

TRADITIONAL USE AND MEANING OF THE AREA: THE TOLOWA COMMUNITY TODAY

Today the Tolowa are a thriving community, interested in their past and preserving their culture. The Elk Valley Rancheria, Smith River Rancheria, and Tolowa Nation all have active cultural programs and sponsor a wide variety of cultural rejuvenation initiatives, including Ne-Dosh (World Renewal) dances and ceremonies. Initiatives include protection of cultural sites, tribal hunting, fishing, gathering and subsistence rights, and development of an interpretive center.

The Tolowa actively participate in the management of cultural resources and planning in partnership with Redwood National and State Parks. Much of this work is done through Tribal Heritage Preservation Office (THPO), programs of the Elk Valley Rancheria and Smith River Rancheria, in direct consultation with Tribal Councils.

Despite all of the changes that have occurred in the area, interviewed Tolowa consultants consistently express a deep connection to the Hiouchi and Red Elderberry Place area, its sacred places, the archaeological sites and the natural environment: “Well, it’s important to know that historically, it played a role, but it still does today” (Lena Bommelyn).

The area is recognized not only for its significance to Tolowa history, but also for its importance to the community’s continued sense of identity. Family gatherings and traditional dances are regularly held at the Jedediah Smith Campground (Figure 46 through Figure 48). The area also remains in use for religious and other traditional purposes. Members of the Tolowa community continue to visit the area to pray, to enjoy the environment, and to gather food, medicine, and other traditionally used materials:

[L]ike I say that prayer rock is there, and of course the weather is always so beautiful in Hiouchi...the environment is so nice. And, even, today, when I could still walk in the redwoods, I’m so inspired, just by the fact...Well, I’m so glad they’re still there and they didn’t get cut down. You know, and somebody saved ‘em. [T]hat was wonderful...And the fact that the river mussels still live in the, Mill Creek is nice. [T]he natural environment...is just a blessing to be amongst. [W]e go by sometimes _____, you know, pray there, and you know, gathered acorns there.

People still practice their religion. They still use places for prayer, you know. And...the Parks people don’t need to know how they do it, they just need to know that they use it, and that it needs to be available to them for that. You know, so, that’s important. [Loren Bommelyn]

Many consultants expressed the desire to continue or resume traditional cultural practices in the area such as fishing and gathering. They are also deeply concerned about the preservation of the area, including local archaeological sites and religious places:

I think that...it’s such a pretty place there and...just to be able to walk through there and...through Shannon’s work, know the ages of those house pits there, and it’s fairly intact for how much use it gets. You know, those first years we were out there...you’ve seen hundreds of people in a week. Hundreds, from all over the country. I think it’s a good money-maker for the park system...it probably sustains itself, but, at what price?...I think [its] a

duty of ours to kind of keep that...to respect it...or what they would say about places...like a burial...your parent or your sibling or your close relative. [They] would have...kept their grave up...and went out there to work and respected it. And, then, just waited for it to go back to the way it was. And, with all those people that go through there, it's not going back and, and it's being forced...I guess my main concern would be just that that return in its natural way. [Richard Brooks]

Richard Brooks expressed regret that this knowledge was lost for *Chvn-su'lh-dvn* and the responsibility he feels to protect the site:

I was aware that right in that place there was something there. And I think, for me the thing that was kind of interesting was, up the river a little bit, and down the river, I knew who descended [from] those places, but I didn't necessarily know of anybody who was a direct descendant of that village at *TcuncuLtn*...I think that that site's important, because of that, because it's always, you know, in the old times...It was important to know where you came from, and to always be recognized kind of that way....So I don't know...I think it's...kind of left to the modern people now...the people that just have a roll number with the tribes to step in and to try to protect those places. [Richard Brooks]



Photo by Richard Gould, Image 5058.

Figure 46. Bernice Humphries and Harriet Smith at Traditional Tolowa Salmon Bake, Big Lagoon State Park, 1982.



The Tolowa Nation performs Ne Dosh or World Renewal demonstration dances every summer in Jedediah Smith State Park. The dances are held in an old growth forest overlooking the Smith River.

Figure 47. Tolowa Nation Demonstration Dance at Jedediah Smith State Park, 2005.



Courtesy of Linda Martin.

Figure 48. Annual Lopez Family Reunion at Jedediah Smith State Park, 1993.

SUMMARY

The subsistence settlement round of Gee Dee-ni', or upriver Tolowa village groups, was likely very similar to the system described for coastal Tolowa. Throughout the region, villages were politically autonomous and permanent, village members engaged in logistical forays to seasonal resources, and individuals within villages owned use rights (to whale claims, surf fish camps, acorn groves, and salmon fishing spots). Variation in the subsistence settlement round depended largely on the settlement location and the associated use rights of individual villagers. For example, salmon fishing techniques and dietary emphasis varied from village to village. At *Etchulet* village on the Lake Earl estuary, most salmon was obtained using net traps placed at a series of owned estuarine creeks and by nets set on Mill Creek, while *Yontocket* villagers owned the only large fish weirs on the Smith River. At upriver villages such as Red Elderberry Place, where salmon was a primary resource and involved negligible transportation costs, salmon fishing techniques included gill netting and harpooning, endeavors which were likely carried out by individual households.

Red Elderberry Place had connections to *Tatatun* at Crescent City and *Etchulet* on Lake Earl, and they likely traveled overland to exploit coastal and lagoon resources near these villages. Salmon was important, both to local villagers and for the people who set up seasonal fish camps in the area. Headmen at *Tatatun* and *Etchulet* owned rights to fish along Mill Creek. Key fishing technology included gill nets, harpoons, and weirs. People regularly maintained Hiouchi Flat with regular burns. Religion was a large part of villager's life, just as it was for other Tolowa. There were many places of ritual or ceremonial significance. Two of them include Flower Dance Rock and Widow Rock.

Most villages in the area were abandoned in the Late Prehistoric or early Contact Period, though people persisted in living at Red Elderberry Place into the early 1900s. They lived much the way they had before white contact. They employed similar subsistence activities, notably salmon fishing and acorn gathering, while incorporating new (historic period) materials and technology into their cultural system. The Contact Period was a time of great upheaval. On the coast, massacres at several village sites had decimated populations in the early 1850s, and forced removals and disease also contributed to the decline. Though Hiouchi was remote, Indians in the area did not escape the violence. The last man at Red Elderberry Place was murdered in 1902 by local white residents and may have been buried at Chief Phillips burial rock (CA-DNO-25). Killings are also reported at *Munsontun* and upriver near Big Flat and at Happy Camp.

After 1902, the Red Elderberry Place cemetery fence was still visible, and the cemetery was still maintained. Shortly after white settlement of the area, the fence was destroyed and permanent settlement in Indian villages ceased permanent settlement by indigenous inhabitants. However, traditional fishing continued in the area. Up until the 1920s, people converged at Mill Creek and along the Smith River to fish for Chinook. The fish camps were set up for as long as two months, and people busied themselves drying fish and collecting acorns and huckleberries. After the fish camps ended, people continued to fish in the area, but after Public Law 280 was passed in 1953 (amended 1968), traditional fishing came to an end. Public Law 280 transferred federal jurisdiction of criminal activities by or against Native Americans to certain state governments (including California).

The Cookes and Catchings families were of mixed Indian-white descent. Both lived a generally simple, self-sufficient and rural lifestyle. The Catching family moved out of Del Norte County shortly after Ephraim Catching's death in 1902. The Cooke family allotment was sold after Minnie died at 104 in the late 1960s or early 1970s, and the family sold the last of their property around 2006, but their descendants remain part of the Indian community today.

Chapter 7: Interpretive Themes

This chapter includes a summary of major research themes that can be addressed by the described archaeological, ethnographic, and historical studies. Tushingham's dissertation (2009) specifically sought answers to two basic questions: (1) how did intensive foraging systems develop in the region (abruptly or gradually)? and (2) when were the two most important dietary staples of ethnographic groups (salmon and acorns) intensified? As the first large-scale effort at any interior river site in northwestern California, the answers to these questions were uncertain at the outset, but became clearer upon investigation.

