

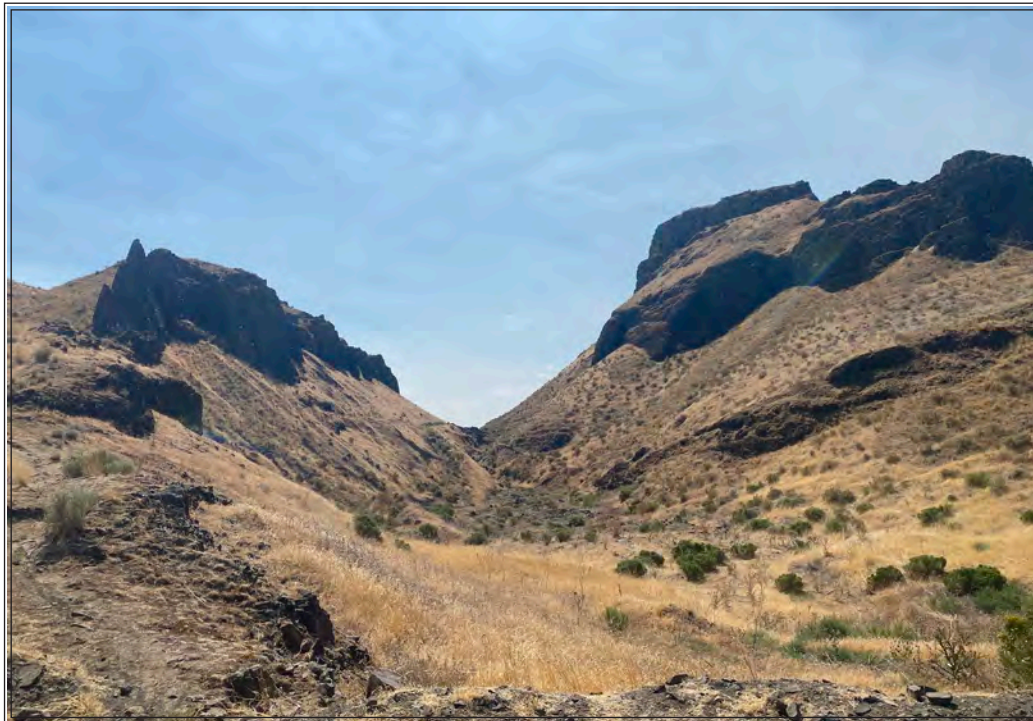
# NORTHWEST ANTHROPOLOGICAL CONFERENCE PROCEEDINGS 2022



*JOURNAL OF NORTHWEST ANTHROPOLOGY*

SPECIAL PUBLICATION #6

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EDITED BY VICTORIA M. BOOZER AND DARBY C. STAPP



NORTHWEST ANTHROPOLOGY



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## 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.”

# ***JOURNAL OF NORTHWEST ANTHROPOLOGY***

## **EDITORS' PREFACE**

Darby C. Stapp and Deward E. Walker, Jr.

The *Journal of Northwest Anthropology (JONA)* is pleased to present the *2022 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. The *2022 NWAC Proceedings* will be distributed to the 2022 attendees; it will also be available for no cost to others on the *JONA* website (<https://www.northwestanthropology.com/nwac-proceedings>). Conference proceedings are good for the contributors because they allow authors to gain exposure for their research beyond those who attended the conference. Proceedings are also good for *JONA* because they provide the journal exposure, which can lead to new manuscript submissions and new subscribers. Most importantly, conference proceedings are good for Northwest anthropology because they provide insight into the current research questions and issues being explored by anthropologists and others.

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. The winning student papers are being published in the fall 2022 regular issue of *JONA* (volume 56, number 2).

Given that this was our second year publishing the *NWAC Proceedings*, we had expected the number of papers and posters to increase significantly from last year. Such was not the case. The small number of submissions is perplexing. With the research completed and the presentation written (or poster created), finalizing the manuscript requires minimal time and effort on the part of the author. Once submitted, the author need only review the proof when we return it to ensure that our minor edits are acceptable.

The benefits are enormous. Rather than limiting the exposure of the research to those who attended the NWAC session, the research results live on in the proceedings. We distribute the proceedings to the conference attendees, so they can view the presentations and posters they missed. We also place the proceedings on the internet via our web site. Anyone with access to the internet who is interested in similar research can learn of the papers/posters by searching for similar key words. This is huge. This awareness and access to current research can have profound impacts on the quality of future research, the creation of research networks, and the development of new ideas. Publishing your paper in the proceedings can also be a step toward publishing expanded papers in a professional journal. For example, one paper from the *2022 NWAC* will be published in the fall 2022 *JONA*, and one will appear in the spring 2023 *JONA*. Again, the result is increased exposure and improved quality.

Given the potential benefits of including one's research in the *NWAC Proceedings*, why was the 2022 participation so small? One explanation may be that most presenters were simply not aware of the opportunity. In reviewing the 2022 conference announcements, the NWAC communications with attendees, and our own social media campaign, we could all have done a better job promoting the "publish your paper in the proceedings" option to presenters. For 2023, we will work harder with the Northwest Anthropological Association Board to increase awareness of the proceedings option and process. We'll also do more with our own social media avenues, which include Facebook and Instagram, along with our direct emails to current subscribers, former subscribers, and friends of *JONA*. Word of mouth is also helpful, so if you are reading this, please help us get the word out about the *NWAC Proceedings* in 2023.

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. Each NWAC, wherever it is held, is attended by anthropologists from all sub disciplines; various social scientists, natural scientists, and historians; Indigenous professionals, elders, and artisans; and a wide variety of individuals interested in specific Northwest cultures. Once the conference ends, there is not much to carry forward beyond memories. 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.

The next NWAC will take place in spring 2023 in Spokane, Washington. If you attend, please stop by the *JONA* table in the bookroom so we can meet you.

Preferred Reference Style:

Northwest Anthropological Association

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# **Fruit Trees and Orchards on Historic Sites: Documentation and Treatment Recommendations\***

René F. Burk

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## **ABSTRACT**

Fruit trees are living artifacts and features. Orchards contribute to historic site's integrity and significance. Fruit trees on historic sites are poorly documented by archaeologists because field technicians are not arborists or botanists. Therefore, the extent of rare varieties is unknown across the nation on historic sites (submitted to 2022 Northwest Anthropological Conference with changes).

*\*An expanded, article-length version of this presentation is scheduled for publication in the Journal of Northwest Anthropology, Volume 56, Number 2, Fall 2022.*

## Speech for 2022 Northwest Anthropological Conference Presentation

### Slide One

Hello, my name is Rene Burk. I have an Interdisciplinary master's degree in Botany, Anthropology, and Geography from Oregon State University. The title of this presentation is "Fruit trees and Orchards on Historic Sites: Documentation and Treatment Recommendations." This presentation is a brief excerpt of a paper to be published in the fall edition of the *Journal of Northwest Anthropology*.

