	Yes
35-WS-221 (Area D)	Unknown	3	107	6	6	Yes
35-WS-428	Unknown	3	102	4	4	No

^a TU (Temporal Unit): Pre- and Post-3,500 B.P.

^b NISP: Number of Identified Specimens

assemblages will have fewer tool classes (low richness) and be more even (Shott 1986). Bifacial tools may be common and overall tools may be smaller. As logistical mobility replaces residential mobility, toolkits will become richer as more specialized tools are needed, but also more uneven as larger numbers of specific tools are needed to procure and process a narrower range of resources in bulk (Shott 1986; Nelson 1991).

Three factors with The Dalles dataset need mention. First, tools were not tallied by individual tool classes. Rather, the number of classes as reported by the original research was recorded with minimal standardization among researchers. As a result, evenness values were not calculated. Second, conclusions regarding lithic debitage technology were recorded (when provided) with basic nominal scale descriptors such as "maintenance and resharpening." Third, assemblage size is a primary influence on assemblage richness values (Jones et al. 1983; Rhode 1988). Removing one site (35-WS-377) with no tools and two very large, outlier assemblages (35-WS-5 and 35-WS-351) showed the number of tool classes is strongly correlated with total assemblage size ($r^2 = .832$; $p = .000$). Regression suggests over 90 percent of the variation in the number of classes found in these 14 assemblages can be explained solely by the total number of tools recovered. To mitigate the influence of assemblage size on tool classes, the log of the total number of tools was plotted against the total number of tool classes and standardized residuals (z-scores) calculated for richness values (Table 6).

TABLE 6. SUMMARY OF LITHIC DATA.

Temporal Unit	Site	Age	Lithics			Residuals	
			Points	Total Tools	Total Classes	Residuals	Standardized (Richness/ z-scores)
Post-3,500	45-KL-225	2,000-0	2	4	3	-0.16	-0.31
	35-WS-242	2,000-0	2	15	6	-0.17	-0.32
	35-WS-14 (Stra A)	3,500-0	6	24	9	-1.02	-1.97
	45-KL-111 (LH)	2,000-0	10	41	6	0.84	1.62
	35-WS-14 (Stra B)	3,500-0	39	129	11	-0.22	-0.43
	Mean	12	43	7	-0.15	-0.28	
	Range	37	125	8	1.86	3.59	
Pre-3,500	35-WS-352	5,000 to 4,000	2	4	3	-0.16	-0.31
	35-WS-360	8,000 to 3,500	3	13	4	0.57	1.11
	35-WS-497	8,000 to 3,500	6	15	6	-0.17	-0.32
	45-KL-111 (MH)	8,000 to 3,500	1	23	5	0.70	1.35
	45-KL-110	8,000 to 3,500	5	146	10	0.34	0.66
	Mean	3	40	6	0.26	0.50	
	Range	5	142	7	0.87	1.67	
Unknown	35-WS-378	Precontact	0	2	2	-0.41	-0.80
	35-WS-380	Precontact	0	2	2	-0.41	-0.80
	35-WS-428	Precontact	1	33	7	0.18	0.35
	35-WS-221 (Area D)	Precontact	10	47	8	0.09	0.18
	Mean	3	21	5	-0.14	-0.27	
	Range	10	45	6	0.59	1.15	
Totals	Mean	6	36	6	0.00	0.00	
	Range	39	144	9	1.86	3.59	

Results of Data Analyses

Site Types and Houses

A distinct difference in the distribution of site types before and after about 3,500 years ago was found (Fig. 2). Prior to 3,500 years ago, there are no Type 1 sites (assemblages with houses) and Type 3 sites (assemblages without houses or other features) dominate. After about 3,500 years ago Type 1 sites occur and the overall site type distribution is much more even. Site reuse is more difficult to assess with the available data. Multiple occupations are likely at several Pre-3,500 B.P. sites such as 35-WS-1 or 35-WS-8. Thick deposits at 45-KL-41 and the Maybe Site also suggest regular reuse (see below), although dating these materials is problematic. Reuse after 3,500 B.P. is somewhat clearer, with multiple distinct occupations at 35-WS-14, 45-KL-26 and 45-KL-225. While conjectural, site reuse may be higher after about 3,500 years ago.

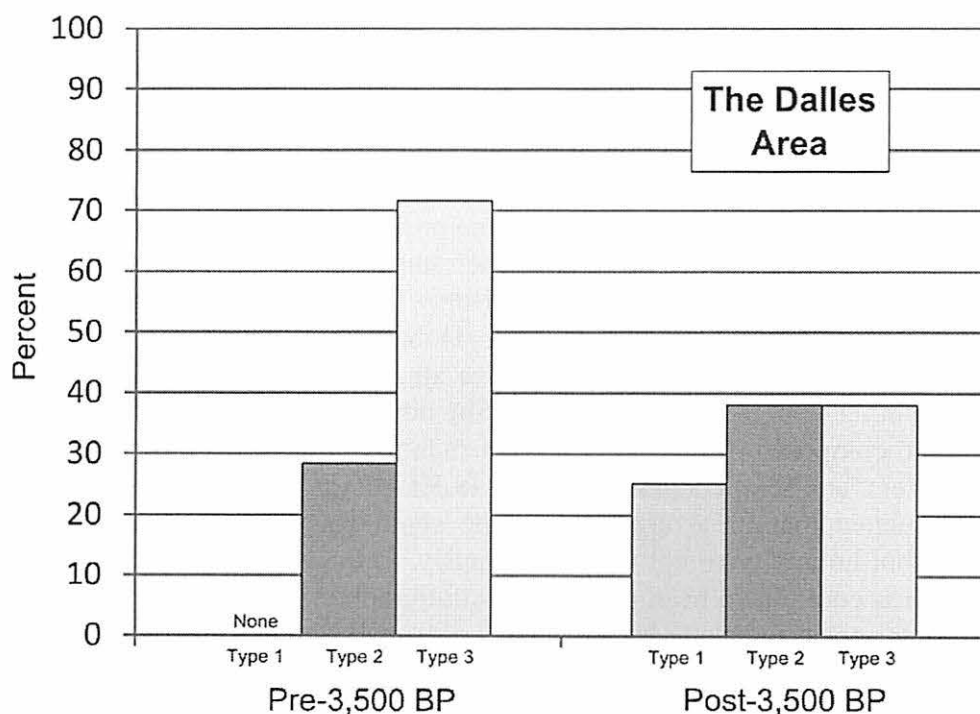


Fig. 2. Site type distributions before and after 3,500 years ago.

No houses are associated with pre-3,500 year old deposits and no clear houses older than about 2,000 years ago have been found. In fact, archaeological examples of houses seem rare for the area, with only two sites having fairly definitive archaeological houses: 45-KL-225 (Old Building) and 45-KL-26 (Wakemap Mound). Cole (1974) found at least three surfaces at 45-KL-225 that he thought were house floors, and although the presence of houses cannot be independently verified, the floors were fairly dense and visible. Possible timbers were also found, suggesting substantial construction so it is assumed here the features are actually house floors. Cole indicated projectile points below the floors dated to ca. 500 years ago, but these dates also cannot be verified from the illustrations (Cole 1974:Fig. 9). The points do seem to date to the last 2,000 years, however. Thus, the house at 45-KL-225 is probably younger than 2,000 years ago and possibly less than 500 years old.

Site 45-KL-26 (Wakemap Mound) may be one of the most famous sites in the region, with several elements that have not been strongly emphasized in the literature before. The site is a large, anthropogenic mound, on the Washington shoreline, at the entrance to the Long Narrows. Termed a "mound," the site is more accurately a "tell," where intensive and successive occupational debris has created a hill about 100 meters in diameter and at least 6 meters high. The site was excavated by several archaeologists (Strong et al. 1930; Caldwell 1956), amateurs overseen by professionals (Butler 1958), and was heavily looted prior to inundation (Butler 2007). Butler (1958) provides the most detailed information on the site's structure, beginning with a house at the base of the mound, which from the drawing and description, is strongly reminiscent of a semi-subterranean plankhouse. Most of the mound's bulk is comprised of repeated mat lodge construction between about 1,200 and 500 years ago. After about 500 years ago, mat lodge

construction ceased and a village of round, semi-subterranean pithouses was constructed on top of the site. Butler (1958) also suggests the mat lodges represent summer occupation, while the circular, semi-subterranean pithouses found on the mound's top indicate a change to winter occupation. Aside from the distinct diachronic change in house styles, which likely represent a change in site function, Butler's description of the mat lodges is particularly suggestive. While not completely clear, it appears that these mat lodges were not simply re-erected regularly in the same general area, but rather were rebuilt exactly in the same position.

Qualitative information applicable to site types and land-use before and after 3,500 years ago is available for several sites in The Dalles area. Butler (1959) describes 45-KL-41 (Congdon), 45-KL-42 (Indian Well) and the Maybe Site (see Fig. 1), based on observations of ongoing, large-scale looting excavations. Butler indicates these sites all have a broadly similar structure: they appear as mounds, noting 45-KL-41 and the Maybe Site deposits were up to seven-feet thick, with the bulk of each site composed of utilitarian objects such as cobble tools, points, grinding slabs, hammerstones, mortars, and scrapers (45-KL-41 (I), 45-KL-42 (I), and Maybe Site (I) in Table 2). Butler (1959) speculated that these deposits predate about 3,500 years ago. The presence of features is unclear, but houses were not noted. Obviously, as the excavations were carried out by looters, house features could have been missed and stratigraphic associations misunderstood, but the bulk of these sites appear to date to before about 3,500 years ago, have a diverse, but utilitarian assemblage, but no features or at least low feature diversity and no houses. Additionally, in one of the more well-done archaeological analyses in the area, Ozburn and Fagan (2003) concluded 35-WS-352 (Chenoweth Creek) was a forager base camp because of a generalized toolkit, relatively diverse faunal assemblage, and a lack of features. This small, low-to-moderate density site was most intensively occupied between about 5,000 and 4,000 years ago (Ozburn and Fagan 2003).

Butler also suggests the upper portions of 45-KL-41, 45-KL-42 and the Maybe Site (45-KL-41 (II), 45-KL-42 (II) and Maybe Site (II) in Table 2), postdate 3,500 years ago. These deposits include the same suite of utilitarian objects found below as well as elaborate material culture such as pipes, stone bowls, zoomorphic sculptures, decorative mauls, and stone beads. Cremations were also found. Finally, Shiner (1953) recovered over 800 projectile points, comprising over 60 percent of the total lithic tools during excavations at 35-WS-5. He (Shiner 1953:14) interpreted the late prehistoric site as a possible "arrowhead factory" where points were manufactured for trade. The recovered assemblage also included several hundred scrapers, but little groundstone. Overall, the highly uneven tool distribution suggests some type of very specialized site, not related to fishing, dating to the later Holocene.

Taxonomic Richness in Subsistence

Thirteen of the twenty-five assemblages considered in this article reported faunal remains (see Table 5). Four of the sites belong to Pre-3500 B.P., seven are assigned Post-3500 B.P. and two faunal assemblages could not be placed into either temporal unit.

Maximum diet breadth is presented in Table 4. All but one site have maximum richness scores between 0 and 13. The remaining site (35-WS-8) is an outlier with nearly 40 categories of fauna. Both Temporal Units are positively skewed (Fig. 3) and the faunal assemblages in the Post-3,500 B.P. period exhibit greater richness in general. With samples of limited size, summary statistics are of limited utility. As such we consider the mean, median, and mode as measures of central tendency. For the average of Pre-3500 B.P., we must remove the huge assemblage from 35-WS-8 from consideration. When considering the mean, Pre-3500 B.P. diet breadth was narrower (after removing the massive 35-WS-8 assemblage) and averaged 2.3 taxa per assemblage. No two sites in Pre-3500 B.P. bear the same number of taxa (i.e., there is no mode).

The mean NTAXA valuations from Post-3500 B.P. show a trend of increasing taxonomic richness (Fig. 3). Thus, the average NTAXA for Post-3500 B.P. (5.3 taxa per assemblages) is nearly double that of Pre-3500 B.P. (2.3 taxa per assemblage). Post-3500 B.P. faunal assemblages have a mode of 3.

Given the skewness of the distributions, the median might represent a better measure of the typical value of each distribution. In this comparison, both analytic units have a median of 3. When taxonomic richness is quantified using the median number of taxa within an archaeofaunal assemblage, there is no difference in diet breadth over time.

The record for fishing deserves specific attention. Despite its reputation as a fishing locale, Minor noted (1988c:75) that aside from the early assemblage at the Five Mile Rapids Site (35-WS-8), fish were rare in the area's faunal assemblages. Of the 25 assemblages identified for this article, 13 (52 percent) have faunal material. Nine (69 percent) assemblages with faunal material include fish. When specific fish taxa are mentioned, salmon is the most commonly noted, followed by sturgeon. We conclude that while faunal remains are only present in roughly half of the archaeological assemblages examined, assemblages with faunal remains typically include fish. To be clear, fish is commonly (more than two-thirds of the time) recovered in archaeological assemblages if fauna is represented at all. Similar to conclusions from other locales along the Columbia River (e.g., Livingston 1985; Butler and O'Connor 2004), the archaeological record for the presence/absence of fish from the sites in The Dalles area further confirms that fish have been an important food resource to Native peoples for many millennia.

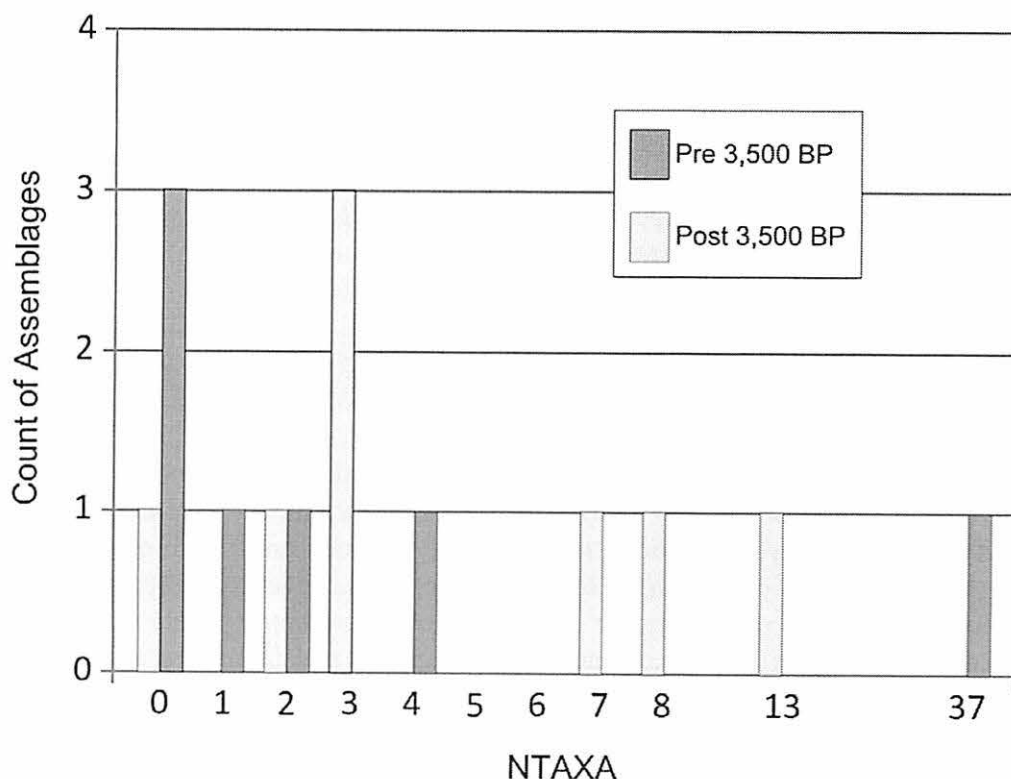


Fig. 3. Taxonomic richness of archaeofaunal assemblages that can be dated to before or after 3,500 years ago.

Lithic Toolkit Organization

A distinct diachronic difference in assemblage richness and content is found (see Table 6 and Fig. 4). Although the Pre- and Post-3,500 B.P. assemblage sizes are roughly similar, Pre-3,500 B.P. assemblages are richer, with less variability among assemblages. The Post-3,500 B.P. assemblages are less rich with greater variability among assemblages. The mean number and range of projectile points is higher after 3,500 B.P. Moreover, the ratio of projectile points to other tools is also higher after 3,500 B.P. Overall, assemblages post-dating 3,500 years ago generally have slightly fewer types of tools present at each site, although differentiation among sites is much greater. These assemblages also have more projectile points, which make up a slightly higher proportion of each assemblage.

Qualitative information concerning lithic technology is available for several local sites in The Dalles area, but is usable only at a coarse scale. Generally, lithic assemblages seem diverse, with chipped and ground stone recovered in fairly high numbers at many sites. Pestles, mortars and possibly used flakes are common in Pre-3,500 B.P. assemblages, although pestles and mortars are more frequent in Post-3,500 B.P. assemblages, as are cobble choppers and graters. These trends are tentative, however. Lithic debitage analysis suggests a more prominent role for tool production at two sites, 35-WS-352 and 35-WS-497, both likely dating to 3,500 years ago, with tool maintenance and rejuvenation more common at sites dating to after this time. Perhaps the most obvious change is the dramatic increase in elaborate stone items such as decorative bowls, mauls, and sculptures as well as stone beads after about 3,500 years ago. While not quantified for this review, our sense is cryptocrystalline silicate (CCS) is the most common toolstone. Minor (2013) indicates obsidian is rare before about 3,500 years ago, but much more common after. Obsidian often comprises about 10 to 15 percent of lithic debitage at most sites, but is highly variable, and can account for up to a quarter of the debitage (Ogle et al. 2007:78, 88).

Observations on Excavation Strategies

Poor reporting hampers quantitative analysis of the relationship between excavation strategies and archaeological knowledge in The Dalles area. The data does allow, however, some general observations. Neither volume nor area excavated is correlated with total number of tools or tool classes recovered. The interpreted richness value for fauna is correlated with area excavated ($r^2 = .589$, $p = .035$) and as discussed above under "Site Types," excavation size does seem related to feature identification. Thus, increasing the area excavated should result in finding more fauna taxa and features.

Table 7 shows projectile point counts as well as the presence and absence of features and fish and non-fish fauna for sites where the area and volume excavated is known. Sorting the data by area excavated is the most reliable metric (as opposed to volume excavated or percentage of site excavated) because many site boundaries are poorly defined and volume excavated is often inflated when chasing flakes or searching for deeper deposits. Several subtle trends are evident. First, it appears that at least 3 m² need to be excavated before projectile points are regularly found. Second, probably 4 m² needs to be excavated before features and faunal material are commonly found, with possibly 8 m² of the site processed before fish remains are routinely found. Obviously, these numbers depend greatly on the type of site being excavated as well as where in the site the excavation occurs. The data do demonstrate, however, a well-known archaeological phenomenon (Rhode 1988; Dunnell 1989; Lyman 1991; Schalk et al. 2000), where greater excavation results in an increase in rare items being found.

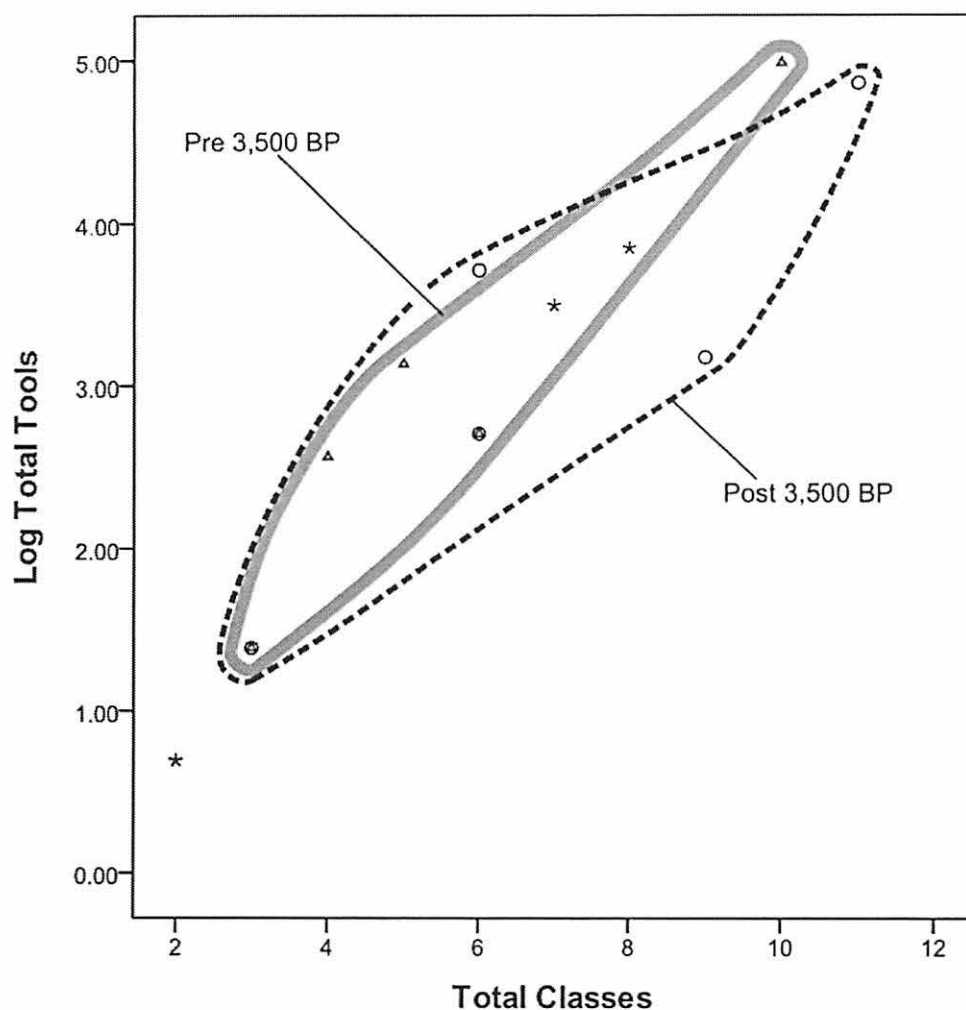


Fig. 4. Lithic tool assemblage richness.

A Simple and Thin Model of Precontact Land-use for The Dalles Area

The quantitative and qualitative analyses presented above allow development of a simple and thin model of precontact land-use for The Dalles area. Its simplicity results from the data's coarse ordering into two broad temporal units, but it also reflects the land-use dimensions framing the analysis. That is, because of data constraints, only three dimensions (site types, subsistence, and organization of lithic technology) were examined. Moreover, data quality severely limited the potential variability visible in these dimensions. Thin models are based on small amounts of data or poor data and may change easily with the addition of new information. The model presented below could be dramatically altered by excavation at a single small site. For example, if a 4,000 year old, semi-subterranean house was found in The Dalles area, the effects on the model could be dramatic. The model is summarized, alongside pertinent regional chronological frameworks, in Fig. 5.

TABLE 7. EXCAVATION SIZE AND RECOVERY AT SITES THAT COULD BE DATED TO BEFORE OR AFTER 3,500 YEARS AGO.

Site	Excavation Size		Recovery			
	Area (m ²)	Volume (m ³)	Points Recovered (Count)	Features	Faunal (Non-fish)	Fish
35-WS-377	1	1	0	No	No	No
35-WS-380	1	1	0	No	No	No
35-WS-428	1	1	1	No	Yes	No
35-WS-378	2	2	0	No	No	No
45-KL-110	3	5	5	No	No	No
35-WS-497	3	4	6	No	No	No
45-KL-111 (MH)	4	4	1	No	No	No
45-KL-225	4	12	2	Yes	Yes	Yes
35-WS-360	4	2	3	No	Yes	No
35-WS-351	6	5	129	Yes	Yes	No
35-WS-14 (Stra B)	6	3	39	Yes	Yes	Yes
35-WS-352	6	4	2	No	Yes	No
35-WS-14 (Stra A)	8	15	6	No	Yes	Yes
45-KL-111 (LH)	16	14	10	Yes	Yes	Yes
35-WS-005	58	100	800	Yes	Yes	Yes

Pre-3,500 B.P.

Prior to about 3,500 years ago The Dalles area land-use reflects residential mobility. Simpler types of sites dominate (Type 3, without features), houses are not found and features are rare. Feature diversity between sites may also be low with hearths most common. Ozburn and Fagan (2003) identified a base camp associated with a residentially mobile land-use strategy present between 5,000 and 4,000 years ago. Although difficult to assess from the available data, site reuse may also be somewhat low at most sites. Site content is variable, but the range of activities as a whole is limited. The diet appears diverse and includes fish, mammals of various sizes, and shellfish. Plant use is unknown, although pestles and mortars are found. Projectile points are common but do not dominate assemblages. Used flakes may be somewhat more common before 3,500 years ago than after. Salmon was taken in large numbers since at least ca. 8,000 to 9,000 years ago (Butler and O'Conner 2004), and there is no reason to suspect that fishing was not an important subsistence pursuit between 8,000 and 3,500 years ago. Salmon were probably taken for immediate use although this is inferred exclusively from the lack of a contemporaneous logistical land-use system in broader studies on the Columbia Plateau (Prentiss et al. 2005).

