

WHAT ARE WE SEARCHING FOR? ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH IN THE PACIFIC NORTHWEST—2023



WHAT ARE WE SEARCHING FOR?

ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH
IN THE PACIFIC NORTHWEST—2023

EDITED BY DARBY C. STAPP AND JULIA G. LONGENECKER

PRODUCTION AND DESIGN BY VICTORIA M. BOOZER

WHAT ARE WE SEARCHING FOR?
ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH
IN THE PACIFIC NORTHWEST—2023



JOURNAL OF NORTHWEST ANTHROPOLOGY

SPECIAL PUBLICATION #7



EDITED BY

DARBY C. STAPP AND JULIA G. LONGENECKER

PRODUCTION AND DESIGN

VICTORIA M. BOOZER

EDITORS

Darby C. Stapp
Richland, WA

Deward E. Walker, Jr.
University of Colorado

ASSOCIATE EDITORS

C. Melvin Aikens (University of Oregon), Virginia Beavert (Yakama Nation), Don D. Fowler (University of Nevada), Rodney Frey (University of Idaho), Ronald Halfmoon (Lapwai), Bruce Miller (University of British Columbia), Jay Miller (Lushootseed Research), Rudy Reimer (Simon Fraser University), Shannon Tushingam (Washington State University)

Julia G. Longenecker
Victoria Boozer

Operations Manager
Publications Assistant

Composed by Northwest Anthropology LLC, Richland, WA; Printed by Kindle Direct Publishing.
Missing issue claim limit 18 months.

POLICY

The *Journal of Northwest Anthropology*, published semiannually by Northwest Anthropology LLC, in Richland, Washington, is a refereed journal and welcomes contributions of professional quality dealing with anthropological research in northwestern North America. Theoretical and interpretive studies and bibliographic works are preferred, although highly descriptive studies will be considered if they are theoretically significant. The primary criterion guiding selection of papers will be how much new research they can be expected to stimulate or facilitate.

SUBSCRIPTIONS

The subscription price is \$55.00 U.S. per annum for individuals and small firms (\$75 international), \$100.00 for institutional subscriptions (\$125 international), \$30.00 for students with proof of student status, and \$25.00 for all electronic subscriptions; payable in advance and online. Remittance should be made payable to Northwest Anthropology LLC. Subscriptions, manuscripts, changes of address, and all other correspondence should be addressed to:

Darby C. Stapp, Ph.D., RPA

Journal of Northwest Anthropology

P.O. Box 1721

Richland, WA 99352-1721

telephone

e-mail

website

(509) 554-0441

JONA@northwestanthropology.com

www.northwestanthropology.com

MANUSCRIPTS

Manuscripts can be submitted in an electronic file in Microsoft Word sent via e-mail to the Richland, WA, office. An abstract must accompany each manuscript. Footnotes and endnotes are discouraged. Questions of reference and style can be answered by referring to the style guide found on the website or to *Journal of Northwest Anthropology*, 47(1):109–118. Other problems of style can be normally solved through reference to *The Manual of Style*, University of Chicago Press. All illustrative materials (drawings, maps, diagrams, charts, and plates) will be designated “Figures” in a single, numbered series and will not exceed 6 x 9 inches. All tabular material will be part of a separately numbered series of “Tables.”

COVER PHOTOGRAPH

The cover photograph was captured by Lucas Davies and provided courtesy of Unsplash and Getty Images Holdings, Inc.

WHAT ARE WE SEARCHING FOR?

ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH IN THE PACIFIC NORTHWEST—2023

CONTENTS

ABSTRACTS.....	v
INTRODUCTION	
<i>Darby C. Stapp, Julia G. Longenecker, and Victoria M. Boozer</i>	1
RURAL ETHNOGRAPHIC RESEARCH	
1. SAVAGES, DEPLORABLES, AND THE PROMISE OF ANTHROPOLOGICAL ETHNOGRAPHY <i>Andrew Gardner</i>	6
2. GROWING PAINS: FARMER AND RANCHER LIVED EXPERIENCES IN THE CONTEXT OF A SHIFT TO AN AMENITY-BASED ECONOMY IN TETON VALLEY <i>Melissa R. Taysom</i>	13
INDIGENOUS ETHNOGRAPHIC RESEARCH	
3. LEGACY ORAL HISTORIES: THE MARY KIONA TRANSLATION/ TRANSCRIPTION PROJECT <i>Richard H. McClure, Jr., and Eugene S. Hunn</i>	22
4. PLATEAU IN THE PITS ~ LÉVI-STRAUSS EXPLORES GENDERED ACTIVITIES <i>Jay Miller</i>	33
ARCHAEOLOGICAL RESEARCH	
5. MAKING PREHISTORY <i>Charles M. Nelson</i>	40
6. THE ARCHAEOLOGY OF STEWARDSHIP AND CULTURAL KEYSTONE SPECIES IN THE PACIFIC NORTHWEST <i>Molly Carney</i>	44

WHAT ARE WE SEARCHING FOR?

ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH IN THE PACIFIC NORTHWEST—2023

CONTENTS (CONT.)

ARCHAEOLOGICAL RESEARCH (CONT.)

7. IT'S TIME TO GET WET—WET SITE RESEARCH IN THE PACIFIC NORTHWEST
Dale R. Croes..... 69
8. X-RAY FLUORESCENCE AT SIMON FRASER UNIVERSITY
DEPARTMENT OF ARCHAEOLOGY
Rudy Reimer..... 84
9. NEW COLLECTIONS-BASED RESEARCH ON THE LIND COULEE SITE
(45GR97), WASHINGTON
Richard L. Rosencrance and Katelyn N. McDonough..... 92
10. END OF THE ROAD OR AT A CROSSROADS? OBSIDIAN MICRODEBITAGE
SOURCING AT THE VIEWPOINT SITE, SIMILKAMEEN VALLEY, B.C.
Rudy Reimer and Stanley A. Copp..... 105
11. COBBLE HYDRATION AS A MEANS TO EXPEDITE NOTCHED NET SINKER
MANUFACTURE
Cynthia R. Hannold..... 116
12. MARITIME ARCHAEOLOGY IN THE PACIFIC NORTHWEST: RECENT WORK
AND THOUGHTS FOR FUTURE RESEARCH
Scott S. Williams..... 127
- EPILOGUE
Christopher Noll..... 136
- APPENDIX. INCORPORATING 56 YEARS OF *NARN/JONA* ARTICLES INTO
NORTHWEST ANTHROPOLOGICAL RESEARCH
Darby C. Stapp and Victoria M. Boozer..... 139
- ABOUT THE AUTHORS..... 145
- INDEX..... 152

ABSTRACTS

1. SAVAGES, DEPLORABLES, AND THE PROMISE OF ANTHROPOLOGICAL ETHNOGRAPHY

Andrew Gardner

University of Puget Sound

As someone employed on a liberal arts campus west of the Cascades, I've been both astounded and disappointed by the stereotyping that I encounter amongst my colleagues and peers when thinking about rural fellow Americans, and particularly those east of the mountains here in Washington State. As a result, I've been collaborating with student-researchers on a long-term project to build a set of community ethnographies that attempt to capture the nuances and dilemmas of rural community life, and to both complicate and humanize the portrayal of rural Americans. I'm working with my first student-produced ethnographic data set now and have more planned for next summer.

2. GROWING PAINS: FARMER AND RANCHER LIVED EXPERIENCES IN THE CONTEXT OF A SHIFT TO AN AMENITY-BASED ECONOMY IN TETON VALLEY

Melissa R. Taysom

Idaho State University

In this essay I will provide a brief ethnographic account of the lived experiences of small family farmers and ranchers in Teton Valley, the field site of my Master's research, as they experience a shift to an amenity-based economy. Teton Valley has long been an agriculturally based community, but a recent influx of wealthy individuals moving to the area, who are drawn by the plentiful natural amenities, has brought on many socioeconomic and landscape changes. These changes are notably felt by farmers and ranchers who have had many aspects of their daily lives impacted. Farmers and ranchers feel particularly connected to the land they work as well as the open spaces around them, and they share feelings of loss, anger, fear, and concern about the landscape changes that are happening to accommodate an increased

ABSTRACTS

population. While the increase in population has resulted in more revenue for farmers and ranchers, especially those who sell goods which are perceived as being of a higher quality, and an increased feeling of local support at farmers' markets, it has also presented many personal challenges for those who have agricultural livelihoods. Some of the challenges I will share in this essay include difficulty navigating change, increased interactions with police and the legal system, and varied outlooks on the future of farming and ranching in the valley. Despite these and other challenges, farmers and ranchers in Teton Valley plan to continue farming and ranching in the valley. I will conclude the essay with some encouraging advice from farmers and ranchers to each other and future farmers/ranchers.

3. LEGACY ORAL HISTORIES: THE MARY KIONA TRANSLATION/TRANSCRIPTION PROJECT

Richard H. McClure, Jr.
U.S. Forest Service (Retired)

Eugene S. Hunn
University of Washington

Mary Kiona (1869–1970) was well-known as a respected elder of the Taytnapam, or Upper Cowlitz, a small western Washington Tribe living along the upper reaches of the Cowlitz River, south of Mount Rainier. Multiple interviews with Mrs. Kiona, conducted between 1927 and 1970, emphasize her considerable knowledge of traditional culture and language. The most extensive of these interviews were a series conducted in 1964 and 1965 by Martha Hardy, a Seattle area educator and author. A collaborative effort involving the collective expertise of multiple Indigenous language scholars is currently underway to produce a complete translation and transcription of these interviews. New analysis of the original Sahaptin (*Ichishkîin*) language narratives reveals additional detail and depth of content not provided in the original English translations. The project highlights the importance of similar collections of “legacy” oral histories held by museums, educational institutions, and Tribes throughout the Pacific Northwest as primary sources of ethnographic material.

ABSTRACTS

4. PLATEAU IN THE PITS ~ LÉVI-STRAUSS EXPLORES GENDERED ACTIVITIES

Jay Miller
Lushootseed Research

The rich versatilities and complexities of human culture, especially in its Plateau modalities, attracted the attention of French anthropologist Lévi-Strauss throughout his century of life—most especially in *The Story of Lynx*, one of four minor volumes complementing his four major volumes of *Mythologiques*. Yet his insights have been virtually ignored in the Plateau, unlike its enthusiastic reception on the Northwest Coast.

5. MAKING PREHISTORY

Charles M. Nelson
Retired

Prehistory is made, not discovered. Archaeology is discovered, but prehistory is made. Archaeology constitutes a body of evidence, highly selected, that is analyzed and turned into an archaeological record. This record, and records from sites in the wider region, is then used to create a story that describes prehistory. The story will be more or less accurate and will change as new archaeological evidence is found and interpreted. In this essay, I will describe how I made prehistory from the archaeological record at the Sunset Creek Site (45KT28).

6. THE ARCHAEOLOGY OF STEWARDSHIP AND CULTURAL KEYSTONE SPECIES IN THE PACIFIC NORTHWEST

Molly Carney
University of Arkansas

Archaeology and anthropology have long sought to define the “middle ground” between exploiting available floral and faunal resources and intentional cultivation among foraging communities. Understanding the variability within those subsistence decisions is key to understanding how

ABSTRACTS

small-scale societies “scale-up” and develop vibrant and intricate cultural institutions. Defining this middle ground and associated alternative subsistence pathways are also critical for those working to revitalize those plant and animal stewardship traditions. In this essay, I summarize the current state of that middle ground in the greater Pacific Northwest region by summarizing recent archaeological and paleoecological resource management studies. I center this review on the traditional management practices associated with cultural keystone species. These species are deeply embedded within Northwest cultural traditions, narratives, vocabulary, and livelihoods, and are the center of many past and present everyday activities. I pull out several themes and offer some suggestions for all those interested in seeing these keystone species with deep-time histories flourish in the future.

7. IT’S TIME TO GET WET—WET SITE RESEARCH IN THE PACIFIC NORTHWEST

Dale R. Croes
Washington State University

Pacific Northwest Coast wet sites are both common and not that difficult to investigate and have abundant new kinds of data to add to our understanding of the archaeology of this dynamic coastal region. Wet site work remains “new current research” since it is not a mainstream approach yet. We need to encourage new and future Pacific Northwest archaeologists to get wet—or much wetter—for the great benefit of ongoing Pacific Northwest archaeological research.

8. X-RAY FLUORESCENCE AT SIMON FRASER UNIVERSITY DEPARTMENT OF ARCHAEOLOGY

Rudy Reimer
Canadian Research Chair in Indigenous Community Archaeology

This essay will highlight the history of use of X-ray fluorescence (XRF) at the Simon Fraser University Department of Archaeology (ca. 1971–today). Over this 50+ years of research, I will highlight several themes in the development in the examination of different forms of material culture and

ABSTRACTS

how these data provide archaeologists working in the Pacific Northwest to better understand (in no order),

1. Ancient exchange systems,
2. Social spheres of influence,
3. The importance of landscape features in the acquisition and movement of materials,
4. Fluctuations of the use of lithic sources,
5. The importance of access to a suitable lithic raw materials reference library and standardization in XRF methodology.

9. NEW COLLECTIONS-BASED RESEARCH ON THE LIND COULEE SITE (45GR97), WASHINGTON

Richard L. Rosencrance

Great Basin Paleoindian Research Unit, Department of Anthropology, University of Nevada, Reno; Museum of Natural and Cultural History, University of Oregon

Katelyn N. McDonough

Department of Anthropology, University of Oregon; Museum of Natural and Cultural History, University of Oregon

Few sites in the Columbia Plateau are more well-known than the Lind Coulee Site. Richard Daugherty originally excavated the site over three field seasons between 1950 and 1953. He uncovered stemmed projectile points, bison bones, ochre-stained handstones, bone tools, crescents, and many other items in stratified deposits. He then submitted burned bison bone fragments to Willard Libby for measurement with the newly established radiocarbon dating method, obtaining a date of 8700 ± 400 14C B.P. and establishing Lind Coulee as one of the oldest sites in the region. Researchers returned to the site between 1972 and 1975, yielding similar materials to Daugherty's but adding eyed bone needles to the assemblage. Although numerous research projects on the collection have occurred, questions about the site remain. In this essay, we briefly reintroduce Lind Coulee, summarize major outstanding research questions, and outline our newly established and ongoing research program with the site collection.

ABSTRACTS

10. END OF THE ROAD OR AT A CROSSROADS? OBSIDIAN MICRODEBITAGE SOURCING AT THE VIEWPOINT SITE, SIMILKAMEEN VALLEY, B.C.

Rudy Reimer

Department of Archaeology, Simon Fraser University

Stanley A. Copp

Port Moody Heritage Society, Department of Sociology and Anthropology,
Langara College (Retired)

Salvage archaeology of a pre-contact site overlooking the confluence of the Ashnola and Similkameen Rivers was conducted in 2007. A single bulk physical sediment sample was passed through 0.025 to 0.50 stacked mesh screens. Over 30 obsidian microdebitage biface thinning flakes were captured in the 0.4 mm screen. These were submitted to portable X-ray fluorescence (pXRF) analysis. Results indicate that the majority originated from sources in Southern Washington and Central Oregon, indicating possible movements of past populations.

11. COBBLE HYDRATION AS A MEANS TO EXPEDITE NOTCHED NET SINKER MANUFACTURE

Cynthia R. Hannold

Doctoral Candidate, University of Alabama

Archaeologists recognize that some past toolmakers used methods like heat treatment to alter fine grained raw materials such as obsidian or flint to improve knappability. It is probable that coarse-grained materials were also altered using a number of methods. One possible method is cobble hydration, the act of submerging stones for a period of time prior to tool manufacture. This study indicates that cobble hydration may reduce the number of strikes necessary to make a cobble stone tool. Methods and results are presented for a cobble hydration experiment using four discrete stone sources. The results imply that toolmakers may have used alternative methods like cobble hydration to improve knappability.

ABSTRACTS

12. MARITIME ARCHAEOLOGY IN THE PACIFIC NORTHWEST: RECENT WORK AND THOUGHTS FOR FUTURE RESEARCH

Scott S. Williams

Washington State Department of Transportation

Maritime archaeology of submerged cultural resources and shipwreck remains in terrestrial sites has a relatively long but spotty history in the Pacific Northwest, dating back to the mid-1980s with the work of John Woodward (1986) and Allison Stenger (1990) in Oregon and the Underwater Archaeological Society of British Columbia (Marc 1990; Stone 1993). Maritime research increased in the late 2000s with the start of the Beeswax Wreck Project (Williams 2007) and the formation of the non-profit Maritime Archaeological Society (MAS) in 2015. MAS has conducted extensive research on known shipwrecks in Washington and Oregon, updating site reports in both states and publishing a book on shipwrecks for the general public (Kozik 2020). The field is ripe for future research, not only on shipwrecks but also in the areas of Contact-era interactions between shipwreck survivors and Native peoples and the development of the maritime cultures of the Pacific Northwest.

APPENDIX. INCORPORATING 56 YEARS OF *NARN/JONA* ARTICLES INTO NORTHWEST ANTHROPOLOGICAL RESEARCH

Darby C. Stapp and Victoria M. Boozer

Journal of Northwest Anthropology

The *Journal of Northwest Anthropology* has digitized the first 56 volumes of the journal and made the collection available in a PDF portfolio to researchers on the *JONA* website. A major benefit of access to the digital collection is the ability for the researcher to conduct keyword searches of the collection and identify any line where that keyword appears. All “hits” are identified in a PDF or CSV table, each with a link to the journal page so the researcher can quickly pull up the e-journal and check the context. Ways to use the *NARN/JONA* research tool are described and examples showing the utility of the tool are provided.

INTRODUCTION

Darby C. Stapp, Julia G. Longenecker, and Victoria M. Boozer

PUBLICATION CRITERIA: *The Journal of Northwest Anthropology* welcomes contributions of professional quality dealing with anthropological research in northwestern North America. Theoretical and interpretive studies and bibliographic works are preferred, although highly descriptive studies will be considered if they are theoretically significant. The primary criterion guiding selection of a manuscript for publication will be how much new research the manuscript will stimulate or facilitate. (*JONA* Peer Review Form)

What Are We Searching For? Current Anthropological and Archaeological Research in the Pacific Northwest presents twelve essays describing current research from the Pacific Northwest (PNW). This is the third collection of short essays produced by the *Journal of Northwest Anthropology (JONA)*,¹ which are available on the *JONA* website for no cost.²

We like short essays, which we define as a piece with 1,000 to 2,000 word count, for a few reasons. First, short essays tend to be more approachable to readers due to their conciseness, yet they maintain their richness in content. Oftentimes, drawn out article-length or book-length research can be off-putting in its taxing nature, and as a result do not get read. The short form allows the reader to easily digest the gist of the research and its implications.

Second, the short essay format allows researchers to detail preliminary research or updates on research in a timely fashion that often cannot be achieved with article- or book-length publications. While not formally peer reviewed as our journal manuscripts are, the researcher is able to

¹ Publications include the bi-annual *Journal of Northwest Anthropology (JONA)*, which now is in its 57th year; the *JONA Memoir Series*, which currently has 22 titles in its catalog; and the *JONA Special Publications Series*, within which the short essay collections are a part.

² *JONA* Special Publication #3, *Why Don't We Write More?: Essays on Writing and Publishing Anthropological Research* and *JONA* Special Publication #4, *How Do We Reach More?: Sharing Cultural and Archaeological Research With Others*, can be downloaded from <https://www.northwestanthropology.com/short-essay-collections>.

receive feedback, commentary, or criticism from the *JONA* readership, while also increasing the public awareness of their efforts as the research is being conducted. The short essay format can also serve as the basis for an extended article-length publication.

Third, because they are short, *JONA* can publish a greater number of manuscripts, which results in a broad scope of research that may appeal to a larger audience due to varying topics and methods discussed throughout the collection. The diversity of research covered throughout the collection has the potential to be far-reaching because most readers will be able to find an essay that not only aligns with their interests but may also pique their attention in a new area of inquiry. The collection of such diverse research allows the readership to glean new conclusions about PNW anthropological or archaeological research questions or problems.

Finally, the short essay format allows young scholars to publish their research, which not only contributes to the anthropological or archaeological discussion, but it may also contribute to the quality of research conducted by the individual. Those at the early stage of their careers have the opportunity to publish research for their theses or dissertations and could possibly receive feedback, comments, or critiques from not only the *JONA* staff but readers who access the collection, as well.

THE ESSAYS

The twelve essays published here provide insight into the types of research that are ongoing across the Northwest. The collection suggests a healthy balance of research touching on ethnography, linguistics, prehistory, ethnobotany, history, experimental, method, and theory. The collection includes cases from the earliest inhabitants (10,000+ years ago) at the Lind Coulee rock shelter, ethnohistoric groups in the Cascades, and the impact of amenity migration on farmers and ranchers living in Teton Valley, Idaho, today. Some authors comment on research that was conducted decades ago, others describe research being conducted today, and still others detail the research they hope to pursue, or have others pursue, in the future.

The essays also give us some insight into the professionals conducting and writing about their research. The majority of authors fall into two groups: graduate students, and retired/near-retired professionals. This

probably reflects the time demands on those full-time working professionals who generally are unable to find the time to pursue publication. Many of the authors are affiliated with universities, while others come from a cultural resource management (CRM) background. Over 70% of the authors are male, with less than 30% female, which is consistent with recent scholarship on gender.

We began our search for authors by writing colleagues who we thought might be interested in contributing an essay. We then included the call for essays in our email update to *JONA* subscribers in spring 2022. Then we announced the call to our social media network, primarily to Facebook and Instagram. While each of these efforts yielded results, by far the greatest response came from colleagues, most of whom are *JONA* subscribers. About half of the authors have published in *JONA* before, the other half are new to us.

For the epilogue we contacted Chris Noll, President of the Northwest Anthropological Association. Chris published his research on a lithic source in *JONA* volume 46 (Noll 2012) and has been a loyal subscriber since then. As he rose through the leadership of the Northwest Anthropological Association, he has always looked for ways to strengthen the relationship between the Northwest Anthropological Conference (NWAC) and *JONA*. He has been instrumental developing the NWAC Proceedings, which *JONA* publishes. Thus, when it came time to find an author for the epilogue, Chris was a logical choice.

This collection is useful because it informs our *JONA* readers (and others) about the research that is ongoing in the Plateau and on the Coast. To the degree that the collection reflects current projects in the Northwest, it also suggests that there is no dominant theoretical approach in anthropology and archaeology today. Forty years ago when two of us (DCS and JGL) were beginning our careers, Lewis Binford and the Processual School dominated the archaeological research agenda. Had we put together a collection of essays at that time, the majority of archaeological essays would have without question been Binfordian in tone.

The original vision was for a thematic collection. Our initial call for essays sought research that compared cultural settings in the Northwest or Plateau with other regions from around the world. It is through comparative research such as this, a re-emerging field known

as comparative area studies (CAS)³, that advances in knowledge can occur. Generalizing our findings and working with cases from other regions can lead to greater understanding of culture and the processes that affect communities and institutions. Further, working with cases from other regions exposes us to new theoretical approaches, methods, and ideas and can be instructive to Northwest researchers. (Look at how Lévi-Strauss benefitted from looking across regions in Jay Miller’s essay.) Our hope, then, was that publishing essays oriented toward CAS would lead to a proliferation of innovative Northwest studies. Unfortunately, our call for CAS-related essays was unsuccessful; either no one is pursuing CAS or they are just too busy to write about their progress. As a result, we had to broaden the call to any research being conducted on Northwest Coast or Plateau settings. In time, we suspect that various theoretical approaches—some new, some old—will emerge and influence anthropological and archaeological research in the PNW. Time will tell whether CAS is among the approaches that dominate.

ORGANIZATION OF DOCUMENT

We have placed abstracts in one section up front where readers can quickly scan them and identify the essays they want to read. The anthropological, mostly ethnographic essays (1 through 4), have been placed first, followed by those that are archaeological in nature (5 through 12). The appendix provides details regarding how to search through the entire collection of *Northwest Anthropological Notes* (NARN; 1967–2000) and the *Journal of Northwest Anthropology* (JONA; 2001–present day) to research any number of topics. Biographical information about the authors follows the appendix.

³ *Comparative Area Studies: Methodological Rationales & Cross-Regional Applications* (Ahrām, Köllner, and Sil 2018) provides a good overview of the history of CAS and its re-emergence.

REFERENCES CITED

Ahrem, Ariel I., Patric Köllner, and Rudra Sil, editors

2018 *Comparative Area Studies: Methodological Rationales & Cross-Regional Applications*. New York, NY: Oxford University Press.

Noll, Christopher D.

2012 The Development of Lithic Extraction Areas in the Okanogan Highlands during the Late Holocene: Evidence from Curlew Lake, Washington. *Journal of Northwest Anthropology*, 46(2):227–242.

1. SAVAGES, DEPLORABLES, AND THE PROMISE OF ANTHROPOLOGICAL ETHNOGRAPHY

Andrew Gardner

University of Puget Sound



FIGURE 1. Main street in Washtucna, Washington. Photograph by the author.

ON ANTHROPOLOGICAL ETHNOGRAPHY

In the first decade of the twentieth century, anthropology remained largely preoccupied with the classification of socio-cultural difference. Amidst the halcyon days of armchair anthropology, practitioners utilized missionaries' reports, travelers' journals, dispatches from colonial administrators, and miscellaneous other tabulations of difference to assess whether a given cultural group might best be classified as *savages*, as *barbarians*, or as *civilized* folk. In the articulation of Social Evolutionary Theory, disciplinary discussions primarily concerned the criteria for these categorizations. Savagery, for example, was defined foremost by the absence of key qualities, technologies, and cultural features. For Edward Tylor (1958:23), who had essentially launched the new discipline with his 1871 book *Primitive Culture*, savagery was recognizable by the absence

of “enlightened Christianity,” and by the presence of the “rudest forms” of animism that might someday evolve into monotheistic coherence. For Lewis Henry Morgan, savagery was more precisely defined by the absence of the “art of pottery” and other technological indicators that distinguished *barbarians* from *savages* (Morgan 1964:17). As scientific appellations these terms seem so antiquated today that it’s easy to forget that Social Evolutionary Theory—in its commitment to a monogenic explanation of human origins, and in its endeavor to grapple with human difference in terms of culture rather than race—was a thoroughly *progressive* position in historical context.

The whole of this theoretical framework would come tumbling down. Bronislaw Malinowski played an integral role in deconstructing these ideas and abandoning the very concept of savagery. Malinowski’s attack was instantiated, foremost, in the methodological proscriptions he envisioned for anthropology’s future. Drawing on the influence of his British mentors and their experiences on the 1898–1899 Cambridge Torres Strait Expedition, Malinowski developed and explored a constellation of new methods for potential inclusion in the ethnographic toolkit (Young 1998:2–3). Foremost, and unlike his disciplinary predecessors, Malinowski sought opportunities to actively participate in village life. He learned the villagers’ language, and with that language in hand, he joined in the quotidian activities of these purported savages. As years in the field passed, Malinowski also came to recognize that the duration of his stay was a key factor in his accumulation of insights. These methods produced a tectonic insight: the evolutionarily stalled Trobriand Islanders were, Malinowski revealed, in reality a socially complicated and interesting people who were fully, equally, and entirely human.

Malinowski’s achievement was threefold. First, he helped shift the anthropological focus from classification to the holistic study of cultures themselves. Second, Malinowski codified parameters and practices that remain integral features of ethnography to this day. More than a century later, for example, aspiring cultural anthropologists still endeavor to learn the language, to participate in everyday life, to stay for a year or more, and to live amongst one’s subjects as best possible. Third and finally, Malinowski demonstrated the latent promise of the ethnographic toolkit—that by using these procedures and these approaches, one might cross thresholds of cultural difference on a mission of empathic understanding, and emerge with an informed grasp of a culture foreign to the anthropologist.

It's this last aspect of ethnography's origins—that it was designed for the endeavor of exiting the familiar, and for plunging into a cultural world foreign to the ethnographer herself—that explains my use of the term *anthropological ethnography*. In American academia today, an array of different disciplinary practitioners claim ethnography in their methodological toolkit. Unlike anthropologists, however, few are concerned with crossing thresholds of cultural difference. Indeed, with the concept of *auto-ethnography*, some practitioners have altogether removed “others” from the equation, and instead claim that the imprimatur of ethnography might also apply to their interrogations of the self. I disregard these claims and applications: with the term *anthropological ethnography*, I instead emphasize the method's original endeavor—to cross thresholds of social and cultural difference, with aspirations for impartiality, on a mission to empathically explore and understand the cultural otherness one might encounter there.

SAVAGES AND DEPLORABLES

In a 2016 campaign speech, American presidential candidate Hillary Clinton declared that, “you could put half of Trump's supporters into what I call the basket of deplorables.... They're racist, sexist, homophobic, xenophobic, Islamophobic—you name it” (Blow 2016). At the time, her statement and its implications were widely reported. I recall harboring a vague conviction about her unfortunate phrasing, but in the months to come, I thought little more about it. In part, I paid so little attention because, as many recall, there were plenty of other episodes, conflagrations, and media-instigated concerns besieging our national attention. Like most everyone else in my ambit, I remained convinced that a victory for Clinton lay just ahead, and like many others, I was stunned to discover, upon the tally of our votes, that we'd instead be governed by the strange celebrity-developer I'd previously mocked.

In the years to come, Clinton's statements began to reemerge from the fog, and her sentiments began to gradually concretize as a watershed event. I noted how Clinton had shifted disdain from her opponent and his impoverished ideals to the swath of the American public who supported his candidacy. Moreover, her public indictment of those supporters was moralistic in tenor, and portrayed those tens of millions of Americans as ideologically incorrigible creatures: they were not to be persuaded

by reason, nor would their minds be changed. Her sentiments seemed to imply that attempts to interact or understand their concerns would only “platform” beliefs that many wished to extricate from the American public sphere. With the passage of time, I came to believe that Clinton’s statement presaged, or even catalyzed, the divisory socio-politics that fragmented the contemporary American polity.

Leaving discussions of the causes for this fragmentation aside, we might agree that this condition is a social fact in contemporary America. On campuses like the one that employs me, these divisory social politics seemed to take exaggerated form. In the wake of Clinton’s comments, signs that rejected the very premises of American democracy began to show up on campus and in the surrounding neighborhood, suggesting the elected President was “not my President,” that we must “resist” Trump, or resist governance more broadly. Students increasingly began to propose ethnographic projects concerned with messaging the uninformed and misguided Americans that inhabited this deplorable terrain. Others on my campus discreetly formed an Antifa chapter to, in part, combat the racists purportedly amassing just over the horizon. Agitated by a tour of rural Washington with his partner, another colleague from a nearby college described a worrisome journey through an enemy territory that, in their telling, seemed to most resemble the Jim Crow American South, albeit sans any African-Americans. It seemed that Clinton’s dismissive understanding of the American polity had taken root on campuses like mine, and I began to notice some recurring features in the portrayal of these deplorable Americans bugbears. They always seemed to be just outside the social networks of those who feared them. And in the Pacific Northwest, those deplorable Americans had a geography—they lived in communities just over the Cascade mountains (Figure 1), or just beyond the suburban fringe of the Seattle-Tacoma metropolitan area.

Eventually I began to see the parallels between these American deplorables and the savages of anthropology’s yesteryear. Both groups were delineated hierarchically—in a social-evolutionary schemata in the case of savages, and in a moralistic cultural hierarchy in the case of American deplorables. Both savages and deplorables were geographically distant from the progenitors of these frameworks and judgments. And both seemed to function as foils in the narratives the proponents of these hierarchies told themselves about themselves. With these parallels in mind, I began to pay closer attention to the handful of ethnographers

who sought to cross the contemporary American thresholds of social and political difference, and who did so on some sort of mission of empathy and understanding (Varenne 1977; Adams 2007; Hochschild 2016). And I began to ponder how ethnography might again help dispel the caricatures, essentializations, simplifications, and ethnocentricities that come so readily to us humans.

THE ETHNOGRAPHIC SURVEY OF RURAL CASCADIA

It was in this context that I've recently established a longitudinal project entitled the Ethnographic Survey of Rural Cascadia (ESRC). The project aspires to convey the tradition of *anthropological ethnography* to successive coteries of undergraduate students, foremost by encouraging them to cross thresholds of cultural and political difference on an impartial mission of understanding. To reiterate the obvious, like Malinowski's venture more than a century ago, the project deploys the ethnographic toolkit in an effort to vanquish the stereotypes, simplifications, and essentializations that permeate the American academic atmosphere. In doing so, the project provides an opportunity for students to ply the ethnographic craft, and to learn by trial, by error, and by experience. The project is also *nomothetic* in nature: it endeavors to gather together empirical observations, with the eventual goal of deriving explanation and theory from an accumulation of evidence.

This project currently depends on a campus program at the University of Puget Sound that provides funding for students to conduct independent summer research projects under the supervision of a faculty member. In conversation with me, students select a community of interest to them. Undergraduate student Maddie Davis piloted this effort in Coulee City, Washington, in the summer of 2022. The first portion of her summer was spent in preparation. Several weeks in the library helped Maddie build a foundational knowledge of Coulee City and its history, and also yielded time for Maddie to familiarize herself with other ethnographic work exploring community life in rural America. The second portion of Maddie's summer was spent conducting ethnographic fieldwork in Coulee City, with periodic visits by her faculty advisor (me). During her time in the field, Maddie sought to interview residents, to participate in the everyday activities of community life, and to gather other sorts of data that might flesh out our ethnographic *community dossier*.

As our project deliverable, the dossier is configured around three basic sections. The first is a social and economic history of the community that begins with its settlement and the people indigenous to that land. The second section of the *community dossier* explicates the contemporary demography and social topography of the community, which ideally enhances available census data with ethnographic insights collected by the student-researcher. The third and final section of the *community dossier* is thematically determined by the student. Maddie, for example, pursued an exploration of the role of churches and faith in contemporary community life. The entirety of this basic structure is peppered with illustrative ethnographic data. For example, student-researchers are encouraged to conduct sufficient interviews to allow for the construction of at least one business synopsis (an historical summary of a commercial enterprise's trajectory from beginning to present), at least one household synopsis (a summary of a household's members, primary sources of income, and history), and at least one individual synopsis (essentially, a summary of an individual's life story, gathered from one or more semi-structured interviews). These synopses, and photography that helps convey a sense of place, pepper the three sections of the *community dossier* described here. Raw ethnographic data—transcriptions and/or fieldnotes—are included as appendices to the ethnographic *community dossier*.

One foundational premise of this project is that communities are ethnographically discernible things (Calhoun 1978). Although sparsely inhabited, in our limited experiences so far, rural communities in the Cascadia region seem to be ideal locations for neophyte ethnographers (Figure 1). Oftentimes they contain individuals who are actively interested in community history, and many of the communities that I've personally scouted over the past years even contain museums staffed by residents poised for participation in projects like this. Moreover, in our experiences, many of the rural Cascadians we've encountered share the ambitions upon which this project is built: they too often recognize the value of interactions and communication with fellow Americans who may reside across thresholds of socio-political difference, imagined or real. We are currently compiling, editing, and revising our pilot attempt at this ethnographic *community dossier*, and numerous additional students are poised to apply for funding as part of next year's campus grant cycle.

Although this project is largely driven by undergraduates exploring the possibilities of the ethnographic toolkit, we hope it will help facilitate the deconstruction of the ideas and understandings that drive the fragmentation

of the American polity. Simultaneously, we hope that the project might contribute in some small way to the longstanding anthropological concern with community life in rural America. In that sense, we are energized by the possibility of the collaborations and conversations stewarded by this journal. Following the lead of Melissa R. Taysom (this collection) and the steady stream of works collected in *JONA* that precede our efforts, we endeavor to join the broader legacy in anthropology that, in its concern with rural American community life, stretches back more than a century.

REFERENCES CITED

Adams, Jane

2007 Ethnography of Rural North America. *North American Dialogue: Newsletter of the Society for the Anthropology of North America*, 10(2):2–6.

Blow, Charles M.

2016 About the “Baskets of Deplorables.” *New York Times*, September 12.

Calhoun, C. J.

1978 History, Anthropology and the Study of Communities. *Social History*, 3(3):363–373.

Hochschild, Arlie Russell

2016 *Strangers in Their Own Land*. New York, NY: New Press.

Morgan, Lewis H.

1964 *Ancient Society: Researches in the Lines of Human Progress from Savagery through Barbarism to Civilization*. Cambridge, MA: Harvard College.

Tylor, E. B.

1958 *Primitive Culture: Researches into the Development of Mythology, Philosophy, Religion, Art and Custom*. New York, NY: Harper Torchbooks.

Varenne, Hervé

1977 *Americans Together, Structured Diversity in a Midwestern Town*. New York, NY: Teacher’s College Press.

Young, Michael W.

1998 *Malinowski’s Kiriwina: Fieldwork Photography 1915–1918*. Chicago, IL: University of Chicago Press.

2. GROWING PAINS: FARMER AND RANCHER LIVED EXPERIENCES IN THE CONTEXT OF A SHIFT TO AN AMENITY-BASED ECONOMY IN TETON VALLEY

Melissa R. Taysom
Idaho State University



FIGURE 1. Tetons from Tetonina. Photograph by the author.

The animals always show up as my first greeters. I slow my car down so it's barely creeping forward as I avoid whatever curious animals are surrounding it and pull into a spot that's hopefully out of the way enough to not interfere with anything that needs to be done. On the farms and ranches I've visited in Teton Valley, the site of my research, I've been greeted by barking dogs, excited and tails wagging happily; chickens who gather and scatter repeatedly; goats; sheep; geese; and cows staring at me from the nearby pasture who quickly lose interest and return to chomping and chewing. The farmers/ranchers soon follow smiling and laughing at the excited animals then smiling at me. They invite me to join them in their home, in their yard, in their greenhouse, or even off to a pen to feed baby goats. They're kind and friendly. I feel comfortable with them, yet something hangs in the air around us. I'm not just a friend stopping in for a visit. I'm also there as an anthropologist conducting

research, and we're all aware that I wouldn't be visiting for an interview if I didn't see a problem to study.ⁱ

In rural regions of the United States, the number of small family farms is decreasing despite population growth in those areas (Todd and Whitt 2021). The majority of these population increases are driven by wealthy individuals' desire to live in amenity rich rural areas that have open, undeveloped landscapes and contain outdoor recreational areas with natural amenities and varied topography (Krannich et al. 2006; McGranahan 2019) (Figures 1–3). Amenity migration is a phenomenon which originated from rural tourism (Özden-Schilling 2019; Sherman 2021). The comparative affordability of rural land combined with the allure and prestige, or elevated status, involved with living in or owning a second home or vacation property in areas with plentiful natural amenities quickly propelled the phenomenon (Sherman 2021).

As a result of amenity migration, farming and ranching communities are experiencing an increasing population of newcomers and a resultant influx of socioeconomic and landscape changes. In the United States, the national average rate of growth from 2010–2019 was 6.3 percent, but in the same time period, Teton County, Idaho, had a growth rate of 19.61 percent, and Teton County, Wyoming, had a growth rate of 10.18 percent (Kassel 2021). These higher than national average rates of population growth are consistent with other rural counties that are rich in natural amenities throughout the United States (Kassel 2021; Sherman 2021). Amenity-based growth restructures local landscapes, communities, and economies which results in reduced open spaces and a shift from traditional extractive rural industries, including agriculture, to service and hospitality centered businesses and the development of an amenity-based “gig” economy consisting of short-term, seasonal, and/or contractual work instead of long-term jobs (Gober et al. 1993; Krannich et al. 2006; Abrams et al. 2012). The resulting landscape and socioeconomic changes impact the lived experiences of farmers and ranchers.