### Presentation Slide One



### Slide Two: Introduction

This paper is meant to share knowledge from the discipline of Arboriculture with this Anthropology audience. Although Cultural Resource Management has evolved over the last 50 years, more is yet to be considered. After combing through approximately 1,000 Oregon site records spanning from 1948 to 2019, I noticed the notation of "fruit trees" on fewer than 10 records with no further information.

This tells us that documentation is lacking in regard to fruit trees on historic sites.

Therefore, this paper is also a call to archaeologists, cultural resource land managers, field technicians, archaeological contractors, students, and volunteers to identify, document, and preserve historic trees as a due diligence effort—avoidance is not enough. And the need to collaborate with Botanists and Arborists.



## Presentation Slide Two

# Introduction

- ▶ Fruit tree seeds arrived in the 1600's, brought westward with settlers in the form of seed
- ▶ The lifespan of domesticated fruit trees are 150+ years old
- ▶ Trees planted in 1850 would now be 172 years old in 2022
- ▶ Undocumented cultivars with rare varieties still on historic sites
- ▶ In danger of extinction due to wildfire, insects, diseases, wildlife
- ▶ Cultural Resource Management has evolved over the last 50 years
- ▶ Due diligence to identify, document, and preserve per the National Historic Preservation Act (54 U.S.C. § 300101 et seq.).

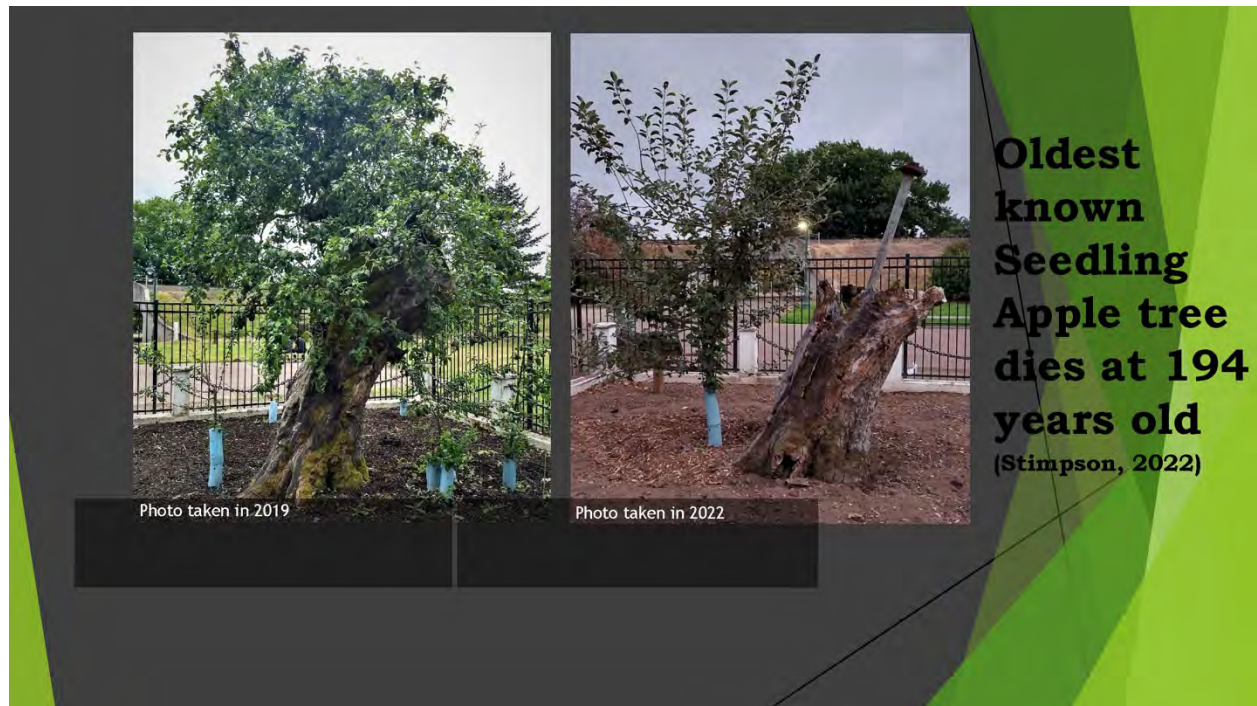
## Slide Three

Fruit trees were introduced to America with the arrival of Europeans in the 1600s. Most were in the form of seeds, which were easy to transport. By the 1800s, grafted fruit trees with improved named cultivars were brought westward with the settlers for subsistence and commercial purposes.

The lifespan of the domesticated apple tree is considered to be about 150 years old, for Pear approximately 200 years old. Therefore, trees planted in 1850s by the settlers in the Pacific Northwest would now be 172 years old in the year 2022. Some of these undocumented trees may contain rare varieties or original strains that are reaching the end of their lifecycle. Historical records may or may not have the names recorded.

No one knows how many historic orchards have already perished, due to climate change, drought, fire, insects, and diseases. The oldest known (seedling) apple tree died in 2020 at the estimated age of 194 years old, and it was maintained through most of its life. Old fruit trees can yield information to scientific study.

### Presentation Slide Three



### Slide Four

Relevant Literature includes Dolan's (2009) publication, *Fruitful Legacy: A Historic Context of Orchards in the United States, with Technical Information for Registering Orchards in the National Register of Historic Places*. This book provides examples for applying the National Register Criteria and Integrity aspects to historic fruit trees.

*The Landscape Lines 12*, another National Park Service publication, describes how fruit trees contribute to the historic context of sites.

The most relevant book to the subject matter here is The California State Park's 2012 publication, *Historic Orchard and Fruit Tree Stabilization Handbook*, which has examples of Orchard Management Plans for National Park Service Orchards and describes how to fill out an assessment form and provides treatment recommendations for historic trees.

Routson's 2007 publication is an Orchard Management Plan created for the Fruita Rural Historic District, at Capitol Reef National Park and was made as intended to be used as a template for your agency or clients, Routson suggests integrating the Orchard Plan into the greater vegetation treatment plan for the entire district or APE.

### Presentation Slide Four

Olmsted Center for Landscape Preservation (Olmstead, 2017) form  
Courtesy of Olmsted

International Society of Arboriculture (ISA, 2017) form  
Courtesy of the ISA

*Dolan (2009) Fruitful Legacy: A Historic Context of Orchards in the United States, with Technical Information for Registering Orchards in the National Register of Historic Places.*

*Landscape Lines 12: Treatment of Plant Features, National Park Service publication*

The California State Park publication (2012) *Historic Orchard and Fruit Tree Stabilization Handbook (CDPR)*

*Routson et al 2007 Orchard Management Plan for Frutita Rural Historic District at Capitol Reef National Park is a Template*

### Slide Five: The Forms

The tree assessment forms in your conference handout were provided courtesy of the Olmsted Center for Landscape Preservation and from the International Society of Arboriculture. Completing the condition assessment form is the first step in preserving historic trees.