As with any exploratory research, new questions and issues emerged. The excavation and identification of five semi-subterranean plank houses drove new research to identify the differences between ethnographic and prehistoric households in northwestern California and the Pacific Northwest Coast, and how the evolutionary trajectories of these regions varied. The astonishing amount of obsidian recovered at the project sites—obtained from sources 250-350 kilometers distant directed questions about when and why obsidian distribution patterns varied so dramatically over time. The discovery of the Contact Period sweathouse was also unexpected. Through conversations with Tolowa participants, the historical context of this period shifted the interpretation of the house and associated assemblage. Historical research begun by Maniery and Millett (2008) demonstrated that the earliest non-aboriginal settlers on Hiouchi Flat consisted of large Indian-white households alongside the last permanent inhabitants of Red Elderberry Place. After this discovery, continued historical and archival research of this period led to the conclusion that Hiouchi Flat provided an inland sanctuary for the native and Indian-white families who lived there.

Several important but ancillary questions not detailed here have been addressed, and there is no doubt that additional research issues will be articulated in the future. For example, a gas chromatography-mass spectrometry (GC-MS) analysis of residue extracted from pipes and pipe fragments recovered at CA-DNO-26 and -333 led to the identification of the earliest evidence of tobacco smoking in the Pacific Northwest Coast (Tushingham et al. 2013a). Work on salmon and acorns in northwestern California developed into projects looking at the implications of findings in regional studies guided by human behavioral ecology and hunter-gatherer nutrition data (e.g., Tushingham and Bettinger 2010, n.d.; Tushingham et al. n.d.).

THE DEVELOPMENT OF INTENSIVE FORAGING SYSTEMS

Two explanatory frameworks address the origin and development of intensive foraging systems akin to those observed in ethnographic northwestern California. One argues for a late and rapid development related to an influx of northern Algonquian and Athabascan speaking peoples into the region (migration). The other argues for an earlier, much more gradual development of the ethnographic pattern by resident foragers (in-situ development). The fundamental difference between these models concerns the timing and origin of hunter-gatherer strategies analogous to the ethnographic pattern. Key elements of this pattern include residence in semi-subterranean plank houses within coastal and riverine villages; a highly local social group structure involving household-based social organization and resource ownership; intensive, task-oriented food-getting pursuits; reliance on mass-capture technology and methods such as weir and net fishing; an emphasis on stored foods with high processing costs (e.g., acorn leaching); and concomitant heavy reliance on female labor (processing and other work related tasks associated primarily with women).

The migration concept has its roots in the thinking of Kroeber and early archaeologists, who believed that based on cultural similarities, “the boat-, harpoon-, and dugout canoe-using, gabled plank-dwelling, salmon and sea mammal eating culture pattern of northwestern California must have had its origin farther north in the Northwest Coast culture area proper” (Elsasser and Heizer 1966:227). Excavated coastal sites, including Patrick’s Point (CA-HUM-118; Elsasser and Heizer 1966) and *Tsurai* (CA-HUM-169; Elsasser and Heizer 1964), were late dating (mostly post-dating 1000 BP) and contained “evidence of a technology and economy which are, with few exceptions, directly comparable with ethnographic forms” (Elsasser and Heizer 1966:226).

During the mid-twentieth century and later, scholars expanded on the notion of migration, arguing for a rapid and late development of intensive use of the coast, the origin of which is related to an influx of Athabascan (Tolowa, Hupa, Chilula) and Algic/Algonquian (Wiyot, Yurok) speaking peoples (see Figure 6) into the region from the north, possibly the Columbia Plateau, beginning around 1,100-1,300 years ago (Bennyhoff 1950; Connolly 1988; Golla 2007, 2011; Moratto 1984; Whistler 1977, 1979). Linguistic (glotto-chronological) data was linked with archaeological evidence to reconstruct population movements, explain major developmental shifts in the region, and give estimated dates of these events.

In this scenario, expanding groups originating from the northern Pacific Northwest Coast introduced an intensive maritime and riverine focus to northwestern California beginning around 1100 BP. Once established, this way of life spread quickly throughout the region. According to Whistler (1977, 1979), the earliest inhabitants were Hokan speakers (as were the ethnographic Karuk) who were highly mobile broad-spectrum hunter-gatherers with an interior subsistence focus. The shift to specialized salmon fishing is said to have occurred between 1100 and 900 BP, when river adapted Algic speaking peoples (such as the Wiyot and Yurok) entered the area from the north, again, possibly from the Columbia Plateau. Algic speakers were river adapted, and probably introduced the bow and arrow, simple harpoon, tobacco-smoking and gravepit burning rituals into the area. A final migration at around 700-900 BP marks the entry of Athabaskan groups (including the Hupa, Tolowa and Mattole), also from the north. Athabaskans were adapted to “rough and forested regions” and may have introduced the toggle harpoon and sinew-backed bow. Recently,

Golla (2007) proposed that Whistler's dates were too late to account for regional linguistic diversity. In his reconstruction, the Wiyot settled Humboldt Bay around 1900 BP, the Yurok arrived on the Klamath River between 1300 and 1200 BP, and the Athabaskans settled the Trinity-Eel drainage no later than 1200-1100 BP. Golla suggests that the archaeological complex often referred to as the "Gunther pattern," characterized by flanged pestles, toggling harpoons, zooform clubs, steatite bowls, and wood working tools (adzes, mauls) associated with plank house and canoe building, is not a general Algic phenomenon, postdating Wiyot arrival, and likely associated with the arrival of the Yurok.

Essential to idea of migration is that population movements involved people who "brought with them" the skills and traditions characteristic of the Pacific Northwest Coast (Fredrickson 1984:483). These late arrivals were pre-adapted to intensive maritime and terrestrial resource acquisition and displaced mobile resident groups who up until that time had been "underutilizing the abundant riverine and coastal resources of the region" (Fredrickson 1984:481), marking the beginning of the Gunther Pattern. Once established, this way of life spread quickly throughout the region. If true, the archaeological record should reflect a relatively sudden entry of fishing-related technology, and an abrupt increase in population, with settlement primarily along rivers. These events should have occurred by approximately 1,100-1,300 years ago, with coastal environments being the last areas to settle.

In contrast, in-situ models of development argue for a more gradual, earlier, and local development of the ethnographic pattern (Hildebrandt and Hayes 1983, 1993; Lyman 1991; Lyman and Ross 1988). In this scenario, terrestrial resources were a focus for much of the region's prehistory, first in the interior uplands during Borax Lake times (8000-5000 BP), then at river basin sites beginning at 3000 BP; marine resources are not intensified until population pressure at interior river sites forces people to move to the coast (Hildebrandt and Hayes (1983, 1993). Intensification of marine resources is delayed simply because people chose to focus on highly productive terrestrial resources such as salmon and acorns (Hildebrandt and Carpenter 2007; Hildebrandt and Levulett 1997, 2002). In areas north of Humboldt Bay, such as Point St. George (CA-DNO-11) where there was access to abundant offshore rocks and sea mammal rookeries, people developed the tools and a method of transportation (the "oceangoing canoe-harpoon complex") so they could exploit this rich resource (Hildebrandt 1981, 1984; Jobson and Hildebrandt 1980). This was a local development that "arose out of necessity" rather than one that was introduced to the area.