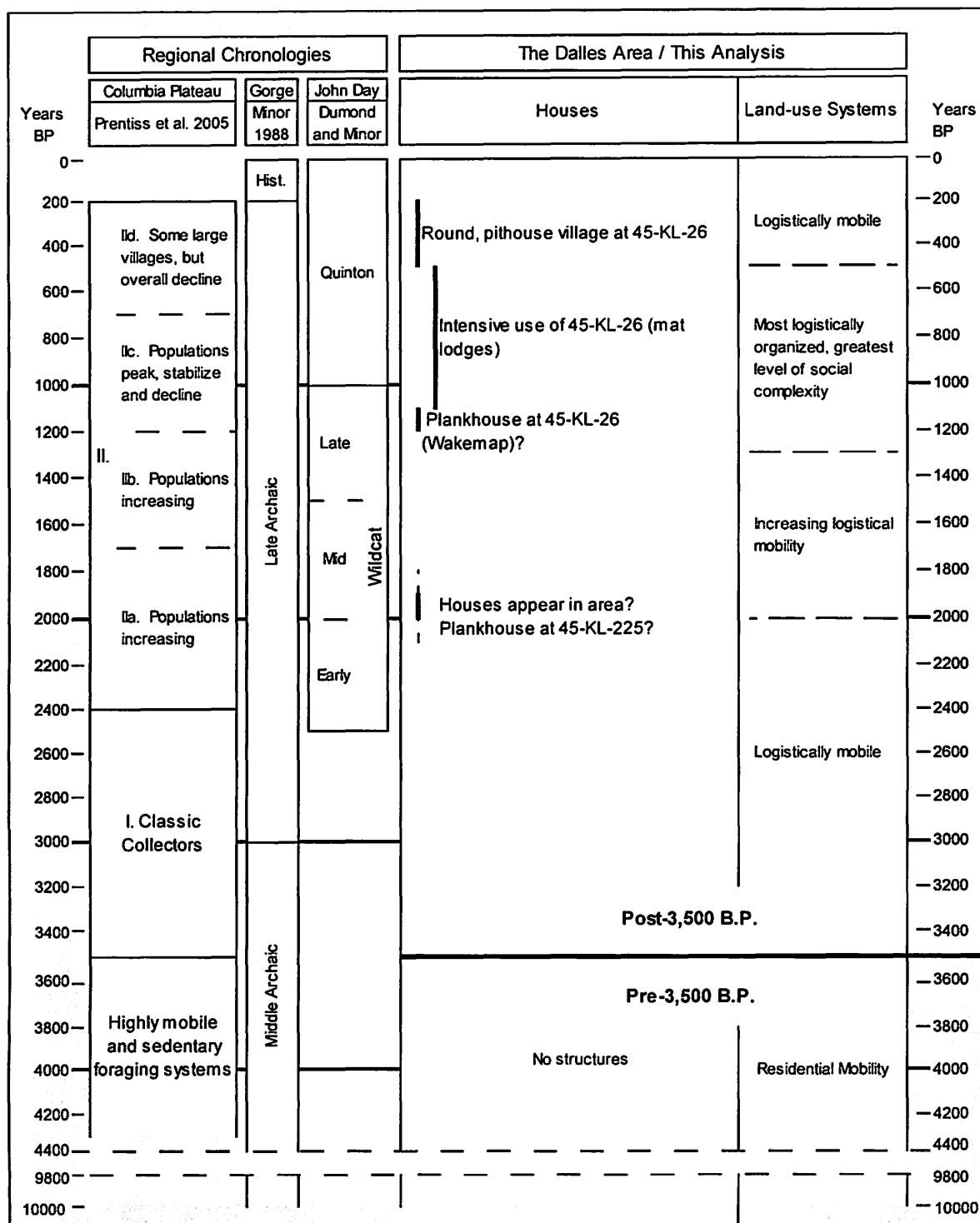


Fig. 5. Land-use model for The Dalles area.

Researchers have posited tethered forager systems in some parts of the Plateau during the Middle Holocene (Lohse and Sammons-Lohse 1986; Chatters 1995; Hicks 2004; Prentiss et al. 2005; Ames 2012). These are lower mobility, often sedentary systems without associated logistical sites and no evidence for storage. Rather, residential sites are situated in highly productive areas until the catchment is exhausted, at which point the residential site is moved. The Dalles area would intuitively seem a suitable location to find evidence for such a system: highly productive fishing locale, access to other riverine and upland resources, and at the boundary of two major, regional environmental zones. Moreover, a number of sites exhibit long-term reuse including 35-WS-8, and the lower portions of 45-KL-41 and 45-KL-42. However, the lack of residential structures or more fine-grained data on site use or local subsistence practices at this time preclude suggesting the presence of a similar tethered foraging system in The Dalles area.

Post-3,500 B.P.

After about 3,500 years ago, evidence for increased sedentism and more logistical organization is found. More complex sites (Type 2, with features) increase in number and sites with houses (Type 1) are known. Feature diversity between sites may increase with hearths, ovens, and pits noted. Site reuse may also increase after 3,500 years ago. Lithic assemblages are less rich than before 3,500 B.P., but variability between assemblages is greater. The lower richness in Post-3,500 year old lithic assemblages could reflect a narrowing of the tasks performed at individual sites, a view supported by the increased differentiation or specialization among sites.

Post-3,500 B.P. subsistence is similar to before. Plant use is again archaeologically unknown, but fish, mammals of various sizes, and shellfish are found. Given the data limitations, two disparate conclusions can be drawn regarding diachronic change in subsistence practices in The Dalles area. When considering the mean taxonomic richness between assemblages before and after 3,500 years ago, the earlier subsistence was based on a narrower set of resources, while after about 3,500 years ago the diet breath widened, with a much larger range of resources used. However, using the median taxonomic richness, which may be a more appropriate measure of tendency, both Pre- and Post-3,500 B.P. assemblages maintain a similar taxonomic richness.

Regardless of whether one considers the mean or median taxonomic richness, the evidence of a focal economy was not found in The Dalles area. This is consistent with Butler and Campbell's (2004) finding of no evidence for resource depression during the Holocene on the Plateau as well as the trending views for areas south of the Columbia (Endzweig 1994; Jenkins and Connolly 1996). There is little direct archaeological data on salmon after about 3,500 years ago. Again, it is likely salmon continued to be an important subsistence pursuit throughout the Late Holocene, but salmon harvest was probably also taken for storage and trade. This is inferred by evidence for more sedentary, logistical land-use systems in The Dalles area after 3,500 and probably 2,000 years ago.

Examining other non-faunal evidence for subsistence shows that pestles, mortars, and grinding slabs increase in frequency after 3,500 years ago as do cobble choppers. These tool classes may not all be related to plant processing, however. Interestingly, if projectile points denote hunting of terrestrial mammals, then hunting may have remained fairly important throughout the Holocene; with relatively high frequencies and ratios of projectile points in Late Holocene lithic assemblages. As noted above, at least one specialized Late Holocene hunting and processing site (35-WS-5) is present.

Houses

Most Post-3,500 B.P. assemblages likely post-date 2,000 years ago, a date that also marks the first potential archaeological evidence for houses in the area (at 45-KL-225, Old Building). The shape or size of this house is unknown, although the presence of timbers suggests more substantial construction and hence cold weather occupation. This house may also post-date 500 years ago (Cole 1974), in which case, the first evidence for houses in The Dalles area is the possible rectangular, semi-subterranean plankhouse at the base of 45-KL-26 (Wakemap) dating to about 1,100 years ago. The 45-KL-26 plankhouse indicates the site's use began as a primary residential site, possibly a winter occupation. The subsequent occupations, numerous successive episodes of more lightweight, mat lodge construction between ca. 1,000 and 500 years ago, suggest an intensively reoccupied locale, but temporary or seasonal use. This temporary use was followed by construction of more substantial, round, semi-subterranean pithouses, signifying a change back to use as a primary residential site again possibly with winter occupation between 500 and 200 years ago.

The successive 45-KL-26 mat lodges were directly superimposed on the preceding structure. That is, the mat lodges were not built in roughly the same location, but rather in exactly the same location for about 500 years. This level of redundancy and consistency in use suggests a formal linkage between each successive version of the mat lodge over time, possibly by the same family groups. This intensity of use combined with formal intergenerational links to a specific location, elaborate, exotic, and dense material culture all suggest that a relatively high level of social complexity existed in The Dalles area during the late precontact period (Hayden and Schulting 1997). Higher levels of social complexity are usually seen as at least partially based on logistical organization, with greater complexity correlated with greater logistical movement.

Logistical Organization

Logistical organization was employed in The Dalles area after about 3,500 years ago, but the level of logistical organization is difficult to gauge. This is due, at least in part, because we are examining only a portion of a much larger system. Data from the Chief Joseph Dam Cultural Resources Project (CJDCRP) (Campbell 1985) on the Middle Columbia (see Fig. 1), however, provides a useful comparison in estimating the level of logistical organization. The CJDCRP is a large, rigorously collected and analyzed data set with site types defined in a manner broadly similar to those used for The Dalles area. The top of Fig. 6 shows the distribution of The Dalles area site types by time period, while the bottom shows the relative frequency of site types from the CJDCRP. Based in part on the differences over time in the relative frequency of site types, the CJDCRP researchers posited a broad change from foragers during the Kartar Phase to collectors during the Hudnut Phase. Moreover, they interpreted the increase in Type 2 sites during the Coyote Creek Phase as evidence of increasing logistical organization (Campbell 1985).

Some useful patterns are evident when The Dalles and CJDCRP site type distributions are compared, however. First, The Dalles Pre-3,500 B.P. site type distribution is very similar to the CJDCRP site type distribution for the Kartar, although substantial houses are found during the Kartar. Both distributions are highly uneven and dominated by simpler types of sites. Second, The Dalles Post-3,500 year old site type distribution is much more even and seems more similar to the Hudnut than the Coyote Creek distribution. This is particularly interesting because most of the Post-3,500 B.P. assemblages from The Dalles area probably date after 2,000 years ago (see Table 2). That is, the Post-3,500 B.P. dataset from The Dalles area is probably the temporal analog of the CJDCRP Coyote Creek period, although the site type distribution looks more like the Hudnut.

Therefore, while logistical movement was employed in The Dalles area after 3,500 years ago, the level of logistical organization may be somewhat lower than elsewhere on the Plateau.

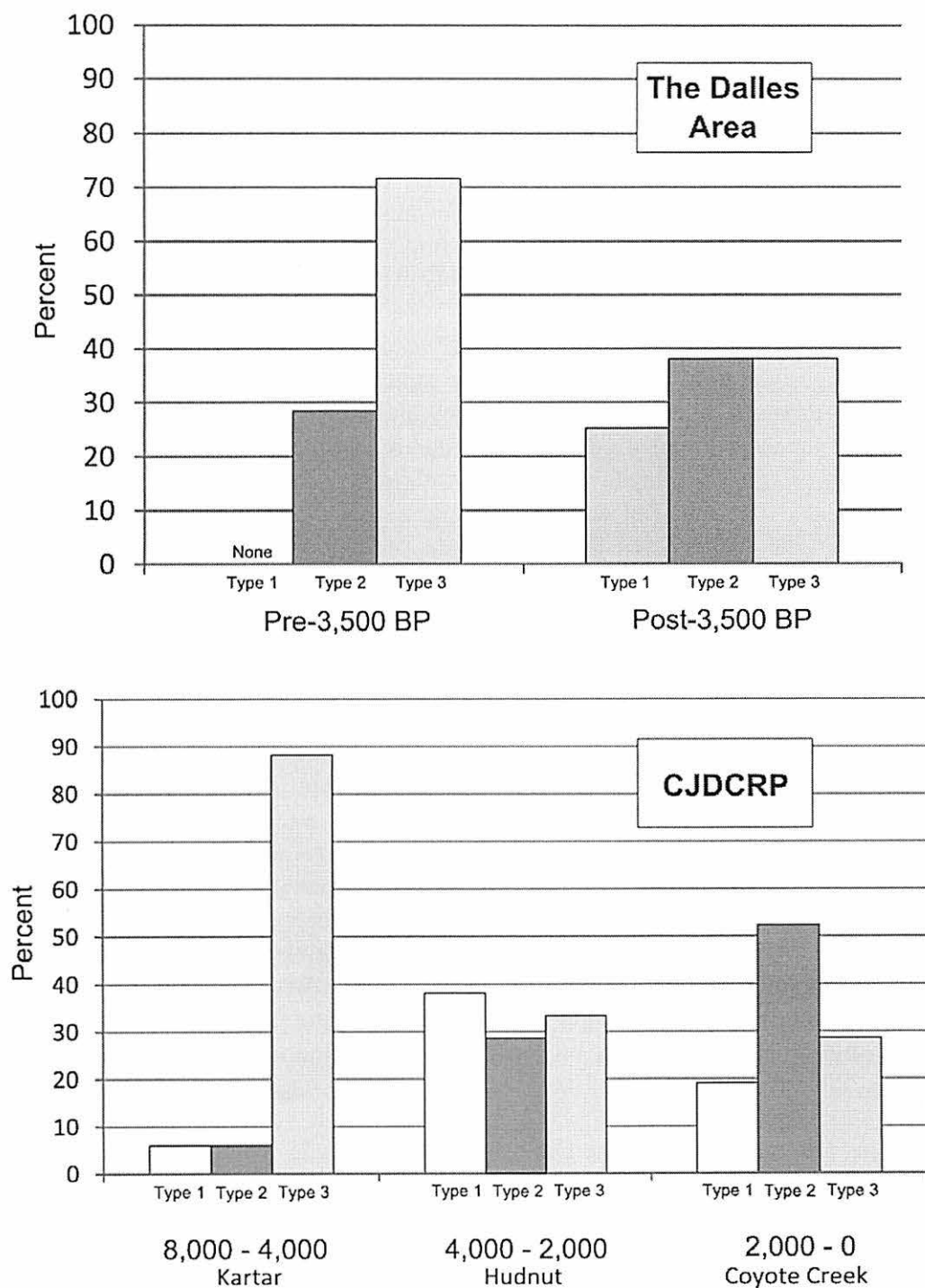


Fig. 6. Comparison of the distribution of site types from The Dalles area for this article (top) and the CJDCRP (Campbell 1985) on the Middle Columbia.

The site type distribution is somewhat at odds with other archaeological evidence for substantially higher logistical organization in The Dalles area during the later precontact period. This evidence includes large, dense sites, well-known elaborate and exotic material culture, as well as the successive mat lodge construction at 45-KL-26 discussed above. If The Dalles saw much higher levels of social complexity, a concomitant level of logistical organization is expected. There are several possible explanations; with the most likely being the data's temporal resolution and scale (*sensu* Ames 1991). That is, analyzed as a whole, the Post-3,500 B.P. site type distribution demonstrates only a moderate level of logistical organization (see Fig. 6). Within that time span, however, there may have been shorter periods of dramatically increased logistical organization not visible in overall distribution.

If logistical organization, elaborate material culture and complex social organization are positively correlated, it remains difficult to accurately define periods of increased logistical/social organization after 3,500 years ago for The Dalles area because of the coarse temporal data. Butler (1959) suggested much of the elaborate material culture found in the area appears after about 3,500 to 3,000 years ago. These dates are speculative, but they are not unreasonable and coincide broadly with the results of this analysis. It is likely, however, that the increase in the quantity and elaboration of material culture in the area was linked to some form of sedentism and logistical organization. If so, an increase in this material did not likely happen prior to about 2,000 years ago as marked by the first possible house in the area at 45-KL-225, but it could also date to the earliest house at 45-KL-26 at ca. 1,100 years ago. The general assumption among archaeologists seems to have been that the mat lodge occupations at 45-KL-26 represents a period of sedentism and complex social interaction and trade in the area. Using this occupation as the point of greatest logistical organization suggests several patterns (see Table 8 and Fig. 5).

Summary and Conclusions

Archaeological work in The Dalles area from before dam construction has provided us with a set of highly selective and poorly reported records. Post-dam work is more formalized, but is often focused on smaller, sparser sites. Importantly, the newer work has not been fully integrated with the earlier work or with current regional research themes in an organized fashion. This article represents an attempt to change this situation by synthesizing qualitative and quantitative archaeological data from around The Dalles area to propose a diachronic model of precontact land-use.

Summary

Our study suggests that before about 3,500 years ago, land-use was dominated by residential mobility and a generalized diet. After 3,500 years ago, land-use became more logistically organized, with an increase in site differentiation. Based on the available data, substantial structures appear about 2,000 years ago at the earliest and possibly around 1,100 years ago. Subsistence remained diverse, however. The area's well known elaborate material culture combined with intensive use of many sites has suggested complex social organization existed in the area at some point during the Late Holocene. This complexity likely post-date 3,500 years ago, and probably 2,000 years ago. The most intensive occupations at 46-KL-26 date to between 1,100 and 500 years ago and may mark the most logistically organized and hence socially complex precontact period in The Dalles area.

TABLE 8. SUMMARY OF LAND-USE BY TIME PERIOD.

Period	Land-use
Prior to 3,500 BP	Residentially mobile.
3,500 to 2,000 BP	Beginnings of logistical organization.
2,000 to 1,100 BP	Established/increasing logistical organization.
1,100 to 500 BP	Most logistically organized period.
Post 500 BP	Poorly understood mobility, likely logistical or equestrian.

Conclusions

Several final thoughts arose from this article concerning archaeology in general and The Dalles area archaeology specifically. For archaeology in general, synthesizing older work and actively integrating it into newer archaeological investigations employing a contemporary research framework should be a primary task. This is particularly true for CRM-based archaeology because without an understanding of what information has been previously collected and how (or if) this information can be used, we are missing a large part of the archaeological context necessary for understanding and evaluating sites. Without integrating such information, most federal laws pertaining to archaeology cannot be properly applied. Archaeological sites are most appropriately evaluated within a context or framework delineating how material at a site is important and can be used to inform about the past. Evaluations that fail to adequately use and assess previously collected information will more likely lead to a reliance on impressionistic assessments, intuitive appraisals based on the sheer number of artifacts found, rather than more stringent use of quantitative data and comparative analyses of qualitative data. Moreover, without a more thorough understanding of what kinds of data are needed to answer particular questions or fill data gaps, and how these data are most effectively recorded, collected and analyzed, our field and laboratory methods are more likely to rely on tradition or intuition rather than rigorous (and contextualized) methodologies for the collection, examination, and preservation of archaeological information.

For The Dalles area specifically, we make two related points. First, vast amounts of archaeological data were collected prior to dam construction from sites now submerged beneath reservoirs, destroyed, or unavailable for further research. This information is considered foundational to our understanding the area's precontact period, but much of the reported information is difficult to use. It is possible new insights can be gleaned from the reports: information missed or misunderstood during our analysis here. For example, an in-depth comparison of Caldwell's (1956) and Butler's (1958) excavation reports for 45-KL-26 may provide new data on the site's structure and content. It is equally likely that these sources have been largely exhausted with the "low hanging fruit" already gathered. As such, revisiting archived notes and collections may be the next step in maximizing use of this material.

Second, there seems an unspoken view among some archaeologists that all the "good" sites in The Dalles area are gone or inundated. Large, near-river sites, which were the focus of the early archaeologists are obviously important, but represent only one facet of the local land-use system. Missing are sites related to non-residential or ceremonial activities such as procurement and

processing of plant and animal resources or upland sites. Thus, a complete understanding of the range and intensity of resources used and procurement strategies in the area should come from examining sites (or the lack of sites) in a range of environmental settings, not just those sites along major rivers. The former are more likely encountered during CRM efforts. One of the benefits of CRM is that research is not limited to highly visible sites but allows for this broader landscape sampling of the archaeological record.

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ABOUT THE AUTHORS

Paul Solimano and Danny Gilmour are archaeologists with Willamette Cultural Resources Associates, Ltd., in Portland, Oregon. Both received their master's degrees from Portland State University.

Willamette Cultural Resources Associates, Ltd.
623 SE Mill Street
Portland, OR 97214

paul@willamettecra.com
danny@willamettecra.com

STONE RINGS IN THE UMATILLA NATIONAL FOREST, SOUTHEASTERN WASHINGTON

R. Lee Lyman, Matthew T. Boulanger, and Dave N. Schmitt

ABSTRACT

Archaeological reconnaissance in the Blue Mountains in 2013 resulted in the discovery of five artificial circular arrangements of local stones. Subsequent examination of satellite photographs of the area revealed two more rings. Ethnographic and archaeological records provide few clues as to the origins and functions of these rings. Local informant testimony suggests at least three of these rings may be helispots (helicopter landing areas); association with Forest Service structures and historical documents both suggest all seven stone rings could be helispots. A local informant suggests one or more of the rings may have originally been associated with American Indians. Future research should be directed toward study of constructional details and chronometric dating of a sample of the rings to facilitate functional interpretation and to provide a robust test of the helispot hypothesis.

Introduction

Artificial arrangements of local stones have a paucity of formal attributes and thus pose interpretive problems for archaeologists (Chartkoff 1983). It is therefore important to describe these phenomena when encountered and to report them when functional significance can be attributed to them. During July 2013, we undertook an archaeological reconnaissance of ~20 km of ridgelines in the Umatilla National Forest (UNF, hereafter), located in the Blue Mountains physiographic province of southeastern Washington (Fig. 1). During that reconnaissance, we revisited several previously recorded prehistoric archaeological sites and recorded a dozen newly discovered prehistoric archaeological sites (Lyman et al. 2013). In this article we describe seven large circular arrangements of local stones; five were recorded during reconnaissance and the other two were detected in satellite photographs after fieldwork was completed. We describe these stone rings and explain what we believe they represent. We have made this effort for several reasons. First, although one of the rings we describe was originally recorded in 1996, large circular dry-laid arrangements of stones have not been previously discussed in the local published literature. Second, large circular arrangements of stones seem to be unknown among Southern Plateau archaeologists, perhaps because of the paucity of archaeological research in remote mountainous areas. Third, we hope to save future workers the time of replicating our research efforts should they discover similar stone rings. Fourth, the explanation provided by local informants for three of the stone rings apparently is unknown among local Forest Service archaeologists. Attributes shared by the rings suggest that all seven may be of similar origin.

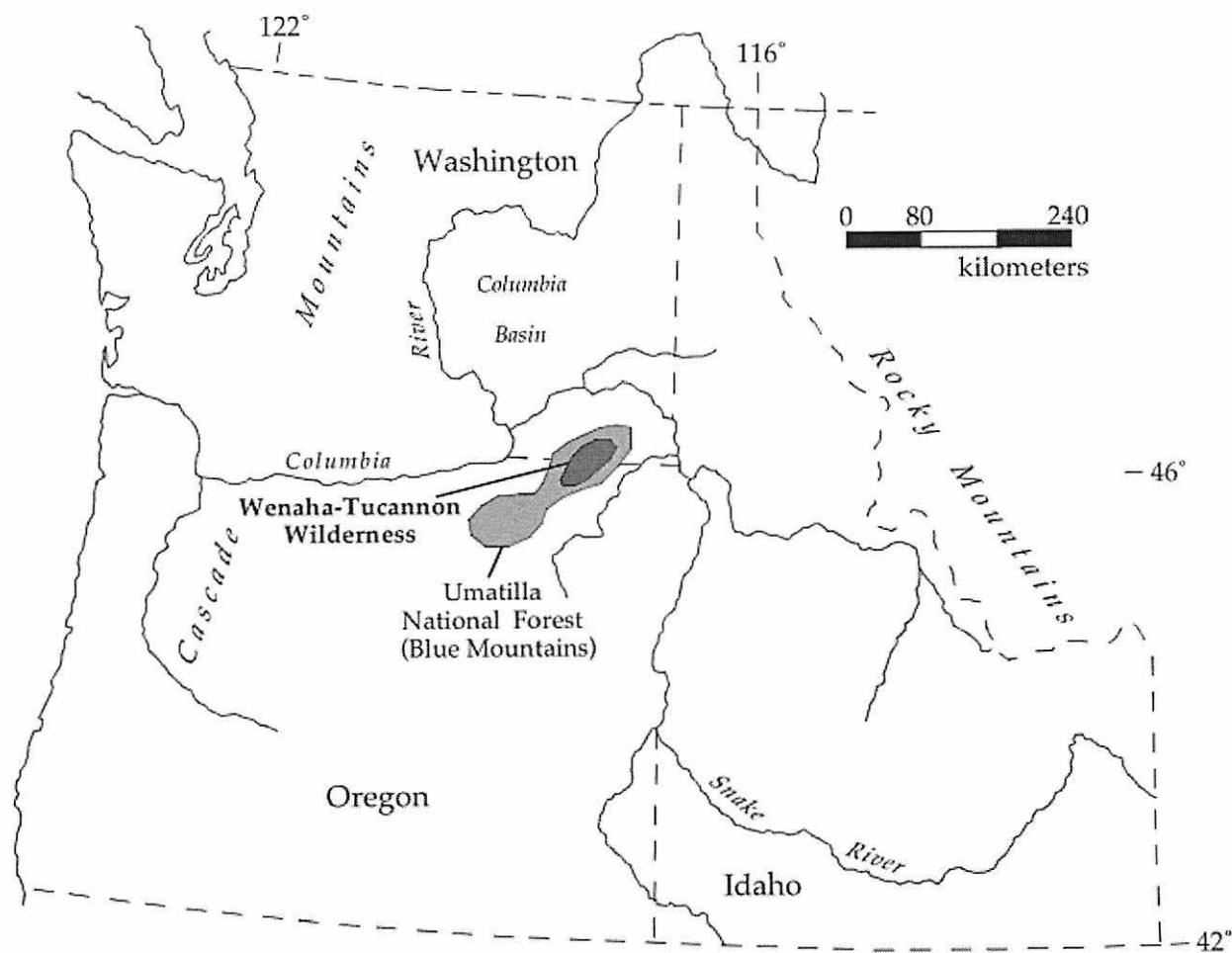


Fig. 1. Location of Umatilla National Forest and Wenaha-Tucannon Wilderness.