### Presentation Slide Five

#### The Handout: Courtesy of the ISA and the Olmsted Center for Landscape Preservation

Completing the condition assessment forms is the first step!

Rene.burk9825@gmail.com

Slide 5: The Forms

The tree assessment forms in your conference handout were provided courtesy of International Society of Arboriculture and the Olmsted Center for Landscape Preservation. Completing the condition assessment form, is the first step in preserving historic trees.

## Slide Six: Tree Identification

Both Assessment forms begin by asking for the tree's Genus, species and variety, the location of the tree, landowner, and measurements, etc. The best time to perform the initial assessment is in the summer when the tree is bearing fruit for identification purposes.

Attach a metal tag (next slide) to a branch and assign a number for record keeping purposes. Enclose a small branch in your clipboard, between sheets of paper and write the corresponding tag number on the paper. So if you have multiple samples, they won't get mixed up. Collect a few samples of fruit from each tree for the botanist to identify. Choose fruit that have some blemishes, so the staff can determine what pathogens or insects are infecting the tree, and therefore determine how to proceed with treatment. Also take a close-up photograph of the tree, for identification purposes.

To properly identify a tree, we must begin with an introduction of the Linnaean taxonomic hierarchy naming system, developed in the 1700s by the Swedish botanist Carl Linnaeus (L.), who initially named many of the plants. This is the standard naming system for all living (biotic) life forms, because common names are not precise enough for scientific study- and given the number of species across the world. This taxonomic naming system is shown here for apple: To write the botanical name of the tree properly on the assessment form. See the example on the top Right of the slide. The botanical name is handwritten and underlined. When typed it is in italics enclosed in parenthesis. The Genus level is always capitalized, with the species written in lowercase.

Examples of the Linnaean taxonomic naming system for commonly occurring trees on historic sites are listed on Slide Six.

### Presentation Slide Six

## Tree Identification

The Linnaean hierarchical naming system is demonstrated for Apple here:

- ▶ Kingdom Plantae
- ▶ Clade Angiosperms
- ▶ Order Rosales
- ▶ Family Rosaceae
- ▶ Genus Malus
- ▶ Species domestica
- ▶ Citation of botanist (Borkh) (Linnaean L.)
- ▶ Variety/Cultivar 'Red Delicious'
- ▶ Identification to the species level requires the specialization of a botanist or arborist

Examples of the Linnaean taxonomic naming system for commonly occurring trees on historic sites are as follows:

Apple	( <i>Malus domestica</i> Borkh var. 'Red Delicious')
Common Name	(Genus species botanist Variety name)

- ▶ Apricot (*Prunus spp.* L.)
- ▶ Black Locust (*Robinia pseudoacacia*)
- ▶ Cherry, Sour (*Prunus cerasus* L.)
- ▶ Cherry, Sweet (*Prunus avium* L.)
- ▶ Hazelnut (*Corylus* L.)
- ▶ Oak tree (*Quercus spp.*)
- ▶ Peach (*Prunus persica* (L.) Batsch)
- ▶ Pear (*Pyrus spp.* L.)
- ▶ Plum/Prune (*Prunus domestica* L.)
- ▶ Quince (*Cydonia oblonga* Miller)
- ▶ Walnut (*Juglans* L.)

## Slide Seven: Historic Fruit Tree Assessment

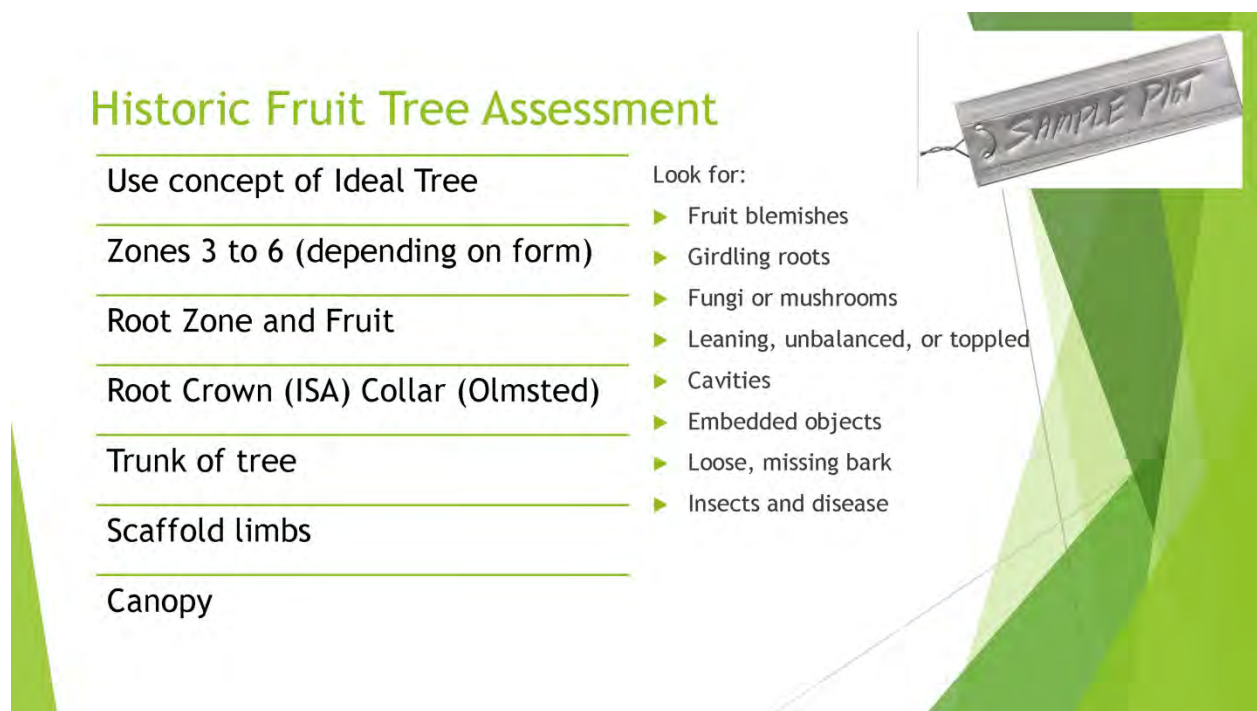
To begin assessing a historic tree, use the concept of an Ideal Tree and compare the assessment tree to nearby trees for a frame of reference. Archaeologists should approach this initial documentation in the same manner as recording traditional features or biotic cultural resources.

This is an example of the kind of small metal tag to temporarily assign each tree a number, to keep track of individual trees for future assessments, and maintenance done to the tree.

Both the ISA form and the Olmsted form break the tree into Zones. I would begin on Page 2 of the Olmsted form and Page 1 of the ISA form where there are check boxes of tree conditions.

The first zone is the roots. These extend from the base of the tree to beyond the canopy or drip line. Followed by the Root Collar or Crown, the trunk, scaffold branches or codominant stems and the canopy or crown of the tree.