The most influential in-situ model in northwestern California is articulated in a series of papers by Hildebrandt and coauthors (e.g., Hildebrandt and Hayes 1983, 1993; Hildebrandt and Levulett 1997, 2002, etc.). The model is fundamentally an environmental argument, based in foraging theory, which assumes humans will respond in predictable ways to changes in the natural environment. This model is based largely on findings during a major three-year archaeological project in the mountains of northwestern California, which included excavations at 13 sites in the Pilot Ridge and South Fork Mountain ridge system (elevation 4,500-6,000 feet). The project, which was the first extensive testing of regional sites in non-coastal settings, provided evidence for extensive use of the uplands during Mendocino and Borax Lake Pattern times. The diverse artifact assemblage characteristic of this period led to the interpretation of these sites as multi-purpose camps where a broad range of activities took place. During this time, upland sites were the main use areas of highly mobile hunters and gatherers who concentrated on upland resources, especially acorns and large game. The authors noted a distinct change in artifact

assemblages (less artifact diversity) and site nature (fewer residential, more specialized sites) after 3000 cal BP. They believed this reflected a fundamental change in use of the uplands. Palynological data compiled by West (1989) showed that between 3000 and 6000 BP, the uplands were warmer and resources were richer and more abundant than later in time. Specifically, beginning around 3000 cal BP, conditions became cooler and wetter and oak groves receded, making this important staple less reliable. In short, the uplands were transformed from a homogeneous environment with diverse resources into a relatively resource poor zone. The combined evidence led Hildebrandt and Hayes (1983, 1993) to hypothesize that in response to changing environmental circumstances, there was a shift to lowland river valleys at 3000 cal BP. Seasonal resources were emphasized at this time, in particular salmon and acorns, which involved specialized technology, including acorn processing equipment and fishing-related gear, reduced mobility, and an emphasis on storage. The authors argue that population pressure at interior river sites forced people to settle the coast later.

The migration and in-situ development models offer very different predictions concerning the development of intensive foraging economies in northwestern California. Migration models hold that at approximately 1100 BP, people entered northwestern California who were “preadapted” to intensive resource acquisition and brought with them the skills and tools related to extraction of riverine and maritime resources. Before this time, people were highly mobile, broad-spectrum hunter gatherers with an interior subsistence focus who essentially “underused” the abundant resources of the region, i.e., coastal resources. The in-situ development model also predicts a shift, but it is a much earlier and less abrupt, local development. Acorns and large game are emphasized at upland sites until approximately 3,000 years ago, when people began to settle river basin sites. Subsistence is based on storage and mass capture of seasonal resources such as salmon and acorns.

Thus, the question is, when does evidence for specialized technology (e.g., acorn processing and fishing-related gear), storage, residential features, and an emphasis on mass capture foods occur? Does it appear abruptly at around 1100 BP (migration) or relatively gradually around 3,000 years ago (in-situ development)? As most regional studies have focused on coastal or upland sites, resolution of these explanatory frameworks has remained speculative.

A Rapid, Qualitative Shift

Project findings demonstrate that the in-situ model of north coast subsistence-settlement development is partially correct: there was an increase in the use of lowland river basins during the Middle Period. Acorn processing was important, and residential stability increased after 3100 BP. The Smith River basin was occupied earlier and on a more sedentary basis than predicted by migration models. Evidence for several key foraging strategies predicted by the in-situ development model are absent until the Late Period.

Specifically, there is a lack of evidence at the project sites for logistical resource procurement, large-scale storage, and salmon intensification (technology associated with mass-extractive methods, specialized fishing gear). While limited, faunal data from CA-DNO-26 also suggests salmon intensification was delayed until the Late Period. The evidence suggests that populations grew in situ, a trajectory of gradual development that was not broken until fairly late, an event likely associated with the influx of northern peoples to the region. Foraging strategies intensified (mass extraction of resources, large-scale storage,

and logistical pursuit of resources) by 1250 cal BP. A relatively abrupt expansion of the pattern is consistent with the project findings described here and in Tushingham (2009).

The following sections address some of the fundamental changes that are associated with this adaptive shift, especially in terms of hunter-gatherer subsistence, household organization, and use of exotic obsidian.

THE TIMING AND TRAJECTORY OF SALMON AND ACORN INTENSIFICATION

Salmon and acorns were the most important terrestrial foods in the diet of aboriginal groups in northwestern California in the ethnographic period. Although the central role of these dietary staples is attested to in the ethnography, how and why this may have differed in the past is poorly understood.

Salmon figures prominently in the ethnographic literature as providing the economic foundation of many north Pacific hunter-gatherer social institutions (cf. Goddard 1945; Hewes 1938; Kroeber 1925; Kroeber and Barrett 1960). Likewise, many archaeologists have stressed reliance on (and control over) anadromous fish as being critical to understanding the development of foraging societies where salmon are available in the north Pacific Rim (northern California, Pacific Northwest Coast, Plateau, and interior Alaska and Canada; cf. Hayden 1992; Hewes 1938; Maschner 1998; Matsui 1996; Schalk 1977). The traditional assumption is that salmon is a relatively low-cost, high-ranking resource that would always have been as prominent in the diet as its numbers would allow.

Among historic American Indian groups in northwestern California, acorns were ranked second to salmon. Yet acorns were used by aboriginal groups who “ate very largely” of the nut (Kroeber 1925:84), and intensive processing methods were identical to those found in the rest of California. While heavy ethnographic reliance on acorns in California persuaded scholars that they too were a high-quality resource (Baumhoff 1963; Gifford 1936), Basgall (1987) showed that they were extremely labor-intensive—easy to collect but costly to process—arguing this was why intensification of the resource was delayed in northern California. In this scenario, acorns are high-cost, low-ranking resource that would have entered into the diet only when people were forced to expand their diet breadth.

Although it appears that acorns and salmon were both important resources in the Late Period, there is little archaeological evidence for mass extraction of salmon any earlier. Following the traditional notion that mortars and pestles are associated with labor-intensive flour making and leaching processing methods, while milling slabs and handstones were used to process small seeds and nuts (c.f. Fredrickson 1973; Moratto 1984; Basgall 1987), the presence of mortar bowls and pestles in Middle Period deposits suggests that acorns were an important staple by 3100 BP.

A handful of previous excavations of Mendocino Pattern components at river basin sites in northern California also point to this trend. Hildebrandt and Hayes (1993:103-104) cite examples from Humboldt County (McKee Flat on the Mattole River [CA-HUM-405; Hildebrandt and Levulett 1997] and Redwood Creek [CA-HUM-452; Hayes 1985]), and examples from north central California (CA-SHA-192 [Johnson 1976], CA-SHA-543 [Jenson 1977], and CA-SHA-177 [Johnson and Skjelstad 1974]) as providing “evidence for acorn use and some degree of occupational stability” (dark midden soils and diverse assemblages, including mortar bowls and pestles) but no “direct evidence for the exploitation of salmon or the extensive use of storage facilities.” Finally, a region-wide

survey of fish bone recovered from northern California midden sites shows relatively low frequencies of salmon bone, and relatively low intensity of fish use until after 1000 BP (Gobalet et al. 2004).

This appears to be a trend throughout California. Acorn intensification occurs at many sites by 6000 BP, and is widespread between 4000 and 3000 BP. In the San Francisco Bay Area, acorn is intensified in many places by as early as 5000 years ago and is widespread between 3000 and 2500 BP. Finally, acorns are intensified at some sites in the north Coast Ranges between 7,000 and 5,000 years ago, and at most sites in northwestern California by about 3500 BP (Tushingham and Bettinger n.d.). While the timing is variable, the sequence is the same throughout northern California, with acorns intensified before salmon. If salmon are traditionally viewed as a low-cost (high-ranking) resource, while acorns are viewed as a high-cost (low-ranking) food, why are salmon not taken and stored en masse earlier?