Both life satisfaction and life quality for farmers and ranchers are potentially at risk of being altered in the evolving landscape and socioeconomic conditions as their communities shift from agriculturally focused economies to amenity-based economies (Taysom 2022). Farmers and ranchers have historically been the primary stewards of these open spaces since colonization, and their identities are significantly tied to these landscapes, which consist of both worked land and open space

(Taysom 2022). Changes to the landscape have impacts on the sense of belonging of farmers and ranchers who have personal and familial history with the land, often spanning more than a century (Escalera-Reyes 2020; Taysom 2022). One farmer/rancher proclaimed,

We've put our blood, sweat, and tears into this ground. Our roots are firmly planted here, and they have been for over 100 years. This land and this valley are what we are and what our family has been.

Then they paused to think about recent change,

You can't stop it [change]. There's nothing you can do to stop it. You've just gotta figure out how to make it work for you. (Taysom 2022)

Change is a seemingly unavoidable part of life, especially right now in Teton Valley, and every farmer and rancher I've talked with has described some experience with solastalgia, known as "distress caused by environmental change" (Albrecht et al. 2007). A lifelong Teton Valley farmer/rancher mused:

I remember when you not only knew everyone in the valley, but you knew every porch light in the valley. We used to go up on the hill and look down into the valley after it got dark. We could point out and name every house and who lived there because the porch lights were about the only lights on as far as you could see. It's not like that anymore. (Taysom 2022)

Another farmer/rancher talks about mourning the loss of the open space across the street from their farm/ranch.

It used to be all open. I loved it. I loved to sit out here and watch the wildlife when I could. Now it's all developed. It's just buildings and people and cars. It's noisy. It used to be so special. (Taysom 2022)

An additional change frequently discussed in the interviews is increased interactions with police and the legal system. Some newcomers file complaints with the police and even launch legal actions against farmers and ranchers for multiple perceived issues

which interfere with the newcomers' goals and expectations of the area, including noise of animals and/or equipment, slow farm equipment and/or livestock on the roads, unpleasant smells, chemical applications on fields, farm equipment obstructing scenic views, and presumed animal abuse (Cai et al. 2018; Taysom 2022). One farmer/rancher said,

It makes me so angry! Of course I'm taking care of my animals and my land! These animals and this land are how my family survives. We do the best we can for them. I don't know how many times I've had to speak with the police now about my animals being out at night in the dark, or out in the cold and snow. What am I supposed to do with them?! I can't bring them into my house. They're happier in the pasture than they would be cooped up in a barn. They're happy and well taken care of. I don't understand how people could feel like they need to call the cops to report that my animals are abused because they're out in the field. This is a farm/ranch. Of course they're out in the field. (Taysom 2022)

Another farmer/rancher discusses the legal actions that they've been having to deal with in court because of the smells and noises their animals make. They said,

They sued me again! They won't stop harassing me and now I have to go to court and deal with this absolute nonsense. This is an agricultural area and they knew that before they moved here. How can you sue a farmer/rancher because of the noises and smells of their animals?! It's not like I'm going out in the middle of the night and getting them all riled up so they'll disrupt the neighbors and wake everyone up. I have no control over their noises or smells. (Taysom 2022)

These complaints add stress, financial burden, and worry to farmers and ranchers who are already experiencing increased stress in the changing landscape, community, and economy which can lead them to feel punished and ostracized for making a living as a farmer/rancher. Despite prevalent negative experiences, every participant insists that the growing population "isn't all bad."



FIGURE 2. Teton Canyon is one of the many natural amenities that Teton Valley offers. Photograph by the author.



FIGURE 3. Tetons from Ski Hill Road in Alta. Photograph by the author.

One farmer/rancher said,

The (farmer's) markets have been excellent! They (newcomers) brought with them a strong desire to buy local and have lots of money to do so. (Taysom 2022)

Farmers/ranchers mention increased feelings of support, appreciation, and encouragement from newcomers at the markets. The drive to “buy local” comes with the perception and desire to buy better and healthier, more natural foods which has prompted some farmers/ranchers to seek certifications which align with and advertise a perceived higher quality of the goods they sell. Organic, certified-humane, certified gluten-free, and other such certifications are pricey to obtain, but if the profit is worth it and they have the available funds to do so, farmers/ranchers acquire them for increased revenue and business (Taysom 2022). This is frustrating for some farmers/ranchers who don't want to “fatten the government's wallet” by obtaining the certifications. One farmer/rancher said,

We follow all the same guidelines. We are an organic farm/ranch. We refuse to give the government money to prove it. (Taysom 2022)

Another positive aspect of the newcomers' presence that is expressed by farmers/ranchers is the knowledge that the valley isn't going to “dry up” any time soon. While things are changing and often challenging, farmers/ranchers feel thankful to know that newcomers love the valley like they do. Even with differing ideas of what should/shouldn't be allowed to happen in the valley and differing ideas about land and water protection and use, citizens of the valley are united in a shared appreciation of what the valley is and has to offer. However, ideas about the future of farming/ranching in the valley vary among participants.

Hope, fear, concern, and uncertainty are frequent emotions expressed by farmers/ranchers about the future of farming/ranching in the valley. While some see a shift to solar or wind power and more sustainable, eco-friendly farming/ranching practices being adapted on a wide scale throughout the valley, others feel the livelihoods will fade away or “die out” due to overdevelopment, “big ag,” poor local government decisions, and/or poor management of land and water health. Regardless of their imagined futures, they're all determined to continue farming/ranching in the valley. As one farmer/rancher said,

We're here. Our roots are here and we're not goin' anywhere.
We're here and we're stayin' put. (Taysom 2022)

I'll conclude this essay with some wise advice. When I asked about any advice they have for current/future small family farmers/ranchers in the valley, farmers/ranchers offered the following:

Don't give up! Remember that you're not in this alone. Pull together and help each other out. Be open to change and be willing to learn new things. If something doesn't work, there's always something else to try—be adaptable. Just because something has been done a certain way for a hundred years doesn't mean that's the way you have to do it. And make sure you take enough time for yourself to get out and enjoy the beautiful area we're so lucky to live in. (Taysom 2022)

ENDNOTES

ⁱIn an effort to protect participant identity, I've used the generalized term "farmer/rancher," and I've intentionally excluded gender terminology as well as specific locations instead using the generalized term "valley." I kept the included quotations as true to form as possible, but they have been modified as necessary to exclude this information as well as any other potentially personally identifiable information. Some quotations have been modified in order to combine similar sentiments that came up in multiple interviews.

ACKNOWLEDGMENTS

I would like to extend sincere gratitude and heartfelt thanks to: the farmers and ranchers of Teton Valley who generously shared their time and themselves with me; my advisor Dr. Sarah Ebel for her unending and invaluable guidance and support; Lewis Thomas, M.A., for his constant encouragement and support; and the Center for Ecological Research and Education for partial funding of my research.

REFERENCES CITED

- Abrams, Jesse, Hannah Gosnell, Nicholas Gill, and Peter Klepeis
2012 Re-creating the Rural, Reconstructing Nature: An International Literature Review of the Environmental Implications of Amenity Migration. *Conservation and Society*, 10(3):270–284.
- Albrecht, Glenn, Gina Sartore, Linda Connor, Nick Higginbotham, Sonia Freeman, Brian Kelly, Helen J. Stain, Anne Tonna, and Georgia Pollard
2007 Solastalgia: The Distress Caused by Environmental Change. *Australian Psychiatry*, 15 (supplement). The Royal Australian and New Zealand College of Psychiatrists.
- Cai, Liping, Shangzhi Qiu, Zhuowei Huang, and Xinran Lehto
2018 Back-to-Trueself as an Identity Element of Indiana Rural Tourism. *The Journal of Rural and Community Development*, 13(3):78–91.
- Escalera-Reyes, Javier
2020 Place Attachment, Feeling of Belonging and Collective Identity in Socio-Ecological Systems: Study Case of Pegalajar (Andalusia-Spain). *Sustainability*, 12:1–22.
- Gober, Patricia, Kevin McHugh, and Denis Leclerc
1993 Job-Rich but Housing-Poor: The Dilemma of a Western Amenity Town. *The Professional Geographer*, 45(1):12–20.
- Kassel, Kathleen
2021 Rural Economy. Accessed at: USDA ERS—Rural Economy, *ERS-USDA*.
- Krannich, Richard S., Peggy Petrzelka, Joan Brehm
2006 Social Change and Well-being in Western Amenity-Growth Communities. In *Population Change and Rural Society*, edited by W.A. Kandel and D.L. Brown, pp. 311–331.
- McGranahan, David
2019 Measures of Natural Amenities and their Research Use. Accessed at: USDA ERS—Natural Amenities, *ERS-USDA*.
- Özden-Schilling, Tom
2019 Amenity Migration Revisited. *Journal for the Anthropology of North America*, 22(2):131–134.

Sherman, Jennifer

2021 *Dividing Paradise: Rural Inequality and the Diminishing American Dream.*
Oakland: University of California Press.

Taysom, Melissa R.

2022 Transcriptions of oral interviews conducted in 2021 and 2022 of farmers and ranchers in Teton Valley, Idaho, by Melissa R. Taysom as part of Idaho State University M.S. thesis research. Transcripts in possession of the author.

Todd, James, and Christine Whitt

2021 Farm Household Well-being. Accessed at: USDA ERS—Farm Household Well-being, *ERS-USDA*.

3. LEGACY ORAL HISTORIES: THE MARY KIONA TRANSLATION/TRANSCRIPTION PROJECT

Richard H. McClure, Jr.
U.S. Forest Service (Retired)

Eugene S. Hunn
Department of Anthropology,
University of Washington



FIGURE 1. *Mukmúk* (Muddy Fork Cowlitz River) looking upstream toward *Likálwit*, as described in the narrative of Mary Kiona. Photograph by Richard McClure, 2020.

INTRODUCTION

The Taytnapam are a small western Washington Tribe who historically occupied a series of villages along the upper reaches of the Cowlitz River, south of Mount Rainier (Figures 1–2). By the early twentieth century, they were often known as the Upper Cowlitz (Jacobs 1934; Gunther 1973). Among the elders most regarded for knowledge of traditional language and culture in that century was a woman named Mary (Yoke) Kiona (“*Xumánshxu*”), born, according to federal census records, in 1869 near present-day Mossyrock, Lewis County, Washington. Her father William Yoke (“*Yukshanat*”) was born about 1839 in the upper Cowlitz Valley near present-day Packwood; her mother Lucy (“*Quil-a-nut*”) was born

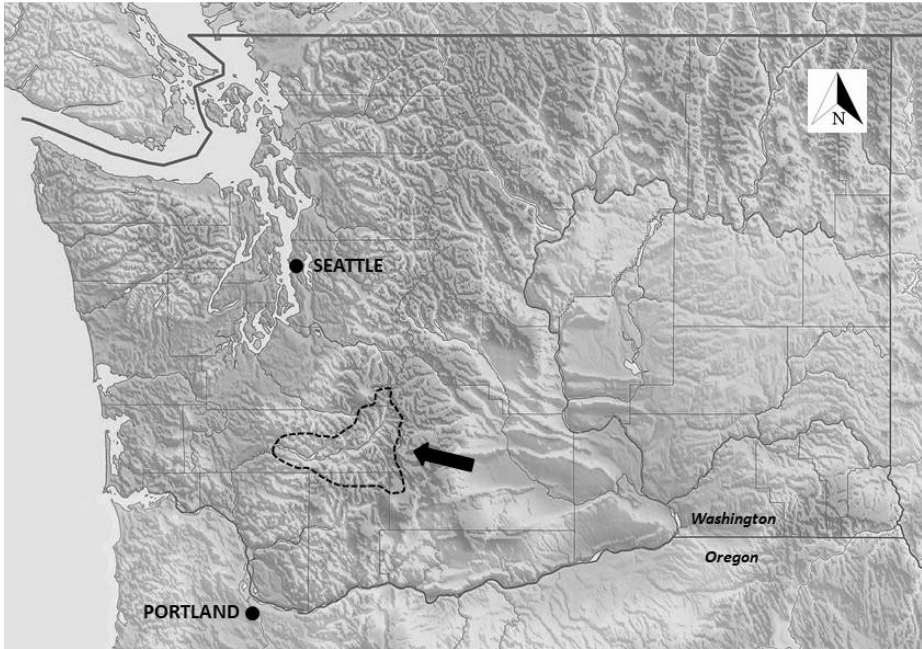


FIGURE 2. Relief map, Washington State (USA), showing the traditional territory of the Taytnapam (arrow) within the upper Cowlitz River watershed of the Cascade Mountain Range. (Base map courtesy Wikimedia commons.)

about 1853 at the Taytnapam village of *Kwiilt*, the present-day city of Mossyrock. Owing to her reputation as a knowledgeable elder, Mary Kiona was sought out many times over the years by those seeking information about Upper Cowlitz/Taytnapam traditions, culture, and history. While living much of her life on off-reservation trust land near Randle, in the upper Cowlitz Valley, Mary was an enrolled citizen of the Confederated Tribes and Bands of the Yakama Nation.

Among those who met and interviewed Mary Kiona was Martha Hardy, a Seattle-area educator and author (Figure 3). Hardy had fallen in love with the upper Cowlitz country while serving there as a Forest Service fire lookout during World War II. That experience became the subject of her first book *Tatoosh*, published in 1947. She had a keen interest in local history, and had been introduced to the Indigenous culture of the area through a copy of Melville Jacobs' *Northwest Sahaptin Texts* (1934), found, of all places, at the community garbage dump in



FIGURE 3. Martha Hardy and Mary Kiona on the Cowlitz River, 1965. (Photo by Mary Vanderpool; courtesy of Lewis County Historical Museum, Chehalis, used with permission.)

Packwood (Hardy 1949:7). Wanting to learn more about the Upper Cowlitz people, Hardy later contacted members of the Kiona family living near Randle to arrange an interview with Mary Kiona. In August of 1964, Mrs. Kiona and several others sat around a kitchen table in a rustic cabin at Skyo Ranch, the summer home of Martha Hardy near Packwood, for the first of four interview sessions. On the table was a large reel-to-reel tape recorder and microphone. Hardy, possibly inspired by a class she had taken at the University of Washington from anthropologist Erna Gunther (and her reading of *Northwest Sahaptin Texts*), had undertaken the interviews as a personal project intended to “collect the facts... of the Upper Cowlitz Tribe” through audiotape. The project produced more than six-and-a-half hours of audio material, the most extensive of surviving Mary Kiona interviews.

It was not the first time that Mary Kiona had consented to an interview. Quite ironically, she had met with anthropologist Melville M. Jacobs in the summer of 1927, dictating a spontaneous and free-form

narrative in her Native Taytnapam Sahaptin (*Ichishkīin*) language, without the benefit of an interpreter. With his remarkable ear for the nuance of speech, Jacobs deftly transcribed her narrative in his field notebook, later working with another Taytnapam speaker, Sam Eyle, Jr., to translate the material into English. Jacobs was disappointed in the quality of his own transcription, however, calling it “practically worthless,” and opted not to include any of Mary Kiona’s 25-page narrative in the collection that included narratives by other Upper Cowlitz elders, published in the aforementioned *Northwest Sahaptin Texts* (Jacobs 1934, 1937).

Mary Kiona was subsequently interviewed by University of Washington anthropologist Erna Gunther, a colleague of Jacobs, in the late 1930s on the subject of ethnobotany, and by lawyers affiliated with the land claims case of the Cowlitz Indian Tribe before the Indian Claims Commission (ICC) in 1953. Anthropologist Herbert Taylor interviewed Mrs. Kiona in 1955, on behalf of the Cowlitz Tribe, again in support of the ICC case. In 1963 she was interviewed by anthropologist Allan H. Smith in conjunction with an ethnographic study of Mount Rainier National Park (Smith 2006:16). Documentation of only one of these five interviews—the 1953 ICC courtroom testimony—survives (Kiona 1953). However, only the English language translations were transcribed by the court reporter.

Martha Hardy’s interviews with Mary Kiona included two sessions in 1964, and two in 1965. Martha directed her questions to Mrs. Kiona through a translator. In the two 1964 sessions, Mary’s daughter Minnie Placid provided translation; in the two sessions from 1965, Mary’s granddaughter Joyce Eyle provided translation. In these recordings, Mary Kiona speaks in her Native Taytnapam Sahaptin (*Ichishkīin*) dialect. Hardy’s questions appear off the cuff, suggesting little preparation was done, but add a relaxed level of spontaneity to the course of each session. The subject matter covers a wide range of topics, from basic vocabulary to spiritual practices and everything in between, including ethnobiology, technology, settlement and subsistence practices, child rearing, doctoring, historical events, and genealogy. The sound quality of the recordings is generally good, and Mary Kiona’s speech is clear and understandable.

Martha Hardy also produced a field recording of Mary Kiona in attendance at a bone game near Morton, Washington, in 1967. The audiotape includes Mary singing some songs and demonstrating her knowledge of Chinuk WaWa, along with the sounds of the bone game. Three additional

interviews with Mrs. Kiona were conducted between 1966 and 1970; the first of these by anthropologist Dorothy Jean Ray focused on genealogy and is documented in field notes. The other two are audiotaped interviews, one conducted by Clifford Wilson, former Chairman of the Cowlitz Tribe, the other by the Lewis County Historical Society.

McClure was given the original 1964–1965 Kiona recordings after the death of Martha Hardy in 1983. Audiocassette copies of the tapes were provided to two of Mary Kiona’s descendants and filed with the oral history collections, Yakama Nation Cultural Center. The original reel-to-reel tapes were transferred to Dr. Hunn for permanent archival curation among the Martha Hardy Papers, University of Washington Libraries, Special Collections. In 1996, Hunn produced a digital version of the recordings. Between 1983 and 1996, there were sporadic efforts to transcribe the interviews. McClure began selective transcription of the English translations in support of federal cultural resource survey work on National Forest lands in the upper Cowlitz River country during the 1980s. In conjunction with an ethnographic study of the Gifford Pinchot National Forest, Hunn hired a graduate student, Jennifer Sepez, to transcribe the English portions of the Mary Kiona interviews and employed Átway James Selam—respected elder, native language consultant, and citizen of the Yakama Nation—to interpret the *Ichishkíin* language segments. Partial transcriptions were completed in 1993 by Selam, but the work was suspended when Selam’s house was flooded and his copies of the tapes were lost.

Years later, in retirement, Hunn and McClure have returned to the Mary Kiona interviews within the context of a larger research project involving Taytnapam culture and history. Listening to the recordings again after many years, we were struck by the brevity of some of the English “translations” and intrigued by what we perceived as potentially more detailed and extensive content within the actual *Ichishkíin* language narratives. To produce a more complete transcription and translation of the original material, the knowledge and expertise of Native speakers and linguists would be essential. Toward that end, we received a grant from the Jacobs Research Fund, providing for the initiation of a collaborative effort involving Indigenous language consultants.

The team formed to work on the translations in 2022 has consisted of notable Native scholars with fluency in the Northern Sahaptin (*Ichishkíin*) language. Included are Thomas Morning Owl, Fred Hill, Sr., Philip Cash

Cash, and Damien Totus, all citizens of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). Dr. Joana Jansen, Associate Director, Northwest Indian Language Institute, University of Oregon, has taken a lead role, along with Dr. Hunn, in the transcription effort. The CTUIR has been more than generous in providing support and services to the project. Additionally, noted Yakama educator and *Ichishkiin* language scholar Dr. Virginia Beavert has contributed to the translation effort. Dr. Beavert had known Mary Kiona, and had visited her at her home near Randle several times in the 1950s and 1960s.

The process of translation has been slow and deliberate, if not painstaking. Dr. Hunn prepared selected cuts of particular interest from the recordings, each only a few minutes in length. Team members, sitting around a conference table, listened intently to these audio cuts multiple times, broadcast over a Bluetooth speaker. They discussed individual words and phrases, their meaning and their context, sometimes analyzing form, structure, or individual sounds, until finally coming to a general consensus on the translation. The sheer amount of collective experience and knowledge of the language directed so intensively and simultaneously to a single word, a phrase, or short passage was powerful. At times, the experience was reminiscent of an archaeological excavation, uncovering layers of meaning in the content and nuance of the language; at other times (to use another settler-colonial metaphor), it was more like the working of a crossword puzzle, seeing how individual words fit together. Work sessions completed to date (2022) have been successful in providing a more complete, often word-for-word translation of particularly important interview segments.

PROBING THE DEPTHS OF THE ORIGINAL NARRATIVE

The following example illustrates the depth of additional content contained within some of the *Ichishkiin* narrative passages, as seen in comparing the original English translation with that produced by the team of language specialists in 2022. The transcript is from the interview with Mary Kiona by Martha Hardy recorded on 20 August 1965. This passage begins with a question, posed to Mary Kiona (MK) by her granddaughter Joyce Eyle (JE). The place she names—*Taaktáak*—is known today as Prairie Mountain (Figure 4), rising to the north of the Cowlitz River about six miles east of Randle.



FIGURE 4. *Taaktáak*, or Prairie Mountain, named in Mary Kiona's narrative, rises above the Cowlitz River between the modern communities of Randle and Packwood. (2015 photo by Pete Caster; courtesy of *The Chronicle*, used with permission.)

JE: *Mish nam panátixana taaktáakchan míwi?*

[Did you used to climb up to *Taaktáak* long ago?]

MK: *Ii, T'áaxw, t'áaxw pi't'xanu. Taaktáak-kan míwi, Taaktáak, K'áshinu, Niq'wút, íchi. Chaw, chaw Laxachini kush timnanáx-ta. Tash akwi nisháykxana kutash winámpta nisháych-pa, Likálwit-pa kutash atmaanít, atmaanítnatash wisíkna. Íkwa ikwáani Mukmúk-pa xwímichan. T'áaxw itxánata wisík. Ku tash panátita, Niq'wút-kan át'ityaw ku hwúkw'yaw, níxyaw. Ku kwnak panátita na'las át'itinan, hwúkw'nan.*

Original translation:

JE: *Ikupaynk aw.* ["I'll translate now"]. Well, they used to pack up that camp up to Packwood, up there in there where the river comes down from Mount Rainier. And they would go

pick blackberries and they'd also pick some little roots. And her mother used to go up there and pick all that. Her mother's name was Lucy. And they'd get up there and pick that.

2022 translation:

Yes, every, every mountain. To *Taaktáak* [Prairie Mountain] long ago, *K'ashinu* [Davis Mountain], *Niq'wút* [Butter Peak], here. No, not *Laxachini*, I recall (from the heart) in this way. We first to this place would camp... camp in *Likálwit* then we do berries, berries. Blackberries... in *Mukmúk* [Muddy Fork], toward the top. All grown with blackberry. And we climbed up to *Niq'wút* [Butter Peak] for huckleberry and avalanche lily, the two of them. And at that place my mother would [get] huckleberries and avalanche lily.

Mary Kiona's original *Ichishkíin* passage provides specific names for five places mentioned within the context of traditional Taytnapam subsistence activities. According to Dr. Beavert, the word *Laxachini* is also a toponym, possibly a site on the Cowlitz River near Salkum. None of these places are specifically named in the original English translation, although "where the river comes down from Mount Rainier" is a fitting description for either *Mukmúk* [Muddy Fork] (Figure 1) or *Likálwit*, a camp near its confluence with the Clear Fork. *Niq'wút*, known locally as Butter Butte or Butter Peak (Figure 5), is the southern-most peak of the Tatoosh Range, rising above the Muddy Fork near Packwood. It is noteworthy that all five of these places are located on federal lands administered by the Gifford Pinchot National Forest, an agency charged with the task of protecting places of cultural and historical significance to Tribes.

This passage also provides specific information on resource gathering activities that took place historically from the "base camp" of *Likálwit*. Joyce Eyle's original translation mentions only blackberries (*wisík*) and "some little roots." In the *Ichishkíin*, we find that huckleberries (*átit*) are also specifically mentioned, gathered along with the roots of avalanche lilies (*hwíikw'*), in the same general places. Mary Kiona follows this with a description of processing methods for these foods in subsequent passages of the interview. Noting this as something her mother did provides a relative temporal context: Lucy ("*Kwilen'it*") Yoke was born about 1853. Mary Kiona was able to revisit the general area with Martha



FIGURE 5. Niq'wút, or Butter Peak, a prominent landform near Packwood, also named in Mary Kiona's narrative, and the southernmost peak of the Tatoosh Range (2021 photograph by Richard McClure.)



FIGURE 6. Mary Kiona gathering cedar root material for basketry along the Cowlitz River near *Likálwit*. (1965 photograph by Martha Hardy; collection of Richard McClure.)

Hardy in the summer 1965, around the time of the interview (Figure 6). Hardy's photographs during this and other field trips provide an added dimension to the oral history interviews.

LEGACY ORAL HISTORIES: PRESERVATION, ACCESS, AND RESEARCH

Archival collections of oral histories involving Indigenous narrators, including those preserving Native languages spoken by the narrators, exist in many public, private, and tribal institutions and educational facilities throughout the Pacific Northwest (Lewis and Kingston 2007). The narratives contained within the oral histories are an important primary source of information regarding traditional culture, history, and language, all too often overlooked by historians, anthropologists, and cultural resources specialists. From our experience, they are often inaccessible to descendant communities and family members who have a justifiable need to connect with their oral traditions through such recordings or transcripts. In our collaboration with Indigenous scholars in the translation and transcription of the Mary Kiona interviews, and in our discussions with descendants and cultural resources program personnel, we have asked the question, "What form should the results of this project take and who should have access?"

Other than stating her desire to "collect the facts of the Upper Cowlitz Tribe," Martha Hardy left no clues as to her intended plans for the Mary Kiona interview materials. There were no consent forms, no transcripts, nor indication of a writing project in progress at the time of her death. While producing a complete, printed *Ichishkûin* and English published version of the interviews might satisfy some as a tangible project outcome, several key participants and members of the Indigenous community have argued for online access or publication through the Plateau Peoples' Web Portal, a "collaboratively curated and reciprocally managed archive of Plateau cultural materials" hosted by the Washington State University library system. In regard to the potential issue of sensitive content, not suitable for public dissemination, Mary Kiona herself addressed the issue in the interviews, saying quite clearly (through the translator) that she was not willing to discuss medicinal plants, for example, for fear of exploitation from the whites, who "are taking everything," as her granddaughter lamented in the recording. With these perspectives in mind,

the project continues to move forward with a collective goal to make this important primary ethnographic material available to the widest possible audience, and through the most effective means.

REFERENCES CITED

Gunther, Erna

1973 *Ethnobotany of Western Washington: The Knowledge and Use of Indigenous Plants by Native Americans Revised Edition*. Seattle: University of Washington Press. [Originally published as *University of Washington Publications in Anthropology*, 10(1), 1945.]

Hardy, Martha

1949 *Skyo*. Seattle, WA: Superior Publishing Company.

Jacobs, Melville M.

1934–1937 Northwest Sahaptin Texts. 2 Pts. Part 1: English; Part 2: Sahaptin. *Columbia University Contributions to Anthropology*, 19(1–2). New York, NY: Columbia University Press.

Kiona, Mary

1953 Testimony before the Indian Claims Commission. National Archives and Records Administration, Record Group 270, Docket 197, Box 837. Seattle, WA: National Archives and Records Administration, Pacific Region.

Lewis, David G., and Deanna Kingston

2007 The History and Context of Oregon Tribal Language Archival Collections. In *Teaching Oregon Native Languages*, edited by Joan Gross, pp. 94–116. Corvallis: Oregon State University Press.

Smith, Allan H.

2006 (1964) *Takhoma: Ethnography of Mount Rainier National Park*. Pullman: Washington State University Press. [Originally published as “Ethnographic guide to the archaeology of Mt. Rainier National Park.” Report prepared for the National Park Service, Seattle, WA.]

4. PLATEAU IN THE PITS ~ LÉVI-STRAUSS EXPLORES GENDERED ACTIVITIES

Jay Miller

Lushootseed Research

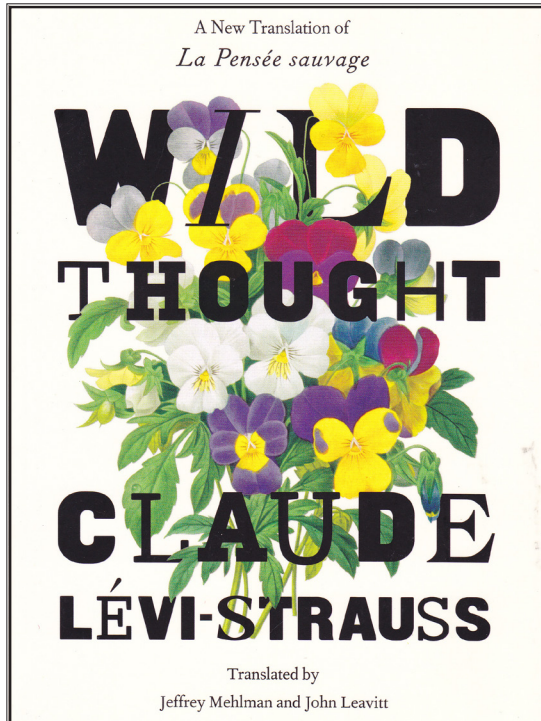


FIGURE 1. Cover photograph of a new translation of *La Pensée sauvage* by Claude Lévi-Strauss titled *Wild Thought* (Mehlman and Leavitt, translators, 2022).

Over sixty years ago, the world came knocking to the Plateau, only to be turned away. Instead, the Northwest Coast and Southwest welcomed it with wide open arms, embracing the dazzling structuralism of Gustave Claude Lévi-Strauss (28 November 1908–30 October 2009). Indeed, this reversal—if not “opposition” between wet and dry regions—is at the heart of his genius.

This genius dominated the 1970s when I was writing a dissertation on the Keresan Pueblos, and one of my advisors was Alfonso Ortiz, a Tewa Pueblo with a Ph.D. from University of Chicago, who was himself applying

Lévi-Strauss structuralism to his own people, noted for the dualism of winter/summer moieties. He would often remark, “You know, I’m still not sure if Lévi-Strauss invented the Pueblos or the Pueblos invented Lévi-Strauss.” The Keres echo this same duality, but expressed as man/woman, and, indeed, reverse Tewa definitions of these genders. In other words, reversed, even upside down, relationships between cultures are as important as within them for reaching a better understanding of regional and global patterns. The intellectual excitements of Lévi-Strauss followed me from the Southwest to the Northwest, and, indeed, as Lévi-Strauss ended the big four volumes of *Mythologiques* (1964, 1966, 1968, 1971) among Chinooks of The Dalles Emporium on the Columbia, so I began my shift to the Northwest, and then the Plateau, along the long involved trail of Lévi-Strauss in the Americas.

By way of background, Lévi-Strauss’ family was from Alsace, devoted to learning and art. His grandfather was the rabbi at Versailles, and Claude lived with him during WWI, but both he and his parents later became agnostics. A socialist given to activism in college, he soon concentrated on academic pursuits and later became a vegetarian. After training in law, which he rejected as boring, and in philosophy, where he excelled, he married an anthropologist, and they served as faculty and fieldworkers in Brazil (1935–1939) until rampant eye infections closed down their research project, leaving only healthy Claude to write it up. He reflected on these experiences in *Tristes Tropiques* (1955, English translation 1973), a stylistic triumph in modern French literature.

During World War II, Claude, because of Jewish ancestry, was stripped of his job and French citizenship by the Vichy government; escaped to Martinique; gained asylum in New York City; and helped set up a French university in exile with other European luminaries, who profoundly influenced his thinking. His stay in New York enhanced his organizational abilities, later used to establish anthropology in France, and he made full use of the resources of the public library to amass his card files on kinship and mythology. He also bought a complete set of the *Bureau of American Ethnology Annual Reports* (1881–1964), which he began mining and coding for his future massive works analyzing mythemes, vivid examples of human thought processes expressed in complex cross-cultural ways. He admired Franz Boas, literally inhaling his last gasp as Papa Franz collapsed beside him and died of a heart attack, as well as Boas’ protégé James Teit, a Shetlander married into families

of the Canadian Plateau, fluent in Interior Salish languages, and active in their political concerns.

Back in France, Claude fully identified himself with anthropology— informed by linguistics, mathematics, music, and other logical systems—and rose through academic ranks, despite continued anti-Semitism, based on his enormous study of kinship systems (1949) before he turned to the complexities of tribal/human thought as best expressed in so-called folklore and mythology, which he elevated to the mythologic throughout *Mythologiques* (1964, 1966, 1968, 1971). Along the way he sampled other possibilities, such as totemism, especially in *La Pensée sauvage* (1962), a title translated as *The Savage Mind* (1966), and now, sixty years later, better as *Wild Thought* (2022), playing with the French word (*pensée*) meaning both “thought” and the flower “pansy,” which adorns the cover: a single pansy in 1962 and now a bouquet in 2022 (Figure 1). Indeed, like all of his work, it is intellectually provoking, very clever, and ethnographically rich.¹ At home, his massive library was arranged by geography, not subject, with North above South America, Europe above Africa, and so on, to emphasize the importance of place.

He established anthropology in its own right in France when he accepted (after two rejections) a chair at the *Collège de France* in 1959; published a first collection of his articles as *Structural Anthropology* (1958), a label that came from an editor by default that he never approved of; and founded the Laboratory for Social Anthropology to train new students and the journal *l'Homme* to publish their research. His influence and impact soon extended to French speaking scholars at British universities, then, with translations, to American ones, then world wide among the reading public. University of Chicago anthropologists added considerations of history to Americanize his theoretical stance. The classic teaching example used in Canada and the U.S. called attention to a code marked by the color red, with its logical set of transformations to produce Santa Claus at one end and Little Red Riding Hood at the other: using old/young, male/female, help/harm, deer/wolf inversions.

Claude Lévi-Strauss’ *magnum opus* appeared during the 1970s—in four volumes totaling 2,200 pages with 30 pages of detailed indices by

¹ The massive coherent output of Lévi-Strauss’ work overcame most of his critics, especially charges of empty logic by French intellectuals, always insisting that his own work be grounded in richly detailed ethnography, though as Edmund Leach (1970), leading British anthropologist based at Cambridge, concluded: Lévi-Strauss could be wrong about the facts, but right somehow about the predictive theory.

M_# number, tribe, or topic—beginning with a South American Bororo story of a man marooned in a tree—tagged as M₁, and ending with M_{813c} after concentrating on the Chinook and their trade emporium at The Dalles—as a tour de force of coherent “transformations” among various codes, modes, regions, tribes, and cross-boundaries to display the amazing versatility of the human mind in all of its creative workings within land-, sky-, and water-scapes. The arguments and demonstrations, some in quasi-mathematical diagrams, are spelled out in detail just once, then given a catch phrase, and woven back into his stylistic French narrative, which won him, the only anthropologist ever, 1973 election to the revered *Académie française*, eventually becoming its Dean and oldest member.

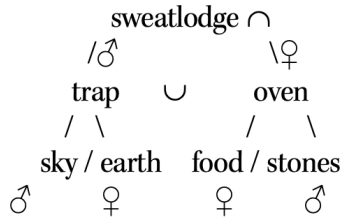
The logical basis of his, and other thought systems, consists of endlessly but coherently varied interrelationships among contrasting oppositions (+/-) resolved by mediators (o)—such as Marxist: thesis, antithesis, synthesis—though expressed more cross-culturally as:

$$\begin{array}{ccc} + / - & \text{for example as} & \text{sky / earth} \\ o & & \text{fire} \end{array}$$

This illustration is specifically chosen because it expresses a vital set of Plateau relationships of increasing importance to tribal peoples concerned about current ethnobotanical research, especially into camas earth ovens, bordering on worry if not outright disrespect, insult, and offense by insensitive outside researchers.

Because it focuses on intellect, many Native people have been drawn to and approve of the work of Lévi-Strauss (1972),² especially on the Pacific Northwest Coast. He is less known in the Plateau, though he engages wholeheartedly in the deeply informed works of James Teit, often harshly edited by Boas. Revealed over the four volumes—and returned to again and again, particularly in his Plateau-focused *The Story of Lynx* (1996), with these Tribes mapped onto a chess board—is a remarkable congruence between the Jê speakers of the Amazon and the Salish of the Northwest as the backbone “spinal column of the [entire] system,” especially in terms of triadic interrelationships involving the earth oven, sweatlodge, and trapping pit (1981:612):

² The saddest example of the lack of interest in the Plateau is that a map in the French editions of the *Way of Masks* confused Sahaptin and Kutenai for 16 years, and still includes Cowlitz among B.C., not Washington, Salish (1972:16; 1991:34 Note*; 1996: 137).



For many Plateau Salish Tribes, Sweatlodge (*kʷilstn*) is deity, for everyone, both men and women; while the earth oven is exclusively associated with women such that men are forbidden any proximity; yet, in contrast, the trap, as both pit to capture animals or weir to hold fish, is an exclusively male domain, denied to women. Still, given the great importance of gender equality among Plateau Salish, balance is provided by the maleness of hot oven stones (Lévi-Strauss 1981:621), as spelled out in detail (his internal citations remain below to show the vastness of his database):

[A] survey the whole North American field [shows]... Arapaho myths, for a start, describe the projectile hurled by the moon at his human wife in order to kill her and prevent her descent from the sky to the earth as a 'heated stone' (M₄₂₈; Dorsey 5, p. 223)... among the central and eastern Algonquin (M₄₃₇₋₄₃₈; M₄₄₄), the hero called Loon or Clad-in-Wampum is killed by a red-hot stone being thrown into his mouth while he is asleep. This motif—the introduction of a red-hot stone into the body of a character who is thus symbolically transformed into an earth oven—occurs at various points... with astonishing persistence, in all... four volumes... from the Maidu of California (M₆₃₆) to the Assiniboine and the Cree (M_{766a,b}), by way of the Okanagon (M₇₃₃) and the Sanpoil (M₇₃₇); and southwards, as far as the Dakota (M_{769b}) and the Navajo (M_{776b})... the earth oven is embodied by a chthonian or trickster character... in the Klamath versions... (M₅₃₈), in the Cowlitz versions of the quarrel between the two bears where Grizzly Woman's father is called Hot-Rock, or Bake-on-hot-rocks (M_{615b}; Adamson, pp. 211–13; M_{615c}; Jacobs I, pp. 159–63); and lastly, in the Navajo myth M_{775b}, where Coyote perishes through swallowing a red-hot stone coated with food, while the Pleiades appear in the sky as a stellar counterpart of the glowing embers in the earth oven.... (Franciscan Fathers 1910:207, 208, 218)

And here is the crux yet missing from Plateau understanding. At its most profound, the earth oven is an opening into the dangerous underworld, comparable to the Gates of Hell for devout Christians. All and every care must be scrupulously observed, with women in the role of guardians because of a close bond between baking and birthing (Miller 2000). And here too the Plateau rejoins North America, where the Mvskoki Creek express this fearful concept in their phrase meaning “fresh earth” = *ekvna mocvse* ~ *i:kana močasi* (in both missionary and linguistic spellings) and subject to strict taboos, especially concerning the dirt of a freshly dug grave. Any contact with this soil, especially on shoe soles, requires purification rites because “Each open grave breaches the surface tension of the earth skin” (Miller 2015:4–5).

Now, twenty-five years on from *Lynx*, Lévi-Strauss can be welcomed back into the Plateau for what he has been teaching us for most of his century of life: Human thought is the basis of human culture, endlessly morphing in very logical ways, interconnected over vast distances, and never single-minded or straightforward, thus making his work intellectually provoking, hugely clever, and ethnographically very rich to instruct all of us.