### Presentation Slide Seven



**Historic Fruit Tree Assessment**

Use concept of Ideal Tree	Look for:
Zones 3 to 6 (depending on form)	▶ Fruit blemishes
Root Zone and Fruit	▶ Girdling roots
Root Crown (ISA) Collar (Olmsted)	▶ Fungi or mushrooms
Trunk of tree	▶ Leaning, unbalanced, or toppled
Scaffold limbs	▶ Cavities
Canopy	▶ Embedded objects
	▶ Loose, missing bark
	▶ Insects and disease

## Slide Eight: Defects and Treatments

Working from the ground up, survey the ground for exposed roots, *fungi* (mushrooms), encroaching vegetation, saturated soil, standing water, irrigation systems, and grade differences.

Another defect is a root growing overtop and across the other roots. This is referred to as Girdling roots and must be removed. In the examination of the root zone, one will most likely observe dropped fruit. The tree drops some fruit in June, this is a normal occurrence. If the tree has no fruit, and other trees of similar morphology do, perhaps the tree is no longer bearing fruit. This is a sign of decline. Look for blemishes on the fruit or leaves such as round black spots

*Fungi* or mushrooms, Leaning, Unbalanced or Toppled trees: The lean angle and aspect should be noted on the form. Cavities or holes in the root crown, trunk, or large branches: Cavities are the result of large branches being pruned off, and the tree was too unhealthy to seal or compartmentalize the wound. Therefore, decay or infection could enter the tree. Measure the cavity and the amount of sealing the tree has accomplished. The rate at which the tree is sealing the wound can be measured over time, during subsequent visits.

Embedded objects such as wire can be measured how far is it embedded in the tree and can be clues to past historic activities. Loose or missing bark is a sign that the tree is close to the end of its life cycle. If still alive, stabilize the tree and plan for repropagation and send samples for germplasm storage, if it is a rare variety and contributes to the archaeological site's integrity. A tree that has toppled or is being supported by one of its limbs, but is still alive, can be vegetatively re-propagated by burying the limb resting on the ground with soil, experienced personally by the author.

Insects can include ants, weevils, aphids, and beetles. The presence of insects should be noted for future treatment decisions. Large masses of web on branches are an infestation of tent caterpillars that need to be removed promptly, as they can infect and defoliate an entire tree and orchard that can spread to commercial orchards in close proximity.

Diseases are most readily seen in the leaves, fruit and the end of branches. If the tree has a sap-like fluid ooze, called *Gummosis*, it is likely infected. Samples of blemishes should be taken to the botanist or arborist for identification, so they know what sprays to use to treat the trees.

## Presentation Slide Eight

### Defects and Treatment

#### Defects

- ▶ Buried Root Collar
- ▶ Root suckers (Epicormic shoots)
- ▶ Broken limbs
- ▶ Girdling Roots
- ▶ Encroaching vegetation (blackberries)
- ▶ Cavities
- ▶ infestation and/or disease
- ▶ sap-like fluid ooze, *Gummosis*
- ▶ Leaning
- ▶ Toppled
- ▶ Fungi or Mushrooms
- ▶ Loose or missing bark

#### Treatments

- ▶ Unbury root collar, mulch
- ▶ Spray for insects and disease
- ▶ Prune (limbs, suckers, girdling roots)
- ▶ Bridge graft cavities
- ▶ Spray insects and diseases
- ▶ Prop up leaning trees
- ▶ Re-propagate with grafts or vegetative.

### Slide Nine: Root Collar Zone

This is an example of a trees showing the root crown or collar. The tree on the left has completely sealed a wound. The tree on the right has fungi growing on the root crown.

This trunk crown zone tapers from the ground to the trunk. If this trunk flare is not apparent, it may be buried, and will need to be excavated to expose the buried roots and root collar. A thin layer of mulch should be added back to allow oxygen and nutrients to reach the roots. Mulch material can consist of mowed encroaching vegetation from the orchard, or wood chips.

Small woody stems, called Epicormic shoots, growing from the base of the root crown will need to be pruned off. If left to grow, they will out-compete the graft.

Looking up at the limbs and branches, one may see broken, split, dead or hanging branches. These are indicators of heavy fruit loads and wildlife attempting to access the fruit. These conditions can be corrected with pruning.

Likewise, in the crown or canopy of the tree, look for intact branches with dead leaves or without leaves altogether, this is called “dieback” and means the tree is in decline. Pruning and maintenance can assist the tree from further deterioration.

### Presentation Slide Nine

#### Root Collar Zone

This tree has good trunk flare, also shows sealed wound (Compartmentalization)  
(Shigo & Marx 1977)



Hazelnut at Dorris Ranch showing fungi on the root crown



### Slide Ten: Measurements of the Historic Tree to Note/Include

The Circumference of the trunk below the limbs.  $\text{Circumference}/3.14 = \text{DBH}$

A measurement from the ground to where the limbs begin is an indicator of how the tree was trained during the historic occupation.

A measurement of the new growth at the end of the branch indicates the health of the tree, and that it is still growing.

### Presentation Slide Ten

#### Measurements of the tree

1. The Circumference/3.14=GBH
2. Where the scaffold limbs begin
3. New Growth at the tip of the branch

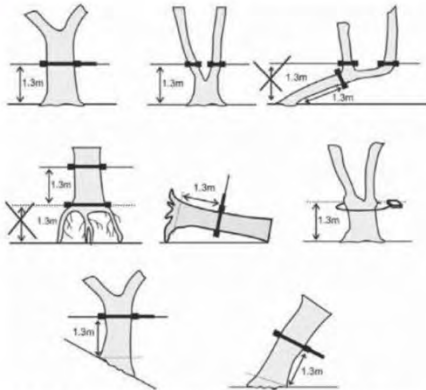


Fig. 10.6 Measuring DBH or GBH for trees of different shapes and forms



### Slide Eleven. Tree Measurements.

A measurement of the cavity and the rate of closure or compartmentalization, as shown in the photo on Slide 11.