Why Foragers Choose Acorns before Salmon

Mass extraction and storage of salmon was resisted partly because of the high costs associated with such techniques. More to the point, foragers had an attractive alternative, acorns, which are a less risky, more flexible resource. Salmon, when taken with high-cost *techniques*, is an extremely “front-loaded” resource, compared to acorns, which is a “back-loaded” resource (Bettinger 1999a, 1999b, 2009). Fish, game, and most roots are front-loaded because they are expensive to procure and process on the “front end” (before storage), but once stored, do not take a great deal of time to prepare before being consumed. Salmon are front-loaded because a great deal of time is required to capture, prepare, and dry them before storage. This is particularly true when taken with nets and other complex technology, which, may increase yields substantially, but take a great deal of time to make and maintain. Weirs also involve a great deal of upfront costs, including weir construction and coordination. Storage of expensive technology (e.g., nets) and processed fish would have been very risky for foragers where the potential for loss of labor and capital would have been high without permanent storage facilities. In pre-Late Period times, when groups were still quite mobile, food storage likely involved “caching,” a strategy involving smaller stores of food in a broad range of places throughout a group’s foraging radius. Back-loaded resources are much less risky for caching, particularly for more mobile foragers who may or may not return to caches, because not a lot of effort is lost if the cache is not used (Bettinger 1999a).

Back-loaded resources (e.g., acorns and piñon nuts) are comparatively simple to procure and store, but a great deal of effort is involved in processing them before consumption. Acorns, for example, can be collected and stored easily, but processing time, particularly when intensive leaching techniques are employed, are extremely costly. Acorn is “backloaded in the extreme, storage time constituting just six percent of its total handling time (McCarthy 1993:Table 5-2)” and preparation taking up the remainder (Bettinger 1999a:53). Though quantitative estimates of handling time for salmon can vary significantly according to technology, species, etc. (Lindström 1996), when mass harvested, stored, and dried, it can be reasonably said that salmon were as front-loaded as acorns were back-loaded.

As pointed out by Schalk (1977), due to the stretched out anadromous fish season, there were likely fewer scheduling demands in California with salmon than in the northern Pacific Northwest Coast. However, though there are many scales of variability with intensive salmon fishing—from large communal weirs to small-scale family endeavors

more characteristic of California—it remained an “either-or” proposition throughout the region. Mass extraction of salmon was resisted in northwestern California because it is acutely front-loaded when taken with high-cost techniques. Rather, low-cost salmon fishing techniques were emphasized early in time. Foragers seem to have chosen to intensify acorns before salmon because, as a back-loaded resource, acorns are a less risky and more flexible food (Tushingham and Bettinger 2010, n.d.).

“Cheating at Musical Chairs”

The Middle Period system of subsistence worked well, but this in-situ development was abruptly altered at around 1250 cal BP, when the rise of linear plank house villages is documented at river basin sites. Migrating groups originated where the use of salmon required mass-harvesting techniques and sophisticated technology, and these strategies were applied locally. Intensive foraging strategies developed and spread quickly due to the competitive advantage of sedentary groups laying claim to productive resource patches. Once the qualitative jump was taken, other front-loaded resources (smelt, sea mammals, pelagic fish, etc.) could enter the diet with a minimum of additional risk.

Prior to Algonquian and Athabaskan entry, northwestern California was inhabited by foragers who were engaged in high-cost acorn processing for thousands of years. This in-situ development was abruptly overtaken by 1250 cal BP. It is unlikely that it was a lack of information or sufficient technology that kept foragers from taking the qualitative jump into intensification of front-loaded resources. Rather, pre-Late Period foragers chose a less risky, more flexible path. In-situ groups were not “underusing” the rich northwestern California resource base; they were following a qualitatively different adaptive strategy. Thus expanding groups did not necessarily introduce unknown methods and technology, but their arrival did set the wheels in motion for a rapid expansion of a fundamentally different pattern.

An apt analogy for sedentism is “cheating at musical chairs—refusing to get up when the (seasonal) music starts” (Rosenberg 1998:660). Groups with plank houses, which function as large permanent storage facilities, were significantly invested in high-cost strategies focused on front-loaded resources (including mass extraction of salmon) and suddenly began “cheating at musical chairs.” Decreased mobility allowed these groups to control a limited number of patchy resources. In a context of increased competition for limited resources, territorial groups who laid claim to productive patches enjoyed a competitive advantage over adjacent groups. Essentially, the rules had changed, creating a context of increased competition for a limited number of resource patches. Such patches would have been difficult to defend for resident groups, who would have been under acute pressure to either adopt some or all of the cultural practices or be displaced.

The Late Period shift to plank houses, storage facilities, and emphasis on front-loaded resources involved a rapid and widespread qualitative shift that cross-cut linguistic boundaries. Growing demographic pressure (exacerbated as additional groups “wedged” themselves into the area) led to settlement of new patches, a complicated history of movements that undoubtedly contributed to the amazing diversity of languages in the area. A developing sense of resource ownership may be tied to this process. In an area where small family groups owned a limited number of productive resource patches, access to valuable salmon fishing spots would have been an additional limiting factor. For example, access to productive fishing patches likely decreased as ownership increased over time. While salmon can be taken wherever they are present within a watershed using low-cost

techniques, there are only a limited number of places suitable for mass extraction of the resource: “Environmental factors making some localities suitable for building weirs or setting gill nets consisted of special combinations of depth of water, current speed, type of bottom. Such places were infrequent” (Drucker 1983).

Though the migration theory emphasizes the effect of the Pacific Northwest Coast on northwest California society, local influences strongly affected what was likely a very complex process. A highly efficient mode of hunting and gathering was already in place, one that emphasized less risky back-loaded resources. The trajectory of intensification in northwestern California was influenced by the tradition of small groups and emphasis on extraction of back-loaded resources, which were probably viewed as privately owned goods. The system was small, efficient, and highly resistant to freeloaders and top down labor demands. Women’s labor was highly valuable in this system. Northwestern California maintained its distinctive Californian flavor and developed along a trajectory unique within the Northwest Coast. As Kroeber (1925) put it, northwestern California “society follows the aims of the societies of the North Pacific Coast with the mechanism of middle California.”

Coastal Correlates

Recent work at sites on the coast of Del Norte and Humboldt counties suggest a similar restructuring in use of coastal environments after about 1,300 years ago. For example, in recent fieldwork at Point St. George (CA-DNO-11), Whitaker and Tushingham (2011) found some of the earliest evidence to date of intensive use of this area of the coast, with archaeological deposits containing significant shell midden, a wide variety of marine resources, and plant processing equipment radiocarbon dated in levels dating to 1137 and 1214 cal BP.

Another key site is CA-HUM-321, a deeply stratified site owned by the Blue Lake Rancheria in Manila on Humboldt Bay, which has possibly the earliest evidence of smelt fishing and intensive shellfish procurement on the North Coast of California. The diversity of remains, including stored resources such as smelt, indicate that CA-HUM-321 represents midden associated with a residential base. All levels, including basal levels dating to as early as 1307 cal BP contain a wide variety of foods and provide evidence that the mass harvest and bulk storage of small forage fish was an important procurement strategy by the early Late Period (Tushingham 2011).

These studies suggest that people were engaged in logistical and storage strategies of intensive shellfish procurement, marine mammal hunting, and fishing of mass-harvested species (smelt, salmon) on the coast by 1,100-1,300 years ago. Future work from well-dated deposits predating this period is essential to better understand hunter-gatherer subsistence-settlement trends on the coast. People living in interior zones were more terrestrially oriented (i.e., there was more evidence for exploitation of interior nuts and salmon than for marine foods), but organizationally, the shift was identical: once people begin to live in large, permanent plank house villages on the coast and along rivers, diet breadth expands, and they begin storing a variety of foods (many of which are logistically procured and mass harvested from distant locations) at their home base.

OBSIDIAN DISTRIBUTION PATTERNS

Understanding inter-regional exchange systems and how they changed through time is an important research issue which can be linked to a series of significant socioeconomic developments in the prehistoric record, including those related to changes in mobility, ethnic boundaries, and territorial circumscription. Although the exchange of exotic items is often difficult to document due to problems of preservation, durable items such as obsidian provide an important indicator of this type of activity.

Tracking changes in obsidian toolstone use is particularly valuable when diachronic evidence is available. In northwestern California, rivers were major corridors for inter-regional exchange of exotic goods, including obsidian toolstone. Obsidian was obtained from several sources, including the closest source, Medicine Lake Highlands, which is located more than 250 kilometers from the project area (see Figure 17). Patterns of obsidian exchange changed through time, possibly in tandem with key socioeconomic developments in the region.