In this article we first describe each of the seven stone rings. Locational information is purposefully vague for the four rings that are located some distance from navigable roads (we refer to these as the *remote* ovals), but we do utilize names of nearby landscape features for each. Two of the seven rings (Godman Spring 1 and Godman Spring 2) are closely associated with a modern road and Forest Service campground, they are highly visible to the untrained eye, and they are being altered by modern landscape use; revealing more or less precise locations of these two rings is unavoidable. Because we hope to determine the functions and origins of the rings, we then provide synopses of local ethnographic and archaeological data to evaluate their possible indigenous cultural origins. Several possible explanations of stone rings used by Native Americans outside the area are also reviewed. We subsequently turn to local historic data to explore potential Euroamerican origins and functions of the rings. Finally, we summarize information from three local informants on the function and origin of some of the rings and then extrapolate from that evidence to the other rings. Our reasoning results in a hypothesis that accounts for both the origin and the function of all seven stone rings.

Stone Rings in the Blue Mountains Recorded in 2013

So far as we know, only one circular arrangement of stones had been recorded in the UNF prior to our reconnaissance in 2013—the ring we have labeled Godman Spring 1. As of August 2013, with the exception of Godman Spring 1, no stone rings with diameters >10 m are documented in eastern Washington and listed on the Washington State Department of Archaeology and Historic Preservation WISAARD database. During our reconnaissance we discovered three previously unrecorded stone rings (Red Fir; Lodgepole; Diamond Peak) in remote locations (>1 km from the nearest maintained road), we visited the previously recorded stone ring near the Godman Spring Campground (Godman Spring 1) and documented an associated and previously unrecorded stone ring there (Godman Spring 2). After leaving the field, we inspected satellite photographs and identified a sixth (Oregon Butte) and seventh (Table Rock) ring. Here we describe all seven rings in the order in which they were discovered. Approximate locations of the rings are shown in Fig. 2.

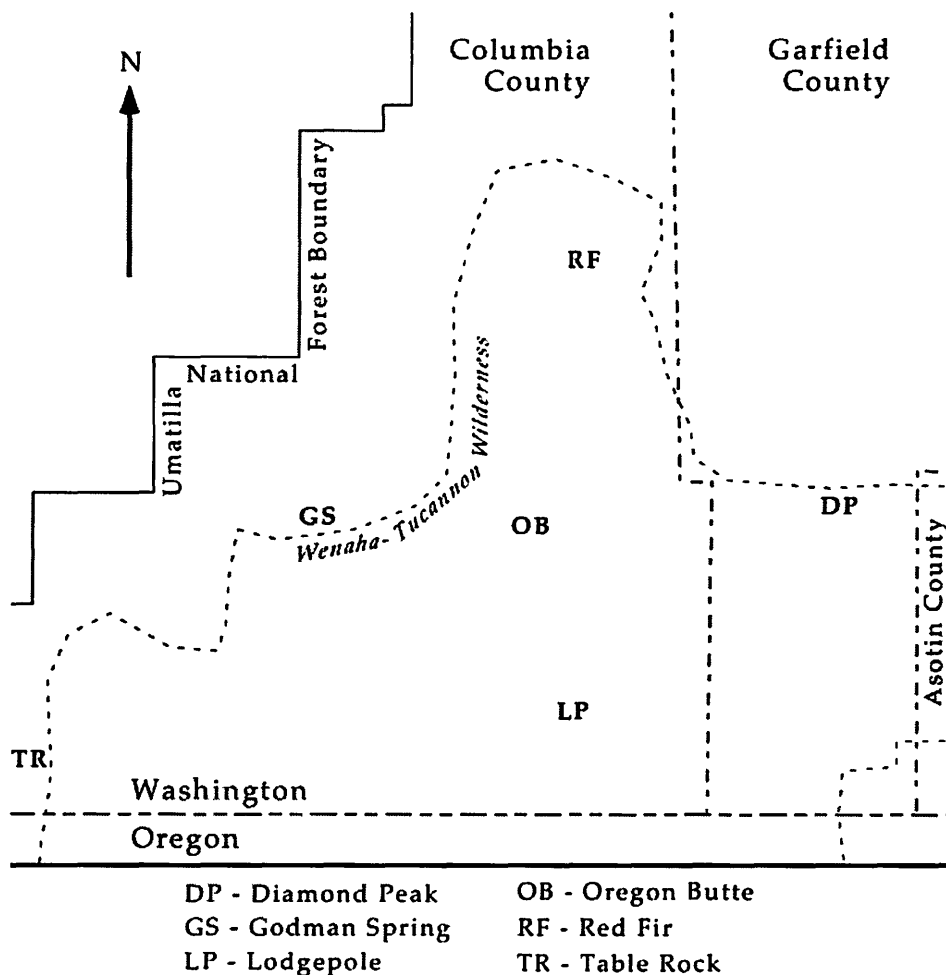


Fig. 2. Schematic map of locations of stone rings in Umatilla National Forest. Wenaha-Tucannon Wilderness Area is within the Umatilla National Forest.

Red Fir

Red Fir was the first stone ring encountered (Fig. 3), and it was found accidentally while attempting to locate a previously recorded lithic scatter. Simply put, we were baffled by the encounter. Who made the ring? There were a few pieces of flaked stone in the general area, but no prehistoric or historic artifacts were observed in direct association with the ring. What was its function? The paucity of artifacts provided no clue. What was the strange but obviously man-made configuration of rocks outside of the ring and adjacent to its southern edge? It had the appearance of a collapsed stone platform, but it also resembled Arabic numerals.

The Red Fir ring appeared to be a perfect circle about 15 m in diameter (Table 1). It could have been easily laid out by using a length of string or cord with a stick attached to both ends. Anchor one stick in the ground, draw the string tight, and use it as a radius to walk around the anchor scratching the dirt with the other stick. Place locally available stones around this circumference. As noted above, the stone configuration adjacent to the ring and in its southern quadrant has the vague appearance of stylized Arabic numerals. A “4” or “9” (it is not discernable in the satellite photograph) on the western half, and perhaps a “6” on the eastern half. There also seems to be what might be described as a colon (:) between the two stylized number-like arrangements of stones.

The Red Fir ring had not been recorded during a previous archaeological reconnaissance of the area (Nakonechny and Bishop 2011). However, that earlier project focused attention on locations near existing trail networks; the nearest modern trail is 50–60 m south of the ring (Fig. 4). There are at least two layers of stones making up the Red Fir ring, and portions of the lower layer are buried by sediment washed in from upslope. The partial burial suggests the ring is of some age, but how much is not clear.



Fig. 3. General view of the Red Fir stone ring, view to the northeast. The stone configuration adjacent to the southern perimeter is in the foreground; the ring extends to the right and then curves left toward the distance. The individual is near the center of the ring.

TABLE 1. ATTRIBUTES OF STONE RINGS IN THE UMATILLA NATIONAL FOREST.

Circle	Diameter (m)	Elevation (m)*	Slope (degrees)*	Aspect (degrees)*	Feature on the Southern Edge
Red Fir	15	1632	5.1	West (268)	Yes
Lodgepole	19	1634	6.6	East (68)	Yes
Diamond Peak	~18	1928	0.8	Southeast (120)	Yes
Godman 1	16	1746	16.5	South (190)	No
Godman 2	~13	1745	4.3	Southeast (153)	No
Oregon Butte	15	1942	4.7	Northwest (319)	Yes?
Table Rock	16	1905	3.2	East (98.8)	Yes

*Derived from 10 m digital elevation models for Deadman Peak (46117a8), Diamond Peak (46117a5), Godman Spring (46117a7), Oregon Butte (46117a6), Panjab Creek (46117b6), and Stentz Spring (46117b5) USGS 7.5' topographic quadrangles.

Lodgepole

The Lodgepole location was specifically chosen for reconnaissance because Lyman visited Lodgepole in 1963 with several other people. The purpose of that visit was to obtain the opinion of a Crow Indian who then was Principal of Dayton High School. Nine people (most now deceased) made the trip to observe what Bob Jackson (a then-resident of Dayton, Washington, and close friend of Lyman's father) described as a "tipi ring." Lyman, who was 12 years old at the time, remembers only the reason for the trip and does not remember any details of the stone ring.

The Lodgepole ring is about 19 m in diameter (Table 1). It appears on the ground to be a perfect circle, and it has an unusual rock configuration outside of but adjacent to the southern edge of the ring similar to what we observed at Red Fir (Fig. 5). A satellite photograph of the Lodgepole ring suggests it is indeed a perfect circle and the southern arrangement of stones appears to be a stylized "44" or "99" (Fig. 6). The eastern portion of the Lodgepole ring is dismantled, hence it is imperceptible in the satellite image. The west wall is in good condition (Fig. 7). As with the Red Fir ring, there are no historic or prehistoric artifacts directly associated with the Lodgepole ring. Some of the rocks making up the ring are partially buried, again suggesting an unclear age. If this is the ring Lyman and others visited in 1963, it puts a minimum age on the ring. The fact that Bob Jackson knew about the Lodgepole ring—he guided the 1963 trip to Lodgepole—and had spent much time in the area between 1930 (he grazed sheep in the UNF during the 1930s and 1940s and hunted there in later years) and 1960, suggests this ring may date to as early as the 1930s. The ring could be considerably younger because we do not know when Jackson first observed it.

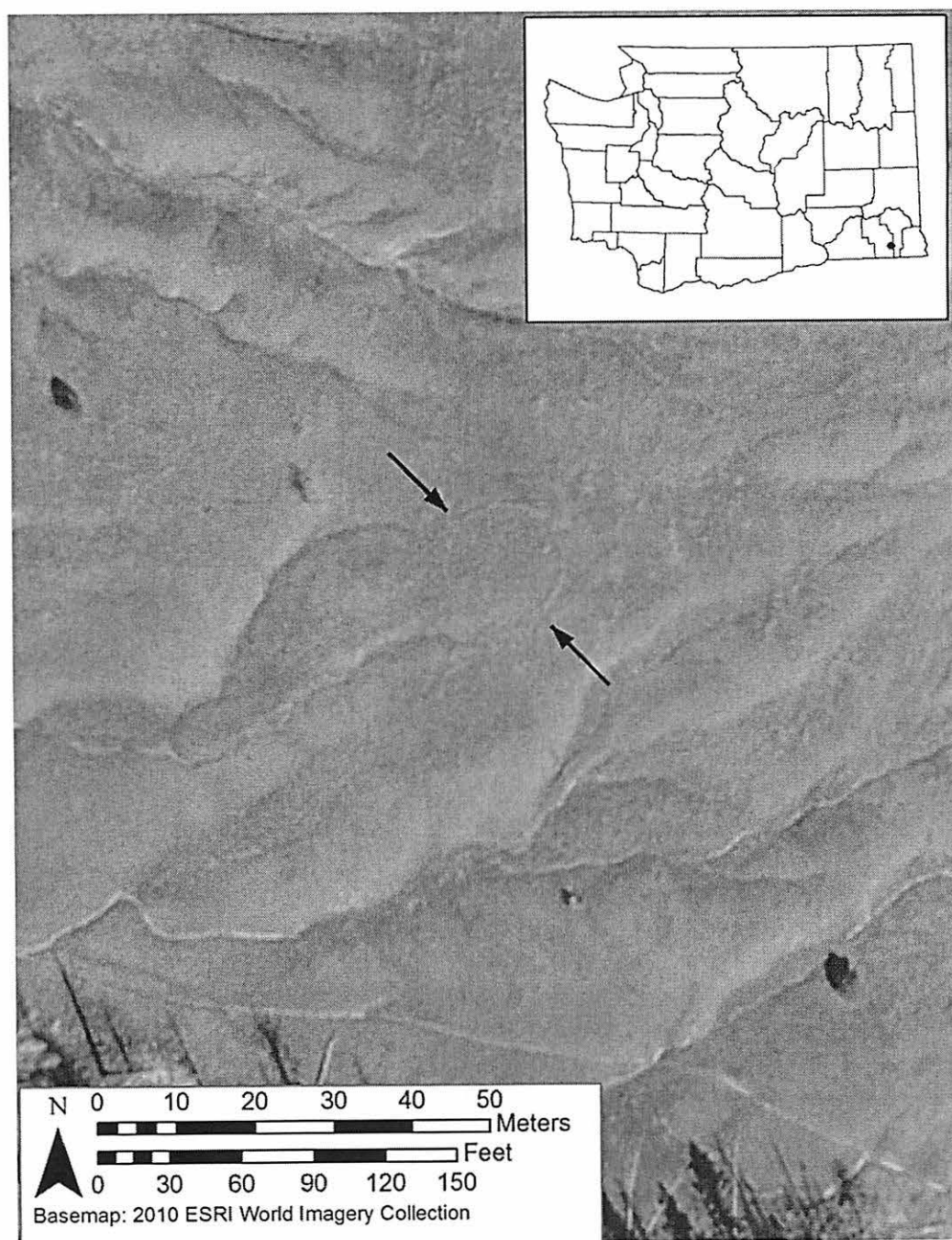


Fig. 4. Satellite view of the Red Fir stone ring, denoted by arrows. Note the east-west trail to the south. Photograph from Google Earth aerial imagery service, accessed September 2013.

Diamond Peak

This is the most dilapidated of the three remote rings we visited (Fig. 8) and it is not discernable in satellite imagery. It is approximately 18 m in diameter (Table 1) and is located within a large lithic scatter that was recorded in 1990. No mention of the Diamond Peak stone ring is included on the official site form (UNF site number 8N42E-34/02 [also known as site number

UM00090]; NOTE: Smithsonian trinomial site numbers are not available for some sites located in the UNF). No historic artifacts were observed in direct association with this ring, though a named trail that runs North-South passes through the ring just west of center, suggesting that perhaps the ring predates that particular trail.

A local informant told Lyman's brother two things of importance with respect to this ring. First, during the 1950s and 1960s this informant worked as an outfitter who packed hunters into the Blue Mountains. He sometimes used the trail passing through the Diamond Peak ring. At that time, the stones making up the ring were painted white and the ring was used by the Forest Service as a helicopter landing location. Second, the informant revealed that the ridge on which the ring and lithic scatter occur was cultivated in the mid-twentieth century with machinery in an attempt to seed grass. The ridge is largely devoid of vegetation today, but what are readily interpreted as crop lines are visible in satellite photographs and were visible during our 2013 reconnaissance. Perhaps this tillage is what exacerbated the deterioration of the Diamond Peak oval.



Fig. 5. Part of the stone configuration along the southern edge of the Lodgepole stone ring. View to the north. The ruler is between the south wall of the ring and the southern configuration. Note the configurations' resemblance to the digit "4."

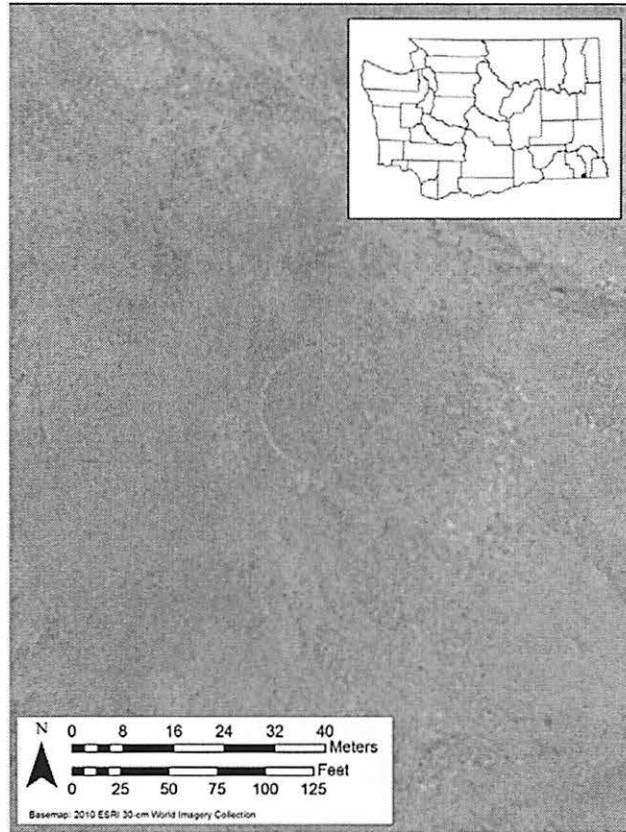


Fig. 6. Satellite view of the Lodgepole stone ring. The east portion of the ring is not visible because it has been dismantled. Note the stylized digits adjacent to the southern edge. Photograph from FlashEarth, Bing Maps aerial imagery service, accessed September 2013.



Fig. 7. Overview of the west wall of the Lodgepole stone ring. View to the south. Note the panoramic vista.



Fig. 8. The northeast wall of the Diamond Peak stone ring. The ring extends from the large rock just left of center at the bottom of the photo and curves to the left and then to the right toward the kneeling individual.

Godman Spring 1

Godman Spring 1 is about 15x18 m in size; its long axis is oriented southwest-northeast (Fig. 9, Table 1). A recently used ring of rocks ~1 m in diameter representing a hearth (some rocks are smoke stained) is located near the center of Godman Spring 1. Fragments of broken glass containers, empty rifle shells, and bits of modern trash are scattered around and within this ring. Several pieces of lithic chipping debris and a late-style lithic projectile point were also found directly associated with this ring in the summer of 2013. Previously recorded data for the site present a mixed bag of information. The lithic scatter at the Godman Spring Campground (UNF site number 7N40E-10/04 [also known as site number FS01319]) was originally recorded in 1978/1980. No mention of a stone ring is made in the site form. The site form was updated in 1990 and again in 1994 and new data were recorded in both instances, yet there is no mention of a stone ring in either update. The site form was updated yet again in 1996, at which time the Godman Spring 1 ring was recorded.

The site form for the Godman Spring Campground was updated again in 2007. This most-recent update notes that the Godman Spring 1 oval “appears to be a modern construction used for ceremony.” No data is provided to substantiate either the assessment of age or the ceremonial function. The 2007 site form indicates that the downslope edge of the ring appears more buried than the upslope edge. We noted nearly all portions of the wall are partially buried (Figs. 10 and 11), suggesting some unclear age of construction. The outer rim of the upslope wall is buried and the inner (downslope) edge of the upslope wall has been eroded somewhat, exposing individual rocks (Fig. 12).

Most of the Forest Service structures at the Godman Spring Campground, including the ranger station (site number UM00001) and picnic shelter, were constructed by the Civilian Conservation Corps (CCC) in the 1930s. Given the age of the CCC constructions and the historic and prehistoric artifacts observed associated with the stone ring, the ring itself could be of significant age. Indeed, Lyman picnicked and camped with his parents at the Godman Spring Campground between 1957 and 1975; he cannot recall this ring not ever having been there. Lyman’s father (deceased 2006) consistently suggested that the Godman Spring 1 ring marked the location of a helicopter landing area used by the Forest Service.

Godman Spring 2

Godman Spring 2 is sufficiently dilapidated that it is not visible in satellite imagery. Its walls are quite indistinct, though we were able to estimate its diameter to be about 13 m (Table 1). Individual stones are partially buried by aeolian silts and clays originating from the adjacent maintained gravel road on the west and from higher elevation slopes to the east. This ring occurs almost precisely in the opening defined by the maintained road and the U-shaped entrance and exit driveways that access a nearby Forest Service horse barn. The general area of the ring is also often used as a parking lot by those who access nearby hiking trails or simply park in the area to take in the panoramic view of scenery to the south. It is likely because of regular vehicle traffic that this ring is so dilapidated.

Four attributes of Godman Spring 2 are of significance with respect to deciphering its function. First, Godman Spring 2 occurs on more level ground than Godman Spring 1 (Table 1). Second, Godman Spring 2 is closer by 60–70 m to the Godman Spring ranger station structures than is Godman Spring 1. Third, Godman Spring 2 is at the same elevation as and immediately adjacent to a modern road, whereas Godman Spring 1 is ~15 m from the road and at ~2 m higher elevation, and can only be accessed by walking through the campground or scrambling up a road-cut bank. Finally, several of the stones making up Godman Spring 2 have been painted white (Fig. 13). All four attributes suggest that Godman Spring 2 would have been more conducive to serving as a helispot than Godman Spring 1: more stable landing surface, shorter hike to structures, easier access to fuel and fire retardant, and high visibility.

Finally, it is important to note that the 1980 site form includes a photograph of a “storage shed” in the location of Godman Spring 2; this storage shed was dismantled in the 1980s. Perhaps Godman Spring 2 is remnants of the storage shed, although as noted above, white-painted stones suggest use of this stone ring as a helicopter landing spot.

Oregon Butte

Inspection of satellite photographs once we had returned from the field revealed two additional stone rings within UNF. One of these is located on Oregon Butte near a CCC-built

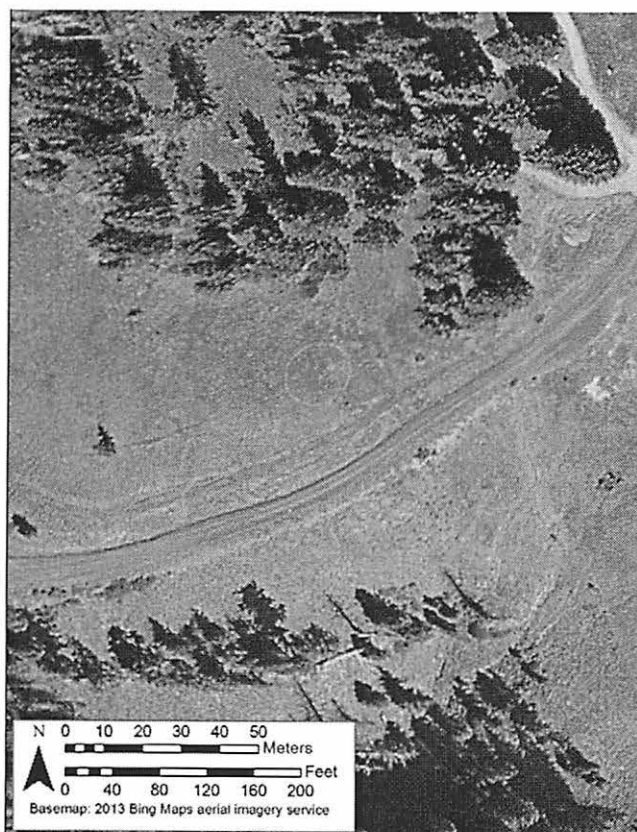


Fig. 9. Satellite view of Godman Spring 1 stone ring. Godman Spring campground is north of the ring. Godman Spring 2 stone ring is due east of the north edge of Godman Spring 1, and on the opposite side of the road. Photograph from Google Earth aerial imagery service, accessed September 2013.



Fig. 10. Closeup detail of a portion of the east wall of Godman Spring 1.



Fig. 11. East wall of Godman Spring 1.



Fig. 12. North (upslope) wall of Godman Spring 1.



Fig. 13. General view of Godman Spring 2 stone ring, view to the southwest. Backpack is near the center of the dilapidated ring. Note the white rock above the backpack. Godman Spring 1 is just beyond the trees on the far side of the road.

Forest Service-maintained fire lookout (Fig. 2). This ring appears in FlashEarth satellite photographs but not in the more recent satellite photographs available from Google Earth (a radio antenna and horse-hitching rail are visible in the latter but not the former set of images; we observed both the antenna and hitching rail in 2013). Like the stone rings we visited, the Oregon Butte ring appears to be a perfect circle. What appears to be a disturbed area outside of and on the southern edge of the Oregon Butte ring may represent a stone configuration similar to those observed at Red Fir, Lodgepole, and Diamond Peak. Lyman's brother, a long-time resident of Pomeroy, WA, indicated that the now bare stones making up the ring had been painted white in the middle 1990s when he visited the lookout. Similar to what was reported by informants for the rings at Diamond Peak and Godman Spring 1, Lyman's brother conveyed his personal understanding that the stone ring at Oregon Butte demarcated a landing spot for helicopters.

Table Rock

The seventh ring was also located by study of satellite imagery. FlashEarth photographs clearly display a perfect circle about 30–40 m south of the Forest Service fire lookout structure at Table Rock (Fig. 2). Google Earth satellite photographs of the same area seem to have been taken at a later time. A jeep trail from the lookout to the main road some distance east of the lookout is well-worn in the latter photographs and less obvious in the FlashEarth imagery. Further, vegetation seems to be more abundant and taller in the Google Earth photograph. The south quadrant of the ring has a break in the wall, and what appears to be the number “700” a few meters

away. Based on available satellite imagery, the Table Rock ring is visually consistent with all other rings observed first-hand.