## Presentation Slide Eleven

### Tree Measurements

- ▶ 4. A measurement of the cavity and the rate of closure or compartmentalization.
- ▶ A photograph of a good representative sample of the fruit bisected, with a scale, similar to a cultural resource or artifact.
- ▶ And note the shape of the fruit. Make sure to note the shape of the fruit
- ▶ Blemishes on or inside the fruit indicate insect infestation and/or disease. Samples of the fruit with blemishes can be taken to a botanist or arborist for identification and to

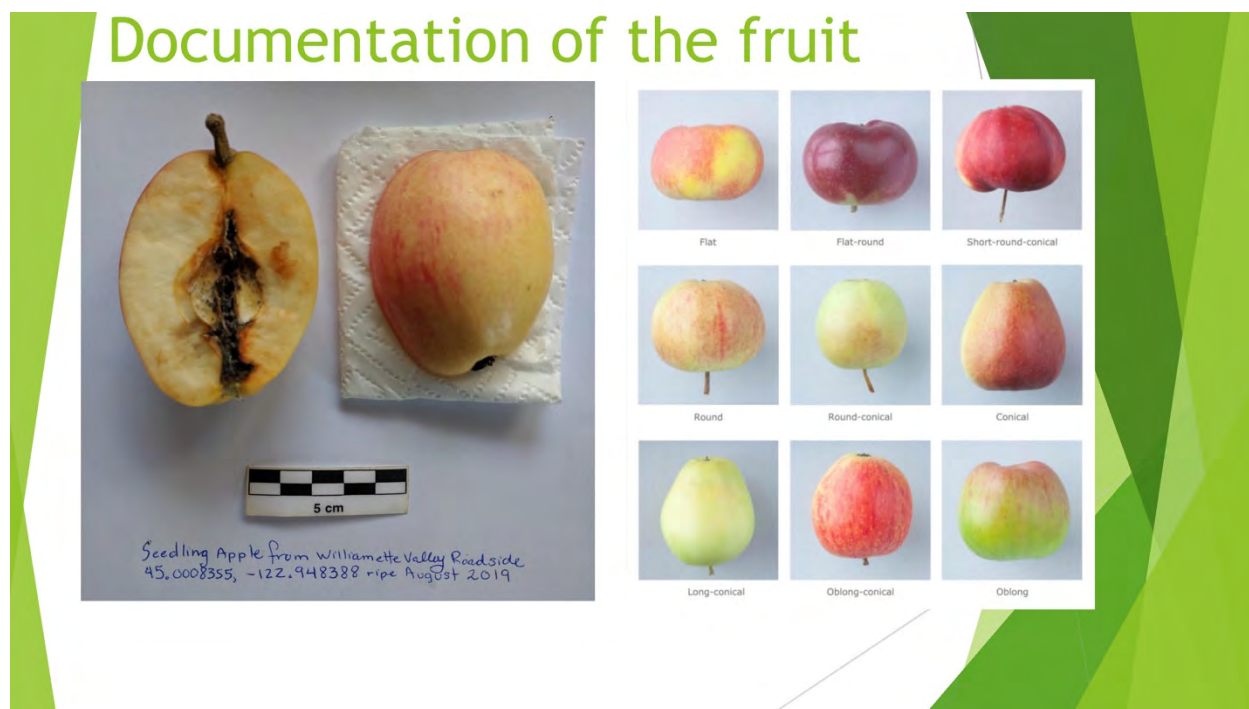


### Slide Twelve: Documentation of the Fruit

A photograph of a good representative sample of the fruit bisected, with a scale, in the same manner as a cultural resource or artifact. Note the shape of the fruit, as this will help determine the fruit variety.

Blemishes on or inside the fruit indicate insect infestation and/or disease. Samples of the fruit with blemishes can be taken to a botanist or arborist for identification and to determine the appropriate treatment.

## Presentation Slide Twelve



### Slide Thirteen: Repositories and Fruit Identification

The preservation of rare cultivar germplasm in a repository is equivalent to the curation of artifacts in a museum. Here is a small list of places that can help with this process. Identification to the exact cultivar requires DNA analysis in most cases.

## Presentation Slide Thirteen

### Germplasm Repositories and Fruit Identification services

For Pear  
USDA-ARS National Clonal Germplasm Repository  
33447 Peoria Rd.  
Corvallis, OR 97333-2521  
Tel: (541) 738-4214  
<https://www.ars.usda.gov/pacific-west-area/corvallis-or/national-clonal-germplasm-repository/>

Apple and Cherry  
Apple/Cherry cultivar DNA identification and germplasm storage  
USDA-ARS Apple Collection  
21 Crabapple Drive, Geneva, NY 14456  
315-787-2244  
<https://www.ars.usda.gov/northeast-area/geneva-ny/plant-genetic-resources-unit-pgru/>

Apple cultivar identification and orchard Temperate Orchard Conservancy  
P.O. Box 529  
Molalla, OR 97038  
<http://www.temperateorchardconservancy.org>

#### Fruit ID

<http://www.fruitid.com>

has 2737 Apple varieties in an online searchable database

The preservation of rare cultivar germplasm in a repository is equivalent to the curation of artifacts in a museum. Here is a small list of places that can help with this process. Identification to the exact cultivar requires DNA analysis in most cases.

### Slide Fourteen: Conclusion

- Document the historic orchard as if it will be destroyed by fire, or it is a one-of-a kind rare cultivar.
- Collaborate with agency Botanists and Arborists in forestry and/or Silviculture departments who have the skillset to maintain trees and identify historically introduced vegetation.
- Lack of funding? Hire arboriculture/botany interns and volunteers to help document and maintain the historic orchards or fruit trees.
- The minimum requirements to maintain trees are stabilization of leans, re-propagation, spraying, pruning, and mowing encroaching vegetation.

## Presentation Slide Fourteen

### Conclusion

Document the historic orchard as if it will be destroyed by wildfire or is a one-of-a-kind rare cultivar.

Collaborate with agency Botanists and Arborists in forestry and/or Silviculture departments who have the right skillset to maintain trees.

Lack of funding, hire arboriculture/botany interns and volunteers to help document and maintain the historic orchards or fruit trees

The minimum requirements to maintain trees are stabilization of leans, repropagate, spray, prune and mow encroaching vegetation

Questions?

## **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 Past Plant Food Significance\***

Dale R. Croes, Ph.D.

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Correspondence: dcroes444@gmail.com



### **ABSTRACT**

Three Central Northwest Coast wet sites have begun to highlight the significance of berries and nuts, particularly salal and acorns, to ancient subsistence practices. At the Ozette site, mudslide encased houses and middens dating to 300–450 years ago produced flotation samples of 250,000 seeds of Salal. At the Sunken Village site, located on Sauvie Island, Oregon, over 100 hemlock-lined acorn leaching pits dated to 150–700 years ago have been recorded. It is estimated that these leaching pits may represent processing of 2,500,000 acorns in a season. Finally, at the Qwuʔgwəs site, located on South Puget Sound, Washington, reanalysis of macrobotanical artifacts lead to the discovery that acorns were also abundant in the site midden. Acorn remains were seven times more common than hazelnut remains here, indicating that acorns might have been the most ubiquitous plant food at this south Salish Sea site. In this paper we argue that salal and acorn ecofacts from the Central Northwest Coast represent substantial resources in the diets of this region.