Diachronic Variation in Obsidian Abundance, Source Use

Patterns of obsidian exchange can be discerned at several sites, sometimes over several thousands of years. Sites CA-DNO-26, -332, and -333 have yielded high frequencies of obsidian flaked stone, up to 60-70% of lithic material, compared to the 0.5% to 5% typically recovered at upland and coastal sites in the region.

Lithic assemblages are characterized by component through flaked stone analysis, and components are compared between and within sites over time. Components and recovered obsidian artifacts are dated via obsidian hydration, associated radiocarbon analysis, and/or cross-dating of diagnostic artifact forms, and obsidian is sourced to its place of origin via X-Ray Florescence (XRF) or Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS). These data sets are then compared to similar data from other regional sites to gain an understanding of broad-scale changes in inter-regional exchange.

To understand obsidian source use, a sample of 382 obsidian tools and debitage from five sites in the project area was sourced using XRF and LA-ICP-MS (Table 20).

There is a great deal of diversity in the obsidian source assemblage, ten sources being represented, though most samples derive from either the Medicine Lake Highlands of north central California, in particular the LIW source (approximately 200 kilometers distant), and Spodue Mountain in the Klamath River Basin of south central Oregon (300 kilometers distant; see Figure 17). Interestingly, the only obsidian derived from distant California sources, Sugar Hill and Buck Mountain obsidian from the Warner mountains of northeastern California, was recovered in either Early or Contact Period deposits. Specimens associated with the Contact Period sweathouse at CA-DNO-26 include a miniature “socioceremonial” blade derived of Buck Mountain obsidian (not submitted to hydration analysis) and a specimen derived from Sugar Hill (1.8 microns). The only other northeastern California obsidian from Sugar Hill is from an Early Period deposit at CA-DNO-XX13, and includes a specimen from Buck Mountain (5.90 microns; catalog number REWD-00284-1), and Sugar Hill (with two readings of 5.55 and 7.73 microns; catalog number REWD-00284-4).

There are multiple lines of evidence showing that obsidian source use changed significantly through time. As many different sources are represented and may hydrate at different rates, it is important to carefully examine the evidence.

Table 20. Cross-Site Obsidian Source Frequency.

SOURCE	SITE (CA-DNO)					TOTAL
	-26	-332	-333	-334	-XX13	
<i>Medicine Lake Highlands</i>						
Medicine Lake Highlands*	2	51	-	5	5	63
Lost Iron Wells	118	21	35	-	-	174
Callahan	-	-	1	-	-	1
Glass Mountain	1	-	-	-	-	1
Railroad Grade	1	-	-	-	-	1
Yellow Jacket	1	-	-	-	-	1
Subtotal	123	72	36	5	5	241
<i>Northeast California</i>						
Buck Mountain	1	-	-	-	1	2
Sugar Hill	1	-	-	-	1	2
Subtotal	2	-	-	-	2	4
<i>Borax Lake</i>	-	1	-	-	-	1
<i>Oregon</i>						
Spodue Mountain	79	35	6	3	1	124
Silver Lake/Sycan Marsh	5	5	-	-	-	10
Subtotal	84	40	6	3	1	134
<i>Unknown</i>	-	1	1	-	-	2
Total	209	114	43	8	8	382

Notes: * Samples sourced using XRF that were too small to be sub-sourced but determined to be derived from Medicine Lake Highlands.

In the simplest comparison, the two most frequently used sources, LIW and Spodue Mountain, are compared by plotting the distribution of micron readings of each source (Figure 49 and Figure 50). The Spodue Mountain distribution has a peak between 3.6 and 5.1 microns, which accounts for 60% of the total Spodue sample, whereas the LIW distribution is more spread out with several peaks between 1.0 and 2.6 and a distinct peak between 4.4 and 5.1 microns. Overall, 74% of Spodue Mountain is greater than 3.6 microns, opposed to 54% for LIW.

A Kolmogorov-Smirnov Test (Smirnov 1939) was employed to test the null hypothesis that there is no significant difference between the distribution of micron measurements between Spodue Mountain and LIW obsidian. As the observed maximum difference (.20) between the cumulative proportions of Spodue Mountain and LIW obsidian is greater than the minimum required (0.12), the null hypothesis is rejected at the .05 level.

If the two sources hydrate at the same rate, then the observed difference would be due to differing use of the two sources through time. Before this conclusion can be reached, however, it must be shown that LIW and Spodue Mountain obsidian do hydrate at the same rate. Previous studies indicate that they either do not differ significantly or that Spodue Mountain hydrates at a slightly lower rate than LIW. Based on findings at sites in southwest Oregon, Pettigrew and Lebow (1987) proposed that Spodue Mountain and Silver Lake/Sycan Marsh obsidian hydrate at a similar rate to Grasshopper Flat/LIW/Red

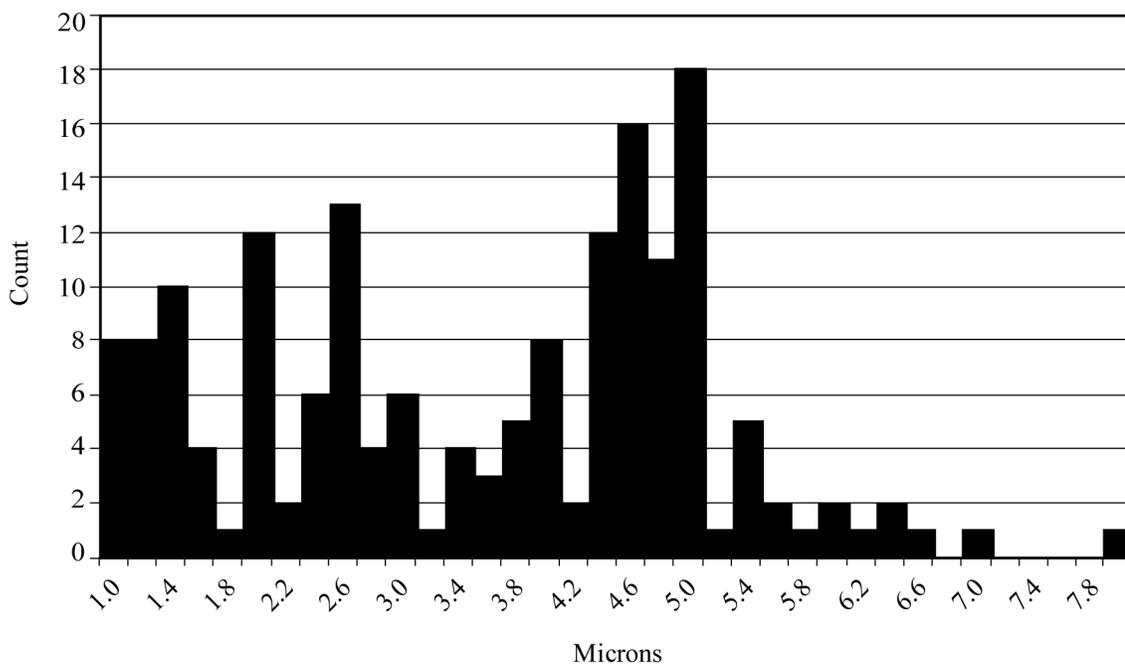


Figure 49. Lost Iron Wells (LIW) Obsidian Frequency by Microns.