Shared Attributes of the Umatilla National Forest Stone Rings

The five stone rings we documented in the field are all dry-laid and made up of multiple (usually 2–3) layers of stones most of which are 10–30 cm maximum dimension. All seven rings are located on high points of the landscape (Table 1) and all occur in natural clearings. Landforms on which all of the rings occur have varied aspects, and standing in or adjacent to the Red Fir, Godman Spring 1, and Lodgepole rings provides stunning panoramic views of landscapes (Fig. 7); the satellite photographs suggest the same for the Table Rock ring. On a clear day the view from the Lodgepole and Godman Spring 1 stone features can extend south as far as ~40 km to the Wallowa Mountains in Oregon and ~100 km southeast to the Seven Devils Mountains in western Idaho. The Red Fir ring provides a view to the south of 10–15 km. Standing in the Diamond Peak ring does not reveal a view beyond 1 km, the view being blocked by trees in many directions and by Diamond Peak (~1 km away) to the south. With the exception of Godman Spring 1, all stone rings are located on nearly level ground (Table 1). Were the stone rings placed where they are to ensure an associated panoramic view? Perhaps, though this explanation does not apply to the Diamond Peak ring.

Discussion

As we encountered the rings our thoughts, based on nearly 100 years of combined experience, were that the stone rings *could be* of Native American origin. Lyman's memory of visiting the Lodgepole "tipi ring" supported this notion, and indicated that at least this ring was more than 50 years old. We all agreed that the rings seemed too large to be tipi rings, but we needed comparative data. We also agreed that the only Native American construction of which we were aware that was this large, made of unmodified local stone, and oval to circular in shape were "medicine wheels." Yet to the best of our knowledge, no such structures were known in the Columbia Plateau. Finally, the overall lack of associated artifacts did not facilitate choosing between alternative explanations.

Three informants independently and at different times (one before and two after our fieldwork) conveyed their belief that at least three of the stone rings (Godman Spring 1, Diamond Peak, Oregon Butte) were at one time used as helicopter landing spots. Importantly, none of our informants was employed by the Forest Service or had direct first-hand knowledge of the use of these rings. The three rings (Godman Spring 1, Diamond Peak, Oregon Butte) asserted to be helicopter landing pads are (or were, in the case of Diamond Peak) associated with Forest Service structures. When we contacted the Forest Service archaeologist for the Pomeroy District of the UNF regarding the stone rings we had observed, she indicated she had no knowledge of them. She did report that the Forest Service "packer" knew of some stone rings in the UNF and that he referred to them as "tipi rings." Recall that the aforementioned Bob Jackson grazed sheep and hunted in the area between 1930 and 1960, and he too referred to local stone rings as "tipi rings." Thus two other informants who likely have an intimate knowledge of the UNF landscape assert that the rings are of Native American construction.

Were these stone rings in fact landing spots for helicopters? Were they perhaps of Native American origin, or do they represent multiple origins and functions? To address these questions, we turn next to the local ethnographic, archaeological, and historical records, and evaluate several possible prehistoric and historic explanations for the stone rings.

Possible Ethnographic Prehistoric Origins and Functions

Ethnographically documented American Indian land use and settlement followed a seasonal pattern (e.g., Marshall 1977; Hunn 1990): (i) the river valleys [winter villages and summer fishing stations], (ii) the low-elevation central basin [spring plant gathering and pronghorn (*Antilocapra americana*) hunting], (iii) the foothills [late summer hunting of deer (*Odocoileus* spp.) and bighorn sheep (*Ovis canadensis*) and plant (camas (*Camassia quamash*), lomatium (*Lomatium* spp.)) gathering], and (iv) the high mountains [autumn hunting of deer and elk (*Cervus canadensis*), berry picking, and root gathering]. The eastern half of the northern portion of the Blue Mountains comprised the traditional territory of the Nez Perce (Spinden 1908; Walker 1998) and the western half comprised the traditional territory of the Cayuse (Stern 1998). These peoples utilized the Blue Mountains as a source of lithic raw material, as a source of deer, elk, bighorn sheep, and smaller animals, and as a place where numerous plant tissues used as food and raw material were procured (Marshall 1977). The rugged forested terrain was also used for vision questing (the attainment of individual spiritual power) and various sociopolitical activities including inter-tribal trade and building of alliances (Ruby and Brown 1972; Slickpoo and Walker 1973). After horses became available early in the eighteenth century (Haines 1938), upland meadows were used as summer pasture and conflict emerged over access to upland resources (Walker and Sprague 1998).

Several details of the ethnographic record are directly pertinent to our discussion. Near the age of puberty, individuals undertook a vision quest to obtain knowledge of their spirit power. These quests usually took place at night and individuals were instructed to pile stones in order to stay awake (Walker 1966). Other stone piles were used as markers for resource patches (Ray 1942). Stone cairns have been documented in many areas of the Columbia Basin (e.g., Osborne 1959, 1967; Galm and Hartmann 1979). Some stone features in eastern Washington such as linear (walls) and oval arrangements have been interpreted as defensive structures when located on mesa tops (Smith 1977); others in similar locations have been interpreted to represent structures (blinds, drive-lines) associated with game drives (Lothson 1998). So far as we know, no circular arrangement of stones in the Columbia Plateau has been interpreted by archaeologists as a tipi ring.

When the ethnographically documented pattern of mountain use began is unclear for want of adequate data. Nor do we know the full range of human activities that took place in the forested high-elevation mountains, or how long those activities took place. Some cultural resource reconnaissance has taken place in the high-elevation portions of the UNF (e.g., Nakonechny and Bishop 2010, 2011; and references therein), and there have been a few archaeological excavations in the forest as well (e.g., Flenniken et al. 1991a, 1991b; Lucas 1998; Thompson et al. 1998; Reid and Root 1999; Gallison and Teigrob 2000; Grieser 2002; Grieser et al. 2003). Archaeological research in the Blue Mountains of northeastern Oregon has revealed sites where people lived at various times during the last 13,000 or so years (e.g., Bryan and Tuohy 1960; Womack 1977; McPherson et al. 1981; Brauner 1985), that is, since humans first arrived in eastern Washington (Ames et al. 1998). Our reconnaissance recorded Windust and Cascade-style projectile points (Leonhardy and Rice 1970; Ames et al. 1998;), as well as examples of all styles of middle and late Holocene points (Lyman et al. 2013). The entire Holocene sequence of human occupation is represented in the UNF of southeastern Washington. This means that the age of the stone rings we describe could fall anywhere in the last 13,500 years, and that ethnographic data recorded <200 years ago may not be relevant.

With the single exception of Godman Spring 1, no previous reconnaissance or excavation project has reported evidence of stone rings. Therefore, if these stone rings are of Native American construction, they are (to the best of our knowledge) locally and regionally unique. But exactly how do they measure up to demonstrably Native American stone features found in neighboring regions?

Stone Rings on the Great Plains

Circular arrangements of local stones on the Northern Great Plains are typically interpreted to represent efforts to anchor the hides of a tipi (Kehoe 1958, 1960; Davis 1983). These rings occur singly or in groups of 100 or more (Frison and Mainfort 1996). Archaeological investigations indicate that some rings contain very little in the way of cultural materials (Frison and Mainfort 1996); other rings contain not only artifacts but features as well (various papers in Davis 1983). Descriptive statistics of 126 archaeological stone rings in New Mexico, Wyoming, and Alberta indicate a range in diameter from 2 to 8 m (Davis 1983). A sample of more than 400 measured rings in western Montana range from 2.3 to 8.2 m in diameter (Kehoe 1958, 1960). Rocks comprising the rings tend to range in size from about 8 cm to 45 cm in maximum dimension (Kehoe 1960). At roughly 15 m in diameter, the UNF stone rings are nearly five times larger than an average-sized stone ring on the Northern Plains (Fig. 14). We are confident that the UNF stone rings discussed here had a different function than those on the Northern Plains.

Ceremonial Circles

As noted above, Columbia Plateau ethnographies contain no references to large stone rings. Chalfant (1974:136), however, indicates that during the summer months women gathered camas in upland meadows; "Camas season was a festive one and terminated with the summer ceremonial dances." Perhaps one or more of the stone rings in the UNF played a role in these summer ceremonial dances. All are located near (<1 km) (Red Fir, Lodgepole, Oregon Butte, Table Rock) or within (Diamond Peak, Godman Spring 1, Godman Spring 2) a prehistoric lithic scatter.

Perhaps the UNF stone rings are associated with a local ritual complex of some sort, similar to that described by Chartkoff (1983) for northern California. That complex has several kinds of associated stone configurations including cairns, rock piles, rock walls, and stone ovals, though the latter average only 4 m in diameter. The northern California ovals are all on relatively high points of the landscape and provide stunning views of the surrounding landscape. The latter two attributes also characterize the UNF rings. Wilson (1995:189) reported that "evidence exists [in the Northern Plains] that simple stone circles were used to demarcate sacred space used in the vision quest (Hoffman 1953)." Perhaps the UNF stone rings are associated with ancient rituals, but if so, they are unlike the complex of stone configurations in northern California.

Medicine Wheels

"Medicine wheels"—more or less circular stone arrangements with diameters greater than several meters—have been known to anthropologists for over a century (Quigg 1996). Nevertheless, so-called medicine wheels have been characterized as the "most enigmatic element of the material culture of Northwestern Plains groups" (Mirau 1995:193). These phenomena are not easily confused with run-of-the-mill stone rings. Medicine wheels tend to be >8–10 m in diameter, often have internal spoke-like linear alignments of stones, and sometimes have a cairn or

pile of stones placed in the center. Until recently medicine wheels were known to occur only in the Great Plains and eastern Rocky Mountains (Brumley 1988; Quigg 1996). At least two rock rings believed to be medicine wheels have recently been found in east-central Oregon (P. O'Grady, University of Oregon Museum of Natural and Cultural History, personal communication August 2012; see also: <http://uonews.uoregon.edu/archive/news-release/2012/2/>).

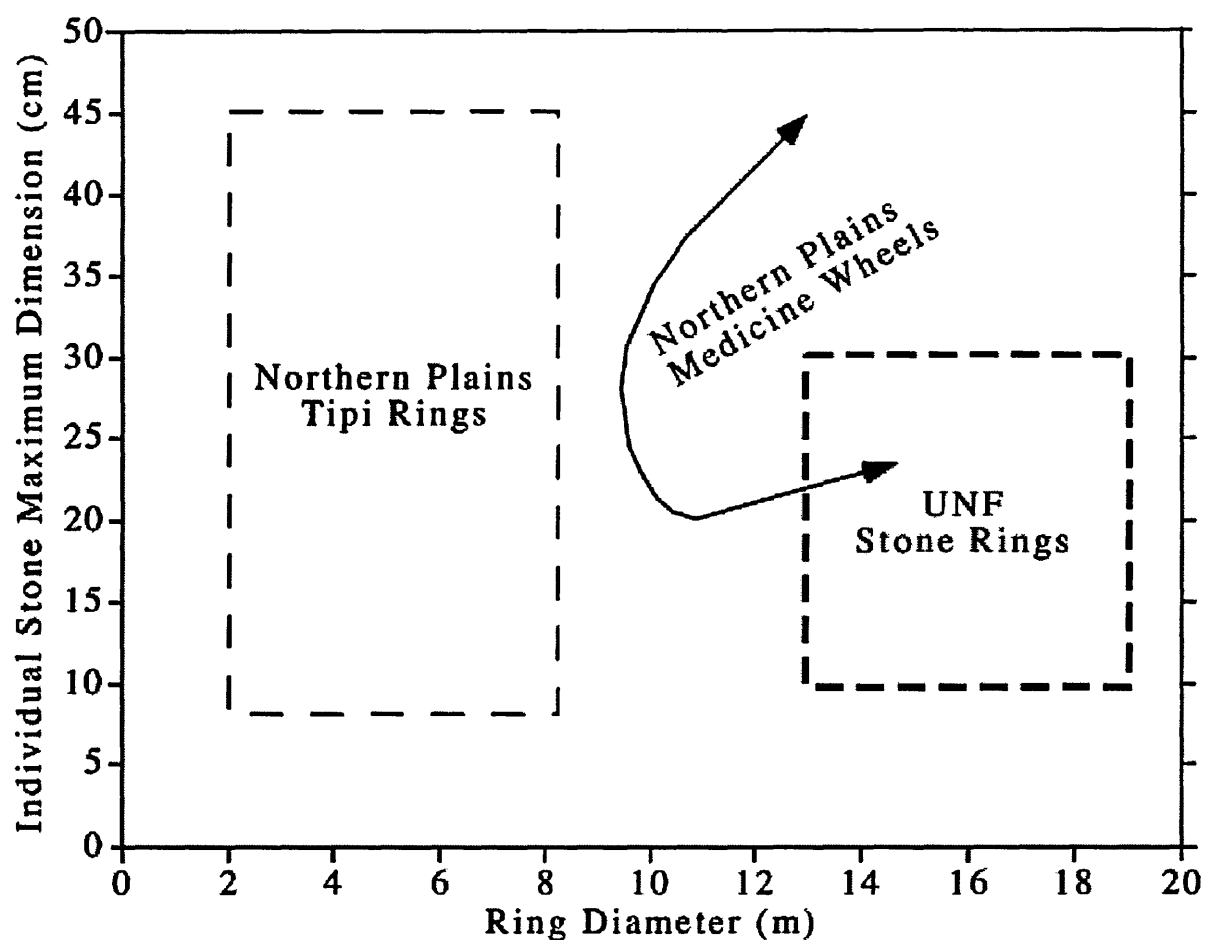


Fig. 14. Ranges of dimensions of stone rings and medicine wheels on the Northern Plains, and the Umatilla National Forest stone rings.

Despite their seeming uniqueness (and hence enhanced significance), few medicine wheels have been rigorously mapped in detail and even fewer have been intensively studied. Limited archaeological testing suggests the function of these stone rings varied from one to another, though in the absence of ethnographic and ethnohistoric data, functional interpretations are largely conjectural (Mirau 1995). Some historically documented medicine wheels are associated with the burial of a prominent individual; others seem to be associated with migration routes of large game such as bison (*Bison* sp.); still others have associated features (other than the oval) that seem to align with astronomical phenomena (see Mirau 1995 for review; see also Wilson et al. 1981; Vogt

1990). The one thing that seems common (and fairly certain) to the ~80 such features known is that they had something to do with ritual and ceremony.

Among 67 medicine wheels known thirty years ago (Brumley 1988), “nearly 48% are situated along valley margins, while another 36 per cent are on prominent knolls or hills, and the majority of the latter are near valleys. Most medicine wheel features were constructed in locations with considerable vistas overlooking present or past water courses. Certainly, these religious features are not built in isolated locations or meant to be out of sight in nonconspicuous [sic] places” (Quigg 1996:10). As noted above, several of the UNF stone rings have stunning views of distant landscapes.

The medicine wheels of the northern Great Plains and eastern Rocky Mountains share several attributes (Brumley 1988; Quigg 1996):

- constructed mostly of local unmodified natural stone.
- have at least two of the following three components: (i) centrally located cairn, (ii) one or more concentric stone rings, (iii) two or more stone lines radiating outward from a central origin, central cairn, or the margins of a stone ring.
- made up of generalized and radially symmetrical arrangement of the listed components.

Mirau (1995:197) reports that simple circular arrangements of stones like those we observed in the UNF “are only marginally similar to what typically are thought of as medicine wheels.” In fact, the single attribute shared among medicine wheels and the UNF rings is that they are made of locally obtainable and unmodified stone. The stone configuration (having the appearance of a platform or a set of numbers) observed along the southern portion of several of the UNF rings is undocumented among North American medicine wheels.

Game Drive Features

Stone structures in Wyoming (Frison 2004) and Colorado (e.g., Benedict 1992, 1996) that are interpreted as game drive facilities are generally two long linear walls arranged in a V- or U-funnel shape. Some times an oval enclosure has been constructed at the apex of the funnel. Similar arrangements of stones have also been documented in Nevada (e.g., McGuire and Hatoff 1991; Hockett 2005). We observed no linear arrangements of stones associated with the UNF rings. Stone alignments in the Columbia Plateau interpreted to represent hunting associated features are located in different topographic settings (on lowland mesas), are of different morphology (irregularly shaped), and are on average smaller (~3 m diameter) than the UNF rings (Lothson 1998). Finally, the UNF rings look nothing like the stone configurations in the southern Plateau thought to represent plant cooking facilities made up of tens to hundreds of fire-modified rocks (Gough 1997; Andrefsky et al. 2000; Thoms 2007).

Possible Historic Origins and Functions

Perhaps the stone rings we describe above are of Euroamerican construction, and date to the early twentieth century. The Civilian Conservation Corps (CCC) worked in the area in the 1930s and early 1940s (Tucker 1940), and five of the seven rings we identified (Godman Spring 1, Godman Spring 2, Diamond Peak [lookout destroyed in 1953], Oregon Butte, Table Rock) are associated with CCC constructions (picnic shelter, ranger stations, fire lookouts). We have, however, been unable to locate information indicating the CCC constructed stone rings, or why they might have done so (Throop 1979; see also www.ccclegacy.org).

As discussed above, three separate informants (Lyman's father, Lyman's brother, and a colleague of Lyman's brother) asserted that the Godman Spring 1, Oregon Butte, and Diamond Peak (respectively) rings were helicopter landing areas. Forest Service Manual 7700 (Transportation System), section 7725.05, defines a "helispot" as "any area of land within the boundaries of the National Forests without road access that is repeatedly used for the takeoff and landing of helicopters." A "helibase" is defined the same way except it has road access. For simplicity, we use the term helispot to denote either or both in subsequent discussion.

Since 1902 when the Wenaha Forest Reserve, precursor of UNF, was created (Powell 2008), the detection and suppression of forest fires was a priority as it justified the existence of the Forest Service to the public (Tomlinson 2002). "The system of fire lookouts that remains standing is representative of what was one of the [Forest Service]'s most important roles" (Tomlinson 2002:27). Helicopters have been used by the Forest Service since 1947 to fight forest fires in northwestern North America (National Museum of Forest Service History website—hosted.verticalresponse.com/488275/1bq9f43392/1791502791/38455c02e1/ accessed Nov. 15, 2013); their use increased dramatically in the 1960s. A 1961 "Development Program for the National Forests" (United States Department of Agriculture 1961) mentions the planned construction of more than 100 helispots (United States Department of the Interior 1964). UNF also used airplanes and helicopters to spray trees with insecticides beginning in 1948 (Eaton et al. 1949). Further, supplies were sometimes air dropped at various UNF locations in the 1950s (Orvis n.d.).

What does a helispot look like? The National Wildfire Coordinating Group's (2013) "Inter-Agency Helicopter Operations Guide" makes various recommendations regarding establishing a helispot: it should be on land as nearly level as possible, and preferably on a slope less than 6°; a safety circle around it should be ~25 m in diameter; it should be located on an exposed knob or ridge free of vegetation; its use should result in minimal ecological impact and it should be readily returned to a natural (undisturbed) state. With the exception of being 5–10 m in diameter smaller than these modern regulations, all of the UNF stone rings fit these criteria. We also note that the 2003 Management Plan for the Frank Church-River of No Return Wilderness in north-central Idaho, states that the "early practice of marking and numbering helispots has been discontinued. Most fire lookouts maintain adjacent helispots, usually outlined by rocks" (United States Department of Agriculture 2003:2–9). Although we cannot be certain that helispots constructed in Idaho would be identical to those in the UNF, the preceding quote provides evidence that at some past time the Forest Service marked and numbered helispots and that the helispots had circular rock outlines. In light of the historical evidence summarized here, we hypothesize that the UNF stone rings were constructed to serve as helispots. In the next section, we argue in favor of this hypothesis and outline a general research design for testing it.

Informant Testimony and Analogical Reasoning

If the UNF rings are indeed helispots, then it would appear that they were constructed at some time after the late 1940s. Today, given their state of disrepair, the general absence of white painted rocks, and the apparent lack of knowledge of them among UNF archaeologists, we suspect that use of them has ceased. Since the early 1960s Lyman's father said Godman Spring 1 was a helispot. The acquaintance of Lyman's brother reports that the Diamond Peak ring was used as a helispot in the 1950s and 1960s, and that the rocks had been painted white. Similarly, Lyman's brother reports that the stones of the Oregon Butte ring had been painted white as recently as the 1990s, and the ring had been used as a helispot. Godman Spring 2 is of unclear origin, but its

rocks are painted white. The shared attributes of the Godman Spring 1, Godman Spring 2, Oregon Butte, and Diamond Peak suggest, based on analogical reasoning, a shared functionality of these four rings (Table 2).

The three remote rings we documented—Diamond Peak, Red Fir, Lodgepole—all have an artificial rock configuration outside of and adjacent to the south edge of the ring. These appear to be stylized multi-digit numbers. The Table Rock ring also has a south-edge number, and the Oregon Butte ring may have had a similar south-edge arrangement. Reasoning by analogy again, given that the Diamond Peak ring was used as a helispot, and that it shares several attributes with the Red Fir and Lodgepole rings (Tables 1 and 2) suggests the latter two also represent helispots.

A final bit of evidence, again by analogy, suggests the helispot hypothesis is correct. Godman Spring 1 is associated with Forest Service structures. The Diamond Peak ring had an associated Forest Service lookout station on Diamond Peak (1 km south of the ring) that was destroyed in 1953 (Orvis n.d.; Tomlinson 2002). By analogy, the Oregon Butte and Table Rock rings, also near lookout stations, are helispots (Table 2).

TABLE 2. SHARED AND UNIQUE ATTRIBUTES OF STONE RINGS IN THE UMATILLA NATIONAL FOREST.

Ring	South Edge Feature	Associated FS Structure(s)	White-Painted Rocks	Reported Helispot
Red Fir	Yes	No	No	No
Lodgepole	Yes	No	No	No
Diamond Peak	Yes	Yes	Yes	Yes
Godman Spring 1	No	Yes	No	Yes
Godman Spring 2	No	Yes	Yes	No
Oregon Butte	Maybe	Yes	Yes	Yes
Table Rock	Yes	Yes	Likely	?

How to Test the Helispot Hypothesis

Our 2013 research design was to locate cultural resources. We thus lacked the time and finances necessary to undertake additional historical and archaeological research that could confirm (or perhaps refute) the helispot hypothesis. In the following paragraphs, we describe in general terms what we believe a robust test of the hypothesis should entail.

To test the helispot hypothesis, archives—both photographs and written documents—should be searched. Many historic materials are posted on the UNF web site (www.fs.usda.gov/detail/umatilla/learning/history-culture), but local archives at Pomeroy and Dayton should also be searched. Aerial photographs taken prior to the availability of satellite

images might prove especially revealing, if such exist for the pertinent locations. Simultaneously, extensive interviews with local informants should take place. Two informants guided us to the helispot hypothesis; one of them is deceased. A third informant added confirmatory testimony. Informants, including the UNF Pomeroy District “packer,” should be interviewed as soon as possible, else these living archives of local history will not be available.

We recommend the eventual implementation of a multi-stage archaeological testing program, regardless of the outcome of the research concerning archives and informants. Such would provide valuable information on these (thus far) regionally unique phenomena. The first stage would involve Godman Spring 1 and 2. Both have been heavily modified by modern activity, and thus excavation to determine aspects of construction and the presence of white paint on unexposed rocks would not destroy pristine features. And they are easily accessible. Second, a non-destructive metal-detector survey of each remote ring may reveal shallowly buried metal artifacts under the rocks used in their construction. This would indicate an historic age for the rings, but not confirm they are helispots. The absence of associated metal artifacts would leave open the questions of age and of function. The third step in testing would be to extract sediment samples for optically stimulated luminescence dating from under individual rocks making up one or more of the remote rings (e.g., Feathers 2003a, 2003b). This could facilitate determination of the age of the rings, if not their function. Finally, as a fourth and final step, limited archaeological testing of one or more of the remote rings should take place given their seemingly relatively pristine condition. We envision one 50x50 cm excavation unit placed over a portion of the ring wall, and another 50x50 cm unit placed over part of the southern, seemingly numerical, configuration of rocks. If white paint is found on undersides of rocks, then the rings are of historic origin.

Finally, a simple but long-term project would be to set semi-permanent stakes near one or more of the rings. The stakes should be marked in at least centimeter increments. Stones would be placed around each stake so as to mimic a section of the wall making up a ring. The stakes should be monitored over the course of multiple years (no less than a decade) to determine how quickly stones are buried and how quickly sediment accumulates. This would produce a relative chronometric scale that would facilitate estimating age based on depth of burial of the stones making up a stone ring.

We suggest detailed archaeological testing of the helispot hypothesis because we also wonder if one or more of the rings might have originally been built prehistorically by American Indians. We offer this possibility for one simple reason. Recall that Bob Jackson knew about the so-called tipi ring at Lodgepole in 1963, and likely knew of its existence before that given his familiarity with the Blue Mountains in general. He is one (unfortunately deceased) individual who likely would have known about Forest Service constructed helispots. If he had indeed known that these rings were helispots, why would he have agreed to guide a 12-hour horseback ride to inspect a “tipi ring?” Perhaps the Lodgepole ring was not originally a helispot. Subsequent to prehistoric construction, it could have been co-opted by the Forest Service as a helispot.

A 2002 report evaluated the National Register eligibility of a sample of the lookout structures on the UNF in Washington and Oregon (Tomlinson 2002). There is no mention in that report of a stone ring being associated with any of the 14 lookouts—including Oregon Butte and Table Rock—discussed. Perhaps the UNF rings are not mentioned because, as we noted earlier, they are no longer used as helispots. Whether or not that is in fact the case, these rock rings are nevertheless valuable cultural resources.