*\*An expanded, article-length version of this presentation is scheduled for publication in the Journal of Northwest Anthropology, Volume 57, Number 1, Spring 2023.*

## Introduction

Northwest Coast archaeological wet sites, preserving wood and fiber materials, have begun revealing new insights on the use of plant foods by ancestral peoples not well recognized in the recent anthropological literature. Considerable literature recently has been published on the plant use and cultivation on the Northwest Coast of North America, mostly lead by Nancy J. Turner and Douglas Deur (Deur and Turner 2005; Turner 2014a, 2014b). Of most note is Nancy J. Turner's excellent 2014 two volume set covering her ethnobotanical career's work, focused on ancestral plant use knowledge of Indigenous peoples, which is presented in over 1,100 pages of observations. In the 2005 Deur and Turner edited volume, use of salal berries is referenced 10 times; however, the use of acorn has zero references. In the two-volume set in 2014, Turner references salal plant use 21 times and oak/acorns 11 times. The new references to oak grooves often refers to burning practices to enhance surrounding camas growth without reference to the additional and significant need to control acorn weevils and the Filbert worm/moth, highly destructive insects to the acorn nuts that can be controlled/killed through burning the leaf matting under oak trees, with no damage to mature trees. Other referencing of acorns as a crop by Turner links to our 2006–2007 exploration and documenting of over 100 acorn leaching pits recorded at the Sunken Village archaeological wet site, Portland, Oregon, occurring after the Deur and Turner edited volume (Croes et al. 2009).

### Salal Berries (*Gaultheria shallon*)

Though not a Euro-American preferred food, its importance for Northwest Coast Indigenous diets is often reflected in the literature. In Turner's recent two volume set, she points out:

On the Northwest Coast, salal berries are one of the most important fruit species. These berries were also harvested in enormous numbers—adding up to 100,000 to 200,000 berries per family per year, and millions if one considers an entire community. They were generally cooked, using hot rocks and dried in cakes, some weighing as much as 10 to 15 pounds each, which were stored in large pack baskets of 20 litres or more capacity, with quantities equivalent to those of saskatoon berries stored by Interior Plateau families. (Turner 2014a:273)

In his often-cited thesis, *Nutrient Composition of Selected Important Northwest Coast Plant Foods* (1980), Patrick Keely singles out salal berries, and observes that:

Salal berries were the most abundant fruit available to the coastal Indians. They were consumed in larger quantities than any other berry in the coastal aboriginal diet. When eaten fresh, the berries were usually dipped into eulachon grease and eaten one at a time. Preparation for winter storage involved mashing, and then drying the berries into berry cakes. These berry cakes were approximately 1 ft. wide, 3 ft. long and 1 in. thick. (Keely 1980:21)

No doubt the first detailed reference to the great importance of salal berries in west coast diets is provided by a 2.5 year *involuntary participant observer*, John R. Jewitt, as a slave in the Nuu-chah-nulth village of Yuquot (1803–1805); he was an Euro-American allowed to survive as the valued blacksmith after the takeover of the American ship, *the Boston*, where the victors obtained, as stated by Jewitt: “cutlasses, pistols, and three thousand muskets and fowling pieces”—making John an important person to let survive

and own. To live, John, age 20, agreed to become a slave of Chief Maquinna through the 1803–1805 years (only 25 years after the first European observation of the Northwest Coast and Yuquot peoples by Captain James Cook's expedition of 1778—so very early and as a 24/7 (total) *participant observer*). Fortunately, John's father sent him to an academy in hopes he would go into medicine, so he was one of few literate crew members on the Boston, and, after capture, kept a daily journal as best he could (Jewitt 1807), and later used this to write up his narrative of his experiences (Jewitt 1815). Though not an anthropologist (the field did not formally exist for another 100 years), Jewitt did everything he could to survive and understand his cultural setting, though as a slave. He learned Nuu-chah-nulth language in part to learn about neighboring communities and information about ships in the area, and to better understand what his master's family and community were doing.

Our interest here was the importance of food resources used by the Nuu-chah-nulth and particular berry crops. Probably the biggest eye-opener in Jewitt published narrative was his discussion of *Yama*, his reference to salal berries and their particular importance. He states:

Among the provisions which the Indians procure at Tashees [their up-inlet salmon trapping site used in Fall], I must not omit mentioning a fruit that is very important, as forming a great article of their food. That is what is called by them the *Yama*, a species of berry that grows in bunches like currants, upon a bush from two to three feet high, with a large, round and smooth leaf. This berry is black, and about the size of a pistol shot, but of rather an oblong shape, and open at the top like the blue whortleberry... To procure it, large companies of women go out on the mountains, accompanied by armed men, to protect them against wild beasts, where they frequently remain for several days, kindling a fire at night, and sheltering themselves under sheds constructed of boughs. At these parties, they collect great quantities. I have known Maquina's queen and her women return loaded, bringing with them upwards of twelve bushels. In order to preserve it, it is pressed in the bunches between two planks, and dried and put away in baskets for use. It is always eaten with oil.

Of berries of various kinds, the *yama* is the only one that they *preserve*.

Fish is, however, their great article of food, as almost all the others, ***excepting the yama, may be considered as accidental*** (bold emphases added). (Jewitt 1815:94–95)

The biggest contribution to recognizing berries in ancient diets comes from the study of botanical samples from the Ozette wet site (45CA24) (Gill 1983, 2005). As Turner summarizes:

Remains of food found at Ozette included two hazelnut fragments and almost 90,000 red elderberry seeds mixed together in various proportions with over 100,000 salmonberry seeds, suggesting that these two types of berries were mixed, possibly to increase the palatability of elderberries. There were also nearly 250,000 seeds of salal. (Turner 2014a:110)

Since salal berry seeds are very small, about the size of a sand grain, they can be missed in the general archaeological contexts, including wet sites, unless they are in concentrations. At the 3,000-year-old West Coast Hoko River wet site, they are found in what appears to be human coprolites in the off-shore river

bank waterlogged areas, and visible because of the seed concentrations. In these proposed coprolites, 20% of the *Vaccinium* seeds were charred, reflecting human processing (Croes 1995:69–70).

At Ozette the concentrations of salal berry seed types, 236,317 seeds, were found in four contiguous 2x2 meter excavation squares (56,57,80, and 91) and a separate square (149; producing 99.9% of the salal seeds), all from middle Unit V exterior midden. Gill further notes that “only 10 of the 240,624 *salal* seeds recovered were from House floor middens (four from House 5, six from House 2)” and further:

The reason for this are straight forward. The Makah historically made sun-dried berry cakes of mashed salal berries and, to lesser extent, huckleberries. At least the drying, and probably the mashing, portions of the process would have been conducted outside of the houses. The mashing stage of the cake manufacturing procedure is most likely to produce spillage. Any spillage of the dried cakes in the house would be relatively easy to clean up, and would thus leave little evidence in the house floor midden. (Gill 2005:91)

These concentrations of salal type berries at Ozette, dried into cakes, would have filled approximately 6 storage baskets, using Turner’s calculations of 40,000 dried berries per 20-liter storage baskets.

The Ozette Village wet site certainly reflects the abundance and significance of salal berries in the diets of this ancient west coast community. As more wet sites and seed preserved dry sites are explored, no doubt the importance of dried salal berries as a main source of carbohydrates/sugar through Northwest Coast ancient times will be demonstrated.