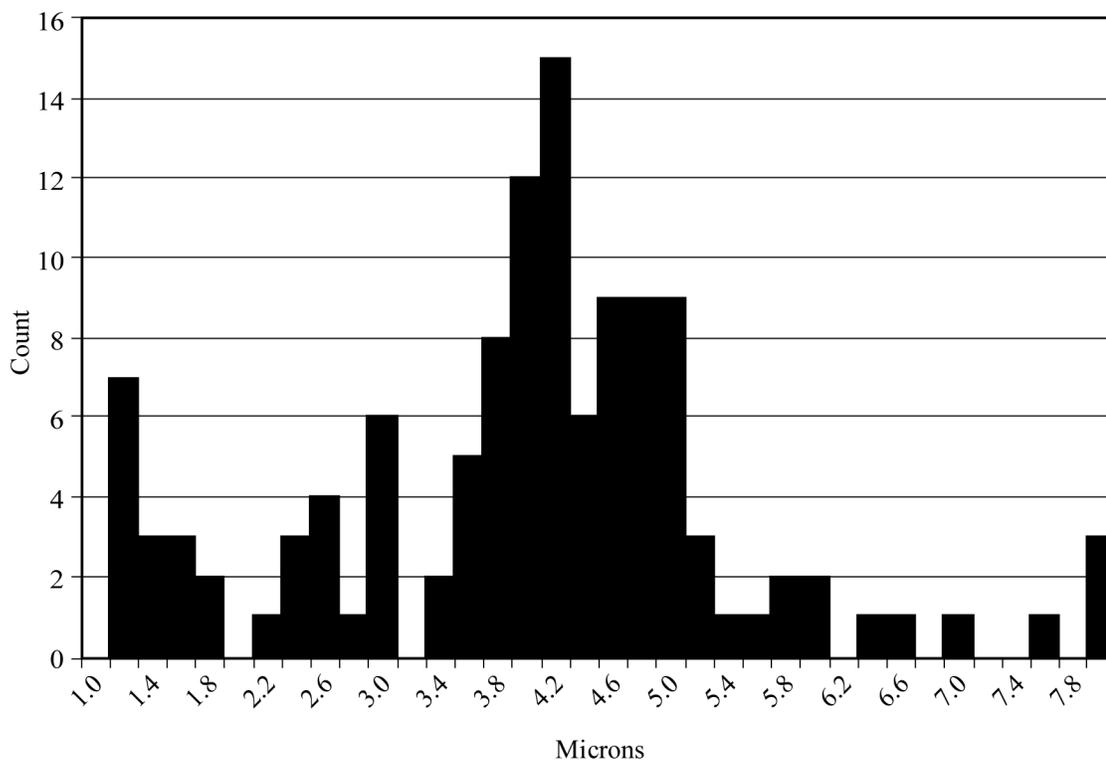


Figure 50. Spodue Mountain Obsidian Frequency by Microns.

Switchback obsidian, and Connolly et al. (1994) proposed a “project vicinity” multi-source hydration rate of 4.1 $\mu^2/1,000$ years for both sources. Findings at CA-DNO-332 suggest that Spodue Mountain hydrates at a slightly slower rate than LIW obsidian (Hildebrandt in Tushingham et al. 2008), which makes the observed trend even more robust.

By dividing the entire sourced and hydrated obsidian sample, regardless of micron reading, into excavated components, it is possible to compare temporal trends in the proportion of all California sources to that of Oregon sources (Figure 51). Again, there is a strong relationship between Oregon sources and chronology, where more distant (Oregon) obsidian is used earlier in time.

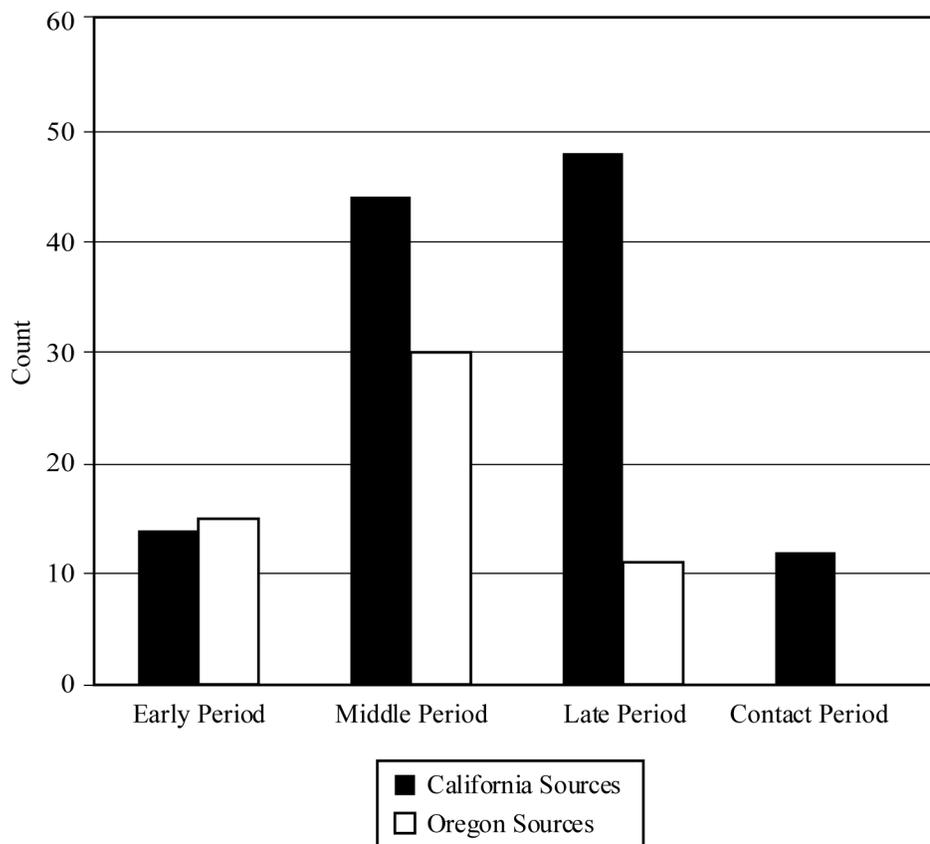


Figure 51. Obsidian Source Use by Excavated Component: Sites CA-DNO-26, CA-DNO-333, and CA-DNO-XX13.

In sum, XRF and LA-ICP-MS sourced obsidian shows that foragers obtained their obsidian from a variety of distant sources in California and Oregon. However, when the sourcing and hydration data are combined, a clear pattern in obsidian source use over time emerges. In excavated Early and Middle Period components dating to between 8500 and 1500 cal BP, obsidian accounts for 83-61% of debitage at the project sites. Source diversity is characteristic of this time period. Foragers obtained their obsidian from both California and more distant sources in Oregon. About 45% of the total sourced obsidian sample comes from distant (300-kilometer) Oregon sources, while the remainder derives from closer (200-

kilometer) California sources. After 1500 cal BP, there is much less obsidian debitage (39% of total debitage), fewer obsidian tools, and most obsidian derives from California sources (84%). In the Contact Period, all obsidian derives from California sources.

The Late Period decrease in obsidian debitage, decrease in source diversity, increase in core technology, and focus on fewer and more local sources is coterminous with the rise of linear plank house villages on the river sites. The obsidian is but one measure of the dramatic social changes that took place. We also see clear evidence for logistical pursuit of resources, the development of large storage facilities, and a focus on mass-extractive methods and technologies. Such change is indicative of the developing insularity of social groups and increased sedentism characteristic of the Late Prehistoric. The restructuring of long-distance exchange relationships was clearly related to this development and may be associated with territorial circumscription, or a decreased ability to trade and/or travel freely after this time.

PERSISTENCE IN THE AFTERMATH OF THE CALIFORNIA GOLD RUSH AND BEYOND

The effects of Euro-American contact on indigenous populations were devastating, particularly during the Gold Rush era, which began circa 1851-1852 in northwestern California. At least four major Tolowa villages suffered horrific massacres in the 1850s, when hundreds of people were killed and their villages burned. These events, along with forced removals, disease, and loss of traditional lands, led to a population crash from approximately 2,600 to 4,000 Tolowa in pre-contact times to 316 in 1856, 200 in 1870, and 121 by 1910 (Baumhoff 1963:231; Cook 1956:101; Kroeber 1925:883; Thornton 1980:703).