REFERENCES CITED

- Bureau of American Ethnology
1881–1964 *Bureau of American Ethnology Annual Reports, 1881–1964*. Washington.
- Franciscan Fathers
1910 *Ethnological Dictionary of the Navaho Language*. Arizona: St Michael’s Mission.
- Leach, Edmund
1970 *Claude Lévi-Strauss*. London, U.K.: Penguin Publishing Group. Reprinted 1971–1976, London, U.K.: Penguin Publishing Group.

Lévi-Strauss, Claude

- 1949 *Les Structures élémentaires de la parenté* [*The Elementary Structures of Kinship*]. Reprinted and translated by J. H. Bell, J.R. von Sturmer, and R. Needham, 1969, Boston, MA: Beacon Press.
- 1955 *Tristes Tropiques* [*Sad Tropics*]. Paris, France: Plon. Reprinted and translated, 1961, London, U.K.: Hutchinson & Co. Reprinted and translated by J. Weightman and D. Weightman, 1973, London, U.K.: Penguin Publishing Group
- 1958 *Anthropologie Structurale* [*Structural Anthropology*]. Paris, France: Plon.
- 1962 *La Pensée sauvage* [*The Savage Mind*]. Translated by J. Weightman and D. Weightman, 1966, Chicago, IL: University of Chicago Press. Reprinted as *Wild Thought*, translated by Jeffrey Mehlman and John Leavitt, 2022, Chicago, IL: University of Chicago Press.
- 1964 *Le Cru et le cuit* [*The Raw and the Cooked*]. Reprinted in *Introduction to the Science of Mythology 1*, translated by J. Weightman and D. Weightman, 1969, New York, NY: Harper & Row Torchbooks.
- 1966 *Du miel aux cendres* [*From Honey to Ashes*]. Reprinted in *Introduction to the Science of Mythology 2*, translated by J. Weightman and D. Weightman, 1973, New York, NY: Harper & Row Torchbooks.
- 1968 *L'Origine des manières de table* [*The Origin of Table Manners*]. Reprinted in *Introduction to the Science of Mythology 3*, translated by J. Weightman and D. Weightman, 1978, New York, NY: Harper & Row Colophon.
- 1971 *L'Homme nu* [*The Naked Man*]. *Mythologiques, tome IV*. Paris, France: Plon.
- 1972 *La Voie des masques* [*The Way of the Masks*]. Translated by S. Modelski, 1982, Seattle: University of Washington Press.
- 1981 *L'Homme nu* [*The Naked Man*]. Reprinted in *Introduction to the Science of Mythology 4*, translated by J. Weightman and D. Weightman, 1981, New York, NY: Harper & Row.
- 1985 *La Potière jalouse* [*The Jealous Potter*]. Translated by B. Chorier, 1988, Chicago, IL: University of Chicago Press.
- 1991 *Histoire de Lynx* [*The Story of Lynx*]. Translated by C. Tihanyi, 1996, Chicago, IL: University of Chicago Press.

Miller, Jay

- 2000 Indian Personhood II: Baby In the Oven Sparks Being In the World ~ Ovens of Incarnation. *American Indian Culture and Research Journal*, 24(3):55–160. Fall.
- 2015 *Allied Mounds ~ Touching the Earth, Modeling the World, Reaching the Sky ~ Vital Communion with Volatile Cosmos*. Amazon Kindle.

5. MAKING PREHISTORYⁱ

Charles M. Nelson

Retired



FIGURE 1. Quilomene Bar looking north on the west bank of the Columbia River. The Sunset Creek Site is at the north end of the bar where it curls around the edge of the cliffs.

INTRODUCTION

Prehistory is made, not discovered. Archaeology is discovered, but prehistory is made. Archaeology constitutes a body of evidence, highly selected, that is analyzed and turned into an archaeological record. This record, and records from sites in the wider region, is then used to create a story that describes prehistory. The story will be more or less accurate and will change as new archaeological evidence is found and interpreted. In this essay, I will describe how I made prehistory from the archaeological record at the Sunset Creek Site (45KT28), whose environmental context is seen in Figure 1.ⁱⁱ

MANAGING THE EXCAVATION

I had the great advantage of working at the Sunset Creek Site for six years, with seven to ten field sessions in the spring and fall. There were

around eight fallow periods in which materials could be analyzed and integrated, leading to an assessment of what needed to be done next in order to answer outstanding stratigraphic questions and enlarge samples where that was needed. Thus, many elements in the archaeological record were formally integrated into a coherent framework even as the excavation moved forward.

TEMPORAL ORDER

Stratigraphic interpretation and house structure were used to identify components and order them in time. Artifacts were assigned to these according to their stratigraphic position. Typological analysis was used to refine the temporal order where this was ambiguous.

ANALYSIS OF COMPONENTS

Typological analysis was used to classify the artifacts from each component and to compare the components with one another based on type frequencies, especially of projectile points and house types, but also of bone tools and the use of blades and microblades. From this phases and sub-phases were identified.

NOW WE BEGIN TO TELL THE STORY

Prehistory is a story composed of many regional and local tales, and finally, at its base, by the stories told from individual archaeological sites. The story begins with presentation of the data, in this case as summarized above. It is presented in a formal typological analysis, tables of occurrence by component, photographs of typical specimens from each category, and photos of typical artifacts in each component or phase. These are the primary elements on which the story is based.

VISUALIZING THE STORY AS A TEMPORAL SUCCESSION

Since different individuals are comfortable with different modes of presentation, and to make the story within the site quite specific and unambiguous, the story is summarized in (1) vertical distribution tables, (2) subjective spindle graphs as adapted from palaeontology and archaeology, (3) schematic quantitative “half spindles” showing

the technological story of the site over the last 2,000 years, and (4) a visual graph illustrated with drawings of projectile points typical of each component to suggest the development of this aspect of material culture.

PLACING THE SITE IN A WIDER CULTURAL CONTEXT

This is done through regional comparisons with other archaeological sites and with the ethnographic and linguistic record. Hypotheses are developed that speak more broadly to culture change, especially economic organization and cultural ecology. This is when our story of prehistory becomes at once more interesting and more controversial.

ENDNOTES

¹Note from the Editors. The genesis for this essay was a manuscript submitted to the *Journal of Northwest Anthropology (JONA)* in 2022 by R. Lee Lyman (Univeristy of Missouri) on visual methods used to portray Plateau archaeological chronologies over the last seventy-five years. One particular approach called out by Dr. Lyman was the spindle graph, which Charles Nelson had used in his widely read and highly regarded Sunset Creek report (Nelson 1969). Because this was a relatively new technique for illustrating artifact frequency through time, Lyman wondered where Nelson had learned about spindle graphs. When Jay Miller, Associate *JONA* Editor, read Lyman’s manuscript during the review process, he suggested that since Dr. Nelson was living in Bellingham, Washington, we should ask him. We did, and with his answer (“probably from reading the 1952 multi-volume edition of *The Book of Knowledge*” [Mee and Thompson 1952]) came this essay, which he wrote to provide additional context about the Sunset Creek report.

Although Nelson’s essay was written for another purpose—primarily to put spindle graphs into a broader context for Dr. Lyman—we asked for permission to include it in this collection of research essays for a few reasons. First, the Sunset Creek report is legendary in Plateau archaeology; this essay provides a rare opportunity to learn additional information about an important piece of Plateau research. Second, following his work at Sunset Creek, undergraduate work at Washington State University,

and completion of his Ph.D. in anthropology at University of California, Berkeley, Dr. Nelson spent 35 years teaching and working in East Africa. Now, with sixty years of archaeology under his belt, his essay provides an opportunity to share his archaeological wisdom with new generations of researchers. And third, archaeological research has changed over the sixty years since the Sunset Creek Site was excavated; this essay provides a good overview of the paradigm that guided much of the research that produced our current understanding of Plateau prehistory, and in that regard, may be useful to the younger generations of archaeologists working today. A fascinating look at Nelson's career and perspectives on archaeology can be found in a two-part 2019 interview produced by the Society for American Archaeology's Archiving the Archaeologists series on YouTube (www.youtube.com/watch?v=5hLLvWxwVSM). The article by R. Lee Lyman, "Graphing Culture Change on the Plateau Culture Area: A History" can be found in *JONA* volume 57, number 1 (2023).

ⁱⁱ The Sunset Creek Site is an important multi-component site located in the Wanapum Dam Reservoir area of central Washington. Investigated between 1956 and 1962, the resulting report (Nelson 1969) is regarded by many as an important piece of archaeological scholarship and pivotal in our understanding of Plateau prehistory.

REFERENCE CITED

Mee, Arthur, and Holland Thompson, editors

1952 *The Book of Knowledge—The Children's Encyclopedia*, Vols. 1–20, edited by Arthur Mee and Holland Thompson. New York, NY: The Grolier Society; London, U.K.: The Educational Book Co.

Nelson, Charles M.

1969 The Sunset Creek Site (45-KT-28) and its Place in Plateau Prehistory. *Washington State University. Laboratory of Anthropology. Report of Investigations* 39. Pullman.

6. THE ARCHAEOLOGY OF STEWARDSHIP AND CULTURAL KEYSTONE SPECIES IN THE PACIFIC NORTHWEST

Molly Carney

University of Arkansas



FIGURE 1. Overview of shrub-steppe habitat common in the central Columbia-Fraser Plateau, which commonly includes cultural keystone plant genera such as balsamroot (*Balsamorhiza* sp.), biscuitroot (*Lomatium* sp.), and bitterroot (*Lewisia rediviva*).

INTRODUCTION

It is no longer a question whether Northwest peoples managed their plant and animal resources—that debate has long been settled (Norton 1979; Blukis Onat 2002; Deur and Turner 2005; Thornton and Deur 2015; Mathews and Turner 2017; Lepofsky and Armstrong 2018; Lyons et al. 2021). What remains to be answered is *when* people began these relationships, *how* those plants and animals were cared for, *why* people invested time and labor into management practices, and *what* underlying principles drove such actions through millennia. These questions matter to diverse Northwest communities as many seek to incorporate deep-time practices into their natural resource management, conservation, and restoration plans (Turner and Spalding 2013; Ignace et al. 2016; Grier et al. 2017; Reynolds and

Dupres 2018; Wynecoop et al. 2019; Marks-Block et al. 2021; Spiler 2021). Recent archaeological and palaeoecological case studies are beginning to answer these how, what, and why questions, and there is finally enough evidence to begin synthesizing management patterns across the region.

In this essay I summarize and update the current state of Northwest resource management archaeological knowledge, pull out some brief themes, and offer suggestions on future courses of inquiry. I focus on cultural keystone species—the species deeply embedded within Northwest cultural traditions, narratives, vocabulary, and livelihoods (Figure 1) (Table 1) (Garibaldi and Turner 2004). As cultural keystones, these floral and faunal species are foundational to past and present Northwest lifeways. To ensure those species flourished, with positive effects across human lives and ecosystems, many people also deliberately managed or otherwise encouraged these species. Management refers to a set of intentional actions or engagement with organisms and/or environments to achieve specific subsistence goals such as increased abundance or predictability (Lertzman 2009:340; Zeder 2015:3192). Traditional resource environmental management (TREM) combines the two concepts to describe the beliefs and practices that are intended to enhance and/or maintain the abundance, diversity, and/or availability of culturally valued plants and animals and their habitats (Fowler and Lepofsky 2011:286).

Here I cover both the Northwest Coast and Interior Plateau cultural and geographic regions for two reasons: first, many of the cultural keystone plant and animal species within Indigenous economies thrive in both regions (Parish et al. 1996; Pojar and MacKinnon 2014). Secondly, extensive evidence of trade between the two regions (Galm 1994) and contemporary practices of movement and kinship across the Cascades indicate that people in these two regions had deep-time cultural connections. Below, I review the archaeological record of management, focusing on those cultural keystone species so intrinsically a part of Northwest lives.

UPDATING THE RECORD

Table 2, adapted and expanded from Lepofsky and Armstrong (2018:60, Table 1) summarizes seven behaviors within the greater realm of TREM and associated aquatic, plant, and mammalian archaeological evidence. As extensive ethnographic work and contemporary practice recount a variety of management practices, I specifically sought out complimentary

**TABLE 1. ARCHAEOLOGICAL CULTURAL KEYSTONE SPECIES
MENTIONED IN THE TEXT.**

LATIN NAME	COMMON ENGLISH NAME	SELECT REFERENCES
<i>Bison bison</i>	bison	Lyman 2004
<i>Canis familiaris</i>	dog	Crockford 1994; Schulting 1994; Crellin and Hefner 2000; Anza-Burgess et al. 2020; McKechnie et al. 2020
<i>Clupea pallasii</i>	Pacific herring	Petrou et al. 2022
<i>Enhydra lutris</i>	sea otter	Szpak et al. 2012; Slade et al. 2022
<i>Leukoma staminea</i>	littleneck clam	Groesbeck et al. 2014; Lepofsky et al. 2020
<i>Oncorhynchus</i> spp.	salmon, trout	McKechnie and Moss 2016
<i>Osmeridae</i> spp.	smelt	Palmer et al. 2018
<i>Pinnipeds</i>	seals	Lyman 2003; Etnier 2007
<i>Salvelinus</i> spp.	bull trout, Dolly Varden	Lyons 2015
<i>Saxidomus giganteus</i>	butter clam	Toniello et al. 2019
<i>Sebastes</i> spp.	rock fish	McKechnie 2007; Rodrigues et al. 2018
Ungulates	hooved mammals	Butler and Campbell 2004; Campbell and Butler 2010
<i>Amelanchier alnifolia</i>	serviceberry or Saskatoon berry	Turner et al. 2021
<i>Camassia</i> spp.	camas	Kramer 2000; Lyons and Ritchie 2017; Carney et al. 2021; Lowther 2022
<i>Corylus cornuta</i>	beaked hazelnut	Armstrong et al. 2018; Fine et al. 2013
<i>Crateagus</i> spp.	hawthorn	Turner et al. 2021

TABLE 1. (CONT.) ARCHAEOLOGICAL CULTURAL KEYSTONE SPECIES MENTIONED IN THE TEXT.

LATIN NAME	COMMON ENGLISH NAME	SELECT REFERENCES
<i>Fritillaria camschatensis</i>	northern riceroot lily	Turner et al. 2021
<i>Malus fusca</i>	Pacific crabapple	Turner et al. 2021
<i>Nicotiana</i> spp.	tobacco	Tushingham et al. 2018; Damitio et al. 2021
<i>Pinus contorta</i>	lodgepole pine	Merrel and Clark 2001
<i>Quercus garryana</i>	Garry oak or Oregon white oak	Pellat and Gedalof 2014
<i>Sagittaria latifolia</i>	wapato	T. Hoffman et al. 2016; Lyons et al. 2021
<i>Shepherdia canadensis</i>	soapberry	Turner et al. 2021
<i>Thuja plicata</i>	western redcedar	Trant et al. 2016; Earnshaw 2019
<i>Trifolium wormskioldii</i>	springbank clover	Deur 2000
<i>Viburnum edule</i>	cranberry	Turner et al. 2021

archaeological and palaeoecological records to underscore the antiquity and continuity of those observations and practices. Astute readers will note this table is biased toward the coastal regions west of the Cascades as present-day population growth and development drive archaeological work, and many academic inquiries favor marine zooarchaeological questions rather than avian, terrestrial, or paleoethnobotanical research (Lepofsky and Lyons 2013; Monks 2019:205). While I attempted to include reports, theses, and unpublished literature, I recognize that this table is not exhaustive. I offer it here as a starting point for others to build upon.

Rather than simply summarizing the evidence, I draw your attention to specific traits, characteristics, and cultural categories that were important to past Northwest peoples and guided these larger practices of management and stewardship. For brevity I offer a few initial observations below.

TABLE 2. TREM ARCHAEOLOGICAL AND PALEOECOLOGICAL EVIDENCE.

ACTION	AQUATIC EVIDENCE	PLANT EVIDENCE	MAMMALIAN EVIDENCE
Selective harvesting	<p>Late Holocene (NWC): Harvesting older shellfish and replacement of juvenile individuals (Hurst 2003; Cannon and Burchell 2009; Groesbeck et al. 2014) 1710–1070 B.P. (NWC): Male chum kept and females released to spawn (Morin et al. 2021)</p> <p>Late Holocene (CFP): Riverine earthen dyke fish traps (Lyons 2015; Dorwin 2017)</p> <p>5500 to 100 B.P. (NWC): Estuarine wood and stone fish traps (Tveskov and Erlandson 2003; Moss 2013; Elder et al. 2014; Greene et al. 2015; Lorraine 2021)</p> <p>2500–250 (NWC): Predominately smaller and younger rockfish kept (McKechnie 2007; Rodrigues et al. 2018)</p>	<p>1100–present (NWC), 300–100 B.P. (CFP): Culturally modified trees (Merrell and Clark 2001; Earnshaw 2019)</p> <p>3500–present (CFP, NWC): Sexually mature camas bulbs harvested, immature bulbs replanted, seeds sown (Carney et al. 2021; Carney 2022)</p>	<p>5000 B.P., late Holocene (NWC): Domesticated dogs for wool production (Crockford 1994; Schulting 1994; McKechnie et al. 2020)</p> <p>700–100 (NWC): Male Steller sea lions are more abundant than female or juvenile remains (Lyman 2003)</p>
Land tenure/control over harvests	<p>3500–present (NWC): Butter clam size stabilized by garden management (Toniello et al. 2019)</p> <p>Late Holocene (CFP): Riverine earthen dyke fish traps (Lyons 2015)</p> <p>5000 B.P., intensified 1500 to present (NWC): Estuarine wood and stone fish traps (Blukis Onat 2002; Tveskov and Erlandson 2003; Elder et al. 2014; Greene et al. 2015; Lorraine 2021)</p>	<p>3500–present (CFP, NWC): Sexually mature camas bulbs harvested and immature bulbs replanted (Carney et al. 2021; Carney 2022)</p>	<p>1200–200 B.P. (NWC, CFP): Low-intensity fires to clear undergrowth for ungulate habitat (Pearl 1999; Walsh et al. 2010a, 2010b, 2018; K. Hoffman et al. 2016)</p>

TABLE 2. (CONT.) TREM ARCHAEOLOGICAL AND PALEOECOLOGICAL EVIDENCE.

ACTION	AQUATIC EVIDENCE	PLANT EVIDENCE	MAMMALIAN EVIDENCE
Tending of individuals	Unknown	<p>Forest gardens near residential sites (Armstrong et al. 2022)</p> <p>Late Holocene (NWC): Cedar trees without branches favored in groves (Blukis Onat 2002)</p> <p>3800–3200 B.P. (NWC): Digging sticks in situ where tilling occurred (T. Hoffman et al. 2016; Lyons et al. 2021)</p>	Feeding dogs primarily anadromous foods (Schulting 1994; Ames et al. 2015)
Translocations	Anecdotal reports of fish in lakes/streams above geologic barriers	Late Holocene (NWC, CFP): Plant translocations/distributions beyond natural range (Armstrong et al. 2018; Damitio et al. 2021; Turner et al. 2021; Tushingham et al. 2018)	Unknown
Competitor removal	Late Holocene NWC): Removal of predatory otters to enhance shellfish production (Szapak et al. 2012; Slade et al. 2022)	1200–200 B.P. (NWC, CFP): Low-intensity fires to clear undergrowth for berry habitat (Pearl 1999; Walsh et al. 2010a, 2010b, 2018)	Unknown

TABLE 2. (CONT.) TREM ARCHAEOLOGICAL AND PALEOECOLOGICAL EVIDENCE.

ACTION	AQUATIC EVIDENCE	PLANT EVIDENCE	MAMMALIAN EVIDENCE
<p>Habitat creation/ expansion/ enhancement/ manipulation</p>	<p>3500–present (NWC): Constructed clam gardens created and expanded available habitats (Lepofsky and Caldwell 2013; Lepofsky et al. 2015; Jackley et al. 2016; Smith et al. 2019; Lepofsky et al. 2020)</p>	<p>Late Holocene (NWC): Estuarine geophyte gardens with rock walls and soil enhancements (Deur 2000, 2005) 3800–3200 B.P. (NWC): Wapato garden with rock pavement (T. Hoffman et al. 2016; Lyons et al. 2021) 3800/1200–200 B.P. (NWC, CFP): Low-intensity fires to clear undergrowth/maintain prairie-oak ecosystems (Pearl 1999; Pellat and Gedalof 2014; Walsh et al. 2010a, 2010b, 2018) Hazelnut genetic diversity (Fine et al. 2013) 6000–200 B.P. (NWC): Red cedar stands near middens are taller, healthier, and more productive (Trant et al. 2016)</p>	<p>2000/1200–200 B.P. (NWC, CFP): Low-intensity fires to clear undergrowth for ungulate habitat (Pearl 1999; Lyman 2004; Walsh et al. 2010a, 2010b, 2018; K. Hoffman et al. 2016)</p>

TABLE 2. (CONT.) TREM ARCHAEOLOGICAL AND PALEOECOLOGICAL EVIDENCE.

ACTION	AQUATIC EVIDENCE	PLANT EVIDENCE	MAMMALIAN EVIDENCE
<p>Acts of respect, rituals, prayers</p>	<p>7500–present (CFP, NWC): Cultural rules for salmon harvests and long-term fishery resilience (Butler and Campbell 2004; Campbell and Butler 2010)</p> <p>2500–present (NWC) Persistent rockfish abundance and diversity through time (McKechnie 2007; Rodrigues et al. 2018)</p> <p>1300–present (NWC): Sustainable smelt harvests through time (Palmer et al. 2018)</p>	<p>700 B.P. (CFP): Plant remains ritually burned with gendered ceremonies (Carney et al. 2019)</p> <p>Unknown period (NCW): Human burials situated at the edge of camas fields (Mathews 2016 in Lowther 2022)</p>	<p>7500–present (CFP, NWC): Cultural rules for sustainable ungulate harvests (Butler and Campbell 2004; Campbell and Butler 2010)</p> <p>4000–present (NWC, CFP): Human-dog co-burials and dog-only burials (Crellin and Hefner 2000; Anza-Burgess et al. 2020; McKechnie et al. 2020)</p>

Table is expanded from Lepofsky and Armstrong (2018:60, Table 1). Each text box indicates one action or behavior. NWC stands for Northwest Coast while CFP indicates Columbia-Fraser Plateau. All dates are reported in years BP per the author's reporting.

REPRODUCTION AND LIFE-CYCLES

Past peoples made many of their TREM decisions based upon intricate knowledge of biological reproductive systems. For example, native Salmonidae species are sexually dimorphic, exhibiting differences in color, markings, or even size across females and males. Recently, a British Columbia team built upon these distinctions using aDNA to identify the sex of individuals caught over from 2300–1000 B.P. Their work revealed male chum (*Oncorhynchus keta*) were preferentially targeted (Morin et al. 2021). By keeping the males for processing and over-wintering and replacing the females to continue running upstream to spawn, ancestral communities ensured there would be spring fry to replenish and grow chum populations long-term (Campbell and Butler 2010; Royle et al. 2018). Among mammals, male Steller sea lions (*Eumetopias jubatus*) at an Oregon coastal site were also preferentially targeted in the late Holocene (Lyman 2003), but sex-selective harvesting was not a uniform guiding principle for all Northwest Coast people-pinniped relationships (Lyman 2003; Etnier 2007). Given the extensive use of fish traps throughout both the coastal and interior regions and manipulation of forest habitats for ungulates (Table 1), it is necessary to see if, where, and when else sex-selection occurs.

Across both aquatic and plant spheres, it also appears that past peoples were highly aware of the relative age of the resources they harvested. Zooarchaeological shellfish assemblages are principally comprised of senile and mature individuals (Hurst 2003; Cannon and Burchell 2009; Groesbeck et al. 2014), driven by cultural rules which favored the replacement of juveniles (non-reproductive individuals less than three years of age). By consuming only clams well into their reproductive cycles, past coastal peoples ensured sustainable and self-replenishing shellfish harvests. Similarly, primarily sexually mature camas plants were harvested, and, it is inferred, immature plants replaced to continue growing (Carney et al. 2021; Carney 2022). As camas takes four to five years to flower and reach maturity, the older individuals are easily spotted by their flowers or seed pods when harvesting in late spring or summer. Such practices again allow immature individuals to proceed through their life-cycles, guaranteeing plant food availability for future harvests.

Size

Larger edible foods, however, do not appear to be a major cultural category influencing past subsistence and TREM decisions. Referring to our previous work with camas, my colleagues and I measured and compared the relative size of harvested bulbs, demonstrating no statistically significant differences in the size of the plant remains themselves across time (Kramer 2000; Carney et al. 2021; Carney 2022). Clam size does not appear to change through time and is instead dependent on environmental location and age-at-harvest (Toniello et al. 2019). Rockfish body size, however, does decrease across time, perhaps due to harvesting pressure (McKechnie 2007). Rockfish are among the longest-living vertebrates on the planet and can take up to 15–25 years to reproduce, though they reach full size within a few years. One possibility is that targeting younger and smaller fish may also have been a strategy to allow mature individuals to thrive and continue to replenish the fishery. Regardless, at this point there is no evidence that people were selecting for an increase in size, an observation that runs counter to most management and domestication frameworks.

Stewardship

Specific cultural institutions dictated how past Plateau and Northwest Coast societies enhanced and used common-pool resources, specifically through extensive spatial manipulation in the form of clam gardens (Lepofsky and Caldwell 2013; Lepofsky et al. 2015; Smith et al. 2019; Toniello et al. 2019; Lepofsky et al. 2020), fish traps (Blukis Onat 2002; Tveskov and Erlandson 2003; Elder et al. 2014; Greene et al. 2015; Lyons 2015; Lorraine 2021), and use of fire near residential locations to favor some species over others (Pearl 1999; Walsh et al. 2010a, 2010b, 2018; Pellat and Gedalof 2014; K. Hoffman et al. 2016). Indeed, they did not just exploit or harvest, but much of the archaeological and paleoecological evidence documented in Table 2 demonstrates a profound amount of care for these landscapes, wherein people deliberately sought to enhance the livelihoods of themselves as well as their plant and animal cohabitants (Aripa et al. 1999; Blukis Onat 2002; Atleo 2007; Losey 2010; Turner 2020).

Given the amount of respect people had for these marine, terrestrial, and plant resources, it strikes me that regard for other-than-human kin extends quite far into the past, and that these management practices might be more accurately called stewardship. Stewardship as a concept

elevates management, describing the ways people engaged in reciprocal relationships with their resources and environments, thus caring for and taking responsibility for the overall well-being of the environment (Turner 2014:149). This term implies that stewards have an obligation to the resources themselves (Lertzman 2009:347). I echo Turner (2014), Lertzman (2009), Sanchez (2020), and others and suggest that the actions and practices in Table 2 reflect an ethos of stewardship and that by referring to these collective actions as stewardship practices, we can acknowledge the long-term role Northwest peoples had in shaping environments and landscapes, as well as reflect Northwest cultural values of respect and care.

SUGGESTIONS FOR THE FUTURE

Readers will notice that there are still blank cells within Table 2—there is much to still learn about the ways past peoples cared for these landscapes. I offer the following as avenues for the future.

1. Selective harvesting—Table 2 illustrates many examples of selective harvesting, the deliberate gathering or culling of organisms according to culturally-defined categories. For example, age at harvest appears to be an important factor in management or stewardship strategies throughout western North America (Table 2) (Sanchez 2020). Could we adapt that line of inquiry to other species? Biologists have shown that selective harvesting based on culturally-defined categories has the potential to rapidly modify populations via directional selection (Fenberg and Roy 2008; Uusi-Heikkilä et al. 2015), and this is one avenue wherein we could collectively look for the presence or absence of genetic or phenotypic signatures of stewardship across cultural keystone species.
2. Seasonality—From the mid-Holocene onward, both coastal and interior peoples had logistical subsistence systems with carefully planned routes to capture a wide diversity of resources as they became available throughout the year (Lantz and Turner 2003). Archaeological sites reflect these deliberate seasonal subsistence rounds (Lepofsky 2004; McKechnie and Moss 2016). We should also look to understand patterns of seasonality and associated harvesting decisions through a closer examination of the zooarchaeological

or paleoethnobotanical remains themselves. We know that herring and salmon harvests were seasonally timed (Grier et al. 2013; Petrou et al. 2022). What can we say regarding terrestrial hunting practices? Many plant harvests too were seasonally dependent (Turner 2014), and archaeobotanical work in coastal California has demonstrated edible corms (underground stems which store starch) were harvested at specific times of the year (Gill 2014). Could we apply similar ideas to the region's edible geophytes? Some early domesticated plants exhibit developmental plasticity (Gremillion and Piperno 2009), and a closer understanding of these seasonal practices may yield further insights into human-biota interactions in the past.

3. Theoretical frameworks—TREM frameworks are quite similar to other evolutionary frameworks, including ecosystem engineering and niche construction, but with a greater focus on the human agency and cultural value-systems that guide these human-led environmental modifications. Other evolutionary and social frameworks may have explanatory power in exploring food production or management transitions and may yield insights to those when, where, why, and how questions. I urge others to consider drawing on similar anthropological frameworks in conversation with descendant communities to illuminate new questions and perspectives. For example, Two-Eyed Seeing is a recent approach that promotes the worldviews of descendant communities (Reid et al. 2020; Atlas et al. 2021). I suggest archaeology look to these Two-Eyed Seeing frameworks to promote knowledge co-production across western scientific and Indigenous epistemological frameworks as one way of honoring the realities of the communities we work with (Lyons and Supernant 2020).

The pathways and above summary are just a snapshot of management across millennia—Northwest peoples had thousands of years to learn, modify, and become experts in these species and environments. Table 2 is not encyclopedic, and additional examples may either fill in those lacunae or illuminate when, where, why, and how stewardship or resource depression episodes occur. I hope that this short summary will spark ideas, conversation, and action, inspiring all of us working across cultural and natural disciplines to reorient our viewpoints and continue chronicling the W and H questions that remain.

REFERENCES CITED

- Ames, Kenneth M., Michael P. Richards, Camilla F. Speller, Dongya Y. Yang, R. Lee Lyman, and Virginia L. Butler
2015 Stable Isotope and Ancient DNA Analysis of Dog Remains from Cathlapotle (45CL1), A Contact-era Site on the Lower Columbia River. *Journal of Archaeological Science*, 57:268–282.
- Anza-Burgess, Kasia, Dana Lepofsky, and Dongya Yang
2020 “A Part of the People”: Human-Dog Relationships Among the Northern Coast Salish of SW British Columbia. *Journal of Ethnobiology*, 40(4).
- Aripa, Lawrence, Tom Yellowtail, and Other Elders
1999 *Stories that Make the World: Oral Literature of the Indian Peoples of the Inland Northwest*. Norman: University of Oklahoma Press.
- Armstrong, Chelsey Geralda, Jacob Earnshaw, and Alex C. McAlvay
2022 Coupled Archaeological and Ecological Analyses Reveal Ancient Cultivation and Land Use in Nuchatlaht (Nuu-chah-nulth) Territories, Pacific Northwest. *Journal of Archaeological Science*, 143.
- Atlas, William I., Natalie C. Ban, Jonathan W. Moore, Adrian M. Tuohy, Spencer Greening, Andrea J. Reid, Nicole Morven, Elroy White, William G. Housty, Jess A. Housty, Christina N. Service, Larry Greba, Sam Harrison, Ciara Sharpe, Katherine I. R. Butts, William M. Shepert, Elissa Sweeney-Bergen, Donna Macintyre, Matthew R. Sloat and Katrina Connors
2021 Indigenous Systems of Management for Culturally and Ecologically Resilient Pacific Salmon (*Oncorhynchus* spp.) Fisheries. *Bioscience*, 71(2):186–204.
- Atleo, E. Richard
2007 *Tsawalk: A Nuu-chah-nulth worldview*. Vancouver: University of British Columbia Press.
- Blukis Onat, Atrida R.
2002 Resource Cultivation on the Northwest Coast of North America. *Journal of Northwest Anthropology*, 36(2):125–144.

Butler, Virginia L., and Sarah K. Campbell

2004 Resource Intensification and Resource Depression in the Pacific Northwest of North America: A Zooarchaeological Review. *Journal of World Prehistory*, 18(4):327–405.

Cambell, Sarah K., and Virginia L. Butler

2010 Archaeological evidence for resilience of Pacific Northwest salmon populations and the socioecological system over the last ~ 7,500 years. *Ecology and Society*, 15(1).

Cannon, Aubrey, and Meghan Burchell

2009 Clam Growth-stage Profiles as a Measure of Harvest Intensity and Resource Management on the Central coast of British Columbia. *Journal of Archaeological Science*, 36(4):1050–1060.

Carney, Molly

2022 Evaluating Human-Camas Relationships in the Willamette Valley, Oregon. Report submitted to the University of Oregon Museum of Natural and Cultural History.

Carney, Molly, Jade d'Alpoim Guedes, Kevin J. Lyons, and Melissa Goodman Elgar

2019 Gendered Places and Depositional Histories: Reconstructing a Menstrual Lodge in the Interior Northwest. *American Antiquity*, 84(3):400–419.

Carney, Molly, Shannon Tushingham, Tara McLaughlin, and Jade d'Alpoim Guedes

2021 Harvesting Strategies as Evidence for 4000 years of Camas (*Camassia quamash*) Management in the North American Columbia Plateau. *Royal Society Open Science*, 8(202213).

Crellin, David F., and Ty Heffner

2000 The Cultural Significance of Domestic Dogs in Prehistoric Keatley Creek Society. In *The Ancient Past of Keatley Creek Volume II: Socioeconomy*, edited by Brian Hayden, pp. 151–164. Burnaby, B.C.: Simon Fraser Press.

Crockford, Susan

1994 Osteometric and Ancient DNA Analysis of Prehistoric Dogs of the Central Northwest Coast: Wool Dog or Bust! *Canadian Zooarchaeology/Zooarchéologie canadienne*, (5):15–20.

Damitio, William J., Shannon Tushingham, Korey J. Brownstein, R. G. Matson, and David R. Gang

2021 The Evolution of Smoking and Intoxicant Plant Use in Ancient Northwestern North America. *American Antiquity*, 86(4):715–733.

Deur, Douglas

2000 *A Domesticated Landscape: Native American Plant Cultivation on the Northwest Coast of North America*. Doctoral dissertation, Agricultural and Mechanical College, Louisiana State University, Baton Rouge.

2005 Tending the Garden, Making the Soil: Northwest Coast Estuarine Gardens as Engineered Environments. In *Keeping it Living: Traditions of Plant Use and Cultivation on the Northwest Coast of North America*, edited by Douglas Deur and Nancy J. Turner, pp. 296–330. Vancouver: University of British Columbia Press.

Deur, Douglas, and Nancy J. Turner, editors

2005 *Keeping it living: traditions of plant use and cultivation on the Northwest Coast of North America*. Seattle: University of Washington Press.

Dorwin, John T.

2017 Box Canyon Hydroelectric Project, Archaeological Evaluation of 45PO426. Report submitted to the Kalispel Tribe of Indians.

Earnshaw, Jacob K.

2019 Cultural Forests in Cross Section: Clear-Cuts Reveal 1,100 Years of Bark Harvesting on Vancouver Island, British Columbia. *American Antiquity*, 84(3):516–530.

Elder, J. Tait, Daniel M. Gilmour, Virginia L. Butler, Sarah K. Campbell and Aubrey Steingraber

2014 On the Role of Coastal Landscape Evolution in Detecting Fish Weirs: A Pacific Northwest Coast Example From Washington State. *The Journal of Island and Coastal Archaeology*, 9(1):45–71.

Etnier, Michael A.

2007 Defining and identifying sustainable harvests of resources: Archaeological examples of pinniped harvests in the eastern North Pacific. *Journal for Nature Conservation*, 15(3):196–207.

Fenberg, Phillip B., and Kaustuv Roy

2008 Ecological and Evolutionary Consequences of Size-selective Harvesting: How Much do we Know? *Molecular Ecology*, 17(1):209–220.

Fine, Paul V.A., Tracy M. Misiewicz, Andreas S. Chavez, and Rob Q. Cuthrell

2013 Population Genetic Structure of California hazelnut, an Important Food Source for People in Quiroste Valley in the Late Holocene. *California Archaeology*, 5(2):353–370.

Fowler, Catherine S., and Dana Lepofsky

2011 Traditional Resource and Environmental Management. In *Ethnobiology*, edited by Eugene N. Anderson, Debra Pearsall, Eugene Hunn, and Nancy Turner, pp. 285–304. Hoboken, NJ: John Wiley & Sons.

Galm, Jerry R.

1994 Prehistoric trade and exchange in the Interior Plateau of northwestern North America. In *Prehistoric Exchange Systems in North America*, edited by Timoth G. Baugh and Jonathon E. Ericson, pp. 275–305. New York, NY: Springer.

Gill, Kristina M.

2014 Seasons of Change: Using Seasonal Morphological Changes in Brodiaea Corms to Determine Season of Harvest from Archaeobotanical Remains. *American Antiquity*, 79(4):638–654.

Greene, Nancy A., David C. McGee, and Roderick J. Heitzmann

2015 The Comox harbour fish trap complex: a large-scale, technologically sophisticated intertidal fishery from British Columbia. *Canadian Journal of Archaeology/Journal Canadien d'Archéologie*, 39(2):161–212.

Gremillion, K. J., and D. R. Piperno

2009 Human behavioral ecology, phenotypic (developmental) plasticity, and agricultural origins: insights from the emerging evolutionary synthesis. *Current Anthropology*, 50(5):615–619.

Grier, Colin, Lilian Alessa, and Andrew Kliskey

2017 Looking to the past to shape the future: addressing social-ecological change and adaptive trade-offs. *Regional Environmental Change*, 17(4):1205–1215.

Grier, Colin, Kelli Flanigan, Misa Winters, Leah G. Jordan, Susan Lukowski, and Brian M. Kemp

2013 Using ancient DNA identification and osteometric measures of archaeological Pacific salmon vertebrae for reconstructing salmon fisheries and site seasonality at Dionisio Point, British Columbia. *Journal of Archaeological Science*, 40(1):544–555.

Groesbeck, Amy S., Kirsten Rowell, Dana Lepofsky, and Anne K. Salomon

2014 Ancient clam gardens increased shellfish production: adaptive strategies from the past can inform food security today. *PLoS One*, 9(3):e91235.

Hoffman, Kira M., Daniel G. Gavin, and Brian M. Starzomski

2016 Seven hundred years of human-driven and climate-influenced fire activity in a British Columbia coastal temperate rainforest. *Royal Society Open Science*, 3(10):160608.

Hoffman, Tanja, Natasha Lyons, Debbie Miller, Alejandra Diaz, Amy Homan, Stephanie Huddleston, and Roma Leon

2016 Engineered feature used to enhance gardening at a 3800-year-old site on the Pacific Northwest Coast. *Science Advances*, 2(12).

Hurst, Jennifer L.

2003 The Analysis of Shell Growth and Age at Harvest of the Butter Clam (*Saxidomus giganteus* Deshayes): An Insight to the Implementation of Management Practices at the *Qwu?gwe*s Archaeological Site (45TN240) in Olympia, WA, USA. Master's thesis, Department of Archaeology and Geography, University of Exeter, Devon, United Kingdom.

Ignace, Marianne B., Ronald E. Ignace, and Nancy J. Turner

2016 Re tmicw te skukwstéls es tuwitentels: Secwepemc Traditional Ecological Knowledge and Wisdom Now and in the Future. In *Secwepemc People and Plants: Research Papers in Shuswap Ethnobotany*, edited by Marianne B. Ignace, Nancy J. Turner, and Sandra L. Peacock, pp. 407–440. Tacoma, WA: Society of Ethnobiology and Shuswap Nation Tribal Council.