Whatever the origin(s) and function(s) of the UNF stone rings, they should be documented in detail prior to their ultimate deterioration. If built prior to 1960, they meet the National Register

criterion of ≥ 50 years of age. If they are helispots or helibases, then they are significant icons of UNF history, just like the lookout structures. Each ring should be mapped such that individual stones are precisely located; depth of burial of each stone should be measured; size of each stone (e.g., maximum dimension) should be measured; and diameter and shape of each ring should be determined (see Finnigan [1981] for other variables that might be of analytical value).

Conclusion

In his concluding remarks about the then limited knowledge and thus controversial notions about various stone rings in the northern Plains, Thomas Kehoe (1960:463–464) made the following remarks:

The solution to the problems presented by the stone configurations, including tipi rings, appears to lie in intensive investigations of the several types in a number of limited areas. If there is preliminary agreement on the classification of these configurations, and use is fully made of [ethnographic, historic, and archaeological data], comparisons of the results of the investigations in each area should throw considerable light on the history and ways of life of many of the tribes once occupying the vast area in the West in which boulder configurations of unknown function are now found.

Thirty-five years after Kehoe, Neil Mirau (1995:193, 210) made similar remarks about various boulder configurations, some of which were thought to represent medicine wheels:

Many theories of the roles, functions, and meanings of medicine wheels have been proposed, but few have been supported by all available data. Archaeologists have lumped medicine wheel structures into a single category and in so doing have deemphasized the relevance of variability and context of individual medicine wheels. Like most archaeological materials, what we do not know about these cryptic structures far outweighs what we know. . .

Unidimensional explanations that purport to account wholly or even partially for a wide range of archaeological material are undoubtedly pleasing to those doing the explaining. Explanations grounded in supposed cultural regularities or systematics . . . often run the risk of not paying sufficient attention to either the complete contexts of the material culture or the context in which the researchers are operating.

In preceding paragraphs we have described stone rings located in the coniferous forests of the Blue Mountains of southeastern Washington. Historic, ethnographic, and archaeological data provide possible explanations for these rings, but they are all unsatisfying. Instead, local informants independently, so far as we know, provide the same explanation for two of the rings (Godman Spring 1, Diamond Peak), plus another ring (Oregon Butte) we did not document is said by a third informant to have the same origin and function as the first two. Analogical reasoning suggests this explanation applies to all seven of the features. We thus hypothesize that the UNF stone circles that are 13 to 19 m in diameter, sometimes with white-painted rocks, sometimes with an associated stone configuration resembling a multi-digit number outside the ring and in the south quadrant, and sometimes with associated Forest Service structures are helispots (Table 2).

We emphasize that our suggested explanation is a hypothesis. The UNF stone rings seem to date to the 1940s or later and to represent helispots used by the UNF and, if so, represent a significant chapter in the history of the national forest. However, Forest Service personnel seem unaware of their existence. The stone rings of the Blue Mountains of southeastern Washington must remain enigmatic until such time as rigorous historical and archaeological research provides insight to who built these rings and reveals their function. In presenting the discussion above, we hope to facilitate resolution of these locally unprecedented archaeological phenomena.

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ABOUT THE AUTHORS

R. Lee Lyman earned his BA (1973) and MA (1976) in anthropology from Washington State University and his Ph.D. (1982) in anthropology from the University of Washington. He has focused most of his research efforts on the Columbia Plateau and zooarchaeology; recent research involved analysis of the terminal Pleistocene mammalian fauna from Marmes Rockshelter. He is currently a professor of anthropology and is studying the history of North American zooarchaeology. Department of Anthropology; 107 Swallow Hall; University of Missouri; Columbia, MO 65211; lymanr@missouri.edu

Matthew T. Boulanger received his BA (1999) from Luther College and his MA (2009) from University of Missouri. His research interests involve lithic sourcing, eastern Paleoindians, landscape ecology, and evolutionary theory. He is currently a Ph.D. candidate in anthropology at University of Missouri, and a Senior Research Specialist at the University of Missouri Research Reactor. Department of Anthropology; 107 Swallow Hall; University of Missouri; Columbia, MO 65211; boulangerm@missouri.edu

Dave N. Schmitt earned his BA (1982) and MA (1986) in anthropology from Oregon State University. His research includes zooarchaeology, prehistoric hunter-gatherer adaptations in the Great Basin, and ethnoarchaeological studies among foragers and farmers in the Congo Basin. He is currently analyzing the types and distribution of Paleoarchaic sites in western Utah for the Desert Research Institute, and the timing and nature of the Central African Iron Age for Southern Methodist University. Desert Research Institute; 2215 Raggio Parkway; Reno, NV 89512; and Department of Anthropology; Southern Methodist University; Dallas, TX 75275; david.schmitt@dri.edu

INSIGHTS ON ADAPTIVE CAPACITY: THREE INDIGENOUS PACIFIC NORTHWEST HISTORICAL NARRATIVES

Benedict J. Colombi and Courtland L. Smith

ABSTRACT

Adaptive capacity is the ability to cope with changing, novel, and surprise situations. Narratives of adapting to change, which often transforms cultures, suggest hypotheses for addressing social and environmental change. By describing three historical narratives exemplifying greater adaptive capacity, we share Indigenous stories of gaining cultural capacity and adapting to change in novel and unexpected ways. The narratives are: (1) Grand Ronde tribal restoration of sovereignty and resilience; (2) Columbia River tribal salmon supplementation and cultural knowledge; and, (3) the Nisqually leadership with Billy Frank Jr. Our aim is to provide insight into adaptive capacity by showing how Indigenous people and cultures adapt to new settings and situations and how historical narratives can offer additional insight into the most important variables and cultural dimensions for explaining adaptive capacity.

Introduction: Novel Systems, No-analog Futures, and Surprises

As cultures head into an unknown future onto which they have stamped their significant footprint, lessons from previous experience may provide insight on adaptations to novel systems of the future. Writing in the journal *Science*, Douglas Fox predicts a “messy world in 2100, as surviving species reshuffle into entirely new combinations, creating “no-analog” ecosystems” (2007:83). We extend Fox’s predictions by showing how cultures adapt to change, contending those with adaptive capacity—the ability to adapt to new settings and situations—have greater potential to persist in the face of change and surprise.

Three historical narratives from the Pacific Northwest of North America exemplify adaptive capacity. These are Indigenous stories of gaining cultural capacity and adapting to change in novel and unexpected ways. The stories reveal strategies of developing portfolios with multiple sources of economic support, using sovereignty, vision, and leadership, building trust and partnerships, and gaining knowledge to confront surprises and unanticipated futures.

In the first narrative, we show how the Confederated Tribes of Grand Ronde gained restoration of their sovereignty and showed the resilience to adapt to threats to their culture through economic portfolio building, language revitalization, and tribal knowledge. In the second narrative, we describe how Columbia River tribes applied cultural values and knowledge to provide the salmon production alternative of supplementation to bring back lost and depleted salmon populations. In the third narrative, we use the example of Billy Frank, Jr., a Nisqually elder, to show how leadership and ecological knowledge helped in restoration of Puget Sound salmon.

Methods

The comparisons in this article are based on anthropological fieldwork and tribal narrative archives. Our collaboration came about as part of the School for Advanced Research, Advanced Seminar Series and book, *Keystone Nations: Indigenous Peoples and Salmon across the North Pacific* (Colombi and Brooks 2012). We titled the edited-volume *Keystone Nations* to examine the histories and futures of Indigenous peoples and salmon and to “signal the marriage of the biological and social sciences” (Colombi and Brooks 2012:xi). Smith’s (2012) chapter examined generalizations around issues of Indigenous and non-Indigenous management practices, showing how each region across the North Pacific is affected differently by agricultural metaphors and their application to salmon fisheries as well as watersheds. Colombi’s vision of *Keystone Nations* explored salmon as a cultural keystone species (Garibaldi and Turner 2004), showing how salmon serve as pillars of culture, history, and economy in the North Pacific as well as North Atlantic regions. His individual chapter (Colombi 2012b) focused specifically on Nez Perce themes of Indigenous knowledge about salmon, fishing policies, water and fishing rights, the tradition of treaties, co-management experiments, and commercial “cultivation” versus the preservation of “wild” salmon.

Our approach takes a conceptual view of the economy and ecology, society and polity, ideology and knowledge dimensions of culture. We argue that the terms and concepts associated with each cultural dimension are numerous and multi-layered. In the dimension of economy and ecology, sovereignty and portfolio building are the main elements creating resilience in adapting to cultural threats. In the dimension of society and polity, leadership that engenders vision and trust is key, as are partnerships to achieve goals in complex systems. For dimension of ideology, local, ecological and contextual knowledge, including the willingness to act in concert with the associated values are key. Local knowledge helps knowing the opportunities of a place. Ecological knowledge helps knowing the processes of adaptation, and contextual knowledge allows people to see opportunities beyond their local places. Ecological values of seeing one’s self and one’s culture as a part of, but not dominant over a place is important for adapting to new realities.

Restoration and Resilience: Grand Ronde

A brief summary of the Grand Ronde historical narrative provides background for discussion of adapting to change and gaining cultural restoration of sovereignty and resilience through economic portfolio building, language revitalization, and tribal knowledge. The Grand Ronde tell their own story, which we paraphrase as an example of the capacity to adapt, and even transform, culture in the face of tremendous change (CTGR 2014). Despite a history of being forced onto a reservation, believing they would all die, failing to have binding legal agreements kept, and having their federal trust status terminated, the Grand Ronde continue to persist, as evidenced by their tribal community at Grand Ronde, Oregon.

Before treaties with the United States in 1854, the 26 tribes and bands that became The Confederated Tribes of Grand Ronde lived in the area west of the Cascade Mountains from northern California to the Columbia River. Prior to contact, the groups that made up the Grand Ronde had a subsistence portfolio of aquatic and terrestrial resources—salmon, skakwal (eels), mammals, camas, wapato, hazelnuts, acorns, and huckleberries. They also quarried obsidian and traded with neighbors.

Between 1853–1855, the Willamette Valley tribes and those south to Shasta signed treaties and were “awarded” 61,440 acres for the Grand Ronde reservation (Lewis 2009), along with other

promises for schools, farming equipment, and supplies. In 1856, about 2000 members these tribes moved to the Grand Ronde reservation (CTGR 2014). The move was so disruptive, that elders talked about wishing to die in the lands of their ancestors rather than move to the reservations. By 1901, 33,468 acres were allotted to 274 individuals and the remaining land was sold as surplus. By early 1930s, around 300 Grand Ronde made their living as mill workers, farm laborers, and arts and crafts specialists. They were suffering from poor health, lack of utilities, and difficult living conditions (Lewis 2009). With the Indian Reorganization Act of 1936, the tribal council, which had been in existence since 1873, established a constitution and bylaws. Next came the termination policy of the U.S. government in 1956, which stripped away federal recognition, terminated the reservation, ended federal trust responsibilities, set policy to “colonize the remainder of their lands through Federal termination policy” (Lewis 2009:iv). The Grand Ronde was left with next to nothing; the Grand Ronde reservation was reduced to a storage shed and cemetery on 7.5 acres.

In the 1970s, several leaders emerged who wanted to restore Grand Ronde lands, society, and culture (CTGR 2014). In 1983, the tribe regained its sovereignty and 9,811 acres were returned in 1988 (Lewis 2009). By 2010, the Grand Ronde reservation was over 11,000 acres, including forest lands and a casino, firefighting departments, and craft activities.

Most interesting about the tribe is how members carved its ideology and identity out of many different linguistic and cultural heritages to become the Grand Ronde, whose language is *Chinuk Wana* (CTGR 2014). Moreover, they retain their knowledge and interest in natural resources. Thus, their adaptive ability includes an economic producing portfolio, a built environment, and strong leadership with a vision for a future that includes a more adaptive tribal capacity. Knowledge of historic ways, language, and the broader society enabled the Grand Ronde to survive both conscious and unconscious efforts for their eradication.

Based on work by Walker (1967), Menzies (2010, 2012), Colombi (2012a, 2012b), and others on adaptation to natural variability (Langdon 2006, 2007), we were surprised that the Grand Ronde narrative did not mention their ecological relationships as much as their struggles with U.S. government policies and actions. Grand Ronde economic patterns show evidence of resource shifting and substitution in pre-reservation times between aquatic and terrestrial portfolios of resources (CTGR 2014). From their settlement on the reservation, up to and including federal termination, various forms of farming and wage labor sustained families. The restoration of sovereignty era was a time of using casino revenues to diversify their economic portfolio.

A strong tribal portfolio consists of multiple economic activities and the sovereignty that enables a group to control its economy. Sovereignty typically implies having rights to a resource. Most often sovereignty is in a land base, but it could also be fishing or hunting quotas, mineral or water rights, access to economic activities open to tribal groups, or ownership of intellectual property. The Economics Resource Group, Inc. (1998) noted, “Tribes that establish their own decision-making power over resources and take control of their economic destinies are better off than tribes that accede to outsiders’ decisions, goals, plans, or programs” (The Economics Resource Group, Inc. 1998).

The Grand Ronde restored their sovereignty in the face of change. The primary tools used by the Grand Ronde were leadership and sovereignty. By leadership, we mean tribal leaders with a vision about the tribe’s future and their ability to gain the sovereignty to achieve that future. They still had a piece of their tribal identity in the small cemetery near the current tribal headquarters. With sovereignty, they obtained a land base, albeit much smaller than the original territory. Tribal leaders had the vision to produce a very high value economic activity on their sovereign land base where they could exercise a competitive advantage in building a casino.

Can the Grand Ronde be called resilient? Resilience is the capacity to absorb and adapt to disturbance or change while maintaining essential functions (Walker and Salt 2006). Through the precontact, reservation, and restoration periods, the Grand Ronde maintained a tribal identity and polity. Further, their resilience was maintained by portfolios that provided multiple sources of economic support, collaborations and connectedness to get political support for goals, and learning and new knowledge (Gunderson and Pritchard 2002:264). The Grand Ronde merged several diverse cultural identities from the pre-contact period into a unified culture in the reservation period and then synthesized cultural elements from several groups to develop their tribal beliefs and language after restoration of sovereignty. The Grand Ronde can be said to be very adaptive, actually conceiving and implementing different states while maintaining their basic cultural identity.

The Grand Ronde faced and made many changes from being wide-ranging groups of foraging people, to being forced into one group on a reservation and encouraged to be farmers and wage laborers in a money economy, and to their current status as a modern corporate entity. These represent at least three structural changes or transformations (Trosper 2009) showing the resilience of their culture.

Cultural Framework for Adaptive Capacity

How can a cultural framework help in understanding adaptive capacity? Culture we conceptualize as a basic concept for understanding adaptation and are a valuable tool for learning how people construct and manage their world. Environments both affect cultures and what they can do and are affected by culture. Adaptation is the iterative process of change as cultures adapt and environments change. Colombi (2012a) defines culture as what people think, make, and do. Culture is learned and shared, and includes symbolic information and meanings encoded in language, behavior, and objects. Culture is “created, maintained, revised, and reproduced through time” (Colombi 2012a:79). Environmental change that is either culture-directed or natural can be addressed with cultural solutions.

Social scientists use the dimensions of the ecology and economy, society and polity, and ideology and knowledge when describing culture. The holistic nature of culture suggests that insights into cultural adaptation should be found in each of these three dimensions. In Table 1, several efforts at parsing culture are linked with economy and ecology, society and polity, and ideology and knowledge—the make, do, and think categories that Colombi (2012a) mentions. The top three rows give social science thinking from Colombi (2012a), Bodley (2005), and Harris (1979). These are followed by brief descriptions of Grand Ronde culture during the three structural changes—precontact, reservation, and restoration of sovereignty.

Ideology and Knowledge: Columbia River Tribal Salmon Supplementation

An interesting feature of Pacific Northwest tribal ideology and knowledge is how it guides adaptive capacity. For example, Columbia Basin tribal values have informed modern non-tribal science with alternatives to some salmon restoration practices. In 1994, four of the Columbia River tribes—Nez Perce, Umatilla, Warm Springs, and Yakama—created an organization and plan for restoring Columbia River salmon and steelhead runs that had been listed as threatened and endangered (CRITFC 2006). The tribes used their knowledge to develop resource restoration and management strategies (Trosper 2002, 2003).

TABLE 1. COMPARISONS OF CULTURE DIMENSIONS WITH LITERATURE IN ANTHROPOLOGY AND WITH THE GRAND RONDE HISTORICAL NARRATIVE.

Dimensions of Culture	Economy and Ecology	Society and Polity	Ideology and Knowledge
Colombi (2012a)	make	do	think
Bodley (2005)	material	behavioral	mental
Harris (1979)	infrastructure	structure	superstructure
Grand Ronde: precontact	portfolio of aquatic & terrestrial resources and sovereignty over territories	26 tribes operating as independent units with their own social and governance systems	believing themselves to be part of natural systems
Grand Ronde: reservation	household income as small farmers and low-wage, logging, and farm labor jobs.	emergence of tribal social organization and governance	valuing their traditional cultural ideas & knowledge
Grand Ronde: restoration of sovereignty	casino on sovereign lands and diversified economic portfolio	more formalized tribal governance and polity	creation of synthetic language & culture

As an example, the tribes have challenged the dominant culture's concept of using hatcheries to augment salmon stocks, a practice that began in the 1870s. After 100 years, salmon stocks had plummeted to a level of about seven percent of historic levels (NPPC 1986). To address the hatchery part of the problem, the tribes insisted that hatchery practices needed reform. They used their cultural knowledge and suggested building supplementation facilities. The idea of supplementation is to model artificial propagation as closely as possible to the life ways of salmon. The tribes argued for the use of supplementation facilities to restore lost salmon populations. As scientists debated the relative merits of hatcheries, no artificial propagation, and supplementation (Licatowich 1999; Taylor 1999, Araki et al. 2008;), the tribes produced evidence that supplementation works better than hatcheries to increase abundance and re-establish runs (Galbraeth 2011).

In establishing hatcheries, the Nez Perce tribal fisheries program emphasizes that their hatcheries differ from those operating on the basis of industrial logic (Ween and Colombi 2013). One such difference between tribal hatcheries and standard hatcheries is the difference in the hatcheries' purpose. While tribal fishery programs view hatcheries as a tool to restore naturally reproducing populations, standard industrial hatcheries are oriented towards increasing production for fisheries. In their work to reverse long-term decline, the Nez Perce argue that they draw upon their local knowledge of salmon as well as past knowledge derived from their horse breeding activities and former resource-management practices, all developed prior to European American

settlement (Colombi 2012b). For example, to avoid inbreeding and the lack of genetic suitability to a particular river environment, tribal hatcheries regularly incorporate wild fish as broodstock into their hatchery programs. Tribal hatcheries, moreover, aspire to “think like a salmon.” To illustrate, the Nez Perce hatchery design incorporates a “natural” rearing pond in their hatcheries, which is an idea informed by Nez Perce cultural understandings of the “needs of the salmon,” as noted by Ed Larson of Nez Perce Fisheries (Five Crows 2011). While conventional-industrial hatchery pens are straight concrete structures, Nez Perce supplemental hatchery designs use local knowledge to mimic healthy riparian areas. The replacement of conventional hatchery pens with natural rearing ponds can reduce the genetic effect of captivity over generations. As Dave Johnson, Nez Perce Fisheries program manager, states “We will treat these fish with the respect they deserve.... They are not ours to do with what we will. Rather, they are a part of us; they share our world” (Five Crows 2011).

Leadership and Vision of Nisqually, Billy Frank, Jr.

A third narrative is the one of the Nisqually leader, Billy Frank Jr. Living at Frank’s Landing near the western boundary of Joint Base Lewis-McChord, Billy Frank Jr. had a major influence on fishery management and landscape restoration practices.¹ His people have lived along the Nisqually River that enters Puget Sound near Olympia, Washington for at least 5000 years (Wilkinson 2000). Nisqually tribal history is like that of the Grand Ronde with being placed on a reservation, failed promises from the U.S. government, having children placed in Indian schools that did not allow practice of tribal culture, dominant culture values that promoted assimilation and homogenizing cultural differences, and, selfish, illegal, and negligent behavior of non-tribal neighbors.

Born in 1931, Frank grew up on the Nisqually River after his parents moved to a place that they liked better than the urban setting of Tacoma, Washington. Frank learned to fish and learned about the riches of the Nisqually traditional area. As a young man, he was part of the fish-ins of the 1960s and 1970s that brought civil rights activists to Washington State. In addition to the challenges faced by most tribes, the State of Washington asserted that it “could not allocate fish” to Northwest tribes (American Friends Service Committee 1970). The result of State policy was that fish wardens prevented tribal members from fishing in their usual and accustomed places. Because non-tribal fishermen took most of the fish in the Pacific Ocean and in Puget Sound, few were available for the Nisqually and other tribes who lived along the rivers that entered Puget Sound.

Frank’s leadership brought the Nisqually together to fight for their fishing rights (Burns 2006). The Nisqually, and their neighbors the Puyallup and Muckleshoot, had little support, but the 1969 Belloni and 1974 Boldt Decisions decided the allocation argument. These decisions settled the fishing rights questions of Northwest tribes by saying that fish had to be made available at the usual and accustomed fishing places and that the tribes should have half the allowable catch of annual salmon runs (*United States vs. Washington*, 384 F. Supp. 312, W.D. Wash. 1974).

Frank became head of the Northwest Indian Fisheries Commission and developed a program of cooperative management between the tribes and non-tribal fish managers for Puget Sound. He also showed leadership with the military at Fort Lewis, which was created when Pierce County illegally condemned two thirds of the Nisqually reservation (Nisqually Indian Tribe 2014). Charles Wilkinson, an attorney who has worked with many tribes, summarizes Frank’s leadership, “. . . if social progress is to be made, a leader must keep ever focused on the ultimate objective and must transcend stereotypes, past transgressions, and even personal hurts of the most profound nature” (Wilkinson 2000:80). Frank worked with the military on conserving and restoring landscapes on the

military reservation. He worked effectively with those who occupied Nisqually lands to protect and restore some of the natural ecological processes. Wilkinson (2000:66) says of Frank:

[H]e never abandoned the warrior mentality he had honed on the banks of Frank's Landing during the Fish Wars. Big heart, yes; collaborative processes, yes; widest smile in the State of Washington, yes—but what mattered in the long term were the fish and the river and the land and the people.

In sum, a vision and strong leadership prepared Frank and the Nisqually people for the future. This is ultimately about setting emergent path, and Frank's example of effective leadership shows how vision and worldview can change the dynamics of a particular situation. Moreover, his leadership in salmon conservation and resource restoration has operationalized Nisqually adaptive capacity.

Adaptive Capacity

The Grand Ronde restoration of sovereignty, Columbia River tribes supplementation programs, and Nisqually leadership narratives reflect something more comprehensive and cultural about coping with new and novel situations. The concept of adaptive capacity is increasingly being used with issues such as climate change, resource conservation and restoration, business organization, and minority groups surviving to overcome discriminatory situations. USAID (2009:x) says,

Adaptive capacity depends on economic well-being, ecological well-being, the extent of dependency on natural resources, infrastructure (human-built or natural), effectiveness of institutions and governance systems, insurance, secure land tenure and mediation measures, and information and communication systems. A community with the capacity to adapt is likely to be more resistant to impacts or able to recover from stressful events and conditions.

Other uses of “adaptive capacity” include Adger et al. (2007:727) saying, “Adaptive capacity is the ability or potential of a system to respond successfully to climate variability and change, and includes adjustments in both behaviour and in resources and technologies.” Brooks et al. (2005) argue that the presence of adaptive capacity is necessary for effective adaptation strategies to reduce harmful outcomes. Adger et al. (2007:727) emphasize that adaptive capacity is influenced by social factors and governance structures as well as economic development and technology. They say that there are “. . . many examples where social capital, social networks, values, perceptions, customs, traditions and levels of cognition affect the capability of communities to adapt to risks related to climate change” (Adger et al. 2007:727). Adaptive capacity is also used by Intergovernmental Panel on Climate Change's (Parry et al. 2007), UN Food and Agricultural Organisation (FAO 2006), The World Bank (2010), The World Resources Institute (2009), United Nations Development Programme (UNDP 2005), and other organizations.

The Resilience Alliance (2014) links adaptive capacity with the adaptive cycle (Holling 1986). The Alliance points to Folke, Colding and Berkes (2002), who identify and expand on four critical factors that interact across temporal and spatial scales and that are required for dealing with natural resource dynamics during periods of change and reorganization—learning to live with change and uncertainty; nurturing diversity for resilience; combining different types of knowledge for learning; and creating opportunity for self-organization towards social-ecological sustainability.

Ecological economists emphasize various forms of capital that support adaptation to change. Costanza et al. (1997) have estimated the value of natural capital to world societies. Vemuri and Costanza (2006) broaden the types of capital by adding built, social, and human capital to evaluating human well-being. The narratives and the summaries of literature in Table 2 suggest many common concepts in each of the ecology and economy, society and polity, and ideology and knowledge dimensions. These three Pacific Northwest narratives suggest concepts that should be given more attention when considering adaptation to novel and no-analog systems and change (Colombi and Smith 2012). In sum, we argue Indigenous culture narratives and experience are a good source of long-term data for generating hypotheses about adaptive capacity as a cultural process.