Despite such circumstances, many aspects of traditional culture did survive. Some villages were resettled after the massacres and were occupied into the twentieth century. Though many traditions (such as major dances and ceremonies, including Nedosh), vanished from public view to escape persecution, they merely went underground and persist to this day. How northwestern California Indians survived during this period is an important research topic, and has been a theme in the writings of several authors (Bommelyn n.d.; Collins 1998; Madley 2011; Reed 1999; Slagle 1985; Thornton 1980, 1984; Tushingham 2005, n.d.a, n.d.b).

Continuity, Survival, and Adaptation at Red Elderberry

While population and settlement range was severely reduced, remnant populations continued to engage in traditional lifeways at particular sites, including Red Elderberry Place. The Contact Period house excavated at CA-DNO-26 provides a window into how native groups lived and survived during an extremely turbulent time in American history (Tushingham 2005, n.d.a, n.d.b). Early anthropologists would have immediately recognized the house as a traditional northwestern California men's plank sweathouse, a unique house form in the Americas. Aspects of the excavated house and its associated assemblage speak to our concept of traditional or "classic" northwestern California aboriginal lifeways; for example, wealth and status correlates suggest the owner of the house would have been considered a wealthy man by other Indians, and that house inhabitants ate similar foods and hunted and fished with the same technology described in ethnographic accounts of Indian groups living in the area.

The house assemblage consists of a diverse array of Euro-American materials and artifacts which bear striking similarity to the site's Late Prehistoric assemblage. In fact, if one were to remove the historically introduced items of metal, porcelain, and glass from the Contact Period assemblage, it would be practically impossible to tell it apart from the Late Period site assemblage.

Euro-American materials that were found in the house include clothing items (buttons, hose clasp, a ring), ammunition, mining tools, and historically introduced foods. Historic glass was incorporated and used like other toolstone; the historic glass assemblage includes glass bifaces, endscrapers, flake serrates, retouched flakes, used flakes, and a black glass microblade core. As the glass assemblage mostly consists of debitage, tools, and broken and incomplete bottle fragments, it seems that the glass was largely used in a traditional, "Indian" way (i.e., for toolmaking) as opposed to being glass associated with dishware, serving plates, and the like.

One of the more striking findings suggested by the artifact assemblage is the wide variety of hunting and fishing techniques employed. The presence of stone projectile points and ammunition indicates that people hunted with both bow and arrow technology and shotguns. Fishing techniques apparently included both the mass harvest of migratory species with nets and the capture of individual fish with harpoons and hook-and-line technology. Marine mammal hunting is suggested by the presence of a single large triangular concave-based harpoon tip; in ethnographic northwestern California these points were widely used as tips for composite harpoons in sea mammal hunting.

There is evidence that people continued to adorn themselves with traditional "Indian" items and symbols of wealth (marine shell beads, ocher paint, the obsidian blade), while also wearing Euro-American clothing (buttons, hose clasp). Perhaps these items were worn at the same time, or they may have been worn in different contexts or under different circumstances (i.e., "Indian" garb for dances and ceremonies, "Euro-American" clothing when interacting with or working for whites). Such "identity switching" may have been a necessary aspect of survival while living on the edge of the dominant white society.

The research demonstrates continuity and persistence of traditional lifeways despite the impact wrought by the arrival of the Euro Americans. The house and its contents demonstrate clear continuity with earlier periods of time. Overall, it appears that site inhabitants incorporated historically introduced materials, technology, foods, and possibly new forms of labor, into their traditional cultural system.

An Inland Sanctuary

The remarkable survival (and renaissance) of Tolowa culture has been a theme in the writings of several authors (Bommelyn n.d.; Collins 1998; Reed 1999; Slagle 1985; Thornton 1980, 1984; Tushingam 2005, n.d.a, n.d.b). While every survivor's story was different, and sheer luck undoubtedly played a role in the survival of many, according to oral histories, many Tolowa survived simply by taking refuge in the inland mountains to flee violence near Crescent City during the height of the massacres (Thornton 1980, 1984; Tolowa Language Class 1972). For example, at the time of the massacres, several Tolowa from coastal villages moved to Mill Creek, located across the river from CA-DNO-26, "to wait until things died down" (Thornton 1980). In the years following, some Tolowa villages were resettled and several continued to be inhabited into the twentieth century. This was an

extremely tenuous existence, however. Native people had to navigate a landscape where violence was common (e.g., scalplings, killings) and there was a high risk of detainment by local enlisted brigades who held regular reservation roundups (Madley 2011).

Despite the great social upheaval of the mid to late 1800s, the archaeological evidence described above suggests that not only did people persist in living at Red Elderberry, they also continued to live much the way they had before white contact. Persistence of Red Elderberry inhabitants during this time can probably be attributed to a combination of factors that are expanded upon in Tushingam (n.d.b). Certainly, the area seems to have been an inland sanctuary of sorts. The site is located about eight linear miles from the major white settlement at Crescent City. The Hiouchi area may have provided a safe haven for Red Elderberry inhabitants, who were close to, and perhaps part of, a marginal multi-ethnic community that was, socially and physically, on the fringe of the dominant settler community.

Census records demonstrate that at least two “mixed” families consisting of white men and their Indian wives and children—the Catchings and the Cookes—were firmly entrenched in the immediate area as early as the 1860s (Maniery and Millett 2008; Tushingam n.d.a, n.d.b). Though the nature of these interactions is unknown, these neighboring households were likely friendly to, or at least tolerant of the Indian people living in the traditional houses at Red Elderberry. People clearly relied on traditional means of subsistence to survive, while adapting and “making do” through cultural flexibility. For example, sweathouse inhabitants may have provided labor for the neighboring settler community, perhaps even working at small mining operations in the area. It seems likely that people may have hid or downplayed their Indian identity under certain circumstances.

ARCHAEOLOGY AND ANTHROPOLOGY

Much of what we know about Indian groups in western North America was recorded by early twentieth century anthropologists who conducted Boasian “salvage ethnography” to record details about rapidly disappearing aboriginal lifeways. In northern California, these studies began at the tail-end of a fifty-year period of extreme population decimation and upheaval which commenced with the California Gold Rush (Figure 52). Even before these events, native people suffered waves of disease that altered populations to an as yet unknown degree (Erlandson and Bartoy 1995, 1996; Platt 2011).

While many ethnographic consultants were survivors of the Gold Rush era, or their direct descendants, little was recorded about how Native peoples survived and responded to historical events. This was because the focus of this work was to record “pure” pre-contact aboriginal lifeways, an approach that attempted to separate aspects of “traditional” Native American society from historical events and influences. Because of this, early anthropologists, in particular A.L. Kroeber, have been accused of ignoring the realities and shattered existence of the Indian people they studied (c.f. Buckley 1989a, 1989b, 1996; Platt 2011; Scheper-Hughes 2001, 2002, 2003).

Archaeologists in northwestern California have always heavily drawn on the ethnography in their interpretation of the past. Clearly, this study is no exception to this tradition. Yet there is a growing recognition in archaeology of the enormous social upheaval that took place immediately preceding the ethnographic period and the need to better



Courtesy of the Phoebe A. Hearst Museum of Anthropology and the Regents of the University of California — Pliny E. Goddard (15-3318).

Photo by Pliny E. Goddard, the first academic anthropologist to work in Tolowa country. Goddard collected vocabularies and stories from Tolowa residing at coastal villages, including Yontocket, which was the center of the Tolowa world and, fifty years prior, had been the site of the “Burnt Ranch” massacre.

Figure 52. Mary Grimes, Clara La Fountain, Lizzie Grimes, and Bertha Stewart at “Burnt Ranch” (Yontocket), 1903.

understand how these events may have altered indigenous populations, land use, and subsistence patterns (e.g., Erlandson and Moss 1997; Tushingham 2005, n.d.a, n.d.b; Tushingham and Bencze 2013; Whitaker and Tushingham n.d.).