Jackley, Julia, Lindsay Gardner, Audrey F. Djunaedi, and Anne K. Salomon

2016 Ancient clam gardens, traditional management portfolios, and the resilience of coupled human-ocean systems. *Ecology and Society*, 21(4).

Kramer, Stephenie

- 2000 Camas Bulbs, the Kalapuya, and Gender: Exploring Evidence of Plant Food Intensification in the Willamette Valley of Oregon. Master's thesis, Department of Anthropology, University of Oregon, Eugene, OR.

Lantz, Trevor C., and Nancy J. Turner

- 2003 Traditional Phenological Knowledge of Aboriginal Peoples in British Columbia. *Journal of Ethnobiology*, 23(2):263–286.

Lepofsky, Dana

- 2004 Paleoethnobotany in the Northwest. In *People and Plants in Ancient Western North America*, edited by Paul E. Minnis, pp. 367–464. Tucson: The University of Arizona Press.

Lepofsky, Dana, and Chelsey Geralda Armstrong

- 2018 Foraging New Ground: Documenting Ancient Resource and Environmental Management in Canadian Archaeology. *Canadian Journal of Archaeology/ Journal Canadien d'Archéologie*, 42:57–73.

Lepofsky, Dana, and Megan Caldwell

- 2013 Indigenous Marine Resource Management on the Northwest Coast of North America. *Ecological Processes*, 2(12):1–12.

Lepofsky, Dana, and Natasha Lyons

- 2013 The Secret Past Life of Plants: Paleoethnobotany in British Columbia. *BC Studies*, 179:39–55.

Lepofsky, Dana, Nicole F. Smith, Nathan Cardinal, John Harper, Mary Morris, Gitla (Elroy White), Randy Bouchard, Dorothy I. D. Kennedy, Anne K. Salomon, Michelle Puckett, and Kirsten Rowell

- 2015 Ancient Shellfish Mariculture on the Northwest Coast of North America. *American Antiquity*, 80(2):236–259.

Lepofsky, Dana, Ginevra Toniello, Jacob Earnshaw, Christine Roberts, Louis Wilson, Kirsten Rowell, and Keith Holmes

- 2020 Ancient Anthropogenic Clam Gardens of the Northwest Coast Expand Clam Habitat. *Ecosystems*, 24(2):248–260.

Lertzman, Ken

- 2009 The Paradigm of Management, Management Systems, and Resource Stewardship. *Journal of Ethnobiology*, 29(2):339–358.

Lorraine, Michael

- 2021 Long-term and Multiscalar Variability in Northwest Coast Fish Traps. Master's thesis, Department of Anthropology, Washington State University, Pullman.

Losey, Robert

- 2010 Animism as a Means of Exploring Archaeological Fishing Structures on Willapa Bay, Washington, USA. *Cambridge Archaeological Journal*, 20(1):17–32.

Lowther, Emma

- 2022 Understanding lək̓'wəŋən soils: The foundation of environmental stewardship in coastal anthropogenic prairies. Master's thesis, School of Environmental Studies, University of Victoria, Victoria, B.C.

Lyman, R. Lee

- 2003 Pinniped behavior, foraging theory, and the depression of metapopulations and nondepression of a local population on the southern Northwest Coast of North America. *Journal of Anthropological Archaeology*, 22(4):376–388.
- 2004 Late-Quaternary diminution and abundance of prehistoric bison (*Bison* spp.) in eastern Washington State, USA. *Quaternary Research*, 62(1):76–85.

Lyons, Kevin J.

- 2015 Recognizing the Archaeological Signatures of Resident Fisheries: Considerations from the Pend Oreille Basin. In *Rivers, Fish, and the People: tradition, science, and historical ecology of fisheries in the American West*, edited by Pei Lin Yu, pp. 96–127. Salt Lake City: University of Utah Press.

Lyons, Natasha, and Morgan Ritchie

- 2017 The Archaeology of Camas Production and Exchange on the Northwest Coast: With Evidence from a Sts'ailes (Chehalis) Village on the Harrison River, British Columbia. *Journal of Ethnobiology*, 37(2):346–367.

Lyons, Natasha, Tanja Hoffmann, Debbie Miller, Andrew Martindale, Kenneth M. Ames and Michael Blake

- 2021 Were the Ancient Coast Salish Farmers? A Story of Origins. *American Antiquity*, 86(3):504–525.

Lyons, Natasha, and Kisha Supernant

2020 Introduction to an Archaeology of the Heart. In *Archaeologies of the Heart*, edited by Kisha Supernant, Jane E. Baxter, Natasha Lyons, and Sonia Atalay, pp. 1–19. Switzerland: Springer Nature.

Marks-Block, Tony, Frank K. Lake, Rebecca Bliege Bird, and Lisa M. Curran

2021 Revitalized Karuk and Yurok cultural burning to enhance California hazelnut for basketweaving in northwestern California, USA. *Fire Ecology*, 17(1).

Mathews, Darcy L., and Nancy J. Turner

2017 Ocean Cultures. In *Conservation for the Anthropocene Ocean*, edited by Phillip S. Levin and Melissa R. Poe, pp. 169–206. London: Elsevier Inc.

McKechnie, Iain

2007 Investigating the complexities of sustainable fishing at a prehistoric village on western Vancouver Island, British Columbia, Canada. *Journal for Nature Conservation*, 15(3):208–222.

McKechnie, Iain, and Madonna L. Moss

2016 Meta-analysis in zooarchaeology expands perspectives on Indigenous fisheries of the Northwest Coast of North America. *Journal of Archaeological Science: Reports*, 8:470–485.

McKechnie, Iain, Madonna L. Moss, and Susan J. Crockford

2020 Domestic dogs and wild canids on the Northwest Coast of North America: Animal husbandry in a region without agriculture? *Journal of Anthropological Archaeology*, 60.

Merrell, Carolynne, and James T. Clark

2001 Peeled Lodgepole Pine: A Disappearing Cultural Resource and Archaeological Record. *Northwest Anthropological Research Notes*, 35(1):27–43.

Monks, Gregory G.

2019 Zooarchaeology on the Northwest Coast of North America. *Journal of Northwest Anthropology*, 53(2):191–242.

Morin, Jesse, Thomas C. A. Royle, Hua Zhang, Camilla Speller, Miguel Alcaide, Ryan Morin, Morgan Ritchie, Aubrey Cannon, Michael George, Michelle George, and Dongya Yang

2021 Indigenous sex-selective salmon harvesting demonstrates pre-contact marine resource management in Burrard Inlet, British Columbia, Canada. *Scientific Reports*, 11(1).

Moss, Madonna L.

2013 Fishing Traps and Weirs on the Northwest Coast of North America: New Approaches and New Insights. In *The Oxford Handbook of Wetland Archaeology*, edited by Francesco Menotti and Aiden O'Sullivan, pp. 323–337. Oxford, U.K.: Oxford University Press.

Norton, Helen H.

1979 The Association Between Anthropogenic Parries and Important Food Plants in Western Washington. *Northwest Anthropological Research Notes*, 13(2):175–200.

Palmer, Erica, Shannon Tushingham, and Brian M. Kemp

2018 Human use of small forage fish: Improved ancient DNA species identification techniques reveal long term record of sustainable mass harvesting of smelt fishery in the northeast Pacific Rim. *Journal of Archaeological Science*, 99:143–152.

Parish, Robert, Ray Coupé, and Dennis Lloyd

1996 *Plants of southern interior of British Columbia and the inland northwest*. Vancouver: B.C. Ministry of Forests and Lone Pine Publishing.

Pearl, Christopher Andrew

1999 Holocene environmental history of the Willamette Valley, Oregon: Insights from an 11,000-year record from Beaver Lake. Master's thesis, Interdisciplinary Studies Program: Environmental Studies, University of Oregon, Eugene, OR.

Pellatt, Marlow G., and Ze'ev Gedalof

2014 Environmental change in Garry oak (*Quercus garryana*) ecosystems: the evolution of an eco-cultural landscape. *Biodiversity and Conservation*, 23(8):2053–2067.

Petrou, Eleni L., Robert Kopperl, Dana Lepofsky, Antonia T. Rodrigues, Dongya Yang, Madonna L. Moss, Camilla F. Speller, and Lorenz Hauser

2022 Ancient DNA reveals phenological diversity of Coast Salish herring harvests over multiple centuries. *Scientific Reports*, 12(1):13512.

Pojar, Jim, and Andy MacKinnon (editors)

2014 *Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia, & Alaska*. Vancouver: B.C. Ministry of Forests and Lone Pine Publishing.

Reid, Andrea J., Lauren E. Eckert, John-Francis Lane, Nathan Young, Scott G. Hinch, Chris T. Darimont, Steven J. Cooke, Natalie C. Ban, and Albert Marshall
2020 “Two-Eyed Seeing”: An Indigenous framework to transform fisheries research and management. *Fish and Fisheries*, 22(2):243–261.

Reynolds, Nathaniel D., and Christine Dupres

2018 The Pacific Crabapple (*Malus fusca*) and Cowlitz Cultural Resurgence. *Journal of Northwest Anthropology*, 52(1):52–36.

Rodrigues, Antonia T., Iain McKechnie, and Dongya Y. Yang

2018 Ancient DNA analysis of Indigenous rockfish use on the Pacific Coast: Implications for marine conservation areas and fisheries management. *PLoS One*, 13(2):e0192716.

Royle, Thomas C. A., Dionne Sakhrani, Camilla F. Speller, Virginia L. Butler, Robert H. Devlin, Aubrey Cannon, and Dongya Y. Yang

2018 An efficient and reliable DNA-based sex identification method for archaeological Pacific salmonid (*Oncorhynchus* spp.) remains. *PLoS One*, 13(3):e0193212.

Sanchez, Gabriel M.

2020 Indigenous stewardship of marine and estuarine fisheries?: Reconstructing the ancient size of Pacific herring through linear regression models. *Journal of Archaeological Science: Reports*, 29.

Schulting, Rick

1994 The hair of the dog: The identification of a Coast Salish dog-hair blanket from Yale, British Columbia. *Canadian Journal of Archaeology/Journal Canadien d'Archéologie*, 18:57–76.

Slade, Erin, Ian McKechnie and Anne K. Salomon

2022 Archaeological and Contemporary Evidence Indicates Low Sea Otter Prevalence on the Pacific Northwest Coast During the Late Holocene. *Ecosystems*, 25(3):548–566.

Smith, Nicole F., Dana Lepofsky, Ginerva Toniello, Keith Holmes, Louie Wilson, Christina M. Neudorf and Christine Roberts

2019 3500 years of shellfish mariculture on the Northwest Coast of North America. *PLoS One*, 14(2):e0211194.

Spiler, Emily

2021 Incorporating Metlakatla First Nation knowledge, perspectives, and values into ecocultural restoration of clam gardens. Master's thesis, School of Resource and Environmental Management, University of Waterloo, Waterloo, ON.

Szpak, Paul, Trevor J. Orchard, Iain McKechnie, and Darren R. Gröcke

2012 Historical ecology of late Holocene sea otters (*Enhydra lutris*) from northern British Columbia: isotopic and zooarchaeological perspectives. *Journal of Archaeological Science*, 39(5):1553–1571.

Thornton, Thomas F., and Douglas Deur

2015 Introduction to the special section on marine cultivation among indigenous peoples of the Northwest Coast. *Human Ecology*, 43(2):187–187.

Toniello, Ginerva, Dana Lepofsky, Gavia Lertzman-Lepofsky, Anne K. Salomon and Kirsten Rowell

2019 11,500 y of human-clam relationships provide long-term context for intertidal management in the Salish Sea, British Columbia. *Proceedings of the National Academy of Sciences*, 116(44):22106–22114.

Trant, Andrew J., Wiebe Nijland, Kira M Hoffman, Darcy L. Mathews, Duncan McLaren, Trisalyn A. Nelson, and Brian M Starzomski

2016 Intertidal resource use over millennia enhances forest productivity. *Nature Communications*, 7:12491.

Turner, Nancy J.

2014 *Ancient Pathways, Ancestral Knowledge: Ethnobotany and Ecological Wisdom of Indigenous Peoples of Northwestern North America*. Montreal: McGill-Queen's University Press.

2020 From “taking” to “tending”: learning about Indigenous land and resource management on the Pacific Northwest Coast of North America. *ICES Journal of Marine Science*, 77(7–8):2472–2482.

Turner, Nancy, and Pamela Spalding

2013 “We might go back to this”; drawing on the past to meet the future in northwestern North American Indigenous communities. *Ecology and Society*, 18(4).

Tushingam, S., C. M. Snyder, K. J. Brownstein, W. J. Damitio, and D. R. Gang

2018 Biomolecular archaeology reveals ancient origins of indigenous tobacco smoking in North American Plateau. *PNAS*, 115(46):11742–11747.

Tveskov, Mark A., and Jon M. Erlandson

2003 The Haynes Inlet weirs: estuarine fishing and archaeological site visibility on the southern Cascadia coast. *Journal of Archaeological Science*, 30(8):1023–1035.

Uusi-Heikkilä, Silva, Andrew R. Whiteley, Anna Kuparinen, Shuichi Matsumura, Paul A. Venturrelli, Christian Wolter, Jon Slate, Craig R. Primmer, Thomas Meinelt, Shaun S. Killen, David Bierbach, Giovanni Polverino, Arne Ludwig, and Robert Arlinghaus

2015 The evolutionary legacy of size-selective harvesting extends from genes to populations. *Evolutionary Applications*, 8(6):597–620.

Walsh, Megan K., Haley J. Duke, and Kevin C. Haydon

2018 Toward a better understanding of climate and human impacts on late Holocene fire regimes in the Pacific Northwest, USA. *Progress in Physical Geography: Earth and Environment*, 42(4):478–512.

Walsh, Megan K., Christopher A. Pearl, Cathy Whitlock, Patrick J. Bartlein, and Marc A. Worona

2010a An 11 000-year-long record of fire and vegetation history at Beaver Lake, Oregon, central Willamette Valley. *Quaternary Science Reviews*, 29(9-10):1093–1106.

Walsh, Megan K., Cathy Whitlock, and Patrick J. Bartlein

2010b 1200 years of fire and vegetation history in the Willamette Valley, Oregon and Washington, reconstructed using high-resolution macroscopic charcoal and pollen analysis. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 297(2):273–289.

Wynecoop, Monique D., Penelope Morgan, Eva K. Strand, and Fernando Sanchez Trigueros

2019 Getting back to fire sumés: exploring a multi-disciplinary approach to incorporating traditional knowledge into fuels treatments. *Fire Ecology*, 15(1).

Zeder, Melinda A.

2015 Core questions in domestication research. *PNAS*, 112(11):3191–3198.

7. IT'S TIME TO GET WET—WET SITE RESEARCH IN THE PACIFIC NORTHWEST

Dale R. Croes

Washington State University

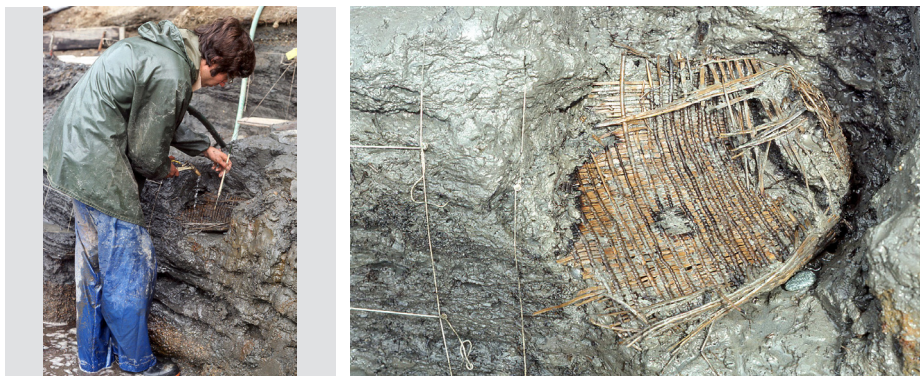


FIGURE 1. Me getting wet as tide comes in at Hoko wet site in 1977, using hose and nozzle to hydraulically recover a 3,000-year-old burnt burden basket of a distinct West Coast style—burnt damage, an example of three millennium year-old frustrated discarding.

INTRODUCING GETTING WET

Why have wet sites been recognized from the earliest archaeological surveys on the Northwest Coast (over 80 years ago) and still have not become a mainstream part of current research? Pioneering Northwest anthropologist/archaeologist Dr. Philip Drucker demonstrated in his 1938 survey efforts that “along the entire coast, sites... are both numerous and large,” and that not only objects of bone and antler, but “even... wood are well preserved even in the deepest of the perpetually damp levels” (Drucker 1943:23; Borden 1976:257). I would argue that every large shell midden site has a wet component with excellent preservation of wood and fiber artifacts, if sought.

A good example of “not seeing,” “not knowing how to look,” or (hopefully not) “avoiding” the wet component of a shell midden site comes from one of the largest explored and well-documented sites on

the coast, the Glenrose Cannery Site (DgRr6), on the Fraser River Delta, B.C., Canada (Matson 1976). A very deep and continuously occupied shell midden “dry” site, it was carefully excavated since the 1970s. Only in the 1990s, when an offshore intertidal survey was conducted in front of the site, was a wet site, 250 m long by 15 m wide (3,750 sq m), discovered, dating to approximately 4500 cal B.P., including hundreds of fish trap stacks and parts of six basketry items, and representing the oldest wet site found in Coast Salish Territory (Eldridge 1991; Croes 2019:1). One must ponder why excavators for years did not see this intertidal wet site component (especially hundreds of fish trap stakes), no doubt walking the intertidal on breaks, during low tides, etc. Probably it required someone who knew “how to look,” and I argue it’s high time for Pacific Northwest archaeologists to learn this critical skill as an integral part of their approach to any sizable site. Morley Eldridge, Glenrose wet site lead surveyor, has published an excellent guide to finding these wet sites (2019:17–37).

I had zero reason to believe that the *Qwu?gwes* wet site, Olympia, Washington, contained a wet site component until testing. Using an auger, a drive in the intertidal midden brought up a piece of twisted cedar bough; only humans twist cedar boughs into ropes (Figure 2). A follow-up 1x1 m test square exposed two-strand bark strings that soon turned into a large area of webbed gill net; our equal partner on the dig, the Squaxin Island Tribe, were delighted (Figure 3, today Tribes openly and often financially support the recovery of the other 90% of their ancient material culture from wet sites).

THE CASE FOR US GETTING WET

As mentioned, wet sites contain the other 80–90% of the artifacts made and used by early Northwest Coast peoples....

Following a number of sites excavated in the 1970s and early 1980s, it became clear that all these sites were producing up to 90% of the ancient perishable material culture (Croes 1976, 1995, 2019, 2021). Also wet sites better preserve fauna and flora remains (the critical carbohydrate/sugar side of subsistence [Croes 2022]). At *Qwu?gwes*, the dry site shell midden mostly preserved salmon vertebra, while the connected wet site discard midden produced salmon vertebra and the more fragile heads and rib components in the correct ratio—an example of better wet site



FIGURE 2. (Top left) A twisted cedar bough rope piece from an auger test at the *Qwu?gweš* wet site—first indication of a wet site component with wood and fiber cultural materials was preserved.



FIGURE 3. (Bottom left, bottom right) The first sections of bark gill net recovered from the *Qwu?gweš* wet site in 1999 testing.

taphonomy (Croes et al. 2013). Also abundant, acorn shell remains at *Qwu?gweš* and acorns remains in over 100 hemlock branch lined acorn leaching pits at the Sunken Village wet site, Portland, Oregon, began demonstrating the value of acorn nuts to ancient central coast diets (Croes et al. 2009, 2013; Croes 2022).

Besides the spectacular Ozette household wood and fiber artifacts, observe the oldest (3,000-years-old) Hoko River wood sculptured and painted art, the end-hafted quartz crystal microblades (a defining artifact in Northwest archaeology), and the un-modified pebble hafted as a toy war club from the *Qwu?gweš* wet site (Figures 4–5). Also recovered are a beautiful formline-carved cedar handle from the 2,000-year-old Lachane wet site in Prince Rupert, B.C. (Inglis 1976:178), and the serpent sculpture on the yew wood atlatl dating to 1,700 years ago from the lower Skagit River, Washington (Fladmark et al. 1987). A unique aspect of wet site work is the frequent surprise discoveries. A founding figure in modern Northwest archaeology, Roy Carlson, pointed out early: “The fact that wet sites offer as many if not more ‘fossilized’ behavior patterns than the usual kind of



Oldest Wood Carved, and Painted. Art on Northwest Coast, dating to 3,000 Years Ago, from Hoko River Wet Site (lower), replicated in Cedar by Bill Holm Student (above) (reported in Hoko River, Dale Croes 1995:174-176, available on Amazon)



FIGURE 4. Hoko River wet site (45CA213): (left) oldest sculptured, and painted, wooden mat creaser dating from 3000 cal B.P. Both sides have a female (left) and male (right) belted kingfisher peak-to-peak forming the handle; (right) end hafted quartz crystal microblade on a cedar stick handle and bound with cherry bark.



FIGURE 5. Illustrated four sides and photograph of the tiny toy war club from the *Qwu?gwe*s wet site (45TN240; cm scale); the handle is split cedar wood, the wrapping is a cherry bark strip, and the head is a green sedimentary pebble (Illustration by Candra Zhang).

sites is quite true. They provide us with that many more artifact types, culture traits, and culture complexes to compare and trace through both time and spaces” (1976:264).

WET SITES OCCUR FROM THE EARLIEST OCCUPATIONS OF THE NORTHWEST COAST

A Paleoindian wet site dating to 10,700 cal B.P., the Kilgii Gwaay wet site (1325T) on southern Haida Gwaii, B.C., Canada, produced wooden wedges (showing the long-term success of this major woodworking technology), wrapped sticks, and a string spruce root and grass braid (Figure 6) (Fedje et al. 2005:187–203). This wet site demonstrates that these kinds of preserved sites should be found for as long as people have occupied the unglaciated coastal margin.



FIGURE 6. (Top left) Wooden wedge recovered in 2012 excavations at Kilgii Gwaay wet site; (top right) Daryl Fedje, Project Director, holding 10,700-year-old braid string fragment (bottom) made of spruce root and grass. Photographs courtesy of Daryl Fedje and Al Mackie.

Elsewhere wet sites have proven to be much earlier, even before anatomically modern humans, such as the 350,000 cal B.P. wooden spears/javelins found with butchered horses in a pond deposit, Schonigen, Germany, no doubt crafted and used by *Homo heidelbergensis* (Thieme 1997:807–810).

WHY WET SITES ARE DOABLE

I too often hear that wet sites are avoided because of the expense and unique equipment involved. If I can do 11 summer field seasons of wet, and dry, site excavations, operating out of a community college, at *Qwu?gweš*, then **any** university-based, or large cultural resource management (CRM), program can certainly investigate these kinds of sites. Yes, it requires different equipment, especially hydraulic excavation (pumps, hoses, fine adjust nozzles—easily obtained locally), but, in fact, such equipment is often used for wet screening at non-wet sites anyway. For conservation, it can involve purchasing polyethylene glycol (PEG, a very safe chemical) and plastic tubs to hold a 50/50 mixture of water and PEG. Of course, this is the basics of the approach, but like any archaeological work, the specific logistics can be worked out (e.g., Bernick 2019:39–58).

AND THEN THERE’S BASKETRY AND CORDAGE...

Recovered basketry and cordage artifacts (often numbering hundreds if not thousands from wet sites) are often emblematic of cultural evolution.

Through four decades of basketry and cordage research, I have tested style similarities in specific regions of the Northwest Coast. In recent work with Salishan Master Basketmaker Ed Carriere, Suquamish Elder, we have coined our approach as *Generationally-Linked Archaeology* (Carriere and Croes 2018:216–218; Croes, Carriere, and Stapp 2018). Fortunately Ed was raised from infancy by his Great-Grandmother Julia Jacobs, who grew up in Old Man House, a cedar plank longhouse, until she was a teenager. Also importantly Ed, as a teenager, learned from her how to make the old-style clam baskets from split cedar limbs and roots, emphasized in all ancient Salish Sea basketry from 4,500-year-old Glenrose Cannery wet site on to Julia’s training.

Working from as far back as possible (deep time), I have tested degrees of similarity of basketry and cordage attributes (modes) and types from all

available wet sites (for examples, Figure 7A–7E and associated map, Figure 8). The different statistical tests and accompanying map shows regional evolution and relatively stable cultural styles, especially in Ed Carrier’s (Salishan) region and those from the outside (Wakashan) West Coast sites for 3,000 years (Croes 2019, 2021) (Figure 9, Figure 10). Also, up north, 2,000-year-old Lachane wet site styles linked well with historic Tsimshian museum styles and the single 6,000-year-old Silver Hole basket linked best with historic Tlingit museum styles (Croes 1989, 2001) (Figure 7E, Figure 9).

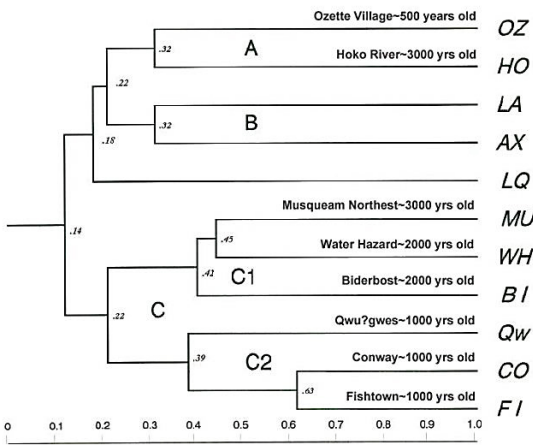
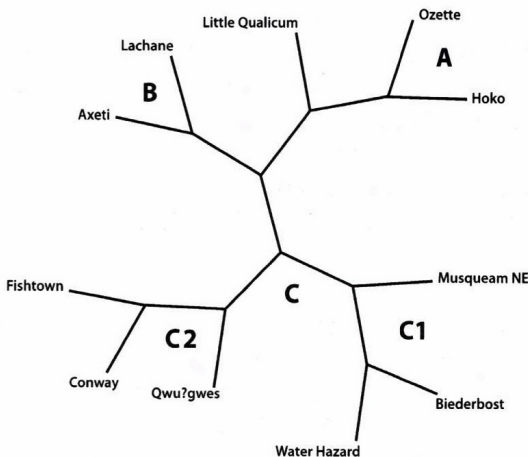


FIGURE 7.

7A. (Top) Average linkage cluster analysis dendrogram (after 40 years of data collection) representing links in Northwest Coast wet site basketry attributes (modes) (Croes 2019:144).

7B. (Bottom) A Cladistic unrooted cladogram representing tests derived from Northwest Coast basketry types (Croes et al. 2005:146–147).



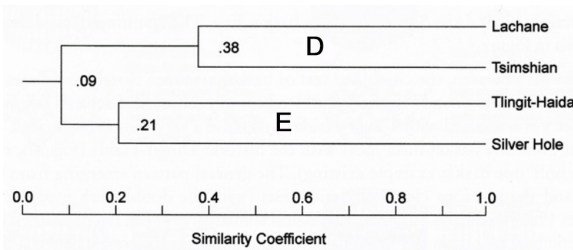
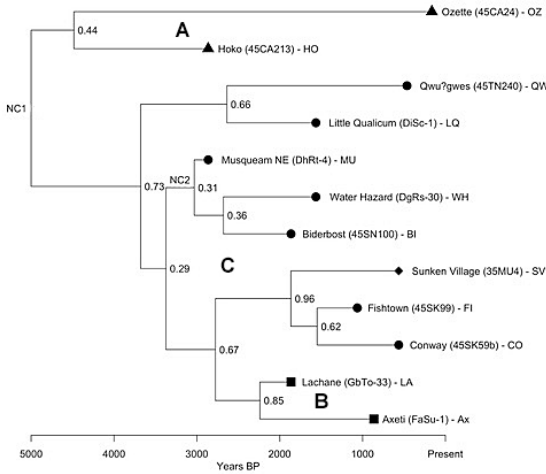
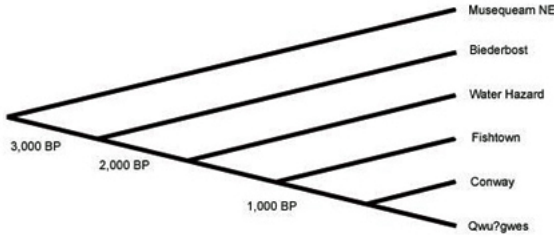


FIGURE 7. (cont.)

7C. (Top) A Cladistic test produces a slanted cladogram from only inner Salish Sea wet sites (Cluster C of the unrooted cladogram [7B]), and arranges in distinct temporal ordering, even though site dates are not considered as part of the testing (see Figure 8, below; Carriere and Croes 2018:1333–136; Croes 2019:192).

7D. (Middle) Bayesian phylogenetic test time-calibrated maximum clade credibility tree based on 66 cordage subtypes from 12 wet sites—incorporating chronological data (Croes 2021:86–87).

7E. (Bottom) Average linkage cluster analysis of North Coast basketry attributes (modes) from (1) Lachane wet site, (2) historic Tsimshian museum collections, (3) historic Tlingit-Haida museum collections, and (4) the Silver Hole wet site basket (Croes 1989, 2001, 2019:395).

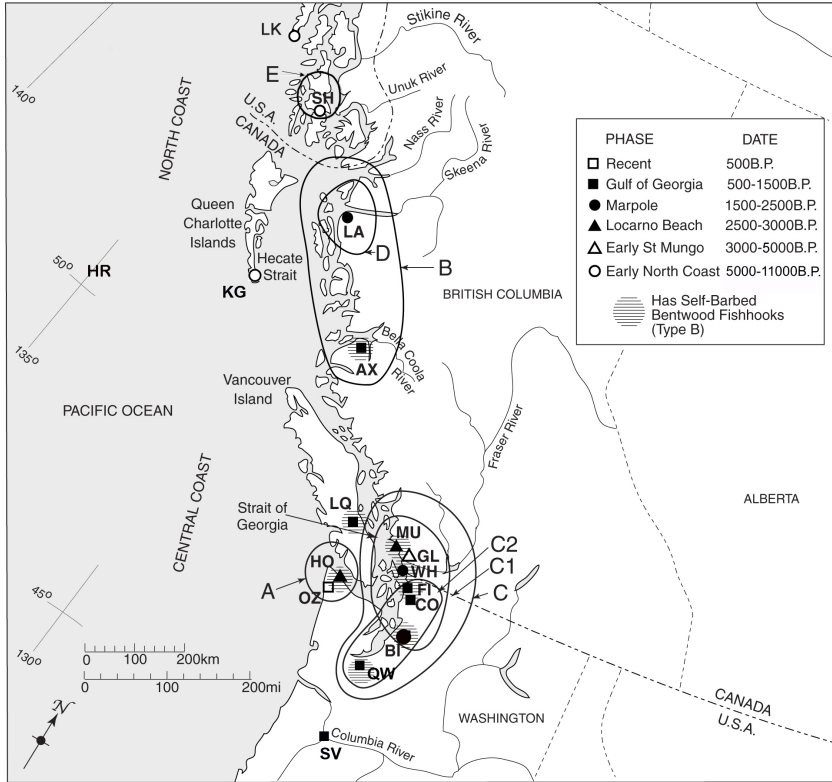


FIGURE 8. Northwest Coast wet sites distributions showing major areas of basketry and cordage style continuity. Site key: LK=Lanaak (49XPA78), SH=Silver Hole (49CCRG433), LA=Lachane (GbTo-33), KG=Kilgii Gwaay (1325T), AX=Axeti (FaSu-1), LQ=Little Qualicum (DiSc-1), MU=Musqueam NE (DhRt-4), GL=Glenrose Cannery (Dg Rr-6), WH=Water Hazard (DgRs-30), FI=Fishtown (45SK99), CO=Conway (45SK59b), BI=Biderbost (45SN100), QW=*Qwu?gwes* (45TN240), SV=Sunken Village (35MU4), HO=Hoko (45CA213), and OZ=Ozette (45CA24). Map adapted from original by Susan Matson.

MAKING THE TRANSITION INTO WET SITE EXPLORATION AND NEEDED FACILITIES

My institutions of work have been happy to support the acquisition of needed pumps, hoses (fire and garden), and fine adjust nozzles for exploring wet sites (whether Ozette, Hoko River, *Qwu?gwes*, or Sunken Village). For general survey work, a battery-operated garden hose pump from a boat was really useful for cleaning and exploring riverbank blue-gleyed clay banks.

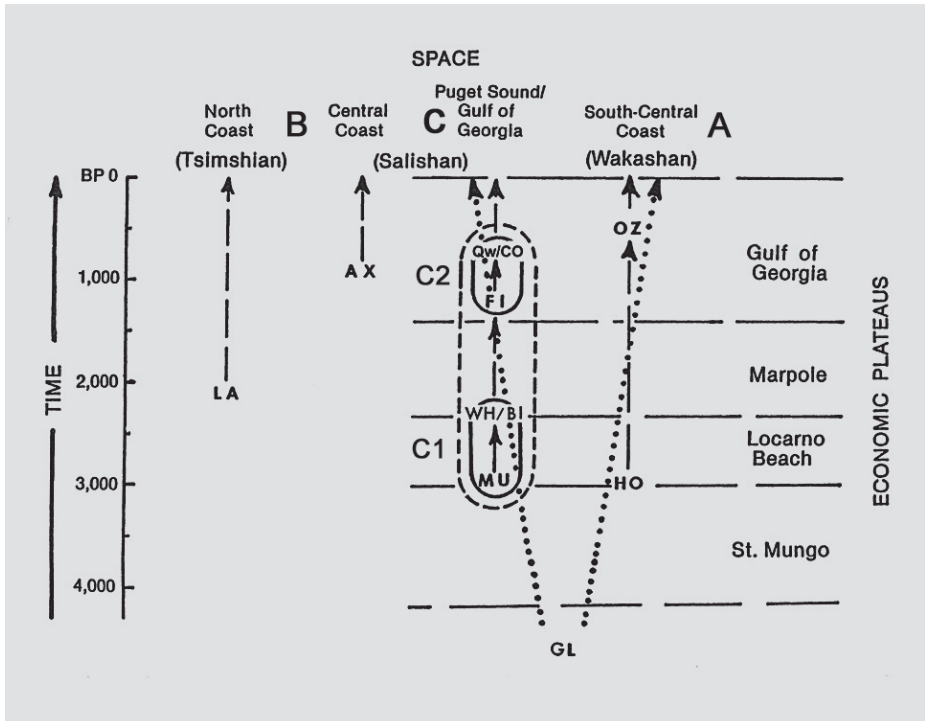


FIGURE 9. Following four decades of testing, this chart represents stylistic/ethnic continuity patterns, based on basketry and cordage statistical analyses and tests (Figure 7), through time and space (Croes 2015, 2019, 2021). Economic Plateaus on right are the designated archaeological phases that south-central coast areas passed through together based on comparisons of their stone, bone-antler, shell (SB-AS) artifacts; these SB-AS artifacts mostly reflect subsistence and manufacturing activities (Croes 2015). Main regions of basketry and cordage style continuity (labelled A–C, and subgroups C1 and C2) can be seen in Figure 7 tests and map with site designations in caption (Figure 8).

In terms of providing wet site lab space, my wet site works with South Puget Sound Community College (SPSCC) at *Qwu?gwes* and Sunken Village gave them incentive to provide needed facilities, as required for permits. They identified a low-use men's locker room on campus and easily converted the shower area into opposing stainless steel sinks with overhead sprayers, and the lockers were removed and lab tables and storage shelves installed for instruction. Grants from the college allowed the purchase of polyethylene glycol preservative and sealing plastic tubs for conservation of wood and fiber

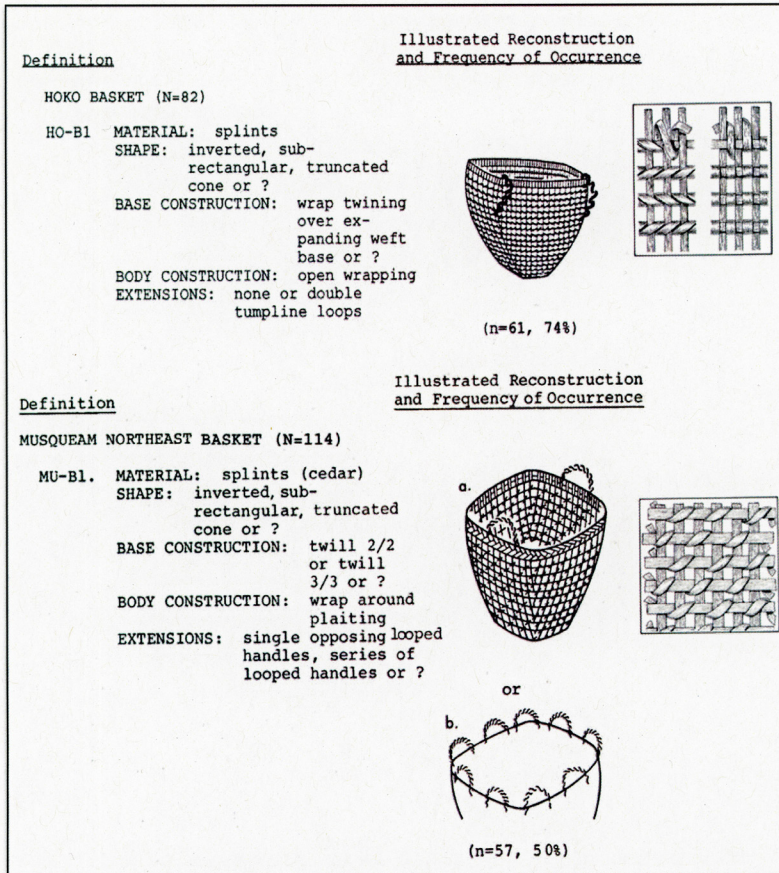


FIGURE 10. Definitions of the common pack basket types from the contemporary 3,000-year-old Hoko River and Musqueam Northeast wet sites (Croes 1995, 2015, 2019). Though functionally equivalent pack baskets, note the considerable stylistic difference—likely carrying emblematic identity symbolism.

artifacts. Later, a new building was planned, and the SPSCC administration had me design how my classroom/lab would be constructed. Rows of sinks on one side of the classroom were installed, and a back room was fitted with a large stainless steel flotation sink, a refrigerator/freezer, and ample shelving for artifacts and space for excavation equipment.

The eventual curation facilities of recovered archaeological items, whether fauna/flora, wood, fiber, bone, shell and stone artifacts, etc., usually needs to be demonstrated for a permit. For *Qwu?gwes*, the equal-

partner on the project, the Squaxin Island Tribe, had a state-of-the-art curation facility at their new museum, and the agreement always was to keep heritage items in their Tribe. For Sunken Village, a National Historic Landmark Site, the National Park Service assumed responsibility for the proper curation, and a conservator was brought in, and she properly labeled and packed the preserved/processed artifacts for movement to the Museum of Anthropology at the University of Oregon in compliance with our permits from the Oregon State Historic Preservation Office.

SUMMARY AND CONCLUSION

Pacific Northwest Coast wet sites are both common and not that difficult to investigate and have abundant new kinds of data to add to our understanding of the archaeology of this dynamic coastal region. Wet site work remains “new current research” since it is not a mainstream approach yet. We need to encourage new and future Pacific Northwest archaeologists to get wet—or much wetter—for the great benefit of ongoing Pacific Northwest archaeological research.