### **Acorns (*Quercus garryana*)**

Though not referenced as a food source in *Keeping it Living*, Erna Gunther did recognize it much earlier in her *Ethnobotany of Western Washington* (1945:27–28) as follows:

*Quercus garryana* Dougl. Oak.

*Food.* The Nisqually, Chehalis, Cowlitz, and Squaxin, who live in sections where oak trees are most numerous, use the acorn as food, but in the true evergreen forest area that is an unknown dish. The Chehalis roast acorns in the fire. Acorns are stored in baskets of young maple bark and buried in mud of a slough all winter. In the spring when they are taken out to eat, they look as though they were spoilt, but they are delicious. The Cowlitz bury acorns in the mud to leach them. The Squaxin roast them on hot rocks. The Klallam eat the acorn as a nut without preparation.

As mentioned, Turner does give reference to acorns as a Northwest Coast food source in her two volume set, with most referencing to the recently excavated over 100 acorn leaching pits from the Sunken Village wet archaeological site, Sauvie Island, Portland, Oregon (Croes et al. 2009). As the largest acorn pit leaching archaeological site anywhere along the entire West Coast of North America (including Oregon/California), this wet site certainly reflects the importance of this food on the Central Northwest Coast of North America.

To not fully repeat the excellent characterization of Sunken Village’s 114 acorn leaching pits documented and mapped in the published final report, the summary from this volume describes the site as in Portland, Oregon, “on Sauvie Island, where a major aquifer pumps under the natural levee into



Multnomah Channel [calculated as 5 gallon flow per hour], providing a unique 125 m wide beach area where acorns placed in shallow hemlock bough-lined pits were leached in huge numbers by ancient Multnomah Peoples” (Croes et al. 2009:15).

Mathews, based on a calculated volume of a cross-sectioned pit, estimates that they would contain an: “estimate of 25,000 acorns per pit, and [with] a minimum of 100 pits, there may have been approximately 2,500,000 acorns being processed at the site every winter, if these pits were filled annually” (Mathews 2009a:92, 2009b:134–135).

Once acorns were placed and covered in the over 100 acorn leaching pits at Sunken Village, they were often marked with a stake (40 wooden stakes found) so that after the fall/winter silting in, they could be re-located for recovery. Probably a major concern is protecting these leaching pits over the fall/winter from predators and possibly other people. The site appears to have a shelter built on the top of the natural levee and one can easily imagine sentries watching over this valuable asset, especially over nights when animals such as racoons (often in Chinook stories where they try to get grandma’s acorns from her storage pit) would be attracted to this large source of foods. We found a lot of projectile points on the beach, possibly shot at predators who came onto the area.

As mentioned, once we became thoroughly introduced to acorn remains at the Sunken Village wet site, we then began to recognize their importance at the south Puget Sound Qwu?gwes wet site that the same crews had been excavating for five summer seasons. This was a true case of “You don’t see the thing because you don’t know how to look.” After two seasons at Sunken Village we knew “how to look,” and realized the importance of acorn remains as a source of carbohydrates at the Qwu?gwes wet site (Croes et al. 2013; Mathews 2013:289-290). Prior to this we saw them, but considered them Douglas fir cone scales, a common macroflora in the site. No doubt this not seeing them possibly has happen at all excavated wet sites along the Northwest Coast, especially in the Central Coast.

### **Distribution of Salal and Acorn Food Products**

Paleoclimatologists have long suspected that the “middle Holocene,” a period roughly from 7,000 to 5,000 years ago, was warmer than the present day. We have used terms like the Altithermal or Hypsithermal or Climatic Optimum to refer to this warm period that marked the middle of the current interglacial period. Though these terms are somewhat obsolete, it’s clear the mid-Holocene, roughly 6,000 years ago, was generally warmer than today during summer in the Northern Hemisphere. No doubt this effected the distribution of salal and Garry oak in the Northwest Coast region, likely expanding oak savannas and possibly reducing or moving to higher elevations concentrations of salal foliage. Probably this was a period of significantly increased acorn use, during the St. Mungo/Old Cordilleran-Olcott Periods, possibly similar to rates of ethnographic California usage, including up further into the central corridor of the Central Northwest Coast—impacting their overall ancient subsistence patterns. Future wet sites from these areas and time periods should bear that possibility out.

Since access to Garry oak may still have been limited along the west coasts, except through trade, these populations probably had to still heavily depend on salal for a major source of carbohydrates/sugar.

### **Conclusion**

I would claim that similar knowledge and practices of tending salal patches and Garry oak trees has a critically important and deep-rooted history and, I hope, soon to be better revealed through expanded wet site explorations on the Northwest Coast of North America.

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## Identity Creation and Maintenance through the Production of Lithics

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### ABSTRACT

With a few notable exceptions, lithic studies have focused broadly on artifact typologies and methods for manufacture and use while lesser informative value is placed on the individuals and groups who produced and utilized them. Great work has been done over the past fifty years in Columbia Plateau archaeology, yet much of this archaeology continues to be tied to functionalist perspectives. Using a 2019 dataset from my analysis of net sinkers at sites along the Lower Snake and Clearwater rivers as well as several archaeological experiments performed to identify manufacturing techniques for notched, perforated, and grooved stone sinkers, I look at ways in which identity may have been created and maintained through the manufacturing processes of these tool types. Further, I identify three theoretical frameworks employed in other regions to interpret lithic, and subsequent social, production and reproduction. This approach highlights human-centered methods of analysis that can significantly contribute to our understanding of historic life in the Columbia Plateau.

## Introduction

Though great work has been done in Columbia Plateau archaeology over the course of the last century, the majority of studies involving lithic material continue to rely heavily on functionalist approaches (see Hannold 2019; Stenak 2021; Vandendriessche and Crombé 2021). While these approaches are not without merit, a more nuanced social theory has developed over the last fifty years and may provide significant and complementary interpretive value for ongoing and future lithic studies. Approaches like communities of practice, object biographies and itineraries, and social anthropology offer alternative methods for analysis that complement materialist studies.

At its heart, archaeology should aim to understand the toolmaker over the tool. Experimental archaeology has been useful in this way for decades, as it offers insight into human behavior based on flake scars and debitage that other methods of analysis cannot. Method and theory have continually advanced in experimental studies over the past fifty years, owed in large part to the work of lithicists and the continual reflection and revision of their previous work (Clark and Woods 2015). Now, experimental archaeologists use these scars and production waste to venture beyond simple toolmaker behavior models and toward explanations of community, the transmission of knowledge, and explanations for aspects of stone tools that functionalist perspectives have not been able to elucidate or, in some cases, have perhaps wrongly explained.

In this paper I outline three useful approaches that move beyond functionalist interpretations using data from my 2019 master's thesis on net sinkers and their manufacture in the Columbia Plateau. This paper combines data from both the experimental and analytical methods and insights from my research. In an effort to foster accessibility, it is also a goal of this paper to present these theories without the flowery language or jargon that makes graduate students' stomachs turn acidic and processualists' eyes roll.