Conclusion

Cultural adaptation is about system complexity, resilience, and adaptive capacity. The three tribal narratives emphasize elements of adaptive capacity within each of the three cultural dimensions. Ecology and economy encompasses the ideas of resilience and the economic relations that tribal cultures practiced in their relations with resources and ecological processes. Tribes built economic portfolios that allow substitution and shifting between activities to deal with variability. Sovereignty is critical to control of resources or establishing rights to engage in an activity limited to sovereigns, i.e., gaming and tribal economic portfolios that can be built from these revenues. Society and polity include the leadership and vision to adjust to novel and no-analog futures. Leaders who have vision engender trust and create new opportunities. Further, these leaders build partnerships with others to achieve their goals. Ideology and knowledge, the third dimension, is about the values people have, the learning they engage in, and the new knowledge they gain. Knowledge at the local, ecological, and contextual levels was critical for the tribes to establish casino gaming, supplementation facilities, and to fight for their legal rights. Having concern for a place, too, is important, especially when sovereignty is so often tied to a land base.

Further progress requires more study, discussion, and synthesis of cultural concepts and processes. Historical narratives can offer insights into the most important variables and relations to use in explaining adaptive capacity. In addition, historical narratives can be useful for identifying the variables and processes necessary to adapt to predicted novel and no-analog futures. Adaptive capacity is the ecological and economic, socio-political, and ideological dimensions of culture that enables societies to be flexible, adaptive, and knowledgeable in the face of unknown futures. The conversation of what makes communities and cultures capable of adapting to change is really about which societies' narratives will survive into the future

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TABLE 2. COMPARISONS OF ADAPTIVE CAPACITY ELEMENTS WITH DIMENSIONS OF CULTURE FROM A SELECTION OF SOURCES.

Dimensions of Culture	Economy and Ecology	Society and Polity	Ideology and Knowledge
Colombi (2012a) Bodley (2005) Harris (1979)	make material infrastructure	do behavioral structure	think mental superstructure
USAID (2009:x)	natural resources, infrastructure (human-built or natural), secure land tenure	effectiveness of institutions and governance systems, insurance, and mediation measures	information and communication systems
Adger et al. (2007:727)	economic development and technology	social capital, social networks, governance structures	human capital, values, perceptions, customs, traditions and levels of cognition
Resilience Alliance (Folk 2001 et al.)	nurturing diversity for resilience	creating opportunity for self-organization towards social-ecological sustainability	learning to live with change and uncertainty; combining different types of knowledge for learning
Capital (Costanza et al. 1997)	natural, built	social	human

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ABOUT THE AUTHORS

Benedict J. Colombi, Ph.D. is Associate Professor of the American Indian Studies Program, School of Anthropology, School of Geography and Development, and School of Natural Resources and Environment at the University of Arizona. His specialization lies at the anthropology of complex human-environmental problems. Recent publications include the book, *Keystone Nations: Indigenous Peoples and Salmon across the North Pacific*, and a number of articles and chapters, including long-term and engaged research with the Nez Perce Tribe (*Nimiipuu*) about large dams, salmon, and the regional economy in the Columbia River basin. He also pursues interests in expanding his research to include Southwestern Indigenous people and watersheds; complimented with field studies of Local-Indigenous resources/management in the United States, Canada, Russia, Iceland, Norway, Japan, and Mexico.

Contact: American Indian Studies; Harvill Room 218, PO Box 210076, Tucson, AZ, 85721-0076; bcolombi@email.arizona.edu

Courtland L. Smith, Ph.D. is Emeritus Professor in the Anthropology Program, School of Language, Culture, and Society, Oregon State University. He is an anthropologist, educator, and scientist who studies how human values, culture, and history affect ecological and economic issues. He joined the Department of Anthropology at Oregon State University in 1969 and is the author of several articles in scientific journals and general interest publications, books, and monographs.

Contact: Anthropology, 238 Waldo Hall; Oregon State University; Corvallis, OR 97331

ⁱ Billy Frank, Jr., the most noted and inspiring tribal leader on Pacific Northwest salmon issues, passed away on May 5, 2014.

AT THE INTERSECTION OF ORPHANED COLLECTIONS AND CIVIC ENGAGEMENT

Kali D.V. Oliver

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ABSTRACT

At times addressing orphaned archaeological collections may seem like an overwhelming task for already overburdened professionals. Yet, in recent years orphaned artifacts have become a source of civic engagement within certain communities meriting them additional attention. This paper will focus on two major examples of how orphaned collections are being used to further social action; one in a federal capacity, through the Veterans Curation Program (VCP), and another within an academic setting, via the Market Street China Town Project (MSCAT). Personal research involving the re-housing and sampling materials from the orphaned Hussey Collection, preformed with the collaboration of the Fort Walla Walla Museum located in Walla Walla Washington, will also be examined. Together, these instances will briefly illustrate how partnering with non-profit associations, such as local museums, to re-examine orphaned archaeological materials can provide ample public engagement opportunities.

Orphaned Collections: What are they and Why are they Important?

Orphans have been “. . .broadly defined as ‘a collection that has lost curatorial support or whose owner has abandoned it’” (Voss and Kane 2012:88). Often this occurs due to, “. . .museum closures or cutbacks, the retirement of faculty, agency staff, or independent researchers, and abandonment by private collectors” (Voss and Kane 2012:88). They will also include characteristics such as “. . .physical deterioration as a result of substandard storage conditions; separation of the artifacts from field and laboratory records; and incomplete inventory and cataloging” (Voss and Kane 2012:94).

The impetus for a renewed interest in orphaned archaeological collections frequently involves attempts to re-contextualize artifacts so as to produce new research venues. The challenge to managing them is what I affectionately refer to as “Battle of Re- . . .” re-contextualization, re-housing, re-cataloging, etc. Yet, orphaned materials, along with underreported and under analyzed collections, are also part of larger issues that intersect both museology and archaeology; namely that of the looming curation crisis (Voss 2012), which, if for no other reason, merits additional attention towards their management today.

Although, to varying degrees, most abandoned collections will suffer a loss of context, that, admittedly, does have the ability to diminish their significance, this is very far from saying that orphaned materials do not also provide benefits to both the public and academia (Kane and Voss 2011; Voss 2004; Voss 2012). This article will briefly discuss three contemporary projects. Two include the Veterans Curation Program (VCP) and the Market Street Chinatown (MSCT) Archaeological Project. Both of these projects represent instances where archaeological materials, falling into one or more of the previously defined orphaned characteristics, have either been the impetus for public outreach activities already, or are currently being used within outreach programs. I will link these projects through discussing a third, more locally sourced orphaned collection, the Hussey Collection, being examined for my thesis work, which has been, and can continue to be, used for civic engagement. It is my hope that together these examples will illustrate how archaeological materials, even those with contextual issues, can provide opportunities for civic engagement and also serve to highlight social justice issues.

Example 1: Origins and Current Status of the Veterans Curation Program

During the 1980s, the United States Army Corps of Engineers (USACE) recognized their need to address growing issues involving access, rehabilitation and consolidation of archaeological collections within its possession (Rubenstein and Riordan 2011), most of which were excavated during the construction of reservoirs between 1947 and 1985 (VCP Manuscript 2012). Consequently, in 1992, the technical specialists working on these issues for the USACE developed a Mandatory Center of Expertise (MCX), for the Curation and Management of Archaeological Collections (CMAC), or the USACE-MCX-CMAC. The Curation and Management of Archaeological Collection's mission was to centralize the policy development, management, and administration of all U.S. Army Corps collections (Rubenstein and Riordan 2011) along new collections management and long-term care standards. Since 1993, this program has also been assisting other governmental agencies; among such is the Department of Defense (DoD) (Rubenstein and Riordan 2011), where, in 2002, an evaluation reported that because of ". . .this level of decentralization and with few concerted management efforts, proper curation to federal standards has rarely been attained for DoD Archaeological Collections (Marino et al. 2002:i)." The USACE-MCX-CMAC, however, consists of much more than just the process that it offers to government agencies, as it is also highly centered on the advocacy of veterans. An example of this advocacy effort is the Veterans Curation Program (VCP), begun in 2009. Originally designed to provide employment skills to veterans returning from Iraq and Afghanistan through government agencies, the VCP aids veterans in developing skills involving: computer database and records management, use of basic computer software programs (Microsoft Office), current photographic and scanning technologies, and technical writing. Skill acquisition is achieved by cultivating a sense of anthropological and historical knowledge gained through the actual processing and preserving of archaeological collections, while at the same time being provided competitive compensation (Rubenstein and Riordan 2011; VCP Manuscript n.d. (a); VCP Manuscript n.d. (b)). Moreover, temporary employment under the VCP is tailored to fit the capabilities of disabled veterans and stresses the importance of higher education as a factor of individual achievement and gratification (Fig. 1). To date, more than 100 veterans have participated in the program with an estimated 64% of former VCP participants having successfully obtained employment within non-profit, government, or private sectors (VCP Manuscript n.d. (b)).

As both the archaeological materials previously gathered by the USACE and the current programs employed by them make use of public funds, the VCP has been compiling digital records of their progress which are available through the Digital Archaeological Record, or tDAR

(<http://www.tdar.org/>) (VCP Manuscript n.d. (b)); a valuable research tool for public and academic communities. The MCX-CMAC, through the VCP, currently enables the use of federal monies from one financial sector to be allocated towards the continued management of collections whose funding has previously ceased but are still in current need of rehabilitation. The archaeological problem of what to do with orphaned or abandoned collections within the public sector is thereby somewhat resolved, while at the same time providing agency to wounded veterans through the promotion of new employment skill sets and active job placement initiatives.



Fig. 1. Veterans in action. Courtesy of the VCP website (www.veteranscurationprogram.org).

Example 2: Local Orphans, Veterans and Civic Engagement within the Hussey Collection

My thesis work started in 2012, when the John Calhoun Smith Memorial Fund Committee financed *Building Ties: Steps to Establish a Collaborative Research Program* between the University of Idaho and the Fort Walla Walla Museum, a project that was proposed by Dr. Mark Warner (University of Idaho) in conjunction with me, then a University of Idaho undergraduate student representative. In union with the Fort Walla Walla Museum (FWWM), the project's primary goal was to assess and remove an orphaned archaeological collection from what had become an unstable environment on the City of Walla Walla's (CWW) property. Its funding was intended to provide a current student with applied archaeological experience and to create additional research opportunities for other students in the future.

Shortly after beginning the project, it was brought to my attention that additional materials, also from the same historic site, 45-WW-33, excavated and processed by the same individual, local historian Larry Hussey, were also being stored, a mere 10 yards away, at the John Wainwright Memorial Veteran's Administration Medical Center (JWMVAMC). When taken together, the Hussey Collection materials represent more than a 20 year period of historical archaeological work in Walla Walla; consisting of over 100,000 artifacts (Fig. 2). My master's thesis, *Adopting an Orphaned Archaeological Collection*, will be based on the findings of the *Building Ties* grant and addresses both re-contextualization and preservation issues surrounding this group of abandoned materials.



Fig. 2. Part of the Hussey Collection prior to Building Ties 2012 extraction. Photo provided by the City of Walla Walla.

Several parties, then, were vested in ensuring the care of the orphaned materials during the 2012 Building Ties field season. The National Preservation Institute (NPI) agreed to devote 800 hours of financing for two local veterans to act as laboratory interns via the John Wainwright Memorial Veterans Administration Medical Center (JWMVAMC) (Fig. 3). The City of Walla Walla (CWW) contributed finances for needed laboratory supplies and disposable safety gear; while the Fort Walla Walla Museum (FWWM) provided both a work space and supplemental labor towards the project, as well as repository space for CWW materials. Then, of course, there was the University of Idaho's (UI) participation through the support of the John Calhoun Smith

Memorial Fund, with myself as a representative, and the veteran interns, who remain a long-standing part of the Walla Walla community. In combination, the cost sharing efforts named above along with the *Building Ties* grant enabled both the removal of CWW materials from their unstable setting and their storage in a new, secure location at the FWWM. Moreover, the JWMVAMC materials were also able to be quickly inventoried and re-boxed by the end of the 2012 field season.

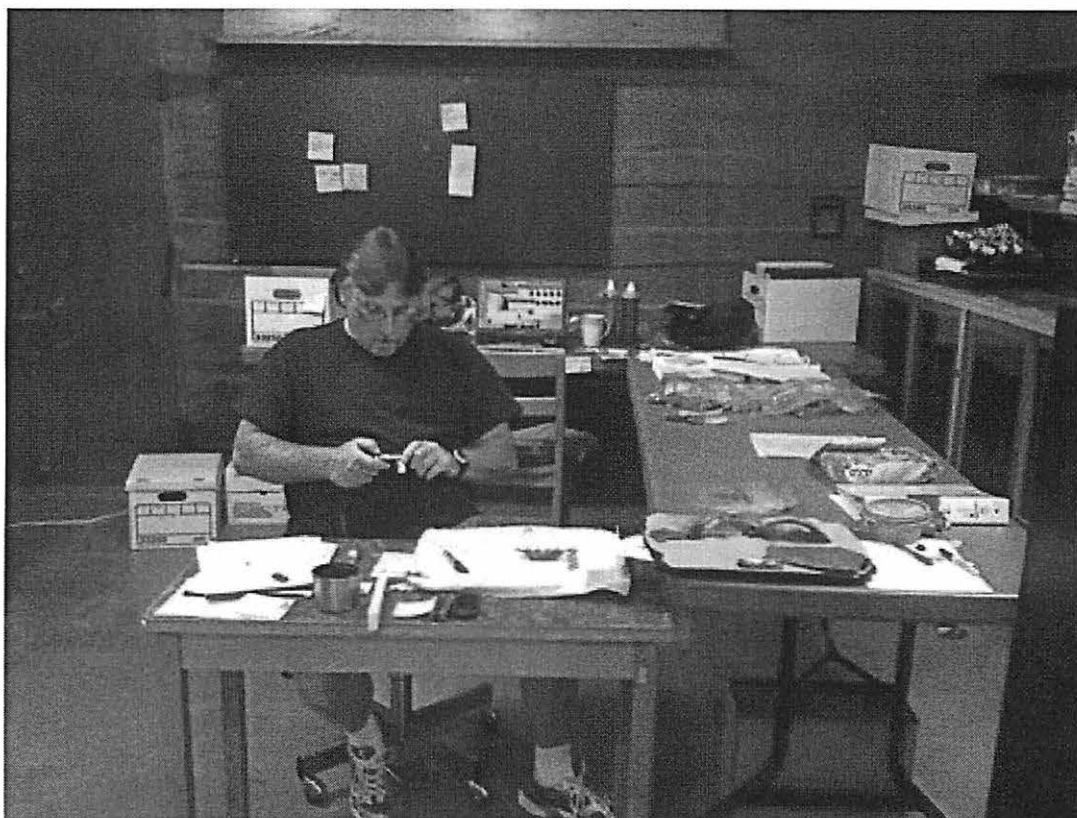


Fig. 3. Veteran intern at work. Photo provided by the City of Walla Walla.

My experience in working with veterans to assess a sample set of this orphaned archaeological collection was very similar to, but not directly funded under, the Veterans Curation Program. Similarities involved: government funding for short-term employment of veterans to work with an archaeological collection, the direct participation of a local Veteran's Administration archaeologist, and the training of veterans in basic laboratory techniques, included but not limited to: computer database and records management, use of basic computer software programs (such as Microsoft Office), and current photographic and scanning technologies; skills that were acquired while receiving regionally competitive pay. Although my experience had been with veterans involved in military operations outside of Operation Iraqi Freedom and Operation Enduring Freedom, the VCP also accepts veterans into its program that have been involved in past conflicts and may not have been physically wounded in the line of duty but have issues with re-integrating into a mainstream work environment (VCP Manuscript n.d. (b)). I am happy express that the veteran interns involved with the Hussey Collection did an excellent job applying the laboratory techniques they had been taught while at the same time thriving at employing their own work

roles, cooperating with one another, and in being responsible for their own schedules without micromanagement. Both gentlemen continue to attain archaeological work.

The re-housing and re-processing of CWW archaeological materials took part on the Fort Walla Walla Museum's living history grounds. Partnership with a non-profit facility such as this provided ample opportunities for myself, as well as the veteran interns, to discuss a wide range of topics with visitors; this ranged from importance of the Hussey Collection to the Walla Walla community, both in the past and present, to the significance of orphaned the materials within archaeology, and finally the impacts of archaeological research in general. More than functioning solely as public education, engagement activities implemented by such associations have the ability to promote future social action as well as provide economic stimulation to communities such as Walla Walla, who, in many respects, rely on their local history to generate further revenue through heritage tourism (Fig. 4). This work also illustrates that despite the probability of diminished significance due to a collection's separation, over time, from associated records and/or the physical deterioration resulting from a lack of maintenance, that orphaned materials do still provide many benefits to both the public and to academia (Kane and Voss 2011; Voss 2004; Voss 2012) through stimulation within the local economy, significant educational components (writ large and for veterans), furthering relationships between local institutions, and advocacy for certain subcultures.

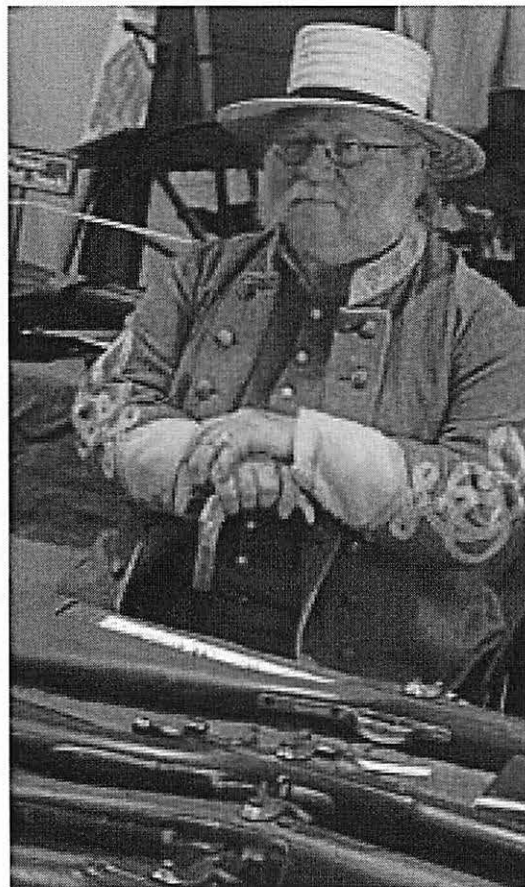


Fig. 4. Fort Walla Walla Days annual event. Photo courtesy the Fort Walla Walla Museum website (www.fortwallawallamuseum.org).

Example 3: The Abandoned Market Street Chinatown Collection and Its Prompting of Further Social Justice Through the Chinese Railroad Workers in North America Project

Another orphaned collection example, called the Market Street Chinatown (MSCT) Collection, is currently being held at Stanford University and actively managed by Barbara Voss (Principal Investigator) and Megan Kane (Collection Manager). The archaeological materials that comprise the MSCT Collection were excavated as part of a salvage archaeology project in the 1980s. Following those excavations, materials were initially cataloged, then boxed, and transferred from a private cultural resource management (CRM) firm to a city department. Afterwards, they were placed in storage for nearly 20 years, during which time the collection was also re-inventoried by two additional CRM firms. Scholars having recently returned to the collection with renewed research interests, prompting Stanford University to aid in further organization and analysis of the orphaned materials. Though this collection faces its own unique set of challenges apart from either the Hussey Collection, or that of materials held by the USACE, it has been used to educate countless students over the last decade. In fact, a re-contextualization study done by one former student, Elizabeth Clevenger, suggests that the capacity of orphaned materials to answer both broad comparative research inquiries and more specific intra-site research questions is not outside of the realm of possibilities, given a fine balance of qualitative and quantitative assessments (Clevenger 2004).

From her long-standing research on orphaned materials, Barbara Voss was also able to eloquently iterate why it is still important for archaeological professionals to direct their attention to orphaned collections. Noted in two passages from her article *Curation as Research: A Case Study in Orphaned and Underreported Archaeological Collections* (2012):

The research potential of orphaned and unreported collections is often perceived as compromised by the passage of time since the original moment of excavation, and by the all too common separation of artifacts from field records and other documents that might provide contextual information. The lack of theoretical attention to curation procedures—accessioning, inventory, cataloging, rehousing and conservation—exacerbates this problem. Most archaeologists commonly view curation procedures as routine activities that manage, rather than investigate, archaeological collections. . . . We have found that curation procedures such as accessioning, cataloging, rehousing, contextualizing and conserving archaeological collections are not simply precursors to research; rather, they are generative research processes in and of themselves [146].

Combined, these statements illustrate that orphaned collections not only have the potential to provide new data sets from which to research, but that they can offer the entire field of archaeology an opportunity to discover new methods of research and preservation from their curation as well. In other words, as they pose new issues they also stimulate new methods with which to solve them. The “Battle of Re- . . .” can, in fact, create or further bonds between local institutions, and, at times, provide opportunities to teach students, support local citizenry, or advocate for specific social groups, as all three of these examples illustrate.

In taking this a step further, the MSCT project has prompted the gathering together of several preeminent researchers and facilitators from public, private, and academic sectors, for the purpose of calling attention to individuals of Chinese ancestry who helped to facilitate westward

expansion in the United States (Fig. 5). The Chinese Railroad Workers in North America Project, formed in 2013, “seeks to give a voice to the Chinese migrants whose labor on the Transcontinental Railroad helped to shape the physical and social landscape of the American West (Stanford University, 2014:home).” This endeavor spreads across continents and disciplines as it attempts to simultaneously uncover and use archaeological, historic, oral and artistic resources through various multimedia formats to delve into the lives of these historic individuals during and after their rail work (Stanford University, 2014:research materials). Looking into the past shared history between the United States and China can, ultimately, have impacts, be they large or small, on the way we come to view social and political relationships between nations. Significantly, though the project is not merely the product of experiences surrounding one orphaned collection, it is the broadly-based product of social action that has been influenced by these particular abandoned archaeological materials.



Fig. 5. Archaeology Workshop 2013. Photo courtesy of Stanford University (www.stanford.edu/group/chineserailroad/cgi-bin/wordpress/).

Conclusion

All of these instances, in their totality, make a meritorious argument for additional contemporary attention to orphaned collections. These ‘orphans’ have the capacity to bring people together to form new relationships, learn about their shared or local history, and to provide individuals and communities, or sub-cultures, with agency and/or support, be it monetarily, or in the form of public education. Even if some context has been lost, it does not mean that larger, inter-site comparative research questions cannot still be asked and answered; it does not mean that those items are not still useful educationally, within teaching kits, or museum displays; it does not mean these orphaned materials cannot provide a sense of agency to a community.

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ABOUT THE AUTHOR

Kali Oliver is in the midst of defending her M.A. in anthropology from the University of Idaho with a focus on applied archaeological methods. She will soon be pursuing a career in Alaska, where her field school experience took place, and hopes to continue working with non-profit agencies and eventually as a cultural liaison for companies entering into remote village areas.

301 Sweet Ave. Apt 7
Moscow, ID 83843

kali.dv.oliver@gmail.com

Public Archaeology in the West: A Case Study from Boise, Idaho

**Mark Warner, Tracy Schwartz, Stacey Camp, Jessica Goodwin,
Amanda Biemann, Tim Mace**

ABSTRACT

The unexpected discovery of a well associated with the Cyrus Jacobs-Uberuaga Boarding House in downtown Boise, Idaho provided archaeologists with a unique opportunity to not only draw conclusions about the material cultural of one of Boise's earliest and most influential families, but to also conduct a public archaeology project in a downtown, urban location. The project attracted over 1000 visitors during the two-week period of fieldwork. In addition to generating considerable public attention, the public program was also able to generate considerable information on the attitudes visitors had about archaeology and how a visit to a working archaeological excavation impacted those visitors. These findings demonstrate the positive impact a public archaeology program can have on an interested public

Introduction

Building public archaeology programming into urban archaeology excavations has been a part of many historical archaeology excavations in United States for well over thirty years now. Indeed, at this point there is an admirable track record of sustained public archaeology programming throughout much of the Eastern United States and in some parts of the west, especially California and Texas. The Pacific Northwest, however, is somewhat of an exception to this trend. A partial explanation for this is the fact that there have been relatively few large-scale urban excavations in the Northwest, but even when these excavations have taken place (in places such as Seattle, WA or Sandpoint, ID), there has been only sporadic support for building public programming into archaeological excavations. One notable exception in the region is the long-term archaeology program at Fort Vancouver, a project that is both collaborative and has been systematically engaging visitors for well over a decade now (Marks 2011).

A project in Boise, Idaho in August of 2012 provided a team of archaeologists a relatively unique opportunity to conduct archaeology in a public setting and also to construct a public program that allowed for archaeologists to share their work with the local community as well as to elicit feedback about their perspectives on archaeology and what they learned while at the site. This article presents a summary of the archaeological process at the Cyrus Jacobs-Uberuaga Boarding House (CJUH), the public outreach program that was developed, and discusses some of the initial results of our engagement with the Boise community throughout the archaeological excavation.