A summary of water-mark points for getting wet:

- We need to start becoming familiar with “how to look”—read Morley Eldridge’s guide to finding wet sites (2019:17–37).
- The other 90+% of ancient Northwest Coast material culture can be recovered, including
 - Complete composite tools with wood and/or fiber components;
 - Superior faunal preservation, as well as critical flora food remains;
 - Painted and sculptured art and status symbols;
 - Analytically sensitive basketry and cordage artifacts;
 - Complete subsistence, manufacturing, and storage technologies.
- This kind of archaeology is not expensive, with equipment and conservation techniques easily available.
- Museums and repositories typically and enthusiastically accept wet site artifacts, often providing popular display materials.
- Northwest Native peoples, as well as the overall public, appreciate and support the comprehensive/all-embracing recovery of the ancient past from wet sites.

Therefore, wet sites have abundant new kinds of data to add to our understanding of the ancient history of our dynamic region. We need to encourage current, new, and future Pacific Northwest archaeologists to get wet—or much wetter—for the greatly expanded benefit of Pacific Northwest archaeological research.

REFERENCES CITED

Bernick, Kathryn

2019 Recovering and Caring for Wet Perishable Artifacts: Strategies and Procedures. In *Waterlogged, Examples and Procedures for Northwest Coast Archaeology*, edited by Kathryn Bernick, pp. 39–58. Pullman: Washington State University Press.

Borden, Charles E.

1976 A Water-Saturated Site on the Southern Mainland Coast of British Columbia. In *The Excavation of Water-Saturated Archaeological Sites (Wet Sites) on the Northwest Coast of North America*, edited by Dale R. Croes, pp. 233–260. *National Museum of Man Mercury Series, Archaeological Survey of Canada*, Paper No. 50, Ottawa.

Carlson, Roy L.

1976 Discussion. In *The Excavation of Water-Saturated Archaeological Sites (Wet Sites) on the Northwest Coast of North America*, edited by Dale R. Croes, p. 264. *National Museum of Man Mercury Series, Archaeological Survey of Canada*, Paper No. 50, Ottawa.

Carriere, Ed, and Dale R. Croes

2018 *Re-Awakening Ancient Salish Sea Basketry, Fifty Years of Basketry Studies in Culture and Science*. Richland, WA: Northwest Anthropology LLC.

Croes, Dale R., editor

1976 The Excavation of Water-Saturated Archaeological Sites (Wet Sites) on the Northwest Coast of North America. *National Museum of Man Mercury Series, Archaeological Survey of Canada*, Paper No. 50, Ottawa.

Croes, Dale R.

1989 Lachane Basketry and Cordage: A Technological, Functional and Comparative Study. *Canadian Journal of Archaeology*, 13:165–205.

- 1995 *The Hoko River Archaeological Site Complex, the Wet/dry Site (45CA213), 3,000–2,600 B.P.* Pullman: Washington State University Press.
- 2001 North Coast Prehistory—Reflections from Northwest Coast Wet Site Research. In *Perspectives on Northern Northwest Coast Prehistory*, edited by Jerome S. Cybulski, Mercury Series Paper, 160:145–171. Hull, Quebec: Canadian Museum of Civilization.
- 2005 *The Hoko River Archaeological Site Complex, The Rockshelter (45CA21), 1,000–100 B.P.*, with contributions by Barbara Stucki and Rebecca Wigen. Pullman: Washington State University Press.
- 2015 The Salish Sea: Using Wet and Dry Site Archaeology to Explore the Defining Temporal Characteristics of this Inland Sea. *Journal of Wetland Archaeology*, 15(1):72–108. Oxford, U.K.: Oxbow Books Ltd.
- 2019 Basketry from the Ozette Village Archaeological Site: A Technological, Functional, and Comparative Study. Ozette Archaeological Project Research Reports Volume IV. *Journal of Northwest Anthropology Memoir* 17; WSU Department of Anthropology Reports of Investigations 69. Richland, WA: Northwest Anthropology LLC; Pullman: Washington State University.
- 2021 Cordage from the Ozette Village Archaeological Site: A Technological, Functional, and Comparative Study. *Journal of Northwest Anthropology Memoir* 21. Richland, WA.
- 2022 A Quarter of a Million Salal Berries and Potential for 2.5 Million Acorns from Central Northwest Coast Archaeological Wet Sites—Time to Recognize their Plant Food Significance. In *Journal of Northwest Anthropology, Special Publication #6*, pp. 15–21, Richland, WA.
- Croes, Dale R., Ed Carriere, and Darby C. Stapp
- 2018 Generationally-Linked Archaeology. *The SAA Archaeological Record*, 18:5. Washington: Society for American Archaeology.
- Croes, Dale R., John L. Fagan, and Maureen Newman Zehendner
- 2009 Sunken Village, Sauvie Island, Oregon, USA. A Report on the 2006–2007 Investigations of National Historic Landmark Site 35MU4. *Journal of Wetland Archaeology Special Edition*, 9:1–216. Exeter, U.K.: Oxbow Books.
- Croes, Dale R. with Rhonda Foster and Larry Ross, editors
- 2013 Qwu?gwes—*The Qwu?gwes Archaeological Site and Fish Trap (45TN240) and Tested Homestead (45TN396), Eleven-Year South Puget Sound Community College Summer Field School Investigation with the Squaxin Island Tribe—Final Report*. On file and online with the Washington Department of Archaeology and Historic Preservation (WDAHP), Olympia, WA.

Drucker, Philip

- 1943 Archaeological Survey on the Northern Northwest Coast. *Bureau of American Ethnology Bulletin* 133:17–142 (*Anthropological Papers*, No. 20). Washington: Smithsonian Institution.

Eldridge, Morley

- 1991 *Glenrose Cannery Wet Component: A Significance Assessment*. Millennia Research Ltd. Report prepared for the B.C. Archaeology Branch, Victoria.
- 2019 *Wet Sites: A Guide to Finding Them*. In *Waterlogged, Examples and Procedures for Northwest Coast Archaeology*, edited by Kathryn Bernick, pp. 17–37. Pullman: Washington State University Press.

Fedje, D.W., A.P. Mackie, R.J. Wigen, Q. Mackie, and C. Lake

- 2005 *Kilgii Gwaay: An Early Maritime Site in the South of Haida Gwaii*. In *Human History and Environment from the Time of Loon to the Time of the Iron People*, edited by D.W. Fedje and R.W. Mathewes, pp. 187–203. Vancouver-Toronto: UBC Press.

Fladmark, K.R., D.E. Nelson, T.A. Brown, J.S. Vogel, and J.R. Southon

- 1987 AMS Dating of Two Wooden Artifacts from the Northwest Coast. *Canadian Journal of Archaeology*, 11:1–12.

Inglis, Richard

- 1976 'Wet' Site Distribution—the northern case, GbTo 33 — the Lachane site. In *The Excavation of Northwest Coast Water Saturated Archaeological Sites (Wet Sites) on the Northwest Coast of North America*, edited by Dale R. Croes, pp. 45–47. *National Museum of Man Mercury Series, Archaeological Survey of Canada*, Paper No. 50, Ottawa.

Matson, R.G., editor

- 1976 The Glenrose Cannery Site. *National Museum of Man Mercury Series, Archaeological Survey of Canada*, Paper No. 52, Ottawa.

Thieme, Hartmut

- 1997 Lower Paleolithic Hunting Spears from Germany. *Nature*, 385(27):807–810.

8. X-RAY FLUORESCENCE AT SIMON FRASER UNIVERSITY DEPARTMENT OF ARCHAEOLOGY

Rudy Reimer

Simon Fraser University



FIGURE 1. *Nch'kay* (Mount Garibaldi) as viewed from Squamish, British Columbia.

INTRODUCTION

X-ray fluorescence (XRF) at Simon Fraser University (SFU), Department of Archaeology has a rich history of leading the investigations of archaeological materials in the Pacific Northwest that are suitable for this type of analysis (i.e., homogenous lithics and other materials). This essay will give a summary history that highlights the establishment of an initial XRF lab, the growth of a large obsidian source reference library, the formulation of broad scale Pacific Northwest exchange networks, a hiatus of XRF analysis and a XRF revolution, and re-establishment of a XRF lab. These developments are important at this time as the introduction of portable XRF instruments have on one side democratized the use of such instrumentation and on the other created a lack of methodical rigor and quality assurance.

INITIAL XRF LAB AT SFU

The Department of Archaeology at SFU was created in 1971 with Roy Carlson as its founder. Other tenure track faculty were quickly hired, including Dr. Erle Nelson. Working with other faculty in the Chemistry and Physics departments at SFU, Dr. Nelson built an XRF lab that was housed in the Chemistry department (Nelson et al. 1975). The XRF lab instrumentation filled a room approximately 10m x 10m with samples having to meet strict requirements, and it took 10 minutes to run a sample! A far cry when compared to the portable XRF and laptop computer we use today. With this new facility, SFU Archaeology faculty and graduate students were encouraged to fan out across the Pacific Northwest (and beyond) to collect source materials to be brought back for analysis (e.g., Nelson and Will 1971; Nelson 1975). Only after a suitable reference library was established could “sourcing” be done. The reference library quickly grew and was inherited by me for its continued use (Table 1). I stress here that reference libraires are key to any sourcing study as they provide a true statistical representation of the variability within and between sources when examined by XRF and other techniques. Building such a library also requires a significant amount of time, energy, and funding to access, collect, and bring samples back to the lab.

FLUCTUATIONS OF THE USE OF LITHIC SOURCES AND ANCIENT EXCHANGE SYSTEMS

With the reference collection in place, SFU archaeologists were then able to engage in new forms of research. An excellent example to this is Fladmark’s (1984, 1985) research on Mount Edziza. The Mount Edziza complex is an alpine source with 10 distinctive flows that range over a vast area (Reimer 2015). Edziza is potentially the largest and longest used source of obsidian in North America as material from its flows spans from Alaska, Yukon, Alberta, and British Columbia (Reimer 2015). An online map area calculator reveals an area of 1,817,072 km². However, other obsidian sources are not as large and have notable fluctuations in their use, such as *Nch’kay* (Mount Garibaldi) (Figure 1). *Nch’kay* is a single flow source also in an alpine context, but its uses and distribution is restricted to the Salish Sea, and its accessibility was hampered by neoglacial advances over the Holocene (Reimer 2000, 2003, 2012, 2014).

**TABLE 1. SOURCES IN THE CURRENT SFU ARCHEOLOGY XRF LAB
OBSIDIAN REFERENCE LIBRARY.
(*indicates a source with multiple distinct flows)**

B.C. SOURCES	WASHINGTON SOURCES	OREGON SOURCES	IDAHO SOURCES	YUKON/ ALASKA SOURCES
Anahim	Copper Ridge	Glass Buttes*	Bitterroot Mountain	Batza Tena
Dean Channel	Douglas Creek	Newberry*	Bear Gulch	Obsidian Cove
Edziza*	Elk Pass	Obsidian Cliff	Cougar Mountain	Hoodoo Mountain
Masset	Hosko*	Paulina Creek	Pine Pass	Wiki
Ilgachuz*	Indian Rock	Riley	Yellowstone	-
Kingcome	Stray Gulch Tachylyte	Whitewater Ridge	Timber Butte	-
Mackenzie Pass	Bickleton Ridge	Hoona Ridge	-	-
Nch'kay	-	Beaver Mountain	-	-
Mount Meagher	-	-	-	-
Uknown Central Coast B	-	-	-	-

On a large-scale Carlson's (1994) seminal contribution is still to this day a useful guide for the spatial and temporal use of multiple obsidian sources. He was able to map out a northern, central, and southern set of exchange networks from almost 2,000 samples. Some aspects of these networks still hold today. Carlson's synthesis also illustrated the fluctuations in access and use by a wide range of cultural groups as based on dozens of archaeological sites in the Sub-Arctic, Plateau, and Northwest Coast.

DEATH AND REINCARNATION OF XRF AT SFU DEPARTMENT OF ARCHAEOLOGY

In the late 1990s and early 2000s, the XRF lab at SFU had become outdated as advances in instrumentation made it quicker and cheaper to examine materials. Funding for lab staff also dropped off and the

instrumentation then became difficult to maintain. When I was hired by SFU First Nations Studies and Archaeology departments, I was trying to finish my Ph.D. dissertation. My research focused on lithic sourcing in the Salish Sea (Reimer 2012, 2018a) where I was able to borrow a Bruker III-V portable XRF (pXRF) instrument to conduct my analysis. Compared to other instrumentation I had used (neutron activation, dated desktop XRFs), these new types of handheld units were remarkable; they were small, portable, and samples only took minutes to acquire data. I have also used them at obsidian and other lithic sources to examine materials in the field, saving valuable time and not having to transport numerous samples. In 2011, SFU Archaeology was able to purchase our own pXRF. From 2011 to 2018, approximately 50,000+ samples were examined by me, SFU faculty, Archaeology Museum staff, and graduate and undergraduate students. Over this time a wider range of other materials were examined for lithic sourcing, curation, and museum collections and art authentication (e.g., Reimer 2018b). Materials were run for my research, other academics, cultural resource management companies, First Nations communities, and the public. This resulted in several publications, many theses, and numerous technical reports. In 2018 my Tracer III-V+ x-ray tube burned out, but I was able to purchase a new Tracer 5i, and research focus began to change as the data accumulated allowed for new nuances into broader venues of inquiry.

SOCIAL SPHERES OF INFLUENCE AND THE IMPORTANCE OF LANDSCAPE FEATURES

As I have previously mentioned in an article in the *Journal of Northwest Anthropology* (Reimer 2018a), the obsidian sources in B.C. and elsewhere in the Pacific Northwest are all in mountainous locations that are difficult to access. This would have certainly played a role of how they were accessed and by who. Indigenous place names and landscape knowledge played a significant role in the access, use, and distribution of lithic sources. With this in mind, archaeologists across the region who are working on mapping the distributions of lithic materials have begun to present data in new and imaginative ways. These studies have started a new generation of inquiry into lithic materials that are not just obsidian (Ozbun and Adams 2015). They also present data sets at a large scale (Connolly et al. 2015) and at a smaller scale in and between

archaeological sites (Reimer and Hamilton 2015). My current research on obsidian sources in British Columbia is gathering data sets related to the major sources across the province and plotting distributions of those materials as heat maps. This methodology builds on older models such as fall off curves (Renfrew 1969; Earle and Ericson 1977). When combined on a regional scale, this will allow for detailed consideration of ancient social-political networks and the effects of landscape features to the distributions of lithic materials. Initial plots of *Nch'kay* and Kingcome obsidians in the Salish Sea illustrate different geographical distributions that are likely due to social-political ties between communities who had control over the use of these sources (Figure 2).

CONCLUSION

It is difficult to present a fuller picture of the history of XRF at SFU Department of Archaeology in a short piece such as this, yet I wish to encourage the application of existing and new directions in the study of lithic materials in the Pacific Northwest that I have been involved with.

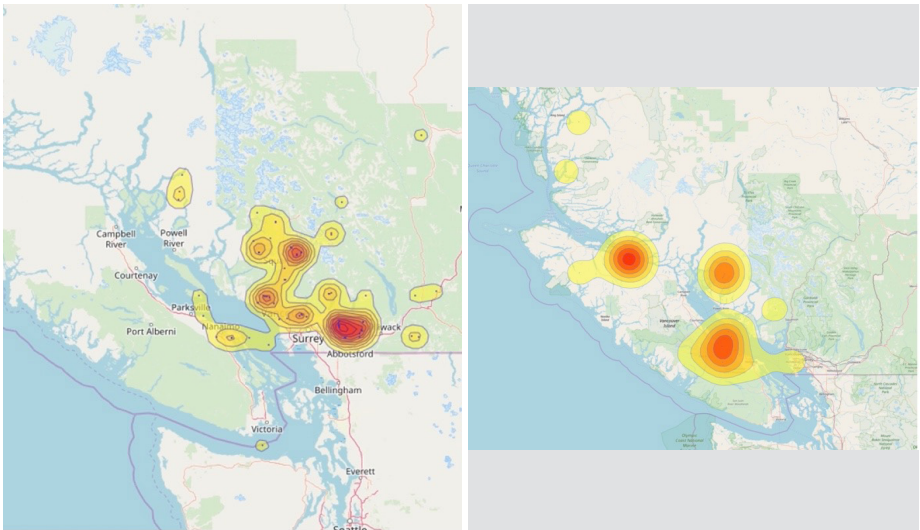


FIGURE 2. Heat map distributions of *Nch'kay* (Mount Garibaldi) on the left and Kingcome obsidians on the right.

1. To ensure methodological rigor, it is foundational to any attempt to the study of sourcing lithic materials to acquire a representative sample of materials that originate from a well-documented and sampled source. These materials should be examined in labs using consistent parameters that are standardized in the region's established literature. I also encourage that researchers share source samples with other labs to help build their mutual reference libraries. These approaches can ensure consistent data sets and prevent the occurrence of unknowns and random assertions of the occurrence of lithic materials in the archaeological record.
2. I encourage researchers to give greater consideration of Indigenous knowledge pertaining to lithic sources and materials. This includes place names, oral history and traditions, and other forms of cultural knowledge.
3. Explore other lithic materials beyond obsidian, especially if they are geochemically homogenous (e.g., fine grained volcanics). Researchers should consider these alongside obsidian when setting frameworks of lithic material use and distributions.
4. Explore data sets in new ways that use innovative presentations to the distributions of lithic materials, and present them in reports and publications.

REFERENCES CITED

Carlson, Roy, L.

1994 Trade and Exchange in Prehistoric British Columbia. In *Prehistoric Exchange Systems in North America*, edited by T.G. Baugh and J. E. Ericson, pp. 307–361. New York, NY: Plenum Press.

Connoly, Tomas J., Craig E. Skinner, and Paul Baxter

2015 Ancient Trade Routes for Obsidian Cliffs and Newberry Volcano Glass in the Pacific Northwest. In *Toolstone Geography*, edited by Ronald Adams and Terry Ozbun. Burnaby, B.C.: Simon Fraser Archaeology Press.

Earle, Timothy K., and Jonathon E. Ericson

1977 *Exchange Systems in Prehistory*. New York, NY: Academic Press.

Fladmark, Knut

1984 Mountain of Glass: Archaeology of the Mount Edziza Obsidian Source, British Columbia, Canada. *World Archaeology*, 16(2):139–156.

1985 *Glass and Ice, The Archaeology of Mount Edziza*. Burnaby, B.C.: Simon Fraser University, Department of Archaeology, Publication No. 14.

Nelson, Erle

1975 The Uses of X-Ray Fluorescence Analysis In Archaeology. *Syesis*, 8: 91–95.

Nelson, Erle, and George Will

1971 Obsidian Sources in the Anahim Peak Area. In *Current Research Reports*. Burnaby, B.C.: Simon Fraser University, Department of Archaeology, Publication No. 3.

Nelson, D.E., J.M. D'Auria, and R.B Bennett

1975 Characterization of Pacific Northwest Coast Obsidian by X-ray Fluorescence. *Archaeometry*, 17(1):85–97.

Ozbun, Terry L., and Ron L. Adams

2015 *Toolstone Geography of the Pacific Northwest*. Burnaby B.C.: Simon Fraser University Archaeology Press.

Reimer, Rudy

2000 Extreme Archaeology: The Results of Investigations at High Elevation Regions in the Northwest. Unpublished Master's thesis, Department of Archaeology, Simon Fraser University, Burnaby, B.C.

2003 Alpine Archaeology and Oral History of the Squamish. In *Archaeology of Coastal British Columbia: Essays in Honor of Phillip M. Hobler*, edited by Roy L. Carlson. Burnaby B.C.: Simon Fraser University Archaeology Press.

2012 The Mountains and Rocks are Forever: Lithics Landscapes of *Skwxwu7mesh Uxwumixw*. Unpublished Ph.D. dissertation, McMaster University, Hamilton, Ontario.

2014 The *Nch'kay* (Mount Garibaldi) Obsidian Source and its Local to Regional Archaeological Distribution. *International Obsidian Studies Bulletin*, 50:10–17.

2015 Reassessing the role of Mount Edziza obsidian in northwestern North America. *Journal of Archaeological Science: Reports*, 2:418–426.

2018a The Social Importance of Volcanic Peaks for the Indigenous Peoples of British Columbia. *Journal of Northwest Anthropology*, 52(1):4–35.

2018b The Watts Point quarry and its role in Salish Sea archaeology, southwestern British Columbia, Canada. *Journal of Archaeological Science: Reports*, 18C:499–508.

Reimer, Rudy, and Tyrone Hamilton

2015 Implications between Technological Organization and Portable X-Ray Fluorescence Analysis on Lithic Material Use at Two Rockshelter Sites on the southern Northwest Coast. In *Toolstone Geography*, edited by Ronald Adams and Terry Ozbun. Burnaby, B.C.: Simon Fraser University Archaeology Press.

Renfrew, Colin

1969 Trade and Cultural Process in European Prehistory. *Current Anthropology*, 10(2-3):151–160.

9. NEW COLLECTIONS-BASED RESEARCH ON THE LIND COULEE SITE (45GR97), WASHINGTON

Richard L. Rosencrance

Great Basin Paleoindian Research Unit,
Department of Anthropology, University
of Nevada, Reno

Museum of Natural and Cultural History,
University of Oregon

Katelyn N. McDonough

Department of Anthropology, University
of Oregon

Museum of Natural and Cultural History,
University of Oregon



FIGURE 1. View looking north of 1952 excavations at Lind Coulee with excavators uncovering bison bones *in situ*. Original photo is property of the Washington State Museum of Anthropology and the U.S. Bureau of Reclamation and used here with permission.

INTRODUCTION

The Lind Coulee Site (45GR97), located in central Washington, is arguably one of the most important archaeological sites west of the Rocky Mountains (Figure 1). Dating to the late Pleistocene and Early Holocene, the site was first excavated by Richard Daugherty (1956) between 1951 and 1953 and later during a series of field seasons by Irwin and Moody (1978) between 1972 and 1975. It contains some of the earliest evidence

for bison (*Bison* spp.) hunting and processing in the Far West as well as robust osseous and lithic tool assemblages. Wilson's (2008) faunal analysis, the distribution of tools, and the nature of the tools further suggest Lind Coulee was a residential location containing a wide array of evidence that is exceptional for the arid Far West. The lithic assemblage is critical to our understanding of the earliest peoples to live in the Columbia Plateau, as it contains a stratified sequence of diagnostic Western Stemmed Tradition (WST) projectile points (Craven 2003, 2004) and is one of only a few sites with crescents in a buried, dated context (see Smith et al. 2014). With the rise in prominence of the WST in debates about the peopling of the Americas (Waters 2019) and evidence that WST technology is at least coeval with and probably older than Clovis technology (e.g., Paisley Caves [Jenkins et al. 2012]; Cooper's Ferry [Davis et al. 2014; Davis et al. 2019]), it is critical to reexamine the Lind Coulee Site to better situate it within today's Indigenous and archaeological landscapes. This essay details the goals of our renewed research on the site collection, including research questions, ongoing analyses, and anticipated results. Our approach is fully collections-based research, and we do not have plans or intent to renew fieldwork any time soon.

SITE BACKGROUND

The Lind Coulee Site is located on the homelands of the Confederated Tribes of the Colville Reservation and the Confederated Tribes and Bands of the Yakama Nation in central Washington (Figure 2). It was the first WST site identified, excavated, and radiocarbon dated (although not accurately) in the Columbia Plateau (Daugherty 1956; Lyman 2000). The collection is housed at the Washington State University Museum of Anthropology (WSMA) and remains one of the oldest sites in the region where it is well-known to Indigenous communities and local archaeologists but less well-known to archaeologists across the continent. We briefly review the site here to refamiliarize readers and set the stage for the description of our new research questions.

The Lind Coulee Site is located along a stream channel from which it derives its name in Washington's Channeled Scablands (Daugherty 1956; Alt 2001). Grass phytoliths preserved in loess deposits throughout the region suggest the area was dominated by *Festuca* grasslands (Blinnikov et al. 2002) during the late Pleistocene when people inhabited Lind Coulee,

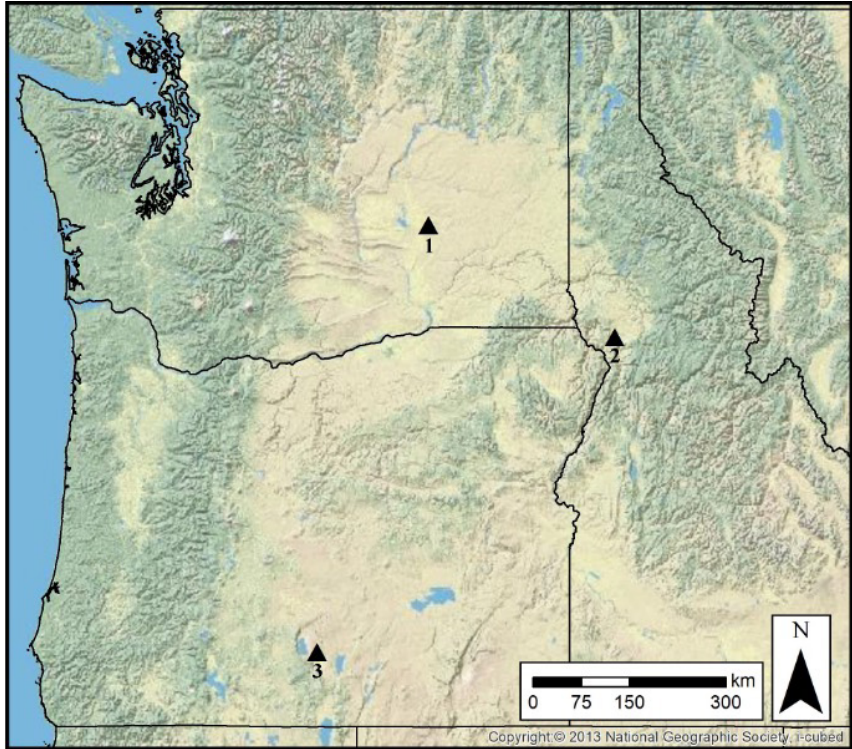


FIGURE 2. Map showing location of Lind Coulee (1), Cooper's Ferry (2), and Paisley Caves (3).

with a cooler and more mesic climate than today. The sedimentary records at Lind Coulee, formed primarily through overbank flooding, indicate the channel regularly flooded and may have been a perineal water source (Amara 1975; Moody 1978). The composition of the site's faunal assemblage further supports these paleoenvironment studies; for example, it contains a high abundance of grass-consuming taxa, such as bison, and semiaquatic taxa, such as beaver (*Castor canadensis*; Wilson 2008).

Irwin and Moody's (1978) report to the U.S. Bureau of Reclamation (who manage the site property) is the most comprehensive report on the 1970s excavations; however, that report is neither exhaustive nor easily accessible. Figure 3 shows the site during excavations in the 1970s. There have been numerous studies on the site collection since the 1970s, most of which are theses or dissertations. These include work on the



FIGURE 3. Photo looking north of in-progress excavations at the Lind Coulee Site in the 1970s. Original photo is property of the Washington State Museum of Anthropology and the U.S. Bureau of Reclamation and used here with permission.

geoarchaeology (Amara 1975; Moody 1978), lithic assemblage (Craven 2003), and faunal remains (Wilson 2008). Peer-reviewed publications beyond Daugherty's (1956) original article are limited to examinations of the bone needle assemblage (Flenniken 1976; Lyman 2015), a short report on new radiocarbon dates (Craven 2004), and the inclusion of the faunal data as part of broader studies (Lyman and O'Brien 1999; Lyman 2012, 2013, 2014). As such, despite the extraordinary importance of Lind Coulee to North American archaeology and history, there remains much work to be conducted and reported on the site. A primary goal of our research is to better consolidate current understandings, interpretations, and outstanding research questions about the site while providing new data and perspectives with new analyses.

Wilson's (2008) faunal analysis suggests Lind Coulee was a stream-side residential locality where people focused on bison processing, with

elk (*Cervus canadensis*) and lesser amounts of small game as secondary foci. The tool assemblage includes Haskett and Lind Coulee type projectile points (Rosencrance 2019), two crescents, scrapers, eyed bone needles, possible bone harpoons, many ochre fragments, and handstones and a palette stone covered in ochre (Daugherty 1956; Irwin and Moody 1978). Lyman (2015) suggested there were specific workstation areas based on an examination of the bone needle assemblage and distribution of artifacts across the occupation surfaces. The largest issue is the chronology of the site (see below), although there has never been attempts to examine botanical remains, nor any systematic study of the unifacial lithic assemblage or rigorous spatial analysis.

Our research questions fall into the categories just described. First, (1) how old are the deposits at Lind Coulee, and how many sequential occupations occurred; (2) do projectile point forms vary chronologically, and if so, how does that compare to the rest of the Far West; (3) what evidence in the lithic assemblage is there for lithic technological organization, mobility, and specific site use; (4) what can the spatial arrangement of the cultural materials illuminate about site formation processes and differential use of site space; and (5) are there botanical remains preserved within the unanalyzed combustion features, and if so, what plant resources were people using and how do they compare to broader dietary records?

CHRONOLOGY BUILDING

The precise chronology of the Lind Coulee Site is somewhat ambiguous, and we list all dates from the site in Table 1. Daugherty (1956) sent numerous burned bison bone fragments to Willard Libby as the radiocarbon dating method was first being established. Libby (1954:739) obtained two different radiocarbon counts which he averaged and reported as a date of 8700 ± 400 ^{14}C B.P. (11,070–8640 cal B.P.), making it the oldest radiocarbon dated site in the Columbia Plateau at the time (Lyman 2000). Dating efforts following the 1970s excavations resulted in two radiocarbon dates between $\sim 12,000$ ^{14}C B.P. and 8500 ^{14}C B.P. (Table 1) (Irwin and Moody 1978). Sheppard and Chatters (1976) also obtained a date of 8600 ± 65 ^{14}C B.P. (9750–9470 cal B.P.) on humus from a soil found above the cultural materials. Irwin and Moody (1978:226) conclude that while there are “problems” with the dates, they “cluster between 8,000 and 9,000 [^{14}C] B.P.” and seem to date the site.

TABLE 1. RADIOCARBON DATES FROM THE LIND COULEE SITE.

¹⁴ C AGE	95.4% PROB.	LAB NUMBER	MATERIAL DATED	REFERENCE
8700±400	11,070–8640	C-827	Burned <i>Bison</i> spp. bone fragments	Daugherty (1956)
8600±65	8750–9470	WSU-1422	Soil humus	Sheppard and Chatters (1976)
8720±300	10,570–9020	WSU-1709	Bulk bone	Irwin and Moody (1978)
12,830±1050	18,600–12,920	WSU-1707	<i>Bison</i> spp. scapula	Irwin and Moody (1978)
9810±40	11,280–11,170	CAMS-95524	Bone collagen (<i>Cervus/B. bison</i>)	Craven (2004)
10,060±45	11,820–11,340	CAMS-94856	Bone collagen (<i>Cervus/Bison</i> spp.)	Craven (2004)
10,250±40	12,430–11,760	CAMS-94857	Bone collagen (<i>Cervus/Bison</i> spp.)	Craven (2004)

Note: All dates are rounded following the conventions of Stuiver and Polach (1977) and calibrated with OxCal v4.4 (Bronk Ramsey 2009) using the IntCal20 curve (Reimer et al. 2020).

Early dating efforts were confounded by the infancy of the radiocarbon dating method, which did not grasp the complexities of carbon exchange between bones and sedimentary matrices and general difficulties of dating bone (see Devière et al. 2018; Herrando-Pérez 2021). Thus, all dates obtained by Daugherty (1956) and Irwin and Moody (1978) should be considered rough estimates at best. The soil humus date is relatively reliable and can serve as *terminus post quem* age for the cultural deposits. Craven's (2003, 2004) thesis research provides the most reliable age estimates for occupations of the Lind Coulee Site. He obtained three dates from large mammal (bison or elk) bone collagen: 10,250±40, 10,060±45, and 9810±40 ¹⁴C B.P. (see Table 1). Contextual problems still plague those

results, as the two oldest dates are stratigraphically inverted, portions of the cultural sequence have no associated dates, and stable isotope data for the bones is not reported.

Obtaining new radiocarbon dates from Lind Coulee is a priority of our research because it informs all other aspects of inquiry on the site. Wilson (2008:101) mentions combustion features (see Mentzer 2014 for combustion feature terminology) from the field notes which were not discussed in any previous publications. He identified higher frequencies of burned bones in the units around these features. With the help of the WSMA staff, we reviewed documents and identified four undated combustion features with available sediment and/or charcoal samples listed. We also identified a cut-marked bison bone associated with most of the bone needle assemblage that lacks an associated combustion feature. Unfortunately, the bone samples dated by Craven (2003, 2004) are not currently with the collection, and the lab that processed the dates is no longer in operation. We hold hope these samples are still housed somewhere, and we will continue to search for them with the goal of reuniting them with the collection and obtaining stable isotope measurements on them in the future.

ARCHAEOBOTANICAL INVESTIGATIONS

In addition to being undated, the combustion features have not been examined for archaeobotanical remains. Each feature has an associated sediment sample(s) of varying size(s). As a probable residential locality, Lind Coulee presents a rare opportunity to study early foodways and the role of plants within them. Current interpretations of Pleistocene food economies in North America are derived primarily from faunal records, which limits our understanding of the full range of early lifeways (McDonough et al. 2022). Recent paleoethnobotanical studies in the neighboring Great Basin region have successfully recovered fragile dietary remains from Pleistocene-aged sites and shown that people using WST projectile point technology consumed a range of plants including seeds, roots, fruits, cacti, and leafy greens (Rhode and Louderback 2007; Kennedy 2018; Blong et al. 2020; Duke et al. 2022; McDonough et al. 2022). Unfortunately, there is no dietary plant data available for this time on the Columbia Plateau. Our paleoethnobotanical analysis of the features from Lind Coulee seeks to address this gap and explore the role of plants in Pleistocene food

economies of the Plateau. Additionally, our study will test for evidence of food preparation practices (e.g., parching or milling), seasonality of site occupation, fuel selection, and indicators of past environments.

SUMMARY AND CURRENT STATUS OF RESEARCH

We have been given permission by the WSMA, U.S. Bureau of Reclamation, Confederated Tribes of the Colville Reservation, and the Confederated Tribes and Bands of the Yakama Nation to work with the museum collection and carry out the above analyses. We are sincerely grateful to these stakeholders for allowing us to pursue this research. We traveled to Pullman, Washington, in October 2022 to conduct research on the stone and bone tools, sample charcoal for radiocarbon dating, and sample sediment samples for archaeobotanical analysis. We have already begun processing samples for radiocarbon dating and will conduct flotation in early 2023. We also plan to return to Pullman to conduct more research on the tool assemblages and digitize original photographs and more documents. We may request to obtain more radiocarbon dates depending on our initial results.

We hope our study will produce a high-resolution perspective of site chronology, technology, subsistence, and seasonality at Lind Coulee. As an early residential locality, Lind Coulee is a rare site type in the region that may provide new insights into land-use strategies among some of the earliest peoples of the Columbia Plateau. When integrated with regional archaeological data, this study will contribute to broader understandings of Pleistocene lifeways on a continental scale. The results of our work will be shared with the public, tribal, and scientific communities through presentations at conferences and publications in peer-reviewed journals.

REFERENCES CITED

Alt, David

- 2001 *Glacial Lake Missoula and its Humongous Floods*. Missoula, MT: Mountain Press Publishing Company.

Amara, Mark S.

- 1975 Mechanical Analyses of Stratigraphic Layers from the Lind Coulee Archaeological Site in Central Washington. Master's thesis, Department of Anthropology, Washington State University, Pullman.

Blinnikov, Mikhail, Alan Busacca, and Cathy Whitlock

- 2002 Reconstruction of the Late Pleistocene Grassland of the Columbia Basin, Washington, USA, Based on Phytolith Records in Loess. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 177(1-2):77-101.

Blong, John C., Martin E. Adams, Gabriel Sanchez, Dennis L. Jenkins, Ian D. Bull, and Lisa-Marie Shillito

- 2020 Younger Dryas and Early Holocene Subsistence in the Northern Great Basin: Multiproxy Analysis of Coprolites from the Paisley Caves, Oregon, USA. *Archaeological and Anthropological Sciences*, 12(9):1-29.

Bronk Ramsey, Christopher

- 2009 Bayesian Analysis of Radiocarbon Dates. *Radiocarbon*, 51(1):337-360.

Craven, Sloan L.

- 2003 Lithic Variation in Hafted Bifaces at the Lind Coulee Site (45GR97), Washington. Master's thesis, Department of Anthropology, Washington State University, Pullman.
- 2004 New dates at the Lind Coulee Site (45GR97), Washington. *Current Research in the Pleistocene*, 21:28-30.

Daugherty, Richard D.

- 1956 Archaeology of the Lind Coulee Site. *Proceedings of the American Philosophical Society*, 100(3):223-278.

Davis, Loren G., David B. Madsen, Lorena Becerra-Valdivia, Thomas Higham, David A. Sisson, Sarah M. Skinner, Daniel Stueber, Alexander J. Nyers, Amanda Keen-Zebert, Christina Neudorf, Melissa Cheyney, Masami Izuho, Fumie Iizuka, Samuel R. Burns, Clinton W. Epps, Samuel C. Willis, and Ian Buvit

2019 Late Upper Paleolithic Occupation at Cooper's Ferry, Idaho, USA, ~16,000 Years Ago. *Science*, 365(6456):891–897.

Davis, Loren G., Alex J. Nyers, and Samuel C. Willis

2014 Context, Provenance and Technology of a Western Stemmed Tradition Artifact Cache from the Cooper's Ferry Site, Idaho. *American Antiquity*, 79(4):596–632.

Deviese, Thibaut, Thomas W. Stafford, Michael R. Waters, Crista Wathen, Daniel Comeskey, Lorena Becerra-Valdivia, and Thomas F. G. Higham

2018 Increasing Accuracy for the Radiocarbon Dating of Sites Occupied by the First Americans. *Quaternary Science Reviews*, 198:171–180.

Duke, Daron, Eric Wohlgemuth, Karen R. Adams, Angela Armstrong-Ingram, Sarah K. Rice, and D. Craig Young

2022 Earliest Evidence for Human use of Tobacco in the Pleistocene Americas. *Nature Human Behavior*, 6(2):183–192.

Flenniken, J. Jeffrey

1976 The Experimental Replication of Paleo-Indian Eyed Needles from Washington. *Northwest Anthropological Research Notes*, 12(1):61–71.

Herrando-Pérez, Salvador

2021 Bone Need Not Remain an Elephant in the Room for Radiocarbon Dating. *Royal Society Open Science*, 8(1):201351.

Irwin, Ann M., and Ula Moody

1978 The Lind Coulee Site (45GR97). *Project Report*, No. 56, Washington Archaeological Research Center, Washington State University, Pullman.

Jenkins, Dennis L., Loren G. Davis, Thomas W. Stafford, Paula F. Campos, Bryan S. Hockett, George T. Jones, Linda Scott Cummings, Chad Yost, Thomas J. Connolly, Robert. M. Yohe II, Summer C. Gibbons, Maanasa Raghavan, Morten Rasmussen, Johanna L. A. Paijmans, Michael Hofreiter, Brian M. Kemp, Jodi Lynn. Barta, Cara Monroe, M. Thomas P. Gilbert, and Eske Willerslev
2012 Clovis Age Western Stemmed Projectile Points and Human Coprolites at the Paisley Caves. *Science*, 337(6091):223–228.