Alterations in Land Use, Subsistence Patterns

In the case of Tolowa, the Contact Period villages and settlement patterns recorded in the ethnography were partly the consequence of a greatly shifted social landscape. Twentieth-century ethnographic literature characterizes the Tolowa as largely a coastal folk who regarded the interior as a “hinterland,” a place people visited to exploit seasonal resources such as salmon and acorns, but returned shortly afterwards to coastal villages: “Except for occasional forays by individuals or families to hunt and fish, and the fall acorn

and salmon harvest, most of the Tolowa hinterland remained unused and unoccupied most of the time” (Gould 1975:164).

Though the ethnographic literature clearly portrays the Tolowa as a coastal people, river environments seem to have been more heavily occupied in the past, and may have even been a focus of activity at certain points in time. The mounting archaeological evidence demonstrates that there were many major inland sites along the Smith River that were not recorded ethnographically. For instance, the only village recorded ethnographically in the project area is *Chvn-su'lh-dvn* (Red Elderberry; CA-DNO-26), a place with a handful of houses that is regarded as a minor settlement or suburb of a major town on the coast (Drucker 1937). Contact Period site deposits are limited to a relatively small area; the sweathouse (House 4) excavated in the easternmost limits of CA-DNO-26. This is consistent with ethnographic description of the site being a minor settlement or “suburb” by Drucker (1937).

However, it is abundantly clear from the archaeological evidence that this section of the Smith River was heavily used aboriginally, particularly during the Late Prehistoric. While sites documented in the project area with prehistoric components include CA-DNO-26, -332, -333, -334, -339, and -XX13, evidence of Contact Period settlement is only confirmed at CA-DNO-26. The disjuncture between the ethnographic and archaeological records is likely because this area suffered a collapse in the Late Prehistoric period, possibly caused by the combined effects of the mid-nineteenth century California Gold Rush.

Recent studies at sites on the Tolowa coast are attempting to grapple with these issues. In recent study of coastal subsistence at two sites at Point St. George (CA-DNO-11 and -13), Tushingam and Bencze (2013) found that the site’s Late Period component was largely consistent with the ethnoarchaeological model that Gould (1966, 1975) constructed about sedentary Tolowa villages and hunter-gatherer organizational strategies. Similarly, in a quantitative reassessment of Gould’s (1966) data at Point St. George (CA-DNO-11), Whitaker and Tushingam (n.d.) confirmed that prehistoric Tolowa villages were organized into distinct habitation and workshop areas, as they were ethnographically.

Certain aspects of the archaeological record are incongruous with the ethnography. For example, Tushingam and Bencze (2013) found that certain foods may have been more important than portrayed in the ethnography (e.g., artiodactyls and small intertidal fish), while others may have been less so. Specifically, there were surprisingly low numbers of acorn shell and salmon bone in fine-grained samples, a finding that is inconsistent with the notion that these two mass-harvested and stored foods were primary staples. While these foods were clearly important to coastal groups historically, we argue that access to inland locations may have simply been not as free in the past as it was ethnographically. Simply put, populations were likely more packed together before the Tolowa suffered massive population losses and upheaval at contact, so it is possible the landscape may have been more constrained in the past. Future studies in partnership with the Tolowa community may help us to better understand these dynamics.

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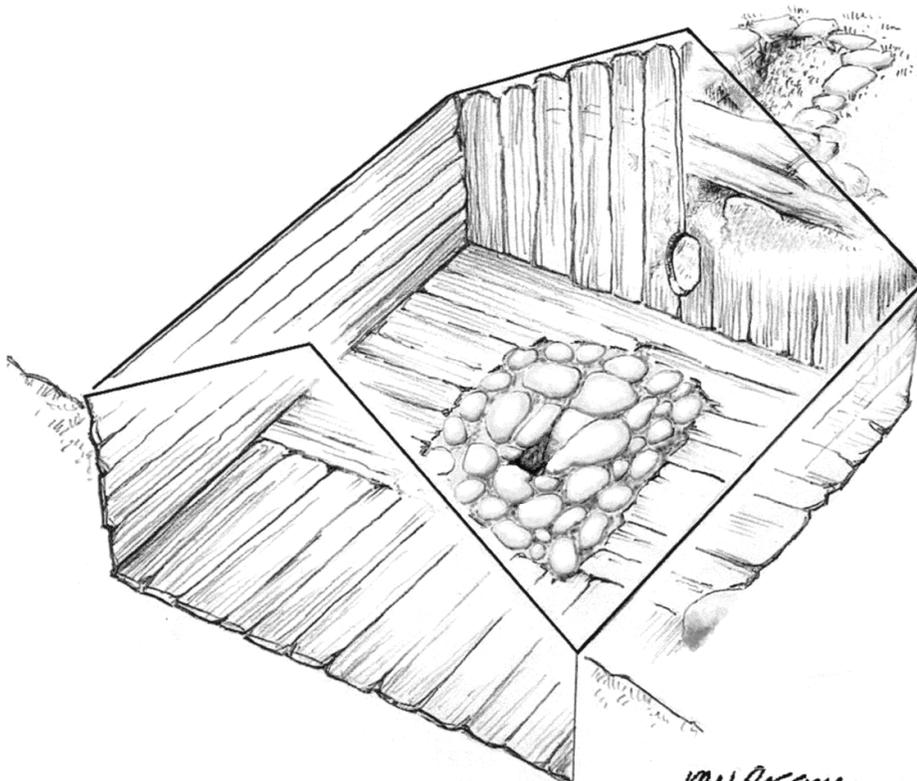
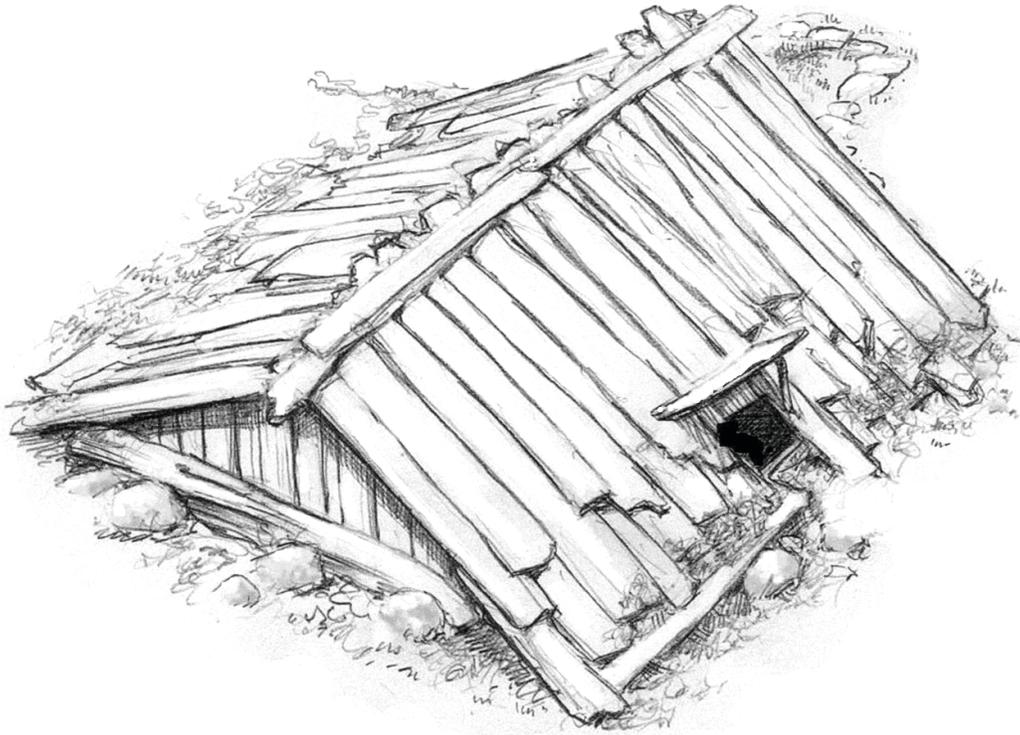


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