Historical Archaeology and Public Outreach

Archaeology has long held a great deal of interest to the general public. The objects recovered through excavations have filled many museums and attracted millions of visitors to the venues in which they are displayed. Yet, despite this powerful curiosity, how archaeologists have engaged the public has varied dramatically ranging from informal site tours and newspaper articles, to structured volunteer programs to museum exhibits and publications (McKee 2002:456–8). To be certain, landmark excavations have attracted site visitors over the years, for example in places such as Cahokia and Colonial Williamsburg, but it was not until the 1980s that archaeologists began to systematically engage visitors while excavations were ongoing. Much of this change was led by historical archaeologists working on sites in urban locations on the East Coast—or on sites occupied by our nation’s founders. Site-specific examples would include excavations at Franklin Square in Philadelphia and Thomas Jefferson’s Monticello in Virginia. Some cities with long-term excavation programs have created standing programs that incorporate public archaeology, the most notable examples being Alexandria Archaeology and the Archaeology in Annapolis project (Pottter 1994; Cheek 2012).

Programs such as these have had a significant impact on the discipline. Public outreach associated with excavations have become a regular feature of many large-scale archaeology projects and have spawned numerous publications describing various examples of public programming and related issues (cf. McGimsey 1972; Jameson 1997; Praetzelis and Praetzelis 1998; Little 2002; Merriman 2004; Shackel and Chambers 2004; Little and Shackel 2007; Skeates et al. 2012). Much of this scholarship has focused on describing the mechanics of public archaeology projects or how archaeology fit (or did not fit) into the agendas of the local communities. Public outreach is also becoming commonplace in parts of the western United States. In the west, examples of sustained public archaeology projects include multiple excavations run by Sonoma State University’s Archaeological Services Center; Laurie Wilkie’s (2010) work on the University of California, Berkeley’s Zeta Psi fraternity house; the University of California, Berkeley’s Archaeological Research Facility; Barbara Voss’ (2004) work on San Jose’s Market Street Chinatown Project in San Jose, California; Bryn Williams’ (2011) work at the Point Alones Chinese fishing village in Monterey, California; Stacey Camp’s (2013) work on an historic Mexican immigrant railway workers’ community in Los Angeles, California; the previously noted Fort Vancouver work (Marks 2011); and Carol McDavid’s (2002) work on the Levi Jordan Plantation (and elsewhere) in Texas.

The key point behind the works noted above is that the public component is accessible through research libraries and publically available databases. In turning to Idaho, there have been numerous archaeology projects that have incorporated volunteers such as Passport in Time (PIT) projects or other excavations supported by the state or federal agencies that have engaged the public through tours, exhibits, talks, etc. Yet what is typically accessible from these projects are reports on the archaeological work, while any reporting on public outreach and engagement is largely invisible. A typical example, is the work done at the Foote House (10-AA-96), not far from Boise, Idaho. Reports on the archaeological findings from this project are available in regional libraries (Jones 1982; Knudson et al. 1982; Longenecker 1992) but what was totally unknown to us was the report on public outreach submitted to the Idaho Humanities Council. This report is a very data-rich summary of an extensive public archaeology project in 1986. The report summarizes basic demographic information on site visitors as well as provides detailed qualitative data on things such as visitors’ motivations for visiting the site/museum exhibit (Longenecker 1988). Similarly, a title survey of both *Idaho Archaeologist* and *Northwest Anthropological*

Research Notes/Journal of Northwest Anthropology failed to identify any articles that directly focused on public outreach, other than the article, “Anthropology and Education” symposium that was printed in the Spring 1986 (1) issue. Thus, we entered into the project largely *unaware* of prior structured public outreach programs in Idaho but also very *aware* of the public outreach opportunity the Cyrus Jacobs-Uberuaga Boarding House was.

The Project

The project took place at the Cyrus Jacobs-Uberuaga Boarding House (CJUH) in downtown Boise, Idaho. The house is the oldest standing brick structure in Boise, dating to 1864 (Fig. 1). It has also become somewhat of a cultural icon in the city—due in part to its current location in downtown Boise. The house was built by Cyrus Jacobs, a prominent Boise businessman who also served as the mayor of Boise from 1879 to 1880. The building has two significant chapters in its history. The Jacobs family called it home for roughly 45 years, and it also served as a boarding house for Boise’s Basque community for another 60 years, between 1909 and 1969 (Bauer 2010a, 2010b). While it is a small structure, it is one of the city’s most prominent landmarks due to its connection to the earliest years of the city, its association with Boise’s Basque community, and its location on the revitalized “Basque Block.” Today the house is a history museum that incorporates the lives of both the Jacobs family and generations of Basque immigrants in the displays. The house is currently owned, interpreted, and managed by the Basque Museum and Cultural Center.

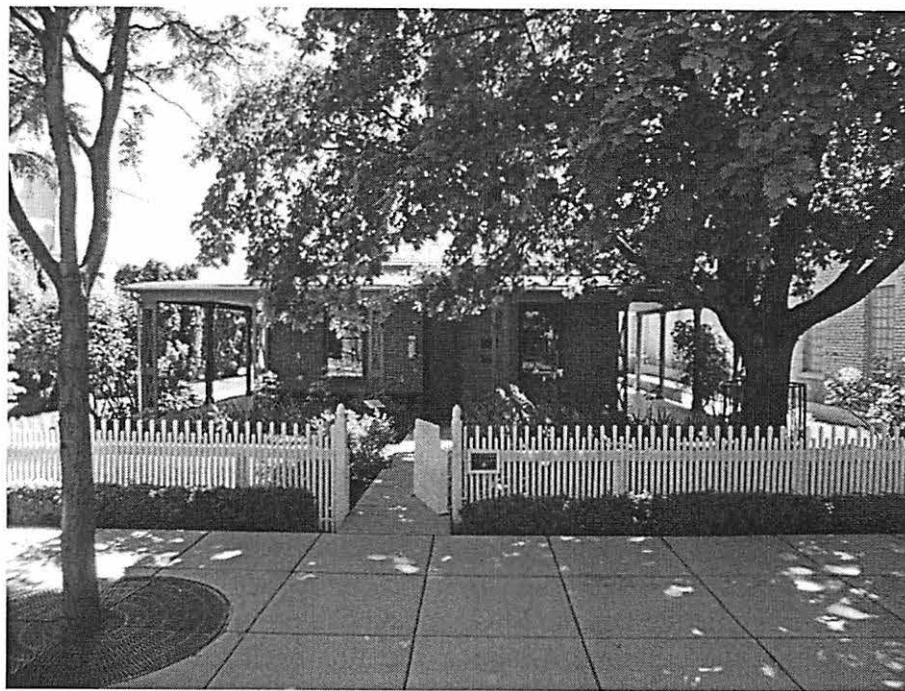


Fig. 1. Photograph of the Cyrus Jacobs-Uberuaga Boarding House as it stood in 2013 (Photograph by Mark Warner).

The Cyrus Jacobs-Uberuaga Boarding House excavations occurred because of the foresight of staff of the Basque Museum and Cultural Center, primarily Patty Miller (Executive Director) and Michael Vogt (Curator), and given their past experience with archaeology at the site. In May

of 2012, the Basque Museum and Cultural Center were planning on removing and replacing the floorboards on a portion of the house's porch. The first board was cut and it began to fall to the ground below. And it kept falling. With no prior knowledge of it, the Basque Museum and Cultural Center had exposed a brick-lined well. Numerous artifacts, including a complete glass bottle, were visible on the surface of the well (Fig. 2), as well as other artifacts scattered on the surface below the porch flooring.



Fig. 2. Photograph showing the surface of the well as initially exposed May 2012, prior to excavation (Photograph by Mark Warner).

This was not the first time the Basque Museum and Cultural Center was surprised by what they found under and within the building. A similar situation occurred in 2004 when they were repairing a section of flooring inside the house during restoration. Upon removal of the flooring they identified numerous artifacts lying on the surface. The discovery of artifacts in 2004 prompted a call to Marc Munch, president of the Idaho Archaeological Society, who organized and supervised a small, volunteer, excavation inside the house. The excavation proved to be quite successful, leading to the recovery of many artifacts that subsequently went on display in the house and the publication of some of the results of the excavations in a catalogue of the house's material culture (Munch 2010; Mackey 2010). When staff and volunteers of the Basque Museum

and Cultural Center saw the well and artifacts in 2011, history repeated itself. The Basque Museum again called Marc Munch, and after noting the logistical challenges of excavating a well of unknown depth, Munch in turn contacted Mark Warner at the University of Idaho Department of Sociology and Anthropology. After an organizational meeting with Patty Miller, Mike Vogt, Marc Munch, Mark Warner and Stacey Camp in late May it was agreed that Camp, also with the University of Idaho Department of Sociology and Anthropology, and Warner would lead a two-week excavation of the well and porch area in late July and early August. During their initial visit to the site, Camp and Warner quickly recognized the potential for public archaeology and began planning to incorporate a public component to the excavation. The rationale for doing this was twofold. First, from a practical standpoint it would be necessary to manage visitors to the site, especially a site that is part of a museum that welcomes nearly 100,000 visitors each year and located in the heart of downtown Boise. In most urban archaeology settings it is best to establish a way to systematically manage site visitors rather than dealing with them on an ad hoc basis—a strategy that is almost uniformly frustrating for archaeologists. The second reason was that, to the best of anyone's knowledge, no previous structured public archaeology program had been conducted in Idaho and this project was naturally and uniquely situated to incorporate the public.

The Cyrus Jacobs Ueberuaga House was an ideal venue for conducting public outreach during the excavation. The site is located in the middle of the “Basque Block” of Boise, which consists of several Basque restaurants/bars, the Basque Museum and Cultural Center, a Basque market, and a handball court, a sport popular with Basques. The block is semi closed off to automobile traffic and is touted as one of the significant cultural and tourist attractions in Boise. Further, the site is situated about five blocks from the Idaho State Capital building and three blocks from The Grove area, which is where the city's Saturday farmers market and Wednesdays' “Alive After 5:00” the city's weekly summer concert series, are both held. In other words, the house was in an area of Boise that receives heavy pedestrian traffic on a daily basis and is a destination point for both visitors and locals.

In addition to the location of the house, there were several other aspects of the project that made for an excellent public archaeology set up. First, archaeologists would be excavating in an extremely confined space. Our project area was the footprint of a porch that measured approximately 8 by 24 feet. Further, the portion of the porch we were working in was enclosed, which provided both a barrier to keep visitors from stepping into the excavation areas but also, with the removal of a few sections of screen, provided excellent viewing areas to see the excavation in progress (Figs. 3 and 4). Second, there was a paved path around the house—making the excavation entirely handicapped accessible and stroller friendly. Third, there was available space for soils to be screened behind the house and for there to be a (shaded) processing lab on the opposite side of the house from the excavations. The cumulative effect is that visitors had the opportunity to see archaeology in action ranging from excavation to screening to processing on a paved walk less than 200 feet from the city sidewalk.

While the layout of the site was excellent for a public program we did not have a great deal of time to plan out an extensive public program. Two key items were immediately agreed upon. First, that there was a need to develop an online presence for the excavation (to be discussed in detail below) and second, that this project represented an opportunity to generate data from visitors to the site not just the artifacts. Archaeologists have been quite adept at tracking numbers of visitors to sites but there is much less information on what visitors take away from a site visit and we wanted to capture information from both the well and the visitors.

To accomplish our objective of gleaning meaningful data from our visitors, we borrowed somewhat from the Archaeology in Annapolis model (Potter and Leone 1987; Potter 1994) and set up a program that would systematically engage visitors to the site. Our first concrete step was to

incorporate cultural anthropologist Tracy Schwartz into the project. Schwartz, who recently completed her MA in Anthropology at the University of Idaho, was ultimately responsible for the public programming. Prior to the excavation she collaborated with Warner and Camp to develop a basic questionnaire (see Appendix to this article) that would capture demographic information as well as elicit some open-ended responses as to what visitors had learned about archaeology and what they saw during the excavation.



Fig 3. Photograph of the project excavation area (Photograph by Jessica Goodwin).

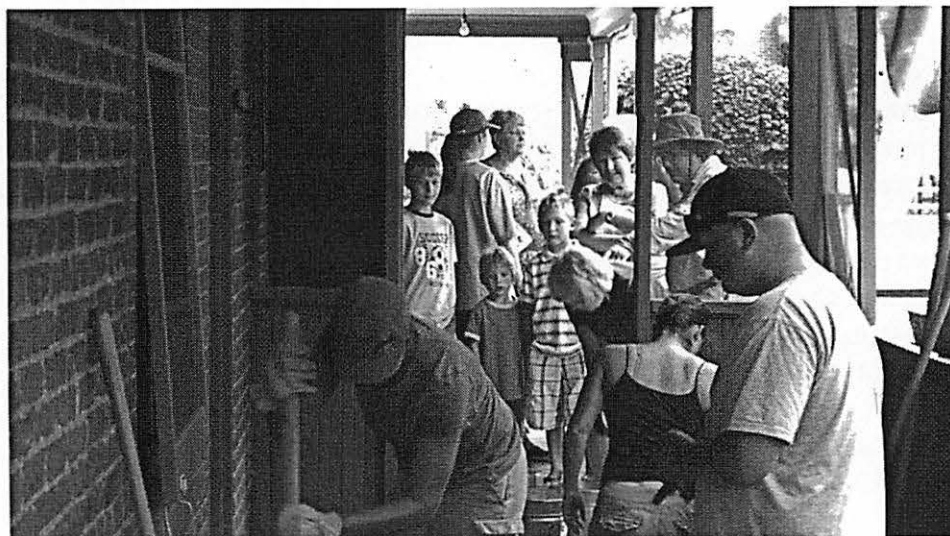


Fig 4. Photograph of people peering into the excavation during a site tour (Photograph by Ana Overgaard).

The importance of the public archaeology component of the project was stressed to the project team, especially the volunteers who participated in the daily activities. As part of the project orientation, which was held the night before excavations began, we explicitly stated that the public interaction on this project was as important, if not more important, than anything we would be excavating. During this orientation we presented a rough outline of how we were going to handle visitors to the site. We also stated it was our expectation that all project archaeologists engage visitors to the site. In other words we made it clear to all of the volunteers that if people came to the area they were working in, that they should stop working and chat with the visitors about what they were doing, what they were finding, answer questions, etc.

To attract visitors to the site we had a sandwich board on the sidewalk in front of the house announcing the excavation and telling people the site was open. In addition, we had a 3 by 4 foot banner in the front yard of the house presenting the Basque Archaeology Project and acknowledging the project sponsors (Fig. 5). The specifics of the site tour will be discussed in greater detail below, but the process was largely standardized. Once site visitors were welcomed to the project by a staff member or volunteer, they were sent in a particular direction to begin the tour. We tried to “script” the visit to the site as much as possible. It is important to recognize that by aggressively managing how we interacted with visitors it is very likely the visitors experience was better than if the situation was more casual. It was also clear that by doing this the working experience for the archaeologists was much better. With roles clearly articulated archaeologists could work with minimal interruption since designated tour guides, or “talkers,” were interacting with visitors and tourists could be entertained and informed about archaeology in a more organized and coherent manner.

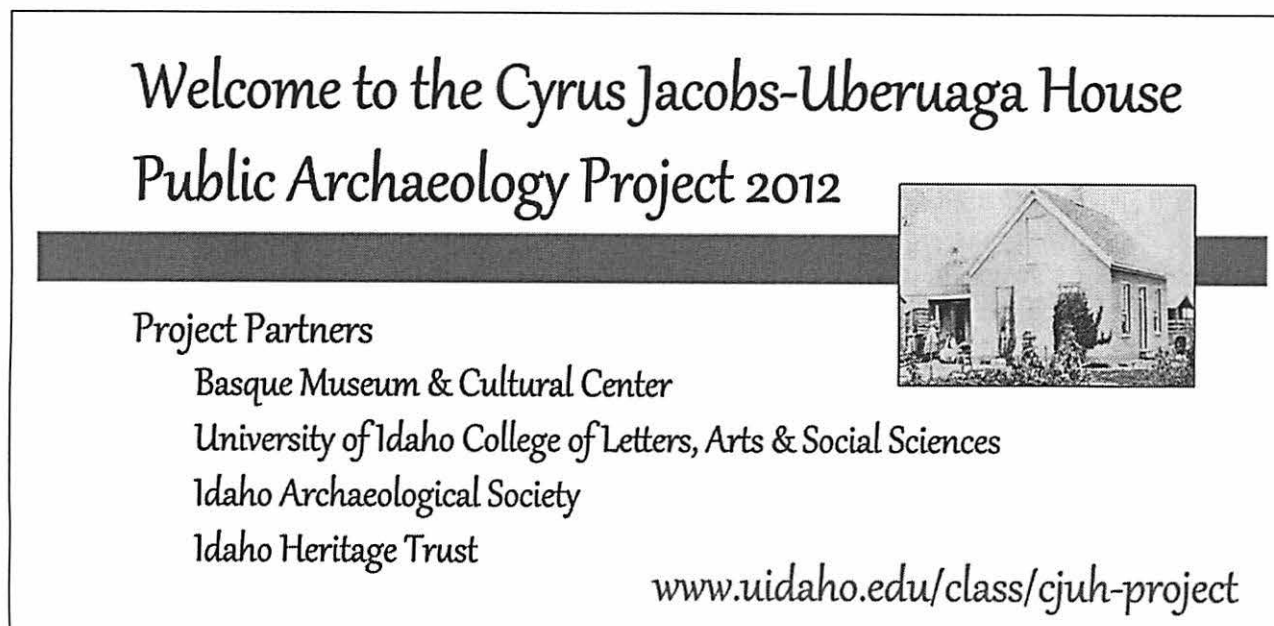


Fig 5. Project banner that was displayed in the front yard of the house during excavations.

Web Presence

Archaeologists have increasingly utilized the internet as a place for sharing information, interpretations, and excavation activities with interested parties from across the world. The web provides an excellent opportunity to make archaeological sites accessible to visitors who cannot physically visit the site as well as allows individuals to examine the progress of an archaeological project once they have left the site. Today, it is not uncommon for archaeologists to develop interactive blogs, websites, Facebook pages, and Twitter feeds that track the progress of an archaeological project from the field into the lab and beyond.

The Cyrus Jacobs-Uberuaga Boarding House Project is no exception. With the help of Micki Panttaja, Marketing Manager and Web Coordinator for the University of Idaho, a website was developed where information on the site's history could be shared with the public. This information included a blog, which was updated over the course of the archaeological excavation. The website also featured photographs and media coverage of the project, including newspaper articles, radio interviews, and television spots. We also established a presence, or "page," on Facebook, as social media is one of the primary ways people stay connected across the globe. Facebook allowed us to provide instantaneous updates on our finds and research in the lab without having to write time-consuming blog posts. An ancillary benefit of the Facebook connection has been the ability to keep in touch with our field crew once the excavation ended.

Site Tour Logistics

"Welcome to the Cyrus Jacobs-Uberuaga Boarding House! Would you like to see some archaeology today? Right this way please!" (Fig. 6). Very few archaeologists have had the opportunity to introduce their site to 1,053 visitors in a mere two-week span. However, when the site is located right in the heart of downtown Boise, Idaho it is easy to draw visitors to an archaeological site, indeed, in this instance it would be harder to have kept them out! Recognizing that public outreach would be as essential to the project as determining the depths of excavated layers, the CJUH archaeological team decided not to waste this chance to educate as well as gather information. However, before information could be gathered, a plan had to first be created as to how to manage what was expected to be a large number of tourists. While there was no closely followed script for tours on any given day, and visitors were not required to be part of a tour to explore the site, there was a general, and seemingly successful, tour plan that was followed throughout the excavation.

The lab area, including the "show and tell" tray of artifacts was easily visible from the entrance to the house. Given the early media attention and its focus on the artifacts it was a constant struggle to keep visitors from directly heading to the lab first. However, if our goal was to educate guests on the entire archaeological process it was important to start the visit with the historic context of the site and the excavation methods. When a visitor first walked through the welcoming, white picket gate fence, they were greeted at the home's front door. Because context is incredibly important to all sites, especially one where the material culture of two very different households was being excavated, a brief introduction to the home was given. While tours of the preservation work done to the interior of the house were only available through the Basque Museum and Cultural Center, a brief history of the house was given to all visitors at the outset of their visit. This included contextual information, derived from previous research done by the Basque Museum and Cultural Center (Mackey 2010), such as when the home was built, how long the Jacobs family occupied it, time periods when Basque families, including the Uberuagas, operated it as a boarding house, and our best guesses as to when and why the well became a

convenient trash pit. After this general background was presented, visitors were directed to where excavations were to be conducted and a designated tour guide shared with them something about the methods and techniques used in archaeology.

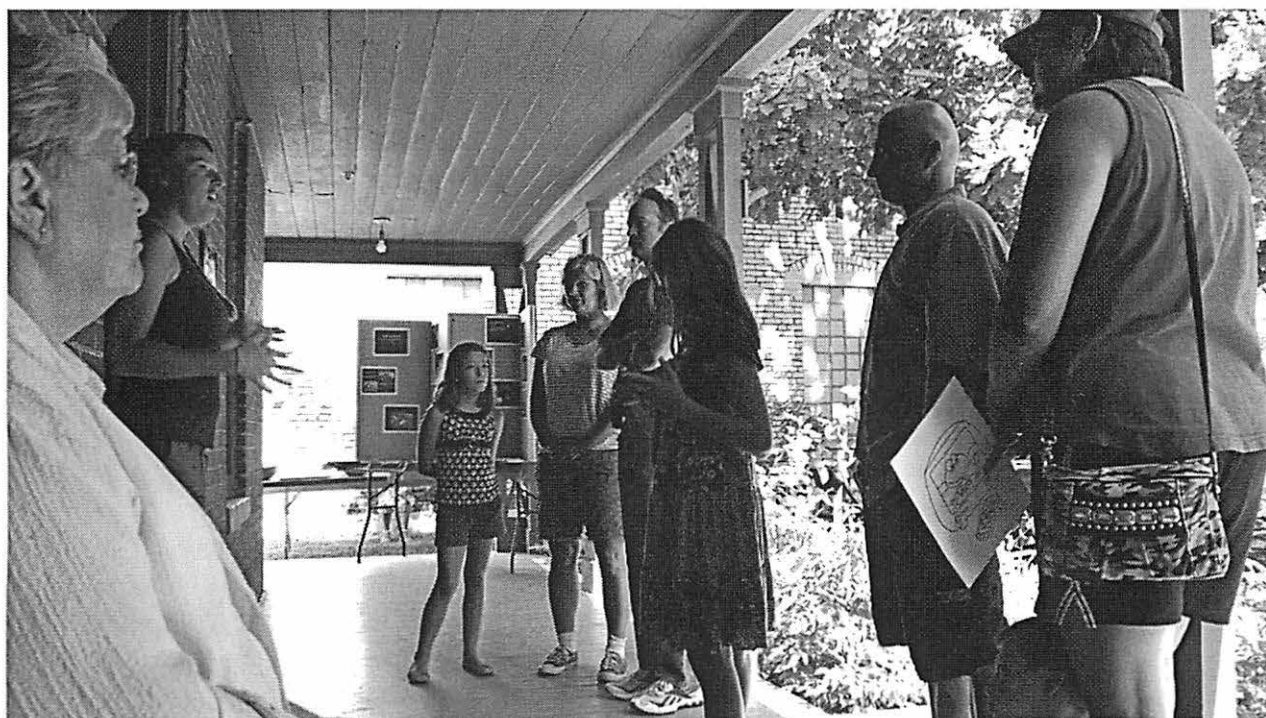


Fig. 6. Visitors to the site being welcomed/introduced to the project (Photograph by Ana Overgaard).

At the start of each work day all project archaeologists participated in a morning meeting to share any announcements, report on events from the previous day, and assign work locations to the crew. Part of each morning meeting was also spent assigning designated tour guides, or “talkers” for each work area as well as reporting on reactions from the previous day’s visitors. Technically, every volunteer, student, or staff member on the site was a “talker,” but the two stations—excavation/screening and the lab—had two to three people who were to be on the lookout for visitors. The role of these designated “talkers” was to be primarily concerned with site visitors. When visitors entered their particular work area the “talker” was to engage the visitor and explain to them about what they were seeing, whether that was digging, screening or cleaning. Talkers were usually veterans to the site or those who came with a general knowledge of archaeology. After explaining the process the “talkers” were available to answer any questions visitors might have had. On the excavation side of the house, talkers were responsible for explaining both excavation and screening. On the lab side, talkers mainly spoke about the cleaning and organizing of the artifacts. The lab director or public outreach coordinator would most often review the identification and dating process, as well as get to share the “show and tell” tray, highlighting what archaeologists had been finding.

As noted earlier, the public outreach component was aided by the site having a built-in “flow” that allowed for guests to explore the site partially on their own. The sidewalk that circled the house helped tours in two major ways. The first is that our site was one hundred percent

handicap accessible. Several strollers, wheelchairs and walkers were able to venture around the site with ease. The second is that, seeing as this was still a working archaeological site with a deadline to meet, visitors did not have to be with one of our working archaeologists the entire time. “Talkers” could direct visitors to follow the sidewalk when they were ready to see the next step. It allowed for many more visitors to see the site on a continuous basis, which was essential as many guests were just passing through and might not have been able to wait for a pre-designated tour time.