Libby, Willard F.

1954 Chicago Radiocarbon Dates V. *Science*, 31(2):386–408.

Lyman, R. Lee

2000 Building Cultural Chronology in Eastern Washington: The Influence of Geochronology, Index Fossils, and Radiocarbon Dating. *Geoarchaeology*, 15(7):609–648.

2012 Human-behavioral and Paleoecological Implications of Terminal Pleistocene Fox Remains at the Marmes Site (45FR50), Eastern Washington State, USA. *Quaternary Science Reviews*, 41:39–48.

2013 Paleoindian Exploitation of Mammals in Eastern Washington State. *American Antiquity*, 78(2):227–247.

2014 Terminal Pleistocene Change in Mammal Communities in Southeastern Washington State, USA. *Quaternary Research (United States)*, 81(2):295–304.

2015 North American Paleoindian Eyed Bone Needles: Morphometrics, Sewing, and Site Structure. *American Antiquity*, 80(1):146–160.

Lyman, R. Lee, and Michael J. O'Brien

1999 Prehistoric Osseous Rods from North America: Arguments on Function. *North American Archaeologist*, 20(4):347–364.

Kennedy, Jaime L.

2018 A Paleoethnobotanical Approach to 14,000 Years of Great Basin Prehistory: Assessing Human-environmental Interactions Through the Analysis of Archaeological Plant Data at Two Oregon Rockshelters. Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.

McDonough, Katelyn, Jaime L. Kennedy, Richard L. Rosencrance, Justin A. Holcomb, Dennis L. Jenkins, and Kathryn Puseman

2022 Expanding Paleoindian Diet Breadth: Paleoethnobotany of Connley Cave 5, Oregon, USA. *American Antiquity*, 87(2):303–332.

Mentzer, Susan M.

- 2014 Microarchaeological Approaches to the Identification and Interpretation of Combustion Features in Prehistoric Archaeological Sites. *Journal of Archaeological Method and Theory*, 21(3):616–668.

Moody, Ula I.

- 1978 Microstratigraphy, Paleoecology, and Tephrochronology of the Lind Coulee Site, Central Washington. Ph.D. dissertation, Department of Anthropology, Washington State University, Pullman.

Reimer, Paula J., William E.N. Austin, Edouard Bard, Alex Bayliss, Paul G. Blackwell, Christopher Bronk Ramsey, Martin Butzin, Hai Cheng, R. Lawrence Edwards, Michael Friedrich, Pieter M. Grootes, Thomas P. Guilderson, Irka Hajdas, Timothy J. Heaton, G. Hogg, Alan, Konrad A. Hughen, Bernd Kromer, Sturt W. Manning, Raimund Muscheler, Jonathan G. Palmer, Charlotte Pearson, Johannes Van Der Plicht, Ron W. Reimer, David A. Richards, E. Marian Scott, John R. Southon, Christian S.M. Turney, Lukas Wacker, Florian Adolphi, Ulf Büntgen, Manuela Capano, Simon M. Fahrni, Alexandra Fogtmann-Schulz, Ronny Friedrich, Peter Köhler, Sabrina Kudsk, Fusa Miyake, Jesper Olsen, Frederick Reinig, Minoru Sakamoto, Adam Sookdeo, and Sahra Talamo

- 2020 The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0–55 cal kBP). *Radiocarbon*, 62(4):725–757.

Rhode, David, and Lisbeth A. Louderback

- 2007 Dietary Plant Use in the Bonneville Basin during the Terminal Pleistocene/ Early Holocene Transition. In *Paleoindian or Paleoarchaic? Great Basin Human Ecology at the Pleistocene/Holocene Transition*, edited by Kelly E. Graf and Dave N. Schmitt, pp. 231–247. Salt Lake City: University of Utah Press.

Rosencrance, Richard L.

- 2019 Assessing the Chronological Variation within Western Stemmed Tradition Projectile Points. Master's thesis, Department of Anthropology, University of Nevada, Reno.

Sheppard, John C., and Roy M. Chatters

- 1976 Washington State University Natural Radiocarbon Measurements II. *Radiocarbon*, 18(1):140–149.

Smith, Geoffrey M., Donald D. Pattee, Judson Byrd Finley, John L. Fagan, and Evan Pellegrini

2014 A Flaked Stone Crescent from a Stratified, Radiocarbon-Dated Site in the Northern Great Basin. *North American Archaeologist*, 35(3):257–276.

Stuiver, Minze, and Henry A. Polach

1977 Reporting of 14C Data. *Radiocarbon*, 19(3):355–363.

Waters, Michael R.

2019 Late Pleistocene Exploration and Settlement of the Americas by Modern Humans. *Science*, 365:eaat5447.

Wilson, Zachary W.

2008 An Analysis of the Lind Coulee (45GR97) Faunal Assemblage. Master's thesis, Department of Anthropology, Washington State University, Pullman.

10. END OF THE ROAD OR AT A CROSSROADS? OBSIDIAN MICRODEBITAGE SOURCING AT THE VIEWPOINT SITE, SIMILKAMEEN VALLEY, B.C.

Rudy Reimer

Department of Archaeology,
Simon Fraser University

Stanley A. Copp

Port Moody Heritage Society,
Department of Sociology and Anthropology,
Langara College (Retired)



FIGURE 1. Obsidian microflakes, Viewpoint Site.

INTRODUCTION

As a project director in 2007, Copp had an understanding at the time with the Upper and Lower Similkameen First Nations to conduct scholarly archaeological research as well as salvage projects when Bands considered them necessary. One salvage operation involved the widening of a forest service road curve along the banks of the Ashnola River Road near the Band's Powwow/Campgrounds. An initial pedestrian survey of the subject property provided evidence of pre-contact use of the early Holocene post-glacial terrace deposits above the road. The roadside

cut-bank indicated a shallow depth of post-glacial cultural deposits, measuring about 20 cm in depth. Fire-cracked rock, bone, shell, and lithic debitage found on the surface as well as eroding from the cut-bank indicated that sub-surface testing was required to assess site significance. Results of this field work provided indicators of cultural and scientific importance related to the origins or movement of peoples in ancient times and the potential association of lithic materials with spiritually important locations. We explore the possibilities of various data sets in relation to this site and its context.

CULTURAL BACKGROUND

The site is located on Indian Reserve No. 10 (Ashnola), within the traditional territory of the Lower Similkameen Indian Band, who with the Upper Band are the Similkameen (*Smalqmx*). They are part of the larger *Sylix* ethno-linguistic Interior Salish group, which includes Aboriginal Peoples of the Okanagan, Nicola, and Similkameen Valleys, extending eastward toward the town of Grand Forks, B.C. Their website indicates that the Lower Similkameen Band origins tell of an earlier pre-Colonial population that was almost destroyed by one, or more, epidemics. These people were saved by hunting parties coming overland from the Methow (*mitxwa?ɥ*) Valley to the south, who stayed and intermarried (Lower Similkameen Indian Band n.d.).

Ethnographic records provide similar evidence of an Athapaskan-speaking hunting party from the Chilcotin Plateau travelling south through the Nicola and Northern Okanagan-Similkameen, stayed and became the ethnohistoric northern Okanagan-Similkameen (*Sylix*) peoples (see Copp 2006 for discussion). The term *Ashnola* (Copp 2006) refers to the residual energy left in the ground by people during sweat lodge activities. There are several stone ring remnants along both banks of the river that most likely represent the remains of ancient sweat lodges, as well as recent lodges that (at the time of research) were located on the nearby Powwow/campgrounds.

ARCHAEOLOGICAL BACKGROUND

The site is situated on an ancient fluvial terrace that overlooks the confluence of the Ashnola and Similkameen Rivers in southwestern British Columbia and is considered, along with the adjacent Okanagan

Valley, to be the northernmost extension of the Sonoran Desert biome that originates in the American Southwest. About 25 to 50% of the site is thought to have been removed sometime in the late nineteenth through mid-twentieth centuries when the old road track was replaced, and its curve widened through the removal of terrace deposits.

Here we use the term *viewscape* to describe the cultural and landscape features. The *viewscape* from the vantage point of the site includes a modern cemetery, ranch lands, sweat lodge rings, lithic scatters, at least one pictograph, and one lithic quarry consisting of fine grained volcanics. Macro-flakes (i.e., >5 mm) were recovered, but not discussed here. Some appear to come from the quarry site based on lithic matrix, cortex, and other variables. Other archaeological sites are located upstream (NNW) of the viewpoint, and include a large house pit depression, lithic scatters, and at least one petroform. In fact, the *viewscape* encompasses a range of pre-contact and historical Indigenous activities including some of sensitive spiritual significance.

A total of nine shovel test units were excavated, each measuring 50 cm square. All sediments were excavated in 10 cm levels, then passed through 6 mm (1/4") mesh screens. Bulk sediment samples were taken from one unit—representing the entire 0–20 cm column of cultural sediments. Fire-cracked rock was not recorded. From these tests a collection of obsidian microdebitage (less than or equal to 0.5 mm) (cf. Fladmark 1982) was recovered and selected for portable X-ray fluorescence (pXRF) analysis to determine obsidian sources, possible associations with cultural origins, and population movements (see Copp 2006) (Figure 1). Our definition refers to flaked lithic material that are at the edge of being discernible by the naked eye.

PXRF ANALYSIS AND RESULTS

The instrument used in this analysis is a Bruker AXS Tracer III-V+ portable energy dispersive X-ray fluorescence (EDXRF) spectrometer. Its operational parameters and calibration procedures can be found elsewhere (Speakman 2012; Reimer 2015; Reimer and Hamilton 2015) and followed recommendations by Ferguson (2012) for the examination of small samples.

A diagnostic trace element value most common to characterize obsidian compared directly to those directly known or established through published literature allows for source designation. This includes

known obsidian sources in the Simon Fraser University, Department of Archaeology reference collection and other known obsidian source values reported in the literature and unpublished elemental data collected through the analysis of other labs (Reimer, this collection). The results of analysis of samples are in Table 1. As such calculated values for two artifacts are from the Hosko (n=1) and the Elk Pass (n=1) obsidian sources in Washington State. Four artifacts come from the Glass Buttes source and thirty derive from the Whitewater Ridge source. All trace elemental values falling within two standard deviations of analytical uncertainty (95%), marking the known upper and lower limits of elemental variability of known sources and flows within this source (Figure 2) (Table 1).

SUMMARY AND DISCUSSION

Obsidian tends to be a rare occurrence in archaeological sites of the Okanagan-Similkameen region (Carlson 1994; Copp 2006). Although the authors of this report have not conducted an extensive literature review of recent reports that include X-ray fluorescence (XRF) analyses, the few obsidian artifacts that have been sourced previously derive from southern Washington State and central Oregon—areas within the Northern Columbia Plateau.

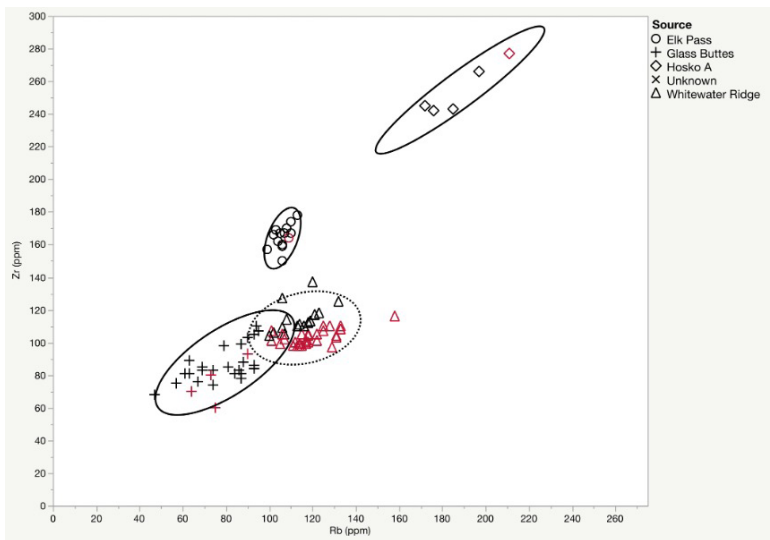


FIGURE 2. Biplot of Rubidium (Rb) and Zirconium (Zr), with samples in this study colored red.

**TABLE 1. RESULTS OF XRF ANALYSIS.
ALL VALUES IN PARTS PER MILLION (PPM).**

SOURCE	ARTIFACT	MN	FE	ZN	GA	TH	RB	SR	Y	ZR	NB
Whitewater Ridge	AR1	305	5917	42	16	5	111	74	18	98	12
Whitewater Ridge	AR10	324	6439	40	13	7	114	75	17	99	10
Glass Buttes	AR11	568	7115	119	21	12	73	73	15	80	7
Whitewater Ridge	AR12	717	16216	200	21	14	122	83	16	105	12
Whitewater Ridge	AR13	402	7775	64	17	8	125	81	19	107	8
Whitewater Ridge	AR14	244	7148	69	17	8	118	79	17	104	8
Glass Buttes	AR15	147	6947	50	17	2	90	28	47	93	10
Whitewater Ridge	AR16	619	12355	190	20	6	114	79	16	98	8
Whitewater Ridge	AR17	221	7219	44	15	5	118	74	27	100	8
Whitewater Ridge	AR18	667	8514	81	18	13	133	79	22	110	10
Whitewater Ridge	AR19	332	5801	34	16	5	101	74	17	101	10
Whitewater Ridge	AR2	291	7416	48	14	9	122	79	17	101	10
Whitewater Ridge	AR20	617	18153	269	26	4	101	85	16	107	9
Elk Pass	AR21	240	19480	106	17	9	109	524	9	164	4
Whitewater Ridge	AR22	253	6898	54	16	11	115	78	16	98	9
Whitewater Ridge	AR23	353	7613	51	15	9	131	81	15	103	11
Whitewater Ridge	AR24	342	6399	34	15	10	106	75	16	105	10
Whitewater Ridge	AR25	194	6448	38	13	7	117	75	17	99	11

**TABLE 1. (CONT.) RESULTS OF XRF ANALYSIS.
ALL VALUES IN PARTS PER MILLION (PPM).**

SOURCE	ARTIFACT	MN	FE	ZN	GA	TH	RB	SR	Y	ZR	NB
Whitewater Ridge	AR26	157	6562	33	12	8	113	71	19	98	11
Whitewater Ridge	AR27	304	7083	35	16	8	117	67	24	101	10
Whitewater Ridge	AR28	276	6871	37	14	9	115	90	17	105	9
Glass Buttes	AR29	956	5126	220	27	13	75	41	15	60	11
Whitewater Ridge	AR3	455	8239	96	19	13	133	89	19	108	15
Glass Buttes	AR30	277	3887	104	16	5	64	58	17	70	10
Whitewater Ridge	AR31	454	8031	59	17	12	125	75	29	110	9
Whitewater Ridge	AR32	649	8821	64	18	14	158	94	22	116	13
Hosko A	AR33	110	16216	106	18	18	211	43	35	277	21
Unknown	AR34	-65	10720	41	6	-5	-4	2	1	15	1
Whitewater Ridge	AR35	300	7300	46	13	7	112	66	24	100	8
Whitewater Ridge	AR36	359	6142	48	15	10	114	76	19	98	11
Whitewater Ridge	AR4	285	7401	55	13	7	118	73	28	105	8
Whitewater Ridge	AR5	395	7241	65	18	13	129	85	17	97	11
Whitewater Ridge	AR6	357	6447	33	13	5	107	80	18	102	11
Whitewater Ridge	AR7	448	9095	68	18	10	131	77	27	104	7
Whitewater Ridge	AR8	306	7223	52	14	10	128	87	18	110	13
Whitewater Ridge	AR9	221	6423	37	14	6	105	78	18	99	9

Considering the microdebitage reported here, we echo Fladmark's (1982) assertion that archaeologists should consider expending more energy in physical sediment analyses of Pacific Northwest sites. As shown in this case, the obsidian flakes captured by the 0.4 mm mesh screen were the only obsidian artifacts in the site. No obsidian larger than this was recovered, either as macrodebitage or formed tools. Again, the capture of obsidian micro-flakes between the 0.4- and 0.5-mm mesh screens puts these artifacts at the edge of normal visibility with the naked eye. This type of artifact requires physical dry or wet screen analyses.

Dating of this material is dependent upon identification of the only temporally diagnostic artifact recovered during testing. This is a small corner-to-basally notched, dacite, projectile point nominally associated with defined Columbia Plateau B to Quilomene Bar sub-types. This single diagnostic artifact, appears to be a Columbia Plateau Corner-notched B projectile point dating ca. 150 to 2000 B.P., possibly refashioned from an earlier broken Quilomene Bar Corner-notched B point dating ca. 1500–2500 B.P. (Copp 2006).

The micro-flakes represent end-stage artifact production (i.e., pressure flakes). This strongly suggests that obsidian was heavily curated—given that no other evidence of obsidian macro-flakes, artifacts, cores, shatter, etc., were recovered. This suggests that obsidian was procured through a “down-the-line” exchange system by which artifact blanks or finished items were conveyed north from parent sources, most likely through intervening trade partners, kinship networks, and/or at regular “trade fairs” held at The Dalles, Kittitas “Fair,” Kettle Falls, and other locations in the northern Columbia Plateau (Griswold 1954; Anastsio 1972; Hayden and Schulting 1997). The Elk Pass material might have been obtained via the Pacific Crest Trail—or its ancient antecedent (Figure 3).

It is noteworthy that most obsidian microdebitage originated from the Whitewater Ridge area. This, in addition to the Glass Buttes flows, suggests that some obsidian was likely conveyed from sources to the Columbia River, then northward to the confluence of the Similkameen and/or Okanagan Rivers, then upstream to the Ashnola. This roughly fits with patterns observed by Connolly et al. (2015:180–192) where materials from obsidian sources that are north of Paiute-speaking peoples in Oregon tend to move along travel routes to northern locales. This is an interesting venue to explore further.

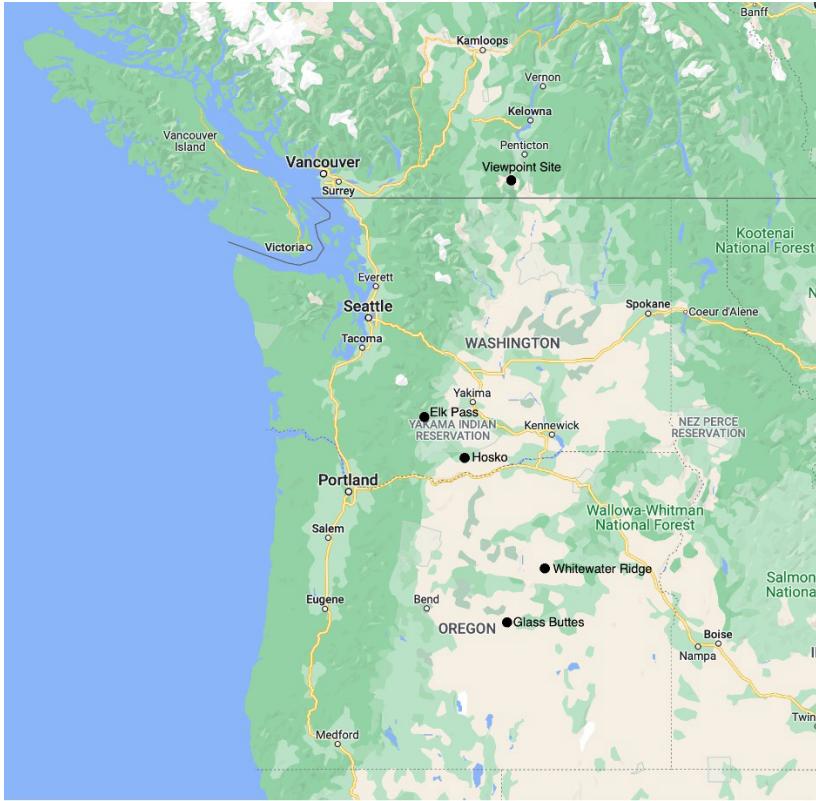


FIGURE 3. Viewpoint Site and obsidian sources in this study.

Of note is McLure's (2015:107–108) research that Elk Pass obsidian has a restricted distribution to the Cowlitz River watershed. This is potentially the first recorded occurrence of this material outside of that area. This may be due to lack of other Washington and Oregon source data that have similar trace element and rare earth values to Elk Pass in the Simon Fraser University Archaeology reference library. Or this can be due to the small nature of the samples used in this study. Otherwise, the nature of the exchange system may have been northward from the Columbia along the Cascade Mountain ridges, or even westward across the Cascades from the coast. The presence of Elk Pass and Hosko sourced microdebitage, although a minority from this site assemblage, may support a Cascades route of dispersion, given that Elk Pass is located on the crest of the Cascade Range in southwestern Washington State, not all that distant from Hosko source(s) (McLure 2015:107–108).

Given the Lower Similkameen Band website's emphasis on origins deriving from the Methow Valley (Lower Similkameen Indian Band n.d.), it is suggested that a down-the-line acquisition model tied through individuals' exchange partners and/or kinship networks is a likely explanation for the presence of the obsidian microdebitage. A literature search is required to determine if these obsidian sources are evident at trade fair sites. Hopefully, a more thorough analysis of the cultural materials from the Viewpoint Site would shed light on this interesting, indeed stimulating topic. Future investigations identifying Northern Columbia Plateau obsidian artifacts identified by source, cultural historical, and temporal attributes seem to be in order as does a study of the non-obsidian micro-flakes recovered.

ACKNOWLEDGMENTS

Robert (Bob) K. and Kelly Dennis are thanked for conducting surface and sub-surface investigations of this site. Both are members of the Lower Similkameen First Nation who worked without pay to ameliorate construction impacts to a site of then-unknown significance. Bob and Kelly also hold British Columbia government Resources Information Standards Committee (RISC) Archaeological and CMT Training certificates in archaeological field work and have many seasons of field work to their credit.

It took one of us (Copp) a long time to get around to reporting these results; he keeps complaining that college teaching and grading, and teaching field schools, meant that he had to wait for retirement before starting to write up a lot of research.

It is also one of us (Reimer) to take the initiative of a long-time mentor (Copp) to consider this as an interesting example of one of a multitude of XRF data sets that can be written up as an article to be considered for publication. In 1993 I took a field school under the direction of Copp, and that is where my archaeological career began.

REFERENCES CITED

Anastasio, Angelo

- 1972 The Southern Plateau: An Ecological analysis of Intergroup Relations. *Northwest Anthropological Research Notes*, 6 (2).

Carlson, Roy L.

- 1994 Trade and Exchange in Prehistoric British Columbia. In *Prehistoric Exchange Systems in North America*, edited by Timothy G. Baugh and Jonathan E. Ericson, pp. 307–365. New York, NY: Springer Press.

Connolly, Thomas J., Craig E. Skinner, and Paul W. Baxter

- 2015 Ancient Trade routes for Obsidian Cliffs and Newberry Volcano Toolstone in the Pacific Northwest. In *Toolstone Geography*, edited by Ronald Adams and Terry Ozbun. Burnaby, B.C.: Simon Fraser University Archaeology Press.

Copp, Stanley A.

- 1980 *Archaeological Excavations of the McCall Site (DhQv-48), South Okanagan Valley, British Columbia*. Unpublished Master's thesis, Department of Archaeology, Simon Fraser University, Burnaby, B.C.
- 2006 *Similkameen Archaeology (1998–2006)*. Unpublished Ph.D. dissertation, Simon Fraser University, Burnaby, B.C.

Ferguson, Jeffery, R.

- 2012 X-Ray Fluorescence of obsidian: approaches to the calibration and the analysis of small samples. In *Studies in Archaeological Sciences: Handheld XRF for Art and Archaeology*, edited by Aaron N. Shugar and Jennifer L. Mass. Leuven, Belgium: Leuven University Press.

Fladmark Knut, R.

- 1982 Microdebitage Analysis: Initial Considerations. *Journal of Archaeological Science*, 9:250–220.

Griswold, Gillet

- 1954 Aboriginal patterns of trade between the Columbia Basin and the Northern Plains. Unpublished Master's thesis, University of Montana, Missoula.

Hayden, Brian, and Rick Schulting

1997 The Plateau Interaction Sphere and Late Prehistoric Cultural Complexity. *American Antiquity*, 62(1):51–85.

Lower Similkameen Indian Band

n.d. Lower Similkameen Indian Band webpage. <<https://www.lsib.net>> Accessed 24 January 2023.

McLure, Rick

2015 Elk Pass Obsidian and Pre-contact Band Territories in the Southern Washington Cascades. In *Toolstone Geography of the Pacific Northwest*, edited by Terry L. Ozbun and Ron L. Adams, pp. 107–117. Burnaby, B.C.: Simon Fraser University Archaeology Press.

Reimer, Rudy

2015 Reassessing the role of Mount Edziza obsidian in northwestern North America. *Journal of Archaeological Science: Reports*, 2:418–426.

Reimer, Rudy, and Tyrone Hamilton

2015 Implications between Technological Organization and Portable X-Ray Fluorescence Analysis on Lithic Material Use at Two Rockshelter Sites on the southern Northwest Coast. In *Toolstone Geography of the Pacific Northwest*, edited by and Terry L. Ozbun and Ron L. Adams. Burnaby, B.C.: Simon Fraser University Archaeology Press.

Speakman, Robert, J.

2012 *Evaluation of Bruker's Tracer Family Factory Obsidian Calibration for Handheld Portable XRF Studies of Obsidian*. Athens, GA: Center for Applied Isotope Studies, University of Georgia.

11. COBBLE HYDRATION AS A MEANS TO EXPEDITE NOTCHED NET SINKER MANUFACTURE

Cynthia R. Hannold

Doctoral Candidate, University of Alabama



FIGURE 1. Examples of notched net sinkers manufactured during replication experiments from varied cobble sources.

INTRODUCTION

Though modern toolmakers do not work in the same temporal or physical environments as past toolmakers, we can say something about the phenomenological aspects of flintknapping. We can begin to glimpse the point of view of the ancient toolmakers, feel the full force of a hard hammer blow as it reverberates back up our arm after a strike, and smell the chemical reaction created by that force. While Indigenous toolmakers have a rich tradition of flintknapping and pass that knowledge on from one generation to the next, the field of archaeology came to stone tool manufacture much later (Coles 1973, 1979; Carrell 1992; Outram 2008). What we learn about stone tools and their manufacturing processes answers questions about the manufacturer, the generational transmission of technical knowledge, and values associated with continued curation and

reuse (Torres 2007). Experimental archaeology, when combined with other archaeological methods, is useful in answering these research questions.

My experience with experimental archaeology began in 2015 with archaeologist and student of Don Crabtree, Jim Woods. During my time with Jim, I learned methods for the production of pottery, bone tools, and stone tools. My work with stone tools continued at the University of Idaho Lithic Technology Lab, and I began to knapp regularly, advised by Lee Sappington and Dave Quinn. When I began my thesis research with net sinker assemblages from the Clearwater, Lower Snake, and Columbia rivers, I knew I wanted to incorporate archaeological experiments to inform aspects of production. I therefore began to knapp cobble tools, finding the experience much different from knapping fine-grained stone.

Past toolmakers have engaged in stone altering activities, such as heat treatment, to make stone easier to knapp. Heat treatment was not considered a viable method for improved knappability of cobbles in my experiments, as the different internal structure of coarse-grained materials may cause spalling rather than creating an easier to knapp material when heated (Domanski and Webb 2007). However, a potentially viable avenue for stone alteration is cobble hydration (Hannold 2019). This study suggests that cobble hydration, the act of submerging stones in water, may aid cobble tool manufacture. In a prehistoric context, this might mean choosing stones from a river, rather than a dry beach or river terrace, or soaking selected cobbles prior to tool manufacture. In this essay, I will discuss the experiments conducted to test my hydration hypothesis, explain the implications of cobble hydration, and discuss next steps that need to be taken in future experiments.

THE COBBLE HYDRATION EXPERIMENT

A variety of flaked cobble tools exist throughout the Columbia Plateau. This study focuses on notched net sinkers (Figure 1) due to their overwhelming ubiquity in the assemblages I had access to for my thesis. Grooved net sinkers, perforated net sinkers, and chipped stone fishing net rings are also present throughout the Inland Northwest, though the majority of the net sinkers in Clearwater and Lower Snake River assemblages (95%) were of the notched variety. Recent studies have demonstrated the value of net sinkers in archaeological narratives (Johnston 1987; Prowse 2010; Cassarino 2017; Hannold 2019).

In 2019, I presented the preliminary results of a net sinker manufacture study I had completed at the Northwest Anthropological Conference. What stood out most from my first experiment was that not all cobbles knapped the same way. One stone source may require less than ten strikes to notch while the next may prove unalterable. In an experiment where the cap was 400 strikes, “unalterable” is a meaningful conclusion. After the session, I was approached by a fellow attendee who asked if I had considered soaking cobbles prior to knapping them. I had not. Since designing this experiment, however, I have heard from many fellow archaeologists that they had “always wondered if that would work.” Despite there being no specific origin in the literature, it appears that the idea has at least circulated in certain circles of cultural resource management (CRM) archaeologists and lithic specialists.

I determined that direct percussion was likely the primary method for net sinker manufacture during previous experiments (Hannold 2019), a conclusion supported by the literature (Butkus and Koelikamp 1979; Prowse 2010). The thickness of the edge of a stone in relation to the center of the stone matters greatly to cobble tool manufacture. Therefore, the placement of each notch was determined by the stone’s tapering thickness (Figure 2). A successful notched net sinker requires two opposing sides to be notched. Cobbles were knapped with an oblong hammerstone at a 45 degree angle using direct percussion. Hammerstones were selected for size, weight, and oblong shape. Two hammerstones approximately 13 cm long and 180 grams were selected for this experiment. I prefer oblong shaped hammerstones rather than spherical ones to avoid my fingers getting between the hammer and target stones. I was the sole toolmaker in this study and had 15 months of experience knapping cobble tools before beginning this experiment in the University of Idaho Lithic Technology Lab.

Four discrete cobble sources, referred to as groups, were divided into two sets of like size, raw material, and shape. The first source consists of rose and ash grey quartzite cobbles between 57 and 95 mm in length. The second is comprised of neutral-colored quartzite cobbles, 47 to 91 mm long. The third source includes basalt cobbles with a waxy exterior that measure between 48 and 107 mm in length. The fourth source includes a wide range of cobble types—basalts, granites, sandstones—and ranges from 63 to 133 mm in length. I relied on the collective assistance of lithics lab persons for raw material collection with the stipulations that they meet the required form—discoid shaped stones with tapering thickness on at least two sides—and that each group comes from the same source.



FIGURE 2. Difference between percussive blows to a stone with tapering thickness and a stone with no tapering thickness at the edge.

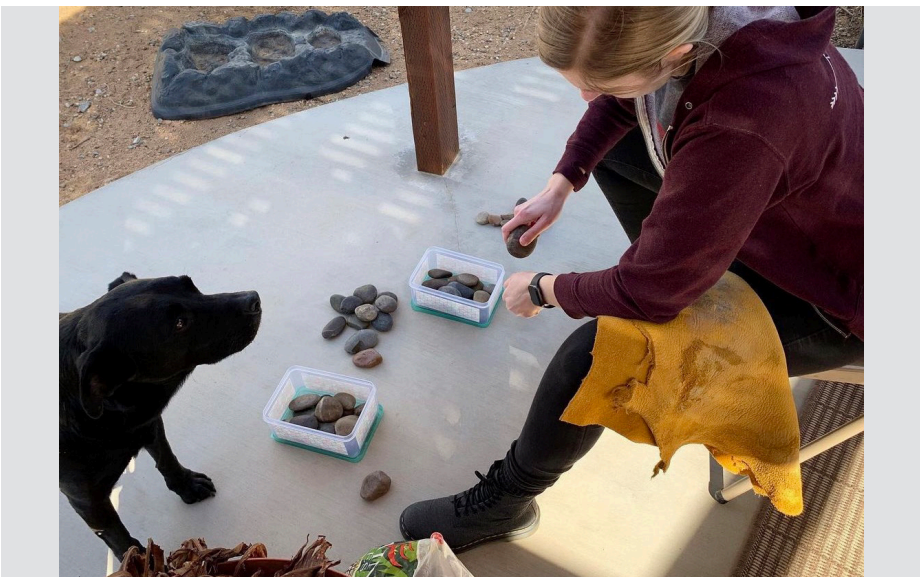


FIGURE 3. Replication of the initial cobble hydration experiment in 2020 with a fifth cobble source.

One set was randomly selected for dry flintknapping while the other was submerged under University of Idaho tap water in a 14" by 12" plastic wash bin for 72 hours prior to manufacture. This hydration period was determined based on Karaca's (2010) study of hydration periods for various stone types. As no material in the study had the tight crystalline structure of obsidians or flints, 72 hours was considered a sufficient hydration period. Each cobble was knapped immediately after it was removed from the water.

Side 1 Face A was struck until a flake could be removed or up to 100 times before flipping the stone to begin Side 1 Face B. When a flake could be removed from Side 1 Face B or it had been struck 100 times without flaking, the cobble was turned to Side 2 Face A, and the process begun again. During my previous experiments, which looked at time to manufacture and cobble source variability, I had placed a 400 strike cap on each net sinker before it was labeled unalterable, striking each side up to 200 times before determining that it could not be knapped. This number is well above the point most Indigenous toolmakers might have stopped. However, I wanted to ensure that even in areas with difficult to knap cobble, I could determine differences between *difficult to knap* and *unalterable*. I continued to use the 400 strike cap in this experiment. Strikes were counted and recorded for each side before moving on to the next and were added after each net sinker was knapped. Each discrete net sinker production was also timed.

A total of 60 cobbles were knapped between the four groups in this study. To address the statistical significance of this experiment, I ran a series of t-tests. The t-test was chosen because it is a simple way to demonstrate the significance in differences between two groups. The sample size of this study prohibited further statistical methods from being used. To eliminate the confounding variable of stone quality (internal fractures, phenocrysts, or exceptionally dense materials), all failed net sinkers were removed before the t-tests. The number of successful net sinkers for groups one through four were greater in the hydrated cobbles (n=23) than in the dry group (n=22). For this reason, 23 separate t-tests were run for the hydrated versus the dry groups, each test eliminating one value from the hydrated group. The p-value discussed below is the mean of these 23 tests.

RESULTS

The results of this experiment indicate that cobble hydration can expedite cobble tool manufacture, a process that could have benefited prehistoric toolmakers (Table 1). In the first three groups, the average number of strikes per cobble was reduced on average by 54, 45, and 60 strikes, respectively, when hydrated. Though time to manufacture did not change significantly, it is important to note that the number of strikes could likely have meant more to the toolmaker than manufacturing time. Repetitive stress, like that caused by direct percussion, has adverse effects on toolmaker health (Lovell and Grauer 2018). Reduction in the number of strikes could reduce this stress. Hydration in groups one through three also increased the success rate. In experiments one, two, and three, the dry-knapped cobbles had a success rate of 17, 83, and 57% while the hydrated groups had a success rate of 67, 100, and 100%.

At first glance, the fourth group seems less promising. The success rate decreased by 40% in hydrated groups while the number of strikes increased by ~40. However, when failed sinkers are removed from the data, the difference in number of strikes once again favors hydrated cobbles—101.5 in the dry set and 83.33 in the hydrated set.

For this study, a p-value of less than .05 would indicate a significant result, or that the variation between the dry and hydrated groups is unlikely to be due to random chance. The mean p-value for the 23 t-tests run for successful notched net sinkers in hydrated versus dry groups is .042436 and the median p-value is .043421. While t-tests were done in good faith, I recognize that without a larger sample size no conclusions can yet be drawn. A p-value of less than .05 does suggest that further tests are warranted.

The experiment was replicated with a fifth group of cobbles in 2020 (Figure 3) (Table 2), eleven quartzite cobbles of the same source in each set. The hydrated cobble success rate was once again significant, 90.91% versus a dry success rate of 54.55%. The average number of strikes per successful hydrated cobble was 46.9 while the dry group was much higher at 111.67.

DISCUSSION

The p-value from the t-test for successful net sinkers in this experiment, coupled with the significant reduction in percussive strikes,

**TABLE 1. NET SINKER GROUPS 1-4
AND TOTAL TIME/TOTAL STRIKES.**

DRY DATA	TIME (MINUTES)	TOTAL STRIKES	HYDRATED DATA	TIME (MINUTES)	TOTAL STRIKES
NSG3-1; Failed	6.50	236	NSG3-2	2.68	18
NSG3-5; Failed	5.60	220	NSG3-3	3.55	118
NSG3-6; Failed	3.85	200	NSG3-4	3.80	41
NSG3-7; Failed	5.00	216	NSG3-10	12.12	394
NSG3-8	3.27	76	NSG3-11	2.27	52
NSG3-9; Failed	3.73	200	NSG3-12; Failed	4.95	200
NSG4-7	3.07	32	NSG4-1	3.12	40
NSG4-8	3.67	105	NSG4-2	4.27	60
NSG4-9; Failed	2.15	200	NSG4-3	4.08	42
NSG4-10	5.10	166	NSG4-4	1.60	25
NSG4-11	1.80	17	NSG4-5	3.23	59
NSG4-12	3.27	58	NSG4-6	3.83	84
NSG5-1	2.22	44	NSG5-8	2.87	46
NSG5-2; Failed	3.33	143	NSG5-9	1.00	11
NSG5-3	1.35	60	NSG5-10	0.67	19
NSG5-4; Failed	3.08	200	NSG5-11	3.52	89
NSG5-5	2.33	97	NSG5-12	1.15	25
NSG5-6	3.55	208	NSG5-13	2.05	58
NSG5-7; Failed	0.62	3	NSG5-14	3.12	85
CSG6-1	6.82	84	CSG6-13	7.07	294
CSG6-2	4.15	155	CSG6-14	6.97	331
CSG6-3	4.73	178	CSG6-15	4.30	175
CSG6-4	6.55	328	CSG6-16	7.78	295
CSG6-5	5.90	73	CSG6-17	3.32	278
CSG6-6	6.28	379	CSG6-18	5.73	350
CSG6-7	7.27	320	CSG6-19	7.03	422
CSG6-8	4.43	615	CSG6-20	7.10	295
CSG6-9	3.05	207	CSG6-21	6.98	345
CSG6-10	2.23	126	CSG6-22	3.76	260
CSG6-11	3.92	274	CSG6-13	7.07	294
CSG6-12	2.57	174	CSG6-14	6.97	331

**TABLE 2. REPLICATION OF EXPERIMENT WITH
A FIFTH DISCRETE COBBLE SOURCE.**

DRY DATA	TIME (MINUTES)	TOTAL STRIKES	HYDRATED DATA	TIME (MINUTES)	TOTAL STRIKES
D1; Failed	5.42	215	H1	0.85	37
D2; Failed	4.9	251	H2	1.83	70
D3	3.58	118	H3	1.65	43
D4	4.9	155	H4	1.27	36
D5	2.75	76	H5	2.53	84
D6; Failed	5.85	248	H6	1.65	57
D7	1.57	67	H7	1.1	35
D8	2.67	124	H8	1.58	39
D9	3.47	130	H9	1.62	46
D10; Failed	5.27	224	H10; Failed	5.93	400
D11; Failed	4.87	212	H11	1.02	22

points to the value of cobble hydration. While the failure rate for group four hydrated cobbles may be due to poor cobble selection, it is also likely that formation processes of this group differently impacted their permeability and porosity. This suggests that cobble hydration may be beneficial to toolmakers in some regions and not others. Additionally, these results indicate that archaeologists should rethink how they classify certain cobble tools. Notched net sinkers may be more appropriately thought of as curated rather than expedient tools.