After visitors explored the site, the public outreach coordinator (Schwartz), often the same person that greeted visitors at the beginning of the tour, would ask if they had any lingering questions that had not been answered. Visitors were then asked if they would be interested in taking a “brief front-back page survey” (Appendix). If they responded affirmatively, a table with chairs located in the appealing shade was their last stop. While there was no monetary or other incentive (though some cookies were occasionally available), visitors were repeatedly thanked for their willingness to participate. Survey data was compiled for each day, and then for the entire two-week excavation. These findings are discussed in a later section.

The Field Side of Things

Professional archaeologists generally are accustomed to a certain degree of privacy when conducting excavations as the majority of archaeological sites are located in remote areas, away from cities and tourists. As project archaeologists who were new to urban archaeology quickly discovered, a constant stream of curious visitors was quite distracting and made for slower progress. They adjusted quickly, however, as they came to realize the value of having constant feedback from the local community, sightseers, and local media. This regular interaction with non-archaeologists allowed project workers to relay their own sense of excitement about archaeology and their findings—a gratifying educational experience for both parties.

In terms of logistics, each day, the project staff was managing a different volunteer field and lab crew (though well over half of the volunteers had previous field experience), which put a premium on routinizing our public activities as much as possible. The excavation area was organized in an attempt to maintain effective communication and interaction with visitors and continuously keep dirt moving; for the most part we were successful, though there were a few times the volume of visitors was such that all of the field crew was engaged with visitors to the site.

The designated “talker” for the field area proved to be particularly helpful to the project for a variety of reasons. Heading into the project the thinking was that the first point of contact on the field side (the “talker”) would be staffed by a different person each day. In reality it was much more efficient to have a single individual assume this position day after day. After the first couple of days of the project, archaeologist Tim Mace effectively became the primary “talker” for the field side of the project. The benefit was that with a rotating field crew, Mace provided a consistent presence for interpreting the field work he had seen and the artifacts that had been recovered earlier. Being part of staff discussions on excavation strategy and current interpretations enabled him to present more context for the project.

The primary focus of our work, and the main attraction for visitors, was the excavation of the well (though there were other units located under the porch being excavated throughout the two week project as well). Between two and four people were gathered around the well at any given time. Due to safety concerns, excavators were not allowed to go into the well, and had to excavate from the outer edges. This restriction posed logistical problems, especially as the well deepened. After standard shovels became obsolete, a ten-foot long utility-pole shovel was acquired. Using this long shovel required at least three people in order to safely and efficiently remove deposits. Our use

of this unique shovel was an incredibly interesting, and sometimes amusing spectacle for visitors who regularly exclaimed, “Look at the size of that shovel!” Equally captivating however, was the fact that because the well was essentially filled with household rubbish, large and intriguing artifacts were constantly being retrieved from the well. The likelihood was high that visitors would witness the recovery of an intact bottle, ceramic sherd, or other interesting item. In addition, during the next stage of the tour visitors were invited to participate in pulling artifacts from the screens, with staff and volunteer supervision, which many did enthusiastically.

From the field side of things we were trying to convey three things in our conversations with visitors. First, we wanted to explain the process of archaeology, discussing the importance of archaeological context and how systematic recovery of artifacts can show how different areas of a site may be used differently and how we can identify differences in use over time. Second, we wanted to share the reality of archaeology, that the interesting, intact items are not necessarily everyday finds and that the smaller, seemingly unimportant items such as bones, nails, or small pieces of glass make up the bulk of an artifact assemblage. More important, it is those everyday items that were not only more common, but in the aggregate can tell interesting stories about the past. Our third point was aimed at the bigger picture pointing out to our visitors that Boise’s history is not just in books but it is literally beneath their feet—a message intended to raise consciousness about the importance of historical preservation.

The other side of the visitors’ experience was their reactions to the field work. As noted, the excavation of the well and our ten foot shovel was particularly interesting for the visitors, but the well itself also generated a great deal of discussion. A particularly effective conversation starter was to have some interesting objects recently found in the well on hand to show, such as a leaded glass ink well, a French shaving cream lid, or a jar of tooth paste from England (Figs. 7 and 8). These objects led to broader discussions about life in the past and Boise’s connection to the world in the nineteenth century. Even with these interesting artifacts the most common question excavators received was something along the lines of “What is the coolest thing you have found?”

The field crew on the excavation side interacted with a wide variety of visitors—children, adults, retirees, Boise residents, tourists from around the world, people in different professions, and people with varying interests in or knowledge of archaeology. Often, the level of enthusiasm in a group or individual could be measured by the questions they asked, and it was the children that were particularly good barometers of interest. Some children shyly stood back and listened, while others got as close as possible to the excavation area and stayed until their parents dragged them away. A popular question from children (like the adults) was what had been the “coolest” thing to be pulled out of the well. Some children were incredibly stimulated by the experience, interacting with volunteers and asking many questions. One child, who was observing the well for a significant amount of time, started making his own hypotheses that explained the artifacts we were pulling from the well. One memorable hypothesis for the crew was his interpretation of a barrel hoop. As the hoop was being pulled out of the well, he excitedly claimed that it probably came from a powder keg that pirates used—a hypothesis that we gently refuted.

One of the messages that all of the archaeologists came away with was how rewarding, yet challenging it can be to do archaeology in public. With all visitors, but children especially, project members tried to express *why* the past is important, and why preserving and studying it is a useful endeavor, but our conversations often took some surprising detours. Oftentimes, workers were asked unexpected questions, or ones they were not necessarily prepared to answer. In other cases, visitors asked questions that the project members should have known, revealing subjects that required further research, keeping everyone on their toes intellectually.

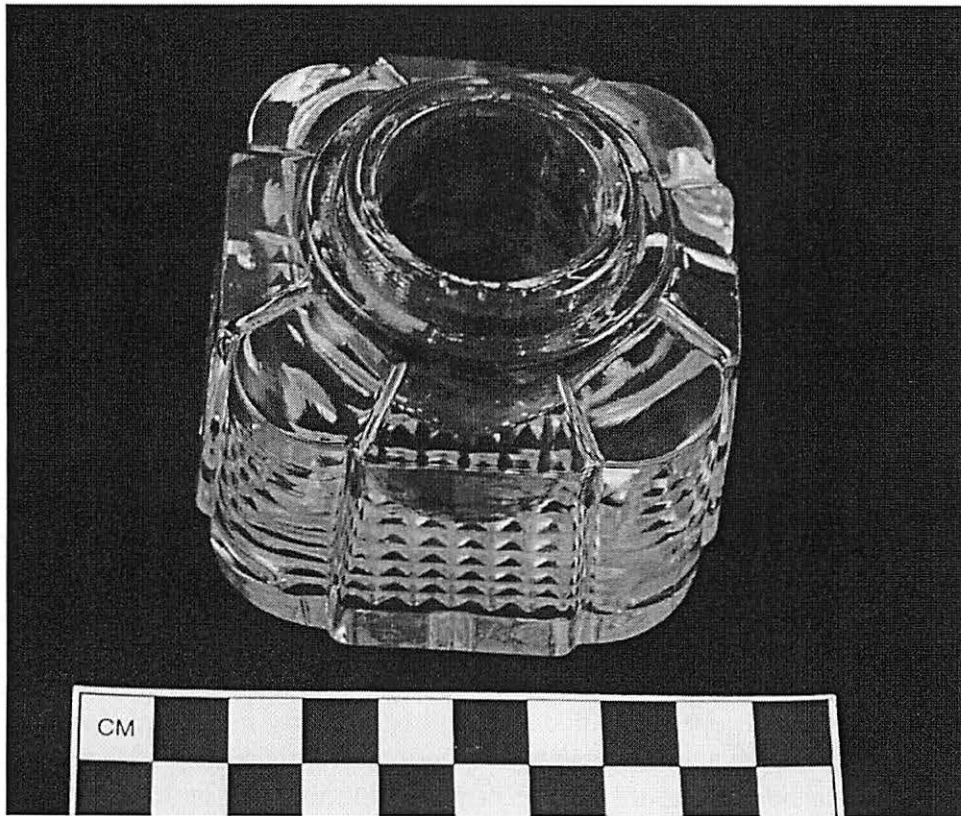


Fig. 7. Photograph of the ink well recovered from the well excavation (Photograph by Theodore Charles).

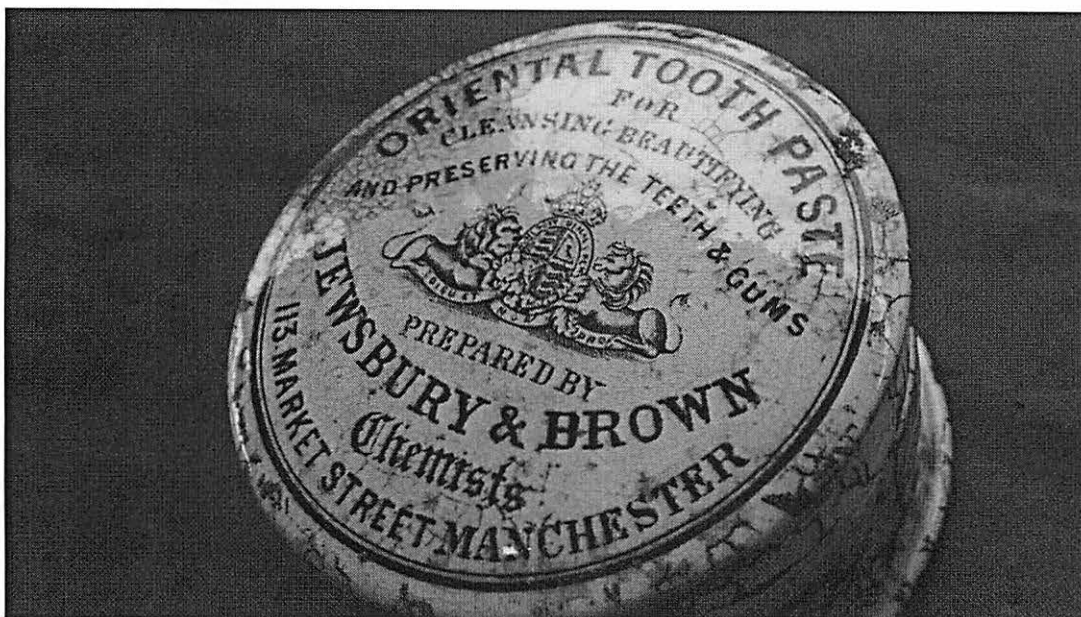


Fig. 8. Photograph of the toothpaste jar recovered from the well excavation (Photograph by Ana Overgaard).

Visiting the Lab

After touring the excavation and screening sites, visitors to the Cyrus Jacobs-Uberuaga House walked around the back of the house to the on-site laboratory. The laboratory setting, located along the west wall of the house, allowed visitors to observe the processing of the recently excavated artifacts for analysis. With tables set up in a row, volunteers processed the artifacts on one side of the tables and visitors walked along the other side (Fig. 9). This gave the guests a close view of our processes, without fencing, barriers, or locked doors.

As they approached the laboratory and its volunteers, visitors were welcomed by our two designated speakers of the day. When the visitors walked through the lab area, lab staff explained the processes being performed in front of them, starting with washing methods: wet washing everything solid, such as glass, metal, and ceramic; and dry brushing more fragile items such as wood, bone and fabric. After seeing similar items unearthed from the well or recovered in the screens just a few moments earlier, visitors were consistently fascinated by the cleaning process and how much more information was discernible from artifacts once they were washed. For example, a ceramic pattern hidden beneath a layer of dirt, or embossing on a bottle that became visible once the grime was removed always piqued the visitor's interest. Many stood to watch what other mysteries were unveiled by the washing process. This is also the point of the tour where visitors realized just how many artifacts we were recovering, as baker's rack trays (used to help dry the washed artifacts) set on the lab tables piled higher and higher with artifact fragments. Regardless of what we were processing visitors were always able to find an artifact that intrigued them.

Once the artifacts were dry, we explained the procedure of "tagging" (a preliminary identification of the artifact recording basic information on it) the artifacts for further study after the excavation had completed. A more mundane process than washing, the emphasis we attempted to convey to visitors was the importance of provenience, from the removal of the artifact from the ground to the analysis later to be conducted at the University of Idaho, essentially reinforcing one of the messages they got from the field crew. Surprisingly, the tagging of artifacts regularly provided another moment for public education relating to how some materials are identified and to what level the identification can proceed. For example, ceramic is easily identified by the untrained eye and a visitor would ask why particular ceramic sherds are in separate piles and not just bagged together. This allowed us to interject some Ceramics 101—explaining how ceramic types, kinds of decoration, and even vessel forms can provide details about the past such as age, place of manufacture, and even social status. Suddenly, our mundane conversation about tags became more informative, if not more interesting.

Albeit, not all visitors to the site were as enthralled by the details of the work, as there were many who just wanted to see the shiny artifacts. However, after a few days on the project it became clear that many of the site's visitors were uniquely interested in how we came about information pertaining to the site and artifacts. This realization ultimately led us to devote half of our laboratory space to identified artifacts and the references and resources used to identify them. We highlighted the references we used most often. For example, ceramic maker's marks books such as Lehner's (1988) *Lehner's Encyclopedia of U.S. Marks on Pottery, Porcelain, and Clay* and Gibson's (2010) *Ceramic Makers' Marks* were laid open to pages that matched ceramic maker's marks found at the site. Laboratory volunteers explained how the books are used and what information they conveyed, such as the mark's date of manufacture and where it was produced. Similarly, we had several complete bottles from the excavated well with intact manufacturing marks or distinctive embossing sitting next to Toulouse's (1971) *Bottle Makers and Their Marks*. Seemingly harder to identify than ceramic, visitors were astonished that there was such a reference as Toulouse that identified shapes and monograms for specific companies.



Fig. 9. Photograph of the field lab, with a site tour in progress (Photograph by Ana Overgaard).

Another reference we shared was the power of the Internet. A shallow terra cotta pan (most likely the base to a flower pot) recovered from the well was impressed with the manufacturer's initials and city location on the base. With a quick internet search we were able to determine the company name and when they were in operation. We printed the website information and placed it on the table with terra cotta sherds. For other items such as a toothpaste jar and multiple tobacco tins, advertisements were located online for the products and printed for the public to see with the actual artifacts.

The Sears, Roebuck and Company catalog is another reference that regularly intrigues people; and rightly so, it is a captivating resource for archaeologists. While we had several different catalogs on hand, we specifically laid out the 1897 edition because it closely matched the date range of the well contents. These catalogs can be used as secret weapons in piquing the interest of the public. Many visitors remember family members who received original catalogs, while even more people are amazed that they are being reprinted today and how much this everyday item (which people loved to remind us was used as toilet paper!) can shed so much light on an archaeological investigation. While we professed the many wonders the catalog holds, we specifically had it open to a page of shoe polishes. One complete corked bottle recovered from the site well was embossed "Gilt Edge Dressing"—a product featured on the shoe polish pages of the 1897 Sears, Roebuck, and Company catalog. The finding of both the bottle and the Sears entry surprised and intrigued our visitors. Here they could read an advertisement stating how the polish was used and how much it cost, which in turn could very well be the same advertisement that enticed the Jacob's family to purchase the product.

At the end of the laboratory tables sat our baker's rack filled with trays of artifacts that were drying, as well as a few trays displaying some of our "show and tell" artifacts. These artifacts were kept on the trays for several days, but upon seeing repeat visitors we began to rotate some of the artifacts to keep the returning guests up to date on what was being found. We relayed what information we knew about the "display" artifacts and let the visitors check out all the trays before we ended the laboratory portion of the tour. Overall, the lab was an area where many visitors really lingered. While the first few days of the project were definitely a learning experience for us, we did settle into a rhythm. We figured out what information was particularly of interest to visitors and we coupled that with the information we wanted to convey to the public creating an informative and engaging introduction to an archaeological field laboratory.

Survey Responses

Visitors to the Cyrus Jacobs-Uberuaga House came from as close by as the Basque Museum and Cultural Center next door, and as far away as Argentina. They came with their camp group, their summer school class, and on their own volition. Some were in strollers, and others were in wheelchairs. Some got sucked into the world of archaeology while driving through Boise heading to another destination. Others came day after day during their lunch breaks to see what else was being pulled out of the well. All in all, 1,053 visitors came to our site over the nine-day excavation. Most were asked at the end of the tour if they would be willing to take a brief two-page survey about their experience and 126 visitors filled them out.

For our purposes, questions three and four were the most telling about an archaeologist's ability to educate in a very short amount of time. The survey asked visitors to identify the amount of the knowledge they felt they had before and after the tour on a one to five scale (one meaning they knew nothing about archaeology, five meaning they had a very good understanding of the archaeological process). The average knowledge before the survey was taken was a 2.88. However, after the tour visitors averaged an archaeological understanding of 3.84. Clearly, this is

a very positive finding, yet one of the reasons why this result is particularly significant is that it represents an actual instance where the impact of a structured public program can be measured. At least on a short-term basis our public programming *measurably increased* people's understandings of archaeology.

In addition to the overall finding of support for archaeology, there were quite a number of responses that provided us with both support and advice for things we could improve upon in the future. For example, several surveys noted that they enjoyed seeing archaeology first hand, and wished that sites were advertised more widely and open to the public. Media coverage is essential to other sites seeking out public outreach components. Of the 126 surveys, 47 of them noted that they heard about the excavation from some form of media (newspaper, television, radio, etc., stories generated out of two media releases we sent out through Idaho's Marketing and Communications Department). Also, there were many comments that acknowledged the enthusiasm of a younger generation of archaeologists (several of the project volunteers were students from a variety of Idaho Universities). One respondent wrote, "Very interesting that young folks are interested in researching the past history of this site."

As for the lessons learned, we may have gone overboard with our enthusiasm from time to time. One survey said, "A little overwhelming with the number of guides sharing information at once. But, as a teacher, what a treat to see people so excited about learning *and* sharing!" While there were many educational moments happening on the site, there were also unintended lessons to be learned. The site had several volunteers and staff members, all constantly being reminded that there could be several hundred visitors each day. Enthusiasm was never lacking, and this may have become overwhelming to some visitors. Also, in an attempt to get good survey data about an archaeologists' ability to educate in the field, visitors lost some of their freedom to explore the site in the way that they may have wanted. Despite these minor flaws, the overall experience that 126 of our visitors were willing to share with us cannot be ignored. Not only was it educational, but it was "Fantastic! Wonderful! Excellent!"

Conclusion and Moving Forward

From the first day of orientation for the project volunteers we stressed that the public outreach component was going to be as important as the archeological findings. While archaeological findings were, indeed, rich (See Goodwin 2014 for a discussion of the archaeological findings), the public programming exceeded our expectations. Certainly our survey data was overwhelmingly supportive, but the impact of our outreach endeavors extended well beyond just generating survey responses. One of the ancillary outcomes was a great deal of media coverage for the project on all three Boise television stations, at least three Boise radio stations, and multiple articles in several newspapers throughout the state and region. Indeed, the project even received a brief mention in the November/December 2012 issue of *Archaeology Magazine*. Yet, it is important to recognize that outreach associated with the project did not end with the conclusion of the excavations. Throughout 2012 and 2013 we shared the results of our findings at various public gatherings. In the fall of 2013 the project was a featured part of the Idaho Heritage Conference in Boise and a brief documentary was produced by Ana Overgaard, a University of Idaho alum who worked at the Basque Museum and Cultural Center as a media relations intern during our excavation (http://www.youtube.com/watch?v=fxHNSN_lAz0) and in June of 2014 a new exhibit was installed at the Basque Museum and Cultural Center that prominently featured some of the archaeological findings. In other words, we counted over 1000 people coming to visit the excavation over a two-week period and we gathered a great deal of information during that

time on what people think of archaeology, etc., but over the long term this is a project that will have reached thousands more people through the media, public talks, videos on the project and the museum exhibit—as well as preserved the well itself. Today, there is no longer an archaeological site to visit but the archaeological outreach continues.

ACKNOWLEDGMENTS

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ABOUT THE AUTHORS

Mark Warner, Ph.D., Associate Professor of Anthropology at the University of Idaho. He is a historical archaeologist and his research interests include issues of inequalities, the American West and zooarchaeology and foodways. Recent work included serving as Co-Principal Investigator on the Sandpoint Archaeology Project, the largest archaeology excavation in Idaho's history.

Mark Warner; Department of Sociology and Anthropology; University of Idaho; 875 Perimeter Dr., MS 1110; Moscow, ID 83844-1110; 208.885.5954; mwarner@uidaho.edu

Tracy Schwartz received her M.A. in Anthropology from the University of Idaho and M.S. in Historic Preservation from the University of Oregon. Her research has focused on Native American history, with an emphasis on colonization, resistance, and desire-based research models. Tracy currently lives in Boise and is still waiting for her big break into employment after spending 21 years as a student. Tracy Schwartz; 499 Ave H #412; Boise, ID 83712; 847.431.3408; t.schwartz87@gmail.com

Stacey Camp, Ph.D, Director of the Alfred W. Bowers Laboratory of Anthropology and Associate Professor of Anthropology at the University of Idaho. Her research is on the historical archaeology of immigrants in the Western United States, focusing on the lives of Chinese, Japanese, and Mexican migrants. She is currently leading an archaeological project that examines Idaho's Kooskia Internment Camp, a World War II Japanese American Internment Camp. Stacey Camp; Department of Sociology & Anthropology; University of Idaho; 875 Perimeter Dr., MS 1110; Moscow, ID 83844-1110; 208.885.6736; scamp@uidaho.edu

Jessica Goodwin received her M.A. in Anthropology from the University of Idaho in 2014. She is currently working for Archaeological and Historical Services, She is a historical archaeologist whose research has focused on the western U.S., specifically women in the frontier west.

Jessica Goodwin; 426 N. Jefferson #5; Moscow, ID 83843; 775.247.1675; jgoodwin2718@gmail.com

Amanda Biemann received her M.A. from the University of Montana, until recently she was employed in the Office of the State Archaeologist and was an instructor in anthropology at College of Western Idaho. She is a historical archaeologist whose research interests are collections management and historic ceramics. Prior to working at the Idaho SHPO she served as lab director for the Sandpoint Archaeology Project. Amanda Biemann; 9774 W Silverspring St.; Boise, ID 83709; 623.399.0746; Amanda.biemann@gmail.com

Timothy C. Mace received his M.A. in Anthropology from the university of Idaho in 2012. His master's thesis research focused on chemical analysis of slag from three Swedish sites dating from the Middle Ages. His focus is primarily historical archaeology. He currently works as a volunteer at the Alfred W. Bowers Laboratory of Anthropology, processing both historic and prehistoric collections. Timothy Mace; 775 SE Glenwood Ct.; Pullman, WA 99163; 509.339.5446; Mace1838@alumni.uidaho.edu

APPENDIX: PUBLIC ARCHAEOLOGY SURVEY

Public Archaeology at the Basque Museum & Cultural Center, Boise, Idaho

Co-Project Investigator: Dr. Stacey Lynn Camp (scamp@uidaho.edu)

Co-Project Investigator: Dr. Mark Warner (mwarner@uidaho.edu)

University of Idaho, Department of Sociology & Anthropology

Engaging and educating the public on the practices and purpose of archaeology is essential for any excavation. So, how are we doing? Not only are we interested in who is visiting our site, but we are also curious as to what you may have learned and what we should incorporate in the future. Your answers to this survey are anonymous and will be used to better understand the public's perception of archaeology and to help design future outreach programs that better meet your needs and wants. Thank you for taking the time to complete this brief survey and for visiting our excavation!

Participant Sex (circle one): MALE FEMALE

Participant
Ethnicity/Race: _____

Town, State of Current Residence: _____

Profession/Occupation: _____

Level of Education (circle one):

High School Degree/GED

Some College

2-year College Graduate

4-year College Graduate

Attended Graduate School

M.A., M.S., J.D., M.D., Ph.D., etc.

N/A, Prefer Not to Answer

1. How did you hear about the Cyrus Jacobs-Uberuaga Boarding House excavation project?
2. On a scale of 1 to 5 (1 meaning you knew nothing about archaeology, 5 meaning you had a very good understanding of the archaeological process), how would you rate your knowledge of archaeology BEFORE visiting this excavation?

1

2

3

4

5

3. On a scale of 1 to 5 (1 meaning you know nothing about archaeology, 5 meaning you have a very good understanding of the archaeological process), how would you rate your knowledge of archaeology AFTER visiting this excavation?

1 2 3 4 5

4. On a scale of 1 to 5 (1 meaning you knew nothing about Basque history and culture, 5 meaning you had a very good understanding of the Basque people), how would you rate your knowledge of Basque history and culture BEFORE visiting the Basque Museum and Cultural Center (Cyrus Jacobs-Uberuaga Boarding House)?

1 2 3 4 5

5. On a scale of 1 to 5 (1 meaning you know nothing about Basque history and culture, 5 meaning you have a very good understanding of the Basque people), how would you rate your knowledge of Basque history and culture AFTER visiting the Basque Museum and Cultural Center (Cyrus Jacobs-Uberuaga Boarding House) today?

1 2 3 4 5

6. Optional: What specifically did you learn about archaeology and/or Basque heritage and culture during your visit today?

7. What else would you have liked to learn about archaeology and/or Basque heritage and culture in Boise?

8. Are you aware of other archaeological projects taking place, or that have taken place in Idaho? If so, which ones and how did you learn about them?

9. Is there anything else you would like to share with us about archaeology, Basque culture or your visit today?

Thank you for taking the time to complete this survey and for exploring our archaeological site!

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