No claim can yet be made as to whether Native peoples of North America definitively used cobble hydration to ease the stress of cobble tool manufacture, though the simultaneous decrease in number of strikes and increase in success rate is compelling. Further research in ethnohistory, geological sciences, and additional archaeological experiments would inform this research question. Future experiments are needed to moderate the force applied during direct percussion and rule out toolmaker inconsistencies, as in measurable flintknapping (Kelterborn 2003). Additionally, future experiments should include stone density measurements before and after cobbles are hydrated. While debitage from each net sinker was saved for later analysis and may reveal

additional insights into differences between hydrated and dehydrated groups, an immediate analysis of flakes as they are detached may prove useful. Tests of toolmaker skill, different hammerstone materials and forms, and varied water sources may also contribute to differences in notched net sinker production.

ACKNOWLEDGMENTS

This study was funded in part by the University of Idaho Don Crabtree Scholarship for Lithic Technology 2018 and 2019. Additionally, many great flintknappers tolerated the incessant pounding of the manufacture of hundreds of notched net sinkers between 2018 and 2019. Thank you to Dave Quinn, Dan Crandall, Lee Sappington, and all of the students in the lithics lab for being so supportive. Thank you also to my colleagues at the University of Alabama and the fantastic team at *JONA* for their support in the editing process.

REFERENCES CITED

- Butkus, Ed, and Ted Koelickamp
1979 Net Sinkers from the Calumet Region of the Chicago Area. *Central States Archaeological Journal*, 26(4):170–173.
- Carrell, Toni L.
1992 Replication and Experimental Archaeology. *Historical Archaeology*, 26(4):4–13.

Casserino, Christopher M.

- 2017 Metric Analysis of Chipped Cobble Net Weights on the Lower Spokane River (Spokane Arm of Lake Roosevelt). *Journal of Northwest Archaeology*, 51(2):230–238.

Coles, John M.

- 1973 *Archaeology by Experiment*. London, U.K.: Hutchinson.
1979 *Experimental Archaeology*. London, U.K.: Academic Press.

Domanski, Marian, and John Webb

- 2007 A Review of Heat Treatment Research. *Lithic Technology*, 32(2):153–194.

Hannold, Cynthia R.

- 2019 A Multi-Faceted Approach to Understanding Notched Net Sinker Manufacture in the Columbia Plateau. Department of Anthropology University of Idaho, Moscow.

Johnston, Robbin

- 1987 Archaeological Evidence of Fishing in the Southern Plateau, a Cultural Area of the Columbia Plateau. Master's thesis, Department of Anthropology. University of Idaho, Moscow.

Karaca, Zeki

- 2010 Water Absorption and Dehydration of Natural Stones versus Time. *Construction and Building Materials*, 24(5):786–790.

Kelterborn, Peter

- 2003 Measurable Flintknapping. In *Mesoamerican Lithic Technology: Experimentation and Interpretation*, edited by Kenneth G. Hirth. Salt Lake City: University of Utah Press.

Lovell, Nancy C., and Anne L. Grauer

- 2018 Analysis and Interpretation of Trauma in Skeletal Remains. In *Biological Anthropology of the Human Skeleton*, 3rd edition, edited by M. Anne Katzenberg and Ann L. Grauer. Hoboken, NJ: Wiley-Blackwell.

Outram, Alan K.

- 2008 Introduction to Experimental Archaeology. *World Archaeology*, 40(1):1–6.

Prowse, Shari L.

2010 Much Ado About Netsinkers: An Examination of Pre-Contact Aboriginal Netsinker Manufacture and Use Patterns at Five Woodland Period Archaeological Sites within Southern Ontario. *Journal of Ontario Archaeology*, 69–96.

Torres E., Jimina A.

2007 ¿Redes o Líneas de Pesca? El Problema de la Asignación Morfofuncional de los Pesos Líticos y Sus Implicancias en Las Tácticas de Pesca de los Grupos del Extremo Austral de Sudamérica. *Magallania*, 35(1):53–70.

12. MARITIME ARCHAEOLOGY IN THE PACIFIC NORTHWEST: RECENT WORK AND THOUGHTS FOR FUTURE RESEARCH

Scott S. Williams

Washington State Department of Transportation



FIGURE 1. Looking northwest to the Nehalem River and Spit, with Neahkahnie Mountain and Cape Falcon in the background. Photograph by the author.

INTRODUCTION

It has been ten years since Dennis Griffin, then the Oregon State Archaeologist, wrote a “History of Underwater Archaeological Research in Oregon” (Griffin 2013). At that time, Griffin noted that Oregon’s archaeological site database contained only 300 shipwreck sites, despite over 3,000 reported shipwrecks off the Oregon coast (Griffin 2013:2). Washington State’s archaeological database only lists 24 shipwrecks, and 6 submerged aircraft.

Shipwrecks (and submerged planes, trains, and other artifacts) capture the public’s imagination worldwide, and the Pacific Northwest is no exception. There are several books on the shipwrecks of Oregon and Washington by Gibbs (1957, 1971, 1978), Kozik (2020), and Marshall

(1984) and at least one “collector’s” guide to underwater artifacts of the region (White 1979). Shipwrecks are also the topic of numerous newspaper articles, websites, online videos, and television stories.

As anthropologists, it is not just shipwreck artifacts that we are interested in, however. The interaction of Native peoples and the crews of visiting ships as well as the survivors of wrecks are also areas of anthropological and archaeological interest. There is a rich body of research work on the archaeology and anthropology of contact between European and American explorers, fur traders, and settlers in the Pacific Northwest. The Native people of both the coast and interior were not passive actors watching the new arrivals to their lands, but actively engaged and adapted to these new people and their new cultural materials, using them to their advantage and deciding what to embrace and what to resist. These interactions have left a rich cultural and material legacy for anthropologists and archaeologists to research in collaboration with the living communities of the region, both Native and non-Native.

IT STARTS WITH TREASURE

For most of the general public, the word “shipwreck” is almost always associated with “treasure.” Oregon passed its Treasure Trove Act in 1966 specifically to allow the public to search for sunken and buried treasures. The act was passed due to the lobbying of a single individual who was seeking permission to excavate on the beach at Manzanita, Oregon (Figure 1), for what he believed was a biblical treasure buried by the crew of a wrecked Spanish ship (Griffin 2013:6). The Treasure Trove Act was repealed by the Oregon Legislature in 1999, with the recognition that historical “treasure” hoards and shipwrecks are important archaeological and cultural sites and are part of the shared cultural heritage of all the citizens of Oregon and not something to be salvaged for profit. Griffin noted (2013:7) that even after the appeal of the Treasure Trove Act, the Oregon State Historic Preservation Office (SHPO) received frequent requests for permits to search for Spanish galleons, Chinese junks, and rumored Japanese submarines sunk off the coast of Oregon. He also noted the high interest among the public, as reflected in newspaper articles, of the exposure of wrecked vessels on Oregon’s beaches by storms.

Lacking legends of wrecked Spanish ships and pirates, Washington State does not have the same level of treasure hunting efforts as Oregon,

but the interest in shipwrecks and the gold they are almost always rumored to have carried is strong in Washington. Unlike Oregon, where shipwrecks over 75 years old are protected as archaeological sites, shipwrecks in Washington can be salvaged for profit, although an archaeological excavation permit from the Department of Archaeology and Historic Preservation is required for any artifact removal. Washington also has a much larger number of sunken historic airplanes from the mid-twentieth century due to the historically large U.S. Navy presence around Puget Sound, and these sunken planes have attracted a lot of public interest over the years.

RECENT RESEARCH

Most underwater archaeological work in the Pacific Northwest is done by volunteer groups rather than as compliance work done by state or federal agencies for development permit requests. Some exceptions are underwater survey projects conducted by the Washington and Oregon State Departments of Transportation for construction of bridge projects, and the Corps of Engineers for various projects in the Puget Sound and the Columbia River. The Maritime Archaeological Society (MAS) is a registered 501c(3) non-profit organization founded to conduct and promote historical shipwreck documentation and public education in maritime heritage in both Oregon and Washington (see www.maritimearchaeological.org). MAS provides training for interested archaeologists and non-archaeologists in underwater archaeological survey and recording, and archaeological ethics. The Underwater Archaeological Society of British Columbia (UASBC) is a non-profit with the same mission in Canada (see www.uasbc.com).

THE MARITIME ARCHAEOLOGICAL SOCIETY (MAS)

MAS provides publicly accessible reports of the Society's investigations on the MAS website and recently published a book on Northwest shipwrecks (Kozik 2020). In addition to producing technical reports, MAS has worked to improve the record of shipwrecks in the Oregon and Washington Historic Preservation Offices' archaeological databases. The state archaeological records contain various levels of information regarding shipwreck sites, and MAS has developed a category scheme in which site data fall into one of four categories:

Category I sites are those known to MAS or the public but no site report information exists in the online database.

Category II sites are found in the online database and include a position (latitude/longitude), vessel name (if known), and the estimated year the ship was sunk (if known).

Category III sites include the information from Category II reports, but also contain additional information such as photos or excerpts from reference material.

Category IV sites are those that are fully documented within the limits of current technology, environment, and federal and state laws concerning site disturbance.

The MAS Shipwreck Survey Project works to provide Category III or IV information for all shipwreck sites in both states' archaeological site databases and all known sites not currently in the databases.

MAS researchers have submitted technical reports to Oregon SHPO and the Oregon Parks and Recreation Department (OPRD) on MAS research into the identification and location of the wreck of the Spanish Manila galleon known regionally as the Beeswax Wreck (Williams 2007, 2008, 2014a, 2014b, 2020; Williams and Peterson 2017; Williams and Marken 2019). The wreck was called this because of the large amounts of beeswax that have been found in the Nehalem and Clatsop areas of the north Oregon coast since the vessel wrecked over 300 years ago. The Beeswax Wreck Project serves as an example of the potential for maritime historical and archaeological research that can be undertaken in the Pacific Northwest outside the area of compliance-driven cultural resources management. Beeswax Wreck articles authored by MAS researchers have also been published in peer-reviewed journals and books (Peterson et al. 2011; Williams 2016, 2017; Williams et al. 2017; Williams et al. 2018), and two M.A. theses have been completed on Beeswax Wreck artifacts (Lally 2008; Litzenburg 2022), and a third is underway.

The Beeswax Wreck Project started with a group of interested volunteer archaeologists, historians, geologists, and community members, working together to research the source of the Native American and early settler stories of the prehistoric wreck (Williams 2007). At the start of the project, some in the historic preservation community weren't convinced

that there was a prehistoric wreck on the Oregon coast, or that if there was, that it could be found or identified. There was an attitude that the story was an Indian legend, rather than one based on a real event.

Not only did a vessel wreck on the north Oregon coast prior to 1700, but we now know which vessel it was and when it wrecked. The Beeswax Wreck was the Spanish galleon *Santo Cristo de Burgos*, sailing from Manila in the Philippines to Acapulco in Mexico, in 1693 (Williams 2016; Williams et al. 2017; Williams et al. 2018). The ship came ashore near the Nehalem River, possibly driven off course by strong southwest storms, and at least part of the crew survived and intermarried with the Nehalem and Clatsop peoples (Smith 1900; Gibbs et al. 1970).

In 2022, MAS assisted OPRD with the recovery of wood beams from the Beeswax Wreck at Cape Falcon (Williams 2020; Williams et al., in press). The Beeswax Wreck Project continues, with future research being focused on completing offshore magnetometer and sidescan sonar surveys of the Nehalem and Cape Falcon areas on the Oregon coast and using divers and a remote-operated vehicle (ROV) to investigate any promising targets revealed by those surveys. MAS will continue to partner with OPRD in future investigations on the site where the wood beams were recovered, and in future investigations within Nehalem State Park to investigate reports of Beeswax Wreck materials within the park.

OTHER RESEARCH

MAS is not the only non-profit group in the Pacific Northwest conducting maritime research. The Underwater Archaeological Society of British Columbia (www.uasbc.com) researches, records, and monitors wrecks in Canadian waters and publishes reports of their projects, and until recently the Maritime Documentation Society (a diver group) in the Seattle area was active in recording wrecks in Lake Washington and the Puget Sound (see www.wreckdiving.org).

There is a rich literature associated with the eighteenth and early nineteenth century ships that arrived on the Northwest Coast to explore and then trade with Native peoples, and the impacts associated with that contact and trade. The fur trade and its impact on people and cultures of the Pacific Northwest is the subject of an extensive list of research and publications, ranging from academic theses and journal articles to popular and academic books.

There are indications that European and Asian visitors and wreck survivors were on the Northwest Coast prior to the fur trade and the documented explorations of Spanish and English explorers. Besides the clear evidence for survivors of the Beeswax Wreck living on the Oregon coast, there is evidence for at least two other eighteenth century wrecks with survivors, probably also Spanish, on the north Oregon coast (Williams 2020). Japanese junks are known to have washed ashore with survivors in the nineteenth century, and it is likely that survivors of earlier Japanese junks landed on the Northwest Coast in the seventeenth and eighteenth centuries as well (Webber and Webber 1999). Despite the common presence of Chinese coins and porcelain sherds in archaeological sites in the Pacific Northwest, there is no evidence that Chinese junks ever visited or were washed ashore here. The presence of Chinese artifacts is the result of Spanish wrecks and early fur traders bringing materials from China, rather than Chinese vessels visiting or wrecking.

Melissa Darby, an archaeologist in Oregon, recently published *Thunder Go North* (2019), laying out evidence that Francis Drake anchored and careened his ship in Oregon in 1579 rather than in California as is commonly accepted. This opens exciting new avenues for research into where on the Oregon coast Drake may have made his landfall.

CONCLUSION

The future of shipwreck and maritime research in the Pacific Northwest is promising. While the MAS Beeswax Wreck Project has been one of the most publicly visible maritime archaeology projects in the past fifteen years, other projects have also gathered public attention and raised the awareness of the rich maritime history of the region, particularly northern Oregon (cf. Darby 2019). As Washington State develops its Maritime Washington National Heritage Area more fully, it may lead to increased opportunities for funded maritime research and more attention to Washington's maritime history.

REFERENCES CITED

Darby, Melissa

2019 *Thunder Go North: The Hunt for Sir Francis Drake's Fair and Good Bay*. Salt Lake City: University of Utah Press.

Gibbs, George, Wm. F. Tolmie, and G. Mengarini

1970 Tribes of Western Washington and Northwester Oregon. In *Contributions to American Ethnology*, Vol. 1. Washington, D.C. 1877. Seattle, WA: The Shorey Book Store, Facsimile Reproduction.

Gibbs, James A.

1957 *Shipwrecks of the Pacific Coast*. Portland, OR: Binford & Mort.

1971 *Disaster Log of Ships*. Seattle, WA: Superior Publishing Co.

1978 *Oregon's Salty Coast*. Seattle, WA: Superior Publishing Co.

Griffin, Dennis

2013 A History of Underwater Archaeological Research in Oregon. *Journal of Northwest Anthropology*, 47(1):1-24.

Kozik, Jennifer

2020 *Shipwrecks of the Pacific Northwest: Tragedies and Legacies of a Perilous Coast*. Guilford, CT: Globe Pequot.

Lally, Jessica

2008 Analysis of the Chinese Blue and White Porcelain Associated with the Beeswax Wreck, Nehalem, Oregon. Unpublished Master's thesis, Department of Anthropology, Central Washington University, Ellensburg.

Litzenberg, Vanessa

2022 Stoneware and Earthenware from the Beeswax Wreck: Classification of the Dubé Collection and Discussion of the Interpretation of the Materials in Protohistoric Sites. Unpublished Master's thesis, Department of Anthropology, Portland State University, Portland, OR.

Marc, Jacques F.

1990 *Historic Shipwrecks of Southern Vancouver Island*. Vancouver: Underwater Archaeological Society of British Columbia. .

Marshall, Don

1984 *Oregon Shipwrecks*. Portland, OR: Binford and Mort.

Peterson, Curt D., Scott S. Williams, Kenneth Cruikshank, and John Dubé
2011 Geoarchaeology of the Nehalem Spit: Redistribution of Beeswax Galleon Wreck Debris by Cascadia Earthquake and Tsunami (~A.D. 1700), Oregon, USA. *Geoarchaeology: An International Journal*, 26(2):219–244.

Smith, Silas B.

1900 Beginnings in Oregon. Appendix, *The Quarterly of the Oregon Historical Society*, 1(4):72–97.

Stenger, Allison

1990 Summary Report on the 1989 Excavations at the Cronin Point Site (35-TI-4B) Nehalem State Park Oregon. On file with the Oregon State Historic Preservation Office, Salem, OR.

Stone, David L.

1993 *Sailing Ship Artifacts of the 19th Century*. Vancouver: Underwater Archaeological Society of British Columbia.

Webber, Bert, and Margie Webber

1999 *Amazing True tales of Wrecked Japanese Junks*. Medford, OR: Webb Research Group.

White, James S.

1979 *Diving for Northwest Relics: Identification and Dating of Bottles, Pottery, and Marine Hardware*. Portland, OR: Binford and Mort.

Williams, Scott S.

2007 A Research Design to Conduct Archaeological Investigations at the Site of the “Beeswax Wreck” of Nehalem Bay, Tillamook County, Oregon. On file at Oregon State Parks and Oregon State Historic Preservation Office. Prepared by the Beeswax Wreck Project, January.

2008 Report on 2007 Fieldwork of the Beeswax Wreck Project, Nehalem Bay, Tillamook County, Oregon. On file at Oregon State Parks and Oregon State Historic Preservation Office, Salem, OR.

2014a A Manila Galleon in Oregon: Results of the “Beeswax Wreck” Research Project. *Proceedings of the 2nd Asia-Pacific Regional Conference on Underwater Cultural Heritage*, edited by H. Van Tilburg, S. Tiripati, V. Walker-Vadillo, B. Fahy, and J. Kimura. Honolulu, HI: Electric Pencil.

2014b Summary of 2007–2013 Fieldwork and Survey Results of the Beeswax Wreck Research Project, Tillamook County, Oregon. On file at Oregon State Parks and Oregon State Historic Preservation Office, Salem, OR.

- 2016 The Beeswax Wreck, A Manila Galleon in Oregon, USA. In *Early Navigation in the Asia-Pacific Region: A Maritime Archaeological Perspective*, edited by Chunming Wu. Singapore: Springer.
- 2017 The “Beeswax Wreck”: A Manila Galleon on the North Oregon Coast. *Alaska Journal of Anthropology*, 15(1–2):79–87.
- 2020 The Cape Falcon Cove Site, Smugglers Cove/Oswald West State Park, Tillamook County, Oregon. On file at Oregon State Parks and Oregon State Historic Preservation Office, Salem, OR.

Williams, Scott S., James Delgado, Stacy Scott, and Kyle Lent

In press Smuggler Cove Wreck Timber Site (35TI122), Oswald West State Park, Tillamook County, Oregon. Manuscript to be submitted to Oregon State Parks and Oregon State Historic Preservation Office, Salem, OR.

Williams, Scott S., and Mitch Marken

2019 Underwater Archaeological Investigations of Sonar Anomalies in Smugglers Cove from 2012 to 2018, Oswald West State Park, Tillamook County, Archaeological Excavation Permits No. AP-1506 and AP-1974. On file at Oregon State Parks and Oregon State Historic Preservation Office, Salem, OR.

Williams, Scott S., Mitch Marken, and Curt D. Peterson,

2017 Tsunami and Salvage: The Archaeological Landscape of the Beeswax Galleon Wreck, Oregon, USA. In *Formation Processes of Maritime Archaeological Landscapes*, edited by A. Caporaso. Cham, Switzerland: Springer.

Williams, Scott S., and Curt D. Peterson

2017 Archaeological Testing of Magnetic Anomalies at the Nehalem Airstrip, Tillamook County, Oregon, Archaeological Excavation Permit No. AP-2243. On file at Oregon State Parks and Oregon State Historic Preservation Office, Salem, OR.

Williams, Scott S., Curt D. Peterson, Mitch Marken, and Richard Rogers

2018 The Beeswax Wreck of Nehalem: A Lost Manila Galleon. *Oregon Historical Quarterly*, 119(2):192–209.

Woodward, John

1986 Prehistoric Shipwrecks on the Oregon Coast? Archaeological Evidence. *Contributions to the Archaeology of Oregon 1983–1986*, edited by Kenneth Ames. *Association of Oregon Archaeologists Occasional Papers*, No. 3.

EPILOGUE

Christopher Noll

Archaeological and Historical Services, Eastern Washington University

What Are We Searching For? Anthropological and Archaeological Research in the Pacific Northwest—2023 illustrates the diversity of anthropological research for which the Pacific Northwest is known. These essays offer insights into existing data, highlight promising directions for future research, and call for the importance of recognizing the value of our research to people outside of our research community.

Historically, anthropological and archaeological data was gathered in vast quantities in response to dramatic changes in the natural and cultural landscape of the Pacific Northwest. Only a small fraction of this information could be analyzed as it was collected, and in some cases, those earlier studies were incomplete. Rosencrance and McDonough (Essay 9) highlight the unexamined potential of a site that is widely known throughout the region, which begs the question of what other answers to major research questions are sitting on shelves waiting for analysis. McClure and Hunn (Essay 3) demonstrate that existing research can still yield important insights when viewed from a fresh perspective. Perhaps looking to past research can help generate context and expectations for future generations. Pacific Northwest research is marked by bodies of work unified by distinct themes and theoretical approaches. This collection highlights the contributions of Nelson (Essay 5), and Lévi-Strauss (Essay 4), who provided approaches to understanding Plateau cultures that echo in current research. The works of the past clearly remain a source of valuable information that we can continue to draw on for inspiration and insight.

New technology and approaches to research are no less valuable to Pacific Northwest research than prior work. The Pacific Northwest is an ideal research environment for the application of technology. Raw material analysis using x-ray fluorescence (XRF) is an excellent example of such technological applications. Reimer, and Reimer and Copp (Essays 8 and 10) note that the technology has been used successfully in the Pacific

Northwest for decades. They also highlight the unexplored potential and increasing accessibility of XRF. The geologic richness of the region has been known since time immemorial and archaeology is just beginning to catch up to that Indigenous knowledge. As technology expands our capability to learn in ways that were unavailable a short time ago, we are able to generate unique approaches to problem-solving. At times, questions of how things were made cannot be learned from an informant. In the Pacific Northwest, like many other parts of the world, much attention is focused on a few artifact classes such as projectile points or basketry which have a large degree of complexity in their design and prompt volumes of literature aimed at understanding what every small detail about them means. In the Pacific Northwest, those artifact classes are present, but they are just a small part of a broad spectrum of materials that in many cases are poorly known in their function or manufacture. In this collection, Hannold (Essay 11) presents a window into the potential of experimental studies to understand how a class of tools that were critical to the use of nets for harvesting salmon and other animals in mass could have been made. Experimentation has the potential to enlighten archaeological research to aspects of the past that were critical to daily life that have been overlooked until now. The diversity of people and environments of the Pacific Northwest lends itself to these innovative and creative approaches to studying the materials of the region.

The Pacific Coast has been a source of prosperity and destruction that archaeologists are only beginning to fully understand. The coastal area was a major focus of the first anthropologists in the region and continues to be where the region's population is concentrated. As such, the attention and activity in the coastal area continues to focus research west of the Cascades, particularly through cultural resource management compliance projects. Despite the energy and money in this research, new discoveries are still waiting to be made. Croes (Essay 7) points to the challenging but immensely rewarding potential of wet sites, where the environment preserves organic materials and features that are commonly lost to the atmosphere, bacteria, and sunlight in open sites. However, if wet site archaeology is challenging, coastal maritime archaeology may be a monumental task by comparison. Shipwreck sites are the products of events rather than patterns of behavior, which makes finding them a laborious effort to conduct documentary research and survey for both site location and identification. Williams (Essay 12) points out that there

is tremendous public support for this type of research. As valuable as these sites are to archaeological and historical research, they are perhaps equally important in generating enthusiasm and public support for archaeological site preservation in the Pacific Northwest.

The idea of research relevance and connection to people outside of anthropology is important. Is what we are searching for meaningful to people today? Anthropological and archaeological research should do more than serve esoteric research questions discussed in a darkened conference room by a handful of people. We have the potential to provide insights into how we relate to one another, or don't, and understand why. Gardner (Essay 1) and Tayson (Essay 2) examine conflicting values and the struggle for people to identify with opposing viewpoints. In the increasing polarized world that we live in, complete with calls to redraw state lines based on political ideologies of the moment, any help to break down that polarization is a benefit to everyone. Archaeology and anthropology have historically been practiced at a distance from the communities they study. As our various subfields reconcile the fact that we are ultimately focused on people who know we are studying them and have an interest in what is being said, we have the potential for growth that will be unlike anything seen before. Carney (Essay 6) exemplifies the cooperative and mutually beneficial potential of research informed by Indigenous perspectives. For the communities we work within, the things we study are part of the culture and should not be viewed in isolation from those people.

In thinking about the anthropological and archaeological research presented in this collection, it is clear that there is tremendous breadth in the work. The subjects are varied, but beyond that, there is distinct evidence that research is becoming increasingly diverse and inclusive. While roughly 80 percent of the authors have university affiliations, they have actively given space to acknowledge people who have traditionally been excluded from academic research, or data that has been overlooked. The expansion of who and what is involved in anthropology and archaeology is critical to the growth of research in the Pacific Northwest. The research that is being conducted has academic, cultural, and social relevance. As we look to the future one can only hope that the existing research community and the voices of new researchers, asking new questions, will be increasingly drawn to share their insights at our regional conferences and in our regional publications, and with the public.

APPENDIX

INCORPORATING 56 YEARS OF *NARN/JONA* ARTICLES INTO NORTHWEST ANTHROPOLOGICAL RESEARCH

Darby C. Stapp and Victoria M. Boozer

Journal of Northwest Anthropology

INTRODUCTION

One of the major changes with the *Journal of Northwest Anthropology* (*JONA*) in the last decade has been improved digital access to all previously published content. Since 1967, over 20,000 pages of anthropological material has appeared in *JONA*, its predecessor *Northwest Anthropological Research Notes* (*NARN*), and 22 published *JONA* and *NARN Memoirs*. However, because most of this material appeared in the pre-internet era, only those with access to printed copies were aware of the published material. While many of the more popular articles found their ways into article and book reference lists, most did not.

Thanks to technological improvements of recent years, researchers can now access an electronic file with all 56 volumes (and *Memoirs* 1 through 7) and search using keywords to find relevant material. We make this 1 GB file available for no cost at the following link <https://drive.google.com/file/d/1w-82McuXpQf6598zhmO3VFvyPO5Fa4_M/view?usp=share_link>. Simply open the file and begin searching, or download the file onto your computer for faster searches.

Searching the *NARN/JONA* electronic file is effective, efficient, and straightforward. Simple and complex searches can be performed to find specific items and various types of data throughout the electronic file. Upon opening the *NARN/JONA* e-file, the researcher can access both the basic search function and the advanced search function with their PDF software to enter a keyword or keyword phrase. The basic search function allows the researcher to conduct a keyword search for a single issue or *Memoir* within the PDF portfolio, whereas the advanced search function grants the

researcher the ability to search the entire PDF portfolio containing 56 years of Northwest anthropological research published by *NARN/JONA*. Searches can be narrow or broad and specific properties—such as whole words only and/or case sensitive—can be applied when utilizing the advanced search function. A step-by-step instructional guide explaining the advanced search process is available on the *JONA* website and is compatible with Adobe Acrobat software <www.northwestanthropology.com/narnjona-digital-archive>. Results for keyword searches will appear within seconds. While searches take seconds, results must be examined one by one to make sure they are the desired result, and that can take some time. Many search terms have multiple meanings. For example, using the search term “Binford” to identify places where the archaeologist Lewis R. Binford is mentioned will also yield results for the publisher Binford and Mort.

Search results will appear in a new window, organized by journal volume and number. The user can then select the specific journal and each place the search term was located will be identified. Selecting the specific result will open another window with the journal page so that the context of the result can be examined (Figure 1).

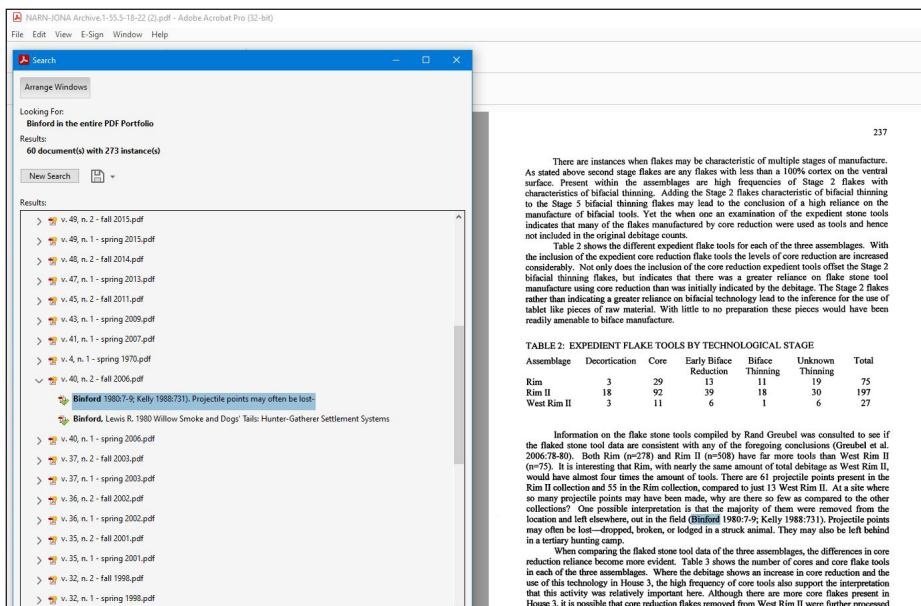


FIGURE 1. Advanced search results for “Binford,” with one result selected to show how the journal page will appear on the right, enabling the user to review the context.

Search results can be downloaded in two formats: a PDF file that shows volume, page number, and adjacent words (Figure 2); and a comma-separated values file (CSV), which allows data to be saved in a tabular format that includes volume, page number, and adjacent words (Figure 3). Both formats identify the number of documents and the number of instances, and CSV files can be used with almost any spreadsheet program, such as Microsoft Excel or Google Sheets.

BENEFITS OF THE *JONA* ADVANCED SEARCH TOOL

One use of the *JONA* search tool is to locate previous research on a topic of interest. The search function is useful for the researcher interested in a particular topic, such as an historical person, an early anthropologist, a particular artifact type, a drainage, an archaeological site or phase, or a theoretical concept. Within the 56 years of *NARN/JONA* material, one will find relevant articles concerning the topic, discussions within articles, and reference material. In addition to contemporary research are many historical works—such as the Report of the Committee for Investigating and Publishing Reports on the Physical Characters, Languages, and Industrial and Social Conditions of the North-Western Tribes of the Dominion of Canada from the Report of the Meeting of the British Association for the Advancement of Science, 1886–1889—that were republished, mostly in *NARN*. Also included in the 56 volumes are the titles, abstracts, and presenters of all papers presented at the annual Northwest Anthropological Conference (NWAC); the abstracts can provide clues to others who have conducted similar research, which can then be used to Google search and determine if he/she/they published any materials, or how they can be contacted. Finally *NARN* and *JONA* have a tradition of publishing bibliographies on anthropological and archaeological topics relevant to the Northwest.

The *NARN/JONA* electronic file can also be used by researchers interested in the history of anthropological and archaeological theory and practice in the Pacific Northwest. Whether the interest is identifying patterns or trends in Northwest anthropological research by searching for theorists, ideas, or methods, the *NARN/JONA* e-file is an excellent way to develop preliminary findings for the past fifty years with minimal effort. For example, if we were interested in the years that Lewis R. Binford influenced Northwest archaeology, a search for “Binford” can provide the raw data to determine the actual numbers (Table 1).

Search

Arrange Windows

Looking For:
camas in the entire PDF Portfolio

Results:
83 document(s) with 610 instance(s)

New Search

Results:

- 50 Years of Northwest Anthropology - Archive of NARN/JONA Volumes 1-50 Memoirs 1-7 & 13
- v. 7, n. 2 - fall 1973.pdf
 - bitterroot, **camas**, clover root, etc., are low in calories, while berries and miscellaneous greens,
 - and] **camas** grounds (Burnett 1904:97). The second statement is provided by Antoine,
- v. 6, n. 2 - fall 1972.pdf
 - ample camas resource sites** (Spier and Sapir 1930:182-83). **Plant resources related**
 - especially **camas**, formed a relatively ample and dependable dietary basis, thus permitting the time
 - mainly **camas**, during the harvesting period made it possible for large numbers of people
 - prepared **camas** roots, root products, hazel nuts, huckleberries, and fibers identified as silk grass
 - of **camas** and other root products for exchange, with those of the Nez Perce
 - particularly **camas**, followed by louse and bitterroot formed the bulk of the plant diet.
 - little **camas** in their territory and obtained most of their supply in Wenatchi and
 - of **camas** if they used **camas** grounds south of the Columbia as did the

The Wishram and their immediate neighbors had ample **camas** resource sites (Spier and Sapir 1930:182-83).

Plant resources related to intergroup behavior in a number of ways: The abundance of plant food, especially **camas**, formed a relatively ample and dependable dietary basis, thus permitting the time and energy to devote to other activities.

The abundance of roots, mainly **camas**, during the harvesting period made it possible for large numbers of people to meet at root grounds. This was particularly true in the Salapatin area.

Some groups gathered surpluses of plant items used for food and other purposes, and local stone and shell material. These were exchanged as raw material or finished items with other groups.

The Klikitat, Yakima, and possibly Kittitas prepared **camas** roots, root products, hazel nuts, huckleberries, and fibers identified as silk grass and bear grass (Lewis and Clark 1905, Vol. 4: 305; Stevens 1855, Vol. 1: 403-4; Curtis 1911, Vol. 8:94). The Klikitat and Yakima also made some baskets (Curtis 1911, Vol. 7:5, 39; Heberlein and others 1928:137).

The Columbia, Wenatchi, Methow, and Chelan produced basketry, basketry materials, tule mats used for housing and other purposes, dried berries, roots products, and hemp (Heberlein and others 1928:139, 140-1, 157, 414; Walters 1938:75; Teit 1928:112, 121, Teit 1930:223). Stone artifacts were made of local materials by the Columbia, Wenatchi, and Methow and probably the Chelan, with those of the Columbia and Wenatchi being considered

University of Utah and *Proceedings* 1030:55. *Notes* 1030:111. *Mtst* 1030:977

FIGURE 2. PDF advanced search results example.

5	Searched for	camas							
6	In document	C:\Users\NWA Deil\Desktop\NARN-JONA Archive.1-55.5-18-22 (1).pdf							
7	Number of document(s) found	83							
8	Number of instance(s) found	610							
9									
10	File name	Title	Page	Search Instance					
11	NARN-JONA Archive.1-55.5-18-2	JONA-Archives Index		57 Nutritional Analysis of Camas (Camassia quamash) from Southern Idaho Mark G. Plew 289					
12	NARN-JONA Archive.1-55.5-18-2	JONA-Archives Index		57 of Camas (Camassia quamash) from Southern Idaho Mark G. Plew 289 1992 Historical					
13	NARN-JONA Archive.1-55.5-18-2	JONA-Archives Index		102 Nutritional Analysis of Camas (Camassia quamash) from Southern Idaho Mark G. Plew Vol.					
14	NARN-JONA Archive.1-55.5-18-2	JONA-Archives Index		102 of Camas (Camassia quamash) from Southern Idaho Mark G. Plew Vol. 27, No.					
15									
16	File name	Title	Page	Search Instance					
17	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 10, n. 1 - spring 1976.pdf		21 processing of edible camas (Camassia quamash) •					
18	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 10, n. 1 - spring 1976.pdf		21 edible camas (Camassia quamash) •					
19									
20	File name	Title	Page	Search Instance					
21	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 10, n. 2 - fall 1976.pdf		12 association with edible camas, a plant of known economic importance ethnographically. Simi					
22	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 10, n. 2 - fall 1976.pdf		13 harvesting and processing camas and other plants. The one Class C aggregate in the					
23	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 10, n. 2 - fall 1976.pdf		14 , C represents camas processing camps , and IJ , Z , F ,					
24	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 10, n. 2 - fall 1976.pdf		15 of these with camas makes it likely that they bear some relationship to Class					
25	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 10, n. 2 - fall 1976.pdf		15 probably served as camas processing stations. The relationship of unassigned floodplain aggr					
26									
27	File name	Title	Page	Search Instance					
28	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 11, n. 2 - fall 1977.pdf		38 move, in the camas prairies and on the winter deer and buffalo hunts (
29									
30	File name	Title	Page	Search Instance					
31	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 12, no. 1 - spring 1978.pdf		11 Salmon River vicinity, Camas Prairie, and the Clearwater Plateau (Fig.1). These areas					
32	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 12, no. 1 - spring 1978.pdf		12 LOWER SALMON RIVER CAMAS PRAIRIE CLEARWATER PLATEAU IUouNe «iter Fig. 1.					
33	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 12, no. 1 - spring 1978.pdf		13 6,000 8,000 10,000 Camas Prairie Phase (Stratum I) 44 Rocky Canyon Phase (
34	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 12, no. 1 - spring 1978.pdf		14 unit is the Camas Prairie Phase which represents only the component in Stratum 1					
35	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 12, no. 1 - spring 1978.pdf		15 surprising, for the Camas Prairie region to a later date because it was "					
36	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 12, no. 1 - spring 1978.pdf		15 surprising, for the Camas Prairie region may have been a refuge area for bison					
37	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 12, no. 1 - spring 1978.pdf		16 ted in the Camas Prairie region for 3500 years, any new cultural manifestation					
38	NARN-JONA Archive.1-55.5-18-22 (1).	pdf-v. 12, no. 1 - spring 1978.pdf		17 Snake River sequence. Camas Prairie Phase = Harder Phase Rocky Canyon Phase = Tucannon					

FIGURE 3. CSV advanced search results example.

**TABLE 1. REFERENCES TO LEWIS R. BINFORD IN THE
JOURNAL OF NORTHWEST ANTHROPOLOGY (2002–2022) AND
NORTHWEST ANTHROPOLOGICAL RESEARCH NOTES (1967–2001).**

YEARS	CALL-OUTS ¹	YEARS	CALL-OUTS ¹
1967–1971	1	1997–2001	22
1972–1976	4	2002–2006	2
1977–1981	1	2007–2011	3
1982–1986	14	2012–2016	10
1987–1991	12	2017–2021	19
1992–1996	10	-	-

¹ A call-out was registered whenever there was a direct reference to Lewis R. Binford and each time a Binford reference was cited. Binford references found in References Cited were not counted. The 98 call-outs made reference to 21 Binford publications. The most frequent publication cited (n=12) was the 1980 *American Antiquity* (45(1):4–20) article “Willow Smoke and Dogs’ Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation.”

A more thorough description of the 56 years of content and ways this information can be used to support research is found in *JONA Memoir 13, 50 Years of Northwest Anthropology: A Content Analysis and Guide to the Journal of Northwest Anthropology*, which can be found on our website <www.northwestanthropology.com/open-access-memoirs>.

SUMMARY

We have made the complete collection of *NARN/JONA* material available on our website to facilitate future research. Nothing is more frustrating than to see a new piece of research that does not include a past *NARN* or *JONA* article that has direct relevance. Our hope is that all professionals conducting research on Pacific Northwest anthropological and archaeological topics will spend an hour or two searching the *NARN/JONA* e-file during the early stages of their research. We also encourage researchers interested the development of anthropology and archaeology in the Northwest to test their ideas using the *NARN/JONA* 1967–2022 electronic file.

ABOUT THE AUTHORS

ANDREW GARDNER

University of Puget Sound
gardner@pugetsound.edu

Andrew Gardner is a Professor of Anthropology at the University of Puget Sound in Tacoma, Washington. A sociocultural anthropologist and ethnographer by training, for the past two decades Andrew's fieldwork has been focused on the places, peoples, and societies that interact in the petroleum-rich states of the Arabian Peninsula. In graduate school at the University of Arizona, he cut his teeth on a constellation of applied projects focused on rural America, on Native American cultural resource management, and on international development efforts and assessments. In addition to numerous journal articles and book chapters, he is the author of *City of Strangers: Gulf Migration and the Indian Community in Bahrain* (Cornell 2010), and *The Fragmented City: Migration, Modernity and Difference in the Urban Landscape in Doha, Qatar* (Cornell n.d.). He has been invited to speak at Oxford, the London School of Economics, the Sorbonne, the University of Cologne, the National University of Singapore, Kyoto University, Duke University, the University of Chicago, UNAM Mexico City, the University of Hawaii, and numerous other colleges, universities, and institutions around the world.

MELISSA R. TAYSOM

Idaho State University
taysmel2@isu.edu

Melissa Taysom is a graduate student in the Department of Anthropology at Idaho State University, where she completed her undergraduate studies in Anthropology and Linguistics as well as a Medical Anthropology Certificate in May 2021. She will graduate with her Master of Science degree in Anthropology in August 2023. Her thesis project is an ethnographic work on how social, landscape, and economic changes stemming from amenity migration to rural areas, specifically Teton Valley, are impacting the subjective well-being of farmers and ranchers. She hopes to extend this project to include other farming and ranching communities throughout Idaho in the future.

ABOUT THE AUTHORS

RICHARD H. McCLURE, JR.

U.S. Forest Service (Retired)
rhmcclurecrm@gmail.com

Rick McClure (M.A., Washington State University, 1984) is a retired federal agency archaeologist. His professional experience has included cultural resource management positions with the USDA Forest Service, Gifford Pinchot and Mt. Hood National Forests in Washington and Oregon, including the role of Heritage and Tribal Programs Manager. During the course of his career, Rick and his wife Cheryl Mack, also a retired Forest Service archaeologist, worked closely with local Tribes to document, protect, and restore traditional cultural landscapes, features, and sites. Rick and Cheryl are the authors of *For the Greatest Good: Early History of Gifford Pinchot National Forest* (Northwest Interpretive Association 1999, 2008), as well as journal articles and technical reports on traditional indigenous and historic period land use on national forest lands. They make their home near the foot of Pahto—Mount Adams—in the Washington Cascades.

EUGENE S. HUNN

University of Washington
enhunn323@comcast.net

Eugene S. Hunn (Ph.D, University of California, Berkeley, 1973) is Professor Emeritus in Anthropology at the University of Washington, Seattle. His research and writing have been devoted to documenting traditional environmental knowledge by Native Americans throughout North America, combining academic interests in the nature of human knowledge and its expression in language with a fascination with natural history. His books include *Tzeltal folk zoology: the classification of discontinuities in nature* (Academic Press 1977); *Resource managers: North American and Australian hunter-gatherers*, co-edited with N. M. Williams (Westview 1981); *Nch'i-Wána "The Big River": Mid-Columbia Indians and their land, with James Selam and Family* (University of Washington Press 1990); and *A Zapotec natural history: trees, herbs, and flowers, birds, beasts, and bugs in the life of San Juan Gbëë* (University of Arizona Press 2008).

ABOUT THE AUTHORS

JAY MILLER

Lushootseed Research

jaymiller3@juno.com

Jay Miller studied anthropology, archaeology, art history, ethnohistory, and linguistics at the University of New Mexico (B.A.) and Rutgers (Ph.D. on Keresan Pueblos, an isolate, contrasting Leslie White to Alfonso Ortiz within a Lévi-Strauss frame), with coursework at Princeton. He also led archaeological surveys and excavations in New Mexico and New Jersey with adult amateurs and college students. Teaching in the U.S. and Canada took him to each of the four quarters (SW, SE, NE, NW), as well as a decade in the heartland in Chicago at the Newberry Library's Center for the American Indian History—now D'arcy McNickle Center For American Indian and Indigenous Studies. At Native American Educational Services (NAES), he taught Algonkian basics with Native speakers of Ojibwa and Menomini. Following *JONA's* lead to Amazon Kindle, during Covid, he published, edited, or republished a hundred titles dealing with Native North America, especially the Northwest.

CHARLES M. NELSON

Retired

chaz@chaz.org

Charles Nelson cut his archaeological teeth in the Washington Archaeological Society and went on to get his degree in Anthropology at Washington State University with lots of geology and soils science. He did archaeology every summer beginning in 1956, working under Osborne, Borden, Butler, Denman, Greengo, Daugherty, Sprague, and others, and published as a high school student and undergraduate. Wanting to experience a different archaeological tradition, he went to University of California, Berkeley, for his M.A. and Ph.D. under Clark and Isaac. He then spent about 35 years working and teaching in East Africa before retiring back to the states, where he has picked up the thread of Plateau archaeology. Learn more at www.chaz.org/index.html.

ABOUT THE AUTHORS

MOLLY CARNEY

University of Arkansas
mc143@uark.edu

Molly Carney is an environmental archaeologist who has worked primarily in the Pacific Northwest. Her specialties include archaeobotany, geoarchaeology, and ethnobiology. She received her M.A. and Ph.D. from Washington State University and continues to conduct fieldwork and research at archaeological sites throughout northern Washington State. She is currently an Assistant Professor at the University of Arkansas.

DALE R. CROES

Washington State University
dcroes444@gmail.com

Dale R. Croes received his B.A. in anthropology from the University of Washington. He got wet through: his Washington State University M.A. and Ph.D., analyzing basketry and cordage artifacts from the Ozette Village wet site (Croes 2019, 2021); post-doctoral research at the Hoko River wet site (Croes 1995, 2005); first-ever archaeological excavations at the National Historic Landmark wet site of Sunken Village, Portland, Oregon (Croes et al. 2009); and excavations of the *Qwu?gwes* wet (and dry) site with the Squaxin Island Tribe (Croes et al. 2013). In retirement he worked with Ed Carriere, Suquamish Elder and Master Basketmaker, analyzing and replicating 2,000-year-old Biderbost wet site basketry (Carriere and Croes 2018). To review the above wet references and others, please go to: wsu.academia.edu/DaleCroes.

RUDY REIMER

Canadian Research Chair in Indigenous Community Archaeology; Department of Archaeology, Simon Fraser University
rudyr@sfu.ca

Rudy Reimer is an Assistant Professor at Simon Fraser University in the departments of Archaeology and First Nations Studies and is a member of the Squamish Nation. He has worked on the Northwest Coast, Plateau, and Sub-Arctic areas for 26 years with research that has examined high elevation land and resource use, lithic technology, settlement patterns, trade and exchange, and combining Indigenous and scientific perspectives in archaeology.

ABOUT THE AUTHORS

RICHARD L. ROSENCRANCE

University of Nevada, Reno; Museum of Natural and Cultural History, University of Oregon
rosencrance@nevada.unr.edu

Richard (Richie) Rosencrance (M.A., University of Nevada, Reno) is currently a Ph.D. student at the University of Nevada, Reno, and an instructor at the University of Oregon archaeological field school. His research interests include the peopling of the Americas, the Western Stemmed Tradition, chronology building, lithic technology, and organization of labor. He has worked in CRM contexts across the American northeast, southeast, and northwest. He is actively involved in field and collections-based research projects in Oregon, Nevada, Washington, and Idaho.

KATELYN N. MCDONOUGH

Department of Anthropology, University of Oregon; Museum of Natural and Cultural History, University of Oregon
kmcdonou@uoregon.edu

Katelyn McDonough (Ph.D. Texas A&M University) is an Assistant Professor in the Department of Anthropology at the University of Oregon and Director of the Northern Basin Archaeology Field School of the Museum of Natural and Cultural History at the University of Oregon. She is an environmental archaeologist who studies relationships between people, foodways, disease, and ecosystems, with an emphasis on the Pleistocene-Holocene transition in western North America.

STANLEY A. COPP

Port Moody Heritage Society, Department of Sociology and Anthropology, Langara College (Retired)
sacopp@gmail.com

Stan retired from teaching at Langara College just as the first wave of Covid hit, so his timing was impeccable. Over a career of 41 years, he mostly taught anthropology and archaeology courses, including field schools, in the Okanagan-Similkameen and Southern Coastal areas of British Columbia, but also in East Africa. He also conducted surveys and site excavations as a consultant and used results of field schools and consulting projects in the Similkameen to cobble

ABOUT THE AUTHORS

together a Ph.D. from Simon Fraser University in 2006. He remains an active researcher in historical and pre-Colonial archaeology, some of the former leading to ethno-historical studies of NeoPaganism in order to understand some curious petroforms located in Stanley Park, Vancouver, during his final field school projects.

CYNTHIA R. HANNOLD

Doctoral Candidate, University of Alabama
crhannold@crimson.ua.edu

The author received her master's degree from the University of Idaho in 2019 and is currently a Ph.D. candidate at the University of Alabama studying variation in lithic and lime plaster technologies in the Maya Lowlands.

SCOTT S. WILLIAMS

Washington State Department of Transportation
willias@wsdot.wa.gov

Scott Williams is the Cultural Resources Program Manager for the Washington State Department of Transportation. He has nearly 40 years of experience conducting multidisciplinary archaeological research in the Pacific Northwest and the Pacific Basin. Prior to joining the Washington State Department of Transportation, he worked in a variety of government and private sector archaeology positions, including the Washington State Department of Archaeology and Historic Preservation, the U.S. Department of Agriculture, the Bishop Museum in Honolulu, and private CRM firms. He is one of the founding members of the non-profit Maritime Archaeological Society and serves as its current President. For the past 16 years he has been the Principal Investigator of the Beeswax Wreck Project.

ABOUT THE AUTHORS

CHRISTOPHER NOLL

Archaeological and Historical Services, Eastern Washington University
cnoll77@gmail.com

Christopher Noll (M.A., Washington State University, 2009) is the program manager for the grant and contract-funded department Archaeological and Historical Services at Eastern Washington University in Cheney. Chris has also served as an officer of the Northwest Anthropological Association as Vice President (2019–2021) and President (2021–2023). Since 1993, Chris has contributed to field investigations, artifact analysis, technical and peer reviewed publications, and conference presentations. He specializes in the study of lithic technological organization in the Pacific Northwest.

INDEX

#

50 Years of Northwest Anthropology 144

A

acorn nuts 71

amenity migrations 2, 13, 14

anthropological ethnography 6, 8, 10

Antifa 9

archaeobotanical 55, 98, 99

Ashnola 106

Ashnola River 106, 111

Ashnola River Road 105

Athapaskan-speaking hunting party 106

auto-ethnography 8

avalanche lilies 29

B

bark gill net 71

Beavert, Virginia 27, 29

Beeswax Wreck 130–131, 132

Binford, Lewis 140, 141, 144

Boas, Franz 34, 36

bone game 25

Bruker III-v portable XRF 87, 107

C

camas 36, 46, 48, 51, 52, 53

Cape Falcon, OR 127, 131

Carlson, Roy 71, 85, 86

Carriere, Ed 74, 75

Cash Cash, Philip 26

cedar bough 70, 71

Channeled Scablands 93

Chilcotin Plateau 106

Chinese artifacts 132

Chinese junks 128, 132

Chinook people 34, 36

Chinuk WaWa 25

clams 52

Clatsop people 131

Clinton, Hillary 8–9

Clovis technology 93

cobble tools 117, 118, 121, 123

Columbia Plateau corner-notched
point 111

comparative area studies 4

Confederated Tribes and Bands of the
Yakama Nation 23, 93, 99

Confederated Tribes of the Colville
Reservation 93, 99

Confederated Tribes of the Umatilla
Indian Reservation (CTUIR) 27

Cooper's Ferry 93, 94

Coulee City, WA 10

Cowlitz River 22, 23, 24, 26–30, 112

Cowlitz Tribe 25, 26

Crabtree, Don 117, 124

crests 93, 96

CSV file 141, 143

cultural resource management (CRM) 3,
74, 87, 118, 137

D

Darby, Melissa 132

Daugherty, Richard 92, 95, 96, 97

Davis, Maddie 10, 11

deplorables 6, 8, 9

direct percussion 118, 121, 123

Drake, Sir Francis 132

Drucker, Philip 69

E

earth oven 36–38

Elk Pass obsidian source 108, 111, 112

Ethnographic Survey of Rural Cascadia
10

ethnographic *community dossier* 10–11

ethnographic toolkit 7, 10, 11

INDEX

experimental archaeology 117, 137

Eyle, Joyce 25, 27, 29

Eyle, Sam Jr. 25

F

farmers 13–16, 18–19

fish trap 48, 52, 53

Fladmark, Knut 85, 111

flaked cobble tools 117

flintknapping 116, 120, 123

Fraser River Delta 70

G

Generationally-Linked Archaeology 74

Gifford Pinchot National Forest 26

Glass Buttes obsidian source 108, 111

Glenrose Cannery Site 70, 74

Grand Forks, B.C. 106

Griffin, Dennis 127, 128

Gunther, Erna 24, 25

H

Hardy, Martha 23, 24–27, 31

Haskett Type projectile point 96

Hill, Fred Sr. 26

Hoko River artifacts 71, 72

Hosko obsidian source 108, 112

huckleberries 29

I

Indian Claims Commission (ICC) 25

Indian Reserve No. 10 106

Irwin and Moody 92, 94, 96, 97

J

Jacobs, Julia 74

Jacobs, Melville 23, 24, 25

Jacob's Research Fund 26

Jansen, Joana 27

Japanese junks 132

Japanese submarines 128

JONA Memoir 13 144

Journal of Northwest Anthropology

(*JONA*) 1–4, 139–144

K

Karaca's study 120

Keresan Pueblos 33

Kettle Falls 111

keyword search 139, 140

Kilgii Gwaay wet site 73

Kingcome obsidian 88

Kiona, Mary 22–31

Kittitas "Fair" 111

L

Lachane wet site 71, 75

Lake Washington 131

Lévi-Strauss, Gustave Claude 33–38, 136

Lewis County Historical Society 26

Libby, Willard 96

Lind Coulee Site 92–99

Lind Coulee Type projectile points 96

Lower Simikameen Indian Band 105,
106, 113

Lyman, R. Lee 42, 43

M

Malinowski, Bronislaw 7, 10

Martha Hardy Papers 26

Maritime Archaeological Society (MAS)
129–132

Maritime Documentation Society 131

Maritime Washington National
Heritage Area 132

MAS Beeswax Wreck Project 130–132

Methow Valley 106, 113

INDEX

microdebitage 105, 107, 111–113
Miller, Jay 4, 42, 147
Morgan, Lewis Henry 7
Morning Owl, Thomas 26
Morton, WA 25
Mossyrock, WA 22–23
Mount Edziza 85
Mount Garibaldi 85
Mount Rainier National Park 25
Mythologiques 34, 35

N

NARN/JONA electronic file 139–144
Nch'kay 85, 88
Nehalem people 131
Nehalem River 127, 131
Nehalem, OR 130
Nelson, Erle 85
net sinkers 116–124
Nicola Valley 106
Noll, Chris 3
Northwest Anthropological Conference
(NWAC) 3, 118, 141
*Northwest Anthropological Research
Notes (NARN)* 4, 139
Northwest Indian Language Institute 27
Northwest Sahaptin Texts 23, 24, 25
NWAC abstracts 141

O

obsidian source reference library 84–86,
112
Okanagan Valley 106–107, 108
Old Man House 74
Oregon Historic Preservation Office 80,
128, 129, 130
Oregon Parks and Recreation
Department 130
Ortiz, Alfonso 33

Ozette artifacts 71

P

Packwood, WA 22, 24, 28, 30
Paisley Caves 93, 94
Paiute-speaking people 111
PDF file 141
Placid, Minnie 25
Plateau Peoples' Web Portal 31
Portland, OR 71
Prairie Mountain, WA 27, 28, 29
Prince Rupert, B.C. 71
Processual School 3
Puget Sound 129, 131

Q

Quillomene Bar corner-notched point
111
Quinn, Dave 117, 124
Qwu?gwes wet site 70–72, 77, 79

R

radiocarbon dating 93, 95–99
ranchers 2, 13–19
Randle, WA 23, 24, 27, 28
Ray, Dorothy Jean 26
rockfish 48, 53

S

Santo Cristo de Burgos 131
Sappington, Lee 117, 124
seasonality 54, 99
Selam, James 26
Sepez, Jennifer 26
shipwrecks 127–129
short essay concept 1–2
shovel test units 107
shrub-steppe habitat 44

INDEX

Similkameen River 106, 111
Similkameen Valley 106
Simon Fraser University 84–88, 108, 112
Skagit River 71
Skyo Ranch 24
small family farms 14, 19
Smith, Allan H. 25
Social Evolutionary Theory 6–7
Sonoran Desert Biome 107
South Puget Sound Community College
78, 79
Spanish galleons 128
spindle graphs 41, 42
Squaxin Island Tribe 70, 80
Story of the Lynx 36, 38
Sunken Village wet site 71, 77, 78, 80
Sunset Creek Site 40, 42, 43
Sylix ethno-linguistic group 106

T

Taylor, Herbert 25
Taysom, Melissa R. 12
Taytnapam 22, 23, 25, 26, 29
Teit, James 34, 36
Teton County, ID 14
Teton County, WY 14
Teton Valley, ID 2, 13–19
The Book of Knowledge 42
The Dalles 111
The Dalles Emporium 34, 36
Thunder Go North 132
Tlingit museum styles 75
Totus, Damien 27
toy war club 71, 72
Tracer III-v 87, 107
Tracer 5i 87
traditional resource environmental
management 45
Treasure Trove Act 128
trends in anthropological research 141

Tristes Tropiques 34
Tsimshian museum styles 75
Tylor, Edward 6

U

Underwater Archaeological Society of
British Columbia 129, 131
University of Idaho Lithics Lab 117, 118,
124
University of Puget Sound 10
Upper Cowlitz Tribe 24, 25, 31
Upper and Lower Simikameen First
Nation 105
U.S. Bureau of Reclamation 92, 94, 99
U.S. National Park Service 80

V

Viewpoint Site 105–113

W

Washington Department of
Archaeology and Historic Preservation
(DAHP) 129
Washington State University Museum
of Anthropology 92, 93, 95
Western Stemmed Tradition 93
wet sites 69–81
Whitewater Ridge obsidian source 108
Wilson, Clifford 26
wooden mat creaser 72
Woods, Jim 117

X

x-ray fluorescence (XRF) 84–89, 107,
108–113, 136

INDEX

Y

Yakama Nation 26

Yakama Nation Cultural Center 26

Yoke, Lucy 29

Yoke, Mary 22

Yoke, William 22

Z

The Journal of Northwest Anthropology



THE JOURNAL

THE *JOURNAL OF NORTHWEST ANTHROPOLOGY (JONA)* IS A REGIONAL, PEER REVIEWED SCHOLARLY JOURNAL FOR THE PACIFIC NORTHWEST REGION WITH JOURNAL ISSUES PUBLISHED BIANNUALLY. WE WELCOME CONTRIBUTIONS OF PROFESSIONAL QUALITY CONCERNING ANTHROPOLOGICAL RESEARCH IN NORTHWESTERN NORTH AMERICA. THEORETICAL AND INTERPRETIVE STUDIES AND BIBLIOGRAPHIC WORKS ARE PREFERRED, ALTHOUGH HIGHLY DESCRIPTIVE STUDIES WILL BE CONSIDERED IF THEY ARE THEORETICALLY SIGNIFICANT. THE PRIMARY CRITERION GUIDING SELECTION OF PAPERS WILL BE HOW MUCH NEW RESEARCH THE CONTRIBUTION CAN BE EXPECTED TO STIMULATE OR FACILITATE.

FOR MORE INFORMATION ABOUT *JONA*, PLEASE VISIT OUR WEBSITE:

NORTHWESTANTHROPOLOGY.COM



MEMOIR SERIES

IN OUR MEMOIR SERIES, WE PUBLISH WORKS OF A THEMATIC NATURE. PAST MEMOIRS INCLUDE THE COLLECTED WORKS OF DISTINGUISHED ANTHROPOLOGISTS IN THE PACIFIC NORTHWEST, NATIVE AMERICAN LANGUAGE DICTIONARIES, REPRINTS OF HISTORICAL ANTHROPOLOGICAL MATERIAL, AND EFFORTS OF INDIGENOUS AND ACADEMIC COLLABORATION.

SPECIAL PUBLICATIONS

OUR SPECIAL PUBLICATIONS INCLUDE SPECIAL REPRINTS, SHORT ESSAY COLLECTIONS, AND CONFERENCE PROCEEDINGS THAT SHOWCASE THE DIVERSITY OF CURRENT ANTHROPOLOGICAL RESEARCH IN THE PACIFIC NORTHWEST. THE MOST RECENT SPECIAL PUBLICATIONS ARE OFFERED AS OPEN ACCESS E-COPIES ON THE *JONA* WEBSITE.

DIGITAL ARCHIVE

JONA'S PRIMARY CRITERION GUIDING US IN SELECTING MANUSCRIPTS IS HOW MUCH NEW RESEARCH THEY CAN BE EXPECTED TO STIMULATE OR FACILITATE. IN ORDER TO STIMULATE AND FACILITATE RESEARCH, WE MAKE ISSUES AVAILABLE TO READ AND DOWNLOAD FOR FREE AFTER ONE YEAR OF PUBLICATION—PROVIDING OVER 55 YEARS OF NORTHWEST ANTHROPOLOGICAL RESEARCH AT NO COST.

JOURNAL OF NORTHWEST ANTHROPOLOGY

SHORT ESSAY COLLECTIONS

WHY DON'T WE WRITE MORE? ESSAYS ON WRITING AND PUBLISHING ANTHROPOLOGICAL RESEARCH

JONA SPECIAL PUBLICATION #3

THE EDITORS OF *JONA* INVITED COLLEAGUES TO SHARE THEIR PERSPECTIVES ON ANTHROPOLOGICAL WRITING AND PUBLISHING IN AN ESSAY FORMAT. THE PURPOSE WAS TO COLLECT EXPERIENCES, INSIGHTS, AND SUGGESTIONS FROM EXPERIENCED AUTHORS TO ASSIST OTHER PROFESSIONALS IN WRITING AND PUBLISHING THEIR OWN RESEARCH. THE ESSAYS CONTAIN PERSONAL WRITING-RELATED ANECDOTES AND PHILOSOPHIES, DESCRIBE THE CHANGES OCCURRING IN THE PUBLISHING INDUSTRY, EXPLORE THE BENEFITS THAT CAN ACCRUE FROM WRITING, AND PROVIDE TIPS TO IMPROVE ONE'S WRITING TO INCREASE THE CHANCES OF GETTING PUBLISHED.



WHY DON'T WE WRITE MORE? Essays on Writing and Publishing Anthropological Research

Edited by Darby C. Stapp, Julia G. Longenecker,
Tiffany J. Fulkerson, and Shannon Tushingham

HOW DO WE REACH MORE? SHARING CULTURAL AND ARCHAEOLOGICAL RESEARCH WITH OTHERS

JONA SPECIAL PUBLICATION #4

ANTHROPOLOGISTS, ARCHAEOLOGISTS, AND OTHERS WORKING WITH CULTURAL GROUPS HAVE A LONG—IF INADEQUATE—HISTORY OF SHARING THEIR RESULTS WITH THE PUBLIC, THE CULTURAL GROUPS THEY WORK WITH, AND OTHERS. IN THIS COLLECTION OF ESSAYS FROM THE PACIFIC NORTHWEST, RESEARCHERS DESCRIBE PUBLIC-ORIENTED PROJECTS THEY HAVE BEEN INVOLVED WITH AND THEIR PERSPECTIVES ON SHARING INFORMATION WITH OTHERS. READERS WILL FIND WITHIN A PLETHORA OF EXAMPLES THEY CAN DRAW UPON TO DESIGN THEIR OWN APPROACHES FOR WORKING WITH EXTERNAL AUDIENCES.



HOW DO WE REACH MORE? Sharing Cultural and Archaeological Research with Others

Edited by Darby C. Stapp and Julia G. Longenecker
Design and Production by Victoria M. Boozer

VISIT THE *JONA* WEBSITE FOR OPEN ACCESS TO SPECIAL PUBLICATIONS #3 AND #4

HARD COPIES AVAILABLE FOR PURCHASE AT AMAZON.COM

JOURNAL OF NORTHWEST ANTHROPOLOGY

SHORT ESSAY COLLECTIONS

WHAT ARE WE SEARCHING FOR? ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH IN THE PACIFIC NORTHWEST *JONA* SPECIAL PUBLICATION #7

JONA SPECIAL PUBLICATION #7 PRESENTS TWELVE ESSAYS DESCRIBING CURRENT RESEARCH FROM THE PACIFIC NORTHWEST THAT PROVIDE INSIGHT INTO THE TYPES OF RESEARCH THAT ARE ONGOING ACROSS THE REGION. THE COLLECTION SUGGESTS A HEALTHY BALANCE OF RESEARCH TOUCHING ON ETHNOGRAPHY, LINGUISTICS, PREHISTORY, ETHNOBOTANY, HISTORY, EXPERIMENTAL, METHOD, AND THEORY. THE COLLECTION INCLUDES CASES FROM THE EARLIEST INHABITANTS (10,000+ YEARS AGO) AT THE LIND COULEE ROCK SHELTER, ETHNOHISTORIC GROUPS IN THE CASCADES, AND FARMERS AND RANCHERS LIVING IN TETON VALLEY, IDAHO, TODAY.



ANTHROPOLOGY CLASS-SPONSORED STUDENT RESEARCH IN THE PACIFIC NORTHWEST

JONA SPECIAL PUBLICATION #9

MANUSCRIPT SUBMISSION DEADLINE: OCTOBER 1, 2023

INVOLVING STUDENTS IN ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH HAS LONG BEEN A STANDARD PART OF THE ANTHROPOLOGY B.A. AND M.A. DEGREES. THE AIM OF *JONA* SPECIAL PUBLICATION #9 IS TO PRESENT THE VARIETY OF RESEARCH BEING CONDUCTED BY ANTHROPOLOGY CLASSES ACROSS THE PACIFIC NORTHWEST. THE GOALS OF SPECIAL PUBLICATION #9 ARE TO PROVIDE MODELS FOR RESEARCH PROJECTS THAT OTHERS CAN ADAPT, AND TO ASSIST THESE RESEARCH PROJECTS IN PUBLISHING AND SHARING THEIR FINDINGS. AS WITH RECENT COLLECTIONS, ESSAYS SHOULD FOLLOW THE *JONA* SHORT ESSAY FORMAT (I.E., 1,500 WORDS, PLUS OR MINUS 500 WORDS, NOT INCLUDING FIGURES, TABLES, AND REFERENCES).

MANUSCRIPTS SHOULD BE SUBMITTED TO THE *JONA* OFFICES BY OCTOBER 1, 2023; FEEL FREE TO CONTACT US WITH QUESTIONS OR TO DISCUSS IDEAS. CHECK THE *JONA* WEBSITE TO SEE THE PREVIOUS *JONA* SHORT ESSAY COLLECTIONS <WWW.NORTHWESTANTHROPOLOGY.COM/SHORT-ESSAY-COLLECTIONS>.

NORTHWEST ANTHROPOLOGICAL CONFERENCE PROCEEDINGS

NORTHWEST ANTHROPOLOGICAL CONFERENCE PROCEEDINGS 2022



JOURNAL OF NORTHWEST ANTHROPOLOGY
SPECIAL PUBLICATION #6

JONA IS PLEASED TO PRESENT THE NORTHWEST ANTHROPOLOGICAL CONFERENCE (NWAC) PROCEEDINGS. THIS IS THE SECOND YEAR THAT *JONA* HAS TEAMED WITH THE NORTHWEST ANTHROPOLOGICAL ASSOCIATION TO PUBLISH THE CONFERENCE PAPERS AND POSTERS.

FOLLOWING THE APPROACH WE TOOK FOR THE INAUGURAL YEAR, WE HAVE INCLUDED ALL OF THE PAPERS AND POSTERS SUBMITTED TO US FOR INCLUSION; ALL HAVE BEEN PUBLISHED AS SUBMITTED, WITH MINOR EDITING AND STYLE CHANGES AS NEEDED. THIS YEAR WE HAVE ALSO INCLUDED THE RUNNER-UP PAPERS FROM THE GRADUATE AND UNDERGRADUATE STUDENT PAPER COMPETITIONS.

WE FIRMLY BELIEVE THAT THE NWAC PROCEEDINGS HAS THE POTENTIAL TO PLAY A MAJOR ROLE IN DISSEMINATING THE CONTRIBUTIONS OF ANTHROPOLOGICAL RESEARCH TO PEOPLES OF THE NORTHWEST. WE SOMETIMES FORGET THAT ALTHOUGH THE NUMBER OF ANTHROPOLOGISTS IN THE NORTHWEST MAY BE RELATIVELY SMALL, THE NUMBER OF PEOPLE WITH AN INTEREST IN NORTHWEST ANTHROPOLOGY IS BROAD.

IF WE CAN DEVELOP THE NWAC PROCEEDINGS INTO A PUBLICATION THAT INCLUDES A SIGNIFICANT NUMBER OF PAPERS AND PRESENTATIONS FROM THE ANNUAL CONFERENCE, WE HAVE AN OPPORTUNITY TO BUILD A NORTHWEST ANTHROPOLOGY COMMUNITY THAT INCLUDES THIS DIVERSE GROUP OF PEOPLE.

JONA AND THE NORTHWEST ANTHROPOLOGICAL ASSOCIATION LOOK FORWARD TO PUBLISHING THE NEXT NWAC PROCEEDINGS IN THE SUMMER OF 2023.



NORTHWEST ANTHROPOLOGICAL CONFERENCE PROCEEDINGS 2021

Journal of Northwest Anthropology
Special Publication

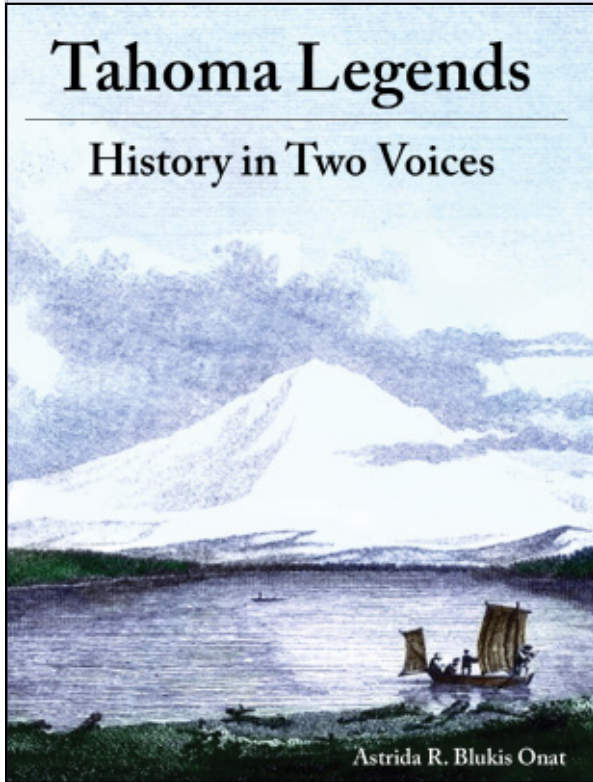
VISIT THE *JONA* WEBSITE FOR OPEN ACCESS TO SPECIAL PUBLICATIONS #5 AND #6

NORTHWESTANTHROPOLOGY.COM/NWAC-PROCEEDINGS

TAHOMA LEGENDS: HISTORY IN TWO VOICES

ASTRIDA R. BLUKIS ONAT

2017 • 212 PAGES • \$19.95



JONA SPECIAL PUBLICATION #2

The discussion includes the relationship that two American cultures, the Indian and non-Indian, have developed to the mountain, and how each has adapted its own legends to incorporate elements of the other culture. The legends are discussed in the context of two different cultural settings, one that calls the mountain Tahoma, the other Mount Rainier.

This work about Indian legends of the Mount Rainier area arose out of a larger review of ethnographic data pertaining to Mount Rainier National Park. In the process of compiling ethnographic data about the Park, it became apparent that Indian legends about Mount Rainier rarely had been recorded in a formal anthropological sense. For the most part, they had been presented selectively in local history books and documents to illustrate Indian relationships to the mountain, as perceived by non-Indians. In most popular accounts, the legends had been altered in their essence and often also in their themes. This work presents a collection of these legends, derived from a variety of anthropological, historical, and popular sources.

SHOSHONE-PAIUTE RELIANCE ON FISH AND OTHER RIPARIAN RESOURCES

DEWARD E. WALKER, JR.

M.J. WALKER

PAMELA GRAVES

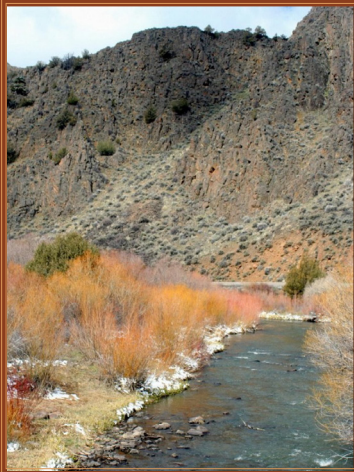
JONA MEMOIR 22

SHOSHONE-PAIUTE RELIANCE ON FISH AND OTHER RIPARIAN RESOURCES

Deward E.
Walker, Jr.

M.J.
Walker

Pamela
Graves



Journal of Northwest Anthropology Memoir 22
Journal of Northwest Anthropology Memoir Series Editor
Darby C. Stapp

The Shoshone-Paiute of the Duck Valley Indian Reservation (DVIR) are traditional fishing Tribes of the northern Great Basin at the virtual upper end of the salmon migration route through Washington, Oregon, Idaho, and into Nevada. The Tribes have been increasingly deprived of salmon by the sequence of dams constructed during the nineteenth and twentieth centuries, resulting in significant cultural, dietary, and even economic losses. The Shoshone-Paiute have, in fact, been among those Tribes most affected by the reduction in fish passage due to dams, irrigation, industrialization, and other factors such that they do not have local access to salmon at this time. Because of these developments, the Shoshone-Paiute have been forced to increasingly expand their geographic range to the far reaches of their homeland and beyond in search of still existing salmon runs.

Phase I of this research reviews the published literature concerning Shoshone-Paiute fishing and documents the processes by which the Shoshone-Paiute have systematically been deprived of their fishing resource through the developments, their loss of ready accessibility to this vital resource on the DVIR, the continuing importance of fish to the Shoshone-Paiute people, and the Tribes' claims of fishing rights to realize changes in the dams' operation or other mitigation measures. It is clear that the right of the Shoshone-Paiute to continue fishing remains in effect despite the absence of fish runs proceeding from the Pacific to their homeland. Phase II examines three river systems in the Great Basin: the Owyhee, the Bruneau, and the Jarbidge and attempts to suggest potential traditional fishing sites and areas based on several criteria.

AVAILABLE AT THE JONA STOREFRONT AND AMAZON.COM

JOURNAL OF NORTHWEST ANTHROPOLOGY
SPECIAL PUBLICATIONS

SPECIAL PUBLICATION #1—THE SOUTHERN PLATEAU: AN ECOLOGICAL ANALYSIS OF INTERGROUP RELATIONS

EDITED BY DEWARD E. WALKER, JR., AND RODERICK SPRAGUE

SPECIAL PUBLICATION #2—TAHOMA LEGENDS: HISTORY IN TWO VOICES (SPECIAL REPRINT)
ASTRIDA R. BLUKIS ONAT

EDITED BY DARBY C. STAPP

SPECIAL PUBLICATION #3—WHY DON'T WE WRITE MORE? ESSAYS ON WRITING AND PUBLISHING ANTHROPOLOGICAL RESEARCH (SPECIAL REPRINT)

EDITED BY DARBY C. STAPP, JULIA G. LONGENECKER, TIFFANY J. FULKERSON,
AND SHANNON TUSHINGHAM

SPECIAL PUBLICATION #4—HOW DO WE REACH MORE? SHARING CULTURAL AND ARCHAEOLOGICAL RESEARCH WITH OTHERS

EDITED BY DARBY C. STAPP AND JULIA G. LONGENECKER

SPECIAL PUBLICATION #5—NORTHWEST ANTHROPOLOGICAL CONFERENCE PROCEEDINGS 2021

EDITED BY DARBY C. STAPP AND VICTORIA M. BOOZER

SPECIAL PUBLICATION #6—NORTHWEST ANTHROPOLOGICAL CONFERENCE PROCEEDINGS 2022

EDITED BY DARBY C. STAPP AND VICTORIA M. BOOZER

SPECIAL PUBLICATION #7—WHAT ARE WE SEARCHING FOR? ANTHROPOLOGICAL AND ARCHAEOLOGICAL RESEARCH IN THE PACIFIC NORTHWEST—2023

EDITED BY DARBY C. STAPP AND JULIA G. LONGENECKER

JOURNAL OF NORTHWEST ANTHROPOLOGY
MEMOIR SERIES

MEMOIR 22—SHOSHONE-PAIUTE RELIANCE ON FISH AND OTHER RIPARIAN RESOURCES
DEWARD E. WALKER, JR., M.J. WALKER, AND PAMELA GRAVES
\$29.95 (MARCH 2022)

MEMOIR 21—CORDAGE FROM THE OZETTE VILLAGE ARCHAEOLOGICAL SITE:
A TECHNOLOGICAL, FUNCTIONAL, AND COMPARATIVE STUDY
DALE R. CROES
\$24.99 (JUNE 2021)

MEMOIR 20—RESILIENCE THROUGH WRITING: A BIBLIOGRAPHIC GUIDE TO INDIGENOUS-AUTHORED
PUBLICATIONS IN THE PACIFIC NORTHWEST BEFORE 1960
ROBERT E. WALLS
\$34.95 (JANUARY 2021)

MEMOIR 19—OF HOUSEPITS AND HOMES: TWENTY-FIRST CENTURY PERSPECTIVES ON
HOUSES AND SETTLEMENTS IN THE COLUMBIA-FRASER PLATEAU
MOLLY CARNEY, JAMES BROWN, AND DAKOTA WALLEN (EDITORS)
\$ 29.99 (JULY 2020)

MEMOIR 18—EXCAVATIONS AT GIVENS HOT SPRINGS: A MIDDLE TO LATE ARCHAIC PITHOUSE
SETTLEMENT ON THE SNAKE RIVER IN SOUTHWEST IDAHO
THOMAS J. GREEN
\$ 29.99 (MARCH 2020)

MEMOIR 17—BASKETRY FROM THE OZETTER VILLAGE ARCHAEOLOGICAL SITE:
A TECHNOLOGICAL, FUNCTIONAL, AND COMPARATIVE STUDY
DALE R. CROES
\$ 34.99 (AUGUST 2019)

MEMOIR 16—HOLOCENE GEOCHRONOLOGY AND ARCHAEOLOGY AT CASCADE PASS,
NORTHERN CASCADE RANGE, WASHINGTON
ROBERT R. MIERENDORF AND FRANKLIN F. FOIT
\$ 39.99 (SEPTEMBER 2018)