## A Communities of Practice Framework

Notched net sinkers exist in various forms. Most commonly, they are end notched, side notched, or notched on four sides. Along the Clearwater and Lower Snake rivers, the most common type of net sinker is end notched. Elsewhere, side notched sinkers are much more common (Casserino 2017; Prowse 2013). A functionalist, let us call them Functionalist 1, might suggest that end notched sinkers would ultimately be more secure as a net is dragged along a craggy river or lake floor. This may result in a lower probability of a net getting snagged or a net sinker getting lost. Another functionalist, Functionalist 2, may suggest that notch orientation is the product of the type of body of water—river, tributary, or lake—or depth thereof.

Functionalists 1 and 2 may be correct. However, if we were to momentarily place their explanations on a shelf, what else could explain notch orientation? What if the orientation of notched net sinkers is not dependent on any environmental factor, but instead a social one? Communities of practice (Blair 2015, 2016; Dorland 2018; Lave 1991; Sallum and Noelli 2020; Silva de la Mora 2017; Wenger 2010) refers to groups of toolmakers or artisans with members of different skill level who learn their craft in a specific way. Communities of practice include masters, those who have already learned and are of mid-level skill, and those individuals who are still learning. Masters, many of them elders in the community, teach their students in the manner that they themselves learned to produce an object, often at every step along the *chaîne opératoire* (manufacturing chain of operations; see Leroi-Gourhan 1971, 1973). The knowledge of where to procure materials and how that material is collected, processed, formed, and finished is passed on from master to student in a very specific and mechanical sense, though *chaîne*

*opératoires* are not confined to functional aspects of a craft and are not monolithic (Gosselain 2000). Applied to my own research, notch orientation on net sinkers in the Columbia Plateau would be the product of the generational transmission of knowledge, whether or not the preferences began as a perceived functional advantage.

### **Object Biographies/Object Itineraries Framework**

Object biographies (Hodge 2017) use a similar framework as a *chaîne opératoire* (Gosselain 2000; Sellet 1993; Shott 2003), yet extend the idea past an object's creation, use, and discard to include its life post-deposition. This could include its excavation, curation, and use by museums. For many objects, including net sinkers in my own research, this includes an assemblages' time waiting idly in temperature controlled storage for the unassuming graduate student to come and wake them from their dusty slumber. The value of an object biographies approach is the ability to understand how an object's meaning persists or changes across time. While this approach can be useful in informing some research questions, it is not without its problems.

Object itineraries (Joyce 2015; Roddick 2015) have more recently replaced the object biographies approach after some criticism pertaining to the approach's conflation of the life cycle of an artifact with that of a biological organism. While similar in nature, object itineraries focus on the dynamic nature of objects, how they move across the landscape, and how their meaning may change spatially and temporally. There is no definitive evidence to suggest that net sinkers were transported from one site to another along the Snake River by their toolmakers (though my thesis research suggests that notched net sinkers were not the expedient tools they are often perceived as, making them objects of higher personal investment). It is likely that many sinkers were swept away in strong river currents or due to a loose knot, though whether these net sinkers were later recovered, by the same community or another, remains as tenuous as their transportation by human.

Despite these interpretive difficulties, the spatial distribution of net sinker types allows for the argument that the meaning, value, and use of net sinkers drastically varied from one region of the Columbia Plateau to another. Preferences for notched, grooved, and perforated sinkers in the Clearwater, Lower Snake, and Columbia river regions change both across space and time, as do their itineraries.

### **Social Archaeology**

Like Hegmon's (2003) processual-plus archaeology, social archaeology is a comprehensive umbrella under which a number of theories fall. Broadly, social archaeology finds explanatory value in various aspects of human social life. The "social" (Joyce 2011) is fundamental to interpreting the past. Social archaeology is, indeed, an eclectic approach with vaguely defined parameters and only one rule: thou shalt interpret the archaeological record through a social lens. However, its varied nature also gives archaeologists room to work.

The difference in manufacturing time between a grooved stone sinker and a notched net sinker is significant. On average, a notched net sinker can be made in approximately eight minutes. If the stone is good, it can be manufactured in two. A grooved sinker, on the other hand, can take hours to manufacture. It is perhaps easiest to assume that there must be a functionalist reason for the manufacture of one over the other. Functionalist I may say that the choice is due to the quality of net sinker blanks from one region to the next. However, what if the manufacture of grooved sinkers is also a mechanism for social interaction and identity maintenance? It is possible that the lengthy production of grooved sinkers, similar to the

production time for many curated tools, provided a space for storytelling, teaching, and other means of solidifying group identity during the manufacturing process.

Another merit of social archaeology's eclectic nature is the possibility that there could be more than one answer. My thesis research did find that net sinker blanks along the Columbia River were more difficult to flake than other sources. Perhaps in this case, the answer could be that both the quality of toolstone as well as social interaction and identity maintenance affect net sinker type along the Columbia River.

## **Conclusion**

The approaches outlined in this paper are just a few of many that can be used to move toward lithic studies that focus as much on the toolmaker as the tool. The primary value of using a communities of practice framework, object biographies and itineraries, or social archaeology in the study of stone tools is the shift in focus from the tool to the toolmaker.

I am not advocating for tossing functionalist studies aside. Both human-centered theoretical approaches and functionalist ones have a place in archaeology. Together, they can benefit lithic studies in the Columbia Plateau and lead to more nuanced, albeit admittedly eclectic, archaeological interpretations. Stone tools, whether flaked or ground or perforated, offer valuable insight into how people learn, the ways in which they maintain group identity, and social aspects of lithic production.

## **ACKNOWLEDGMENTS**

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## **Channeled Scablands Women Homesteaders: Summary Statistics and Spatial Patterns for Five Counties**

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### **ABSTRACT**

Western historians estimate that nearly a quarter of American homesteaders were women and that most women's homesteading occurred after 1900, shortly before American homesteading was at its peak in the 1910s. An analysis of western Washington homestead records concluded that female sole women comprised only 3.5% of homesteaders, and that homesteading peaked in the late 1880s and sharply declined in 1899. How does this compare to the homesteading history of the Channeled Scablands, where the Homestead Act requirement to farm presented distinct challenges? This poster presents summary data of women's homesteading history in Washington's Channeled Scablands and explores the temporal and spatial patterns of women's homesteading history.

## Goals

The Washington Women Homesteaders project aims to develop a historical context for Washington homestead history that includes female homesteaders. Previous studies (Mathews 2019, 2020, 2021) have established that the homesteading history of Washington may have unique local variations from that of the West in general. The goal of the present study was to summarize statistics for women homesteaders in Washington's Channeled Scablands to explore 1) how common it was for women to homestead; 2) when homesteading peaked; and 3) if spatial or temporal patterns exist in women's homesteading. The Channeled Scablands region was selected as a study area because of this region's unique American settlement history and the difficulty of farming in this area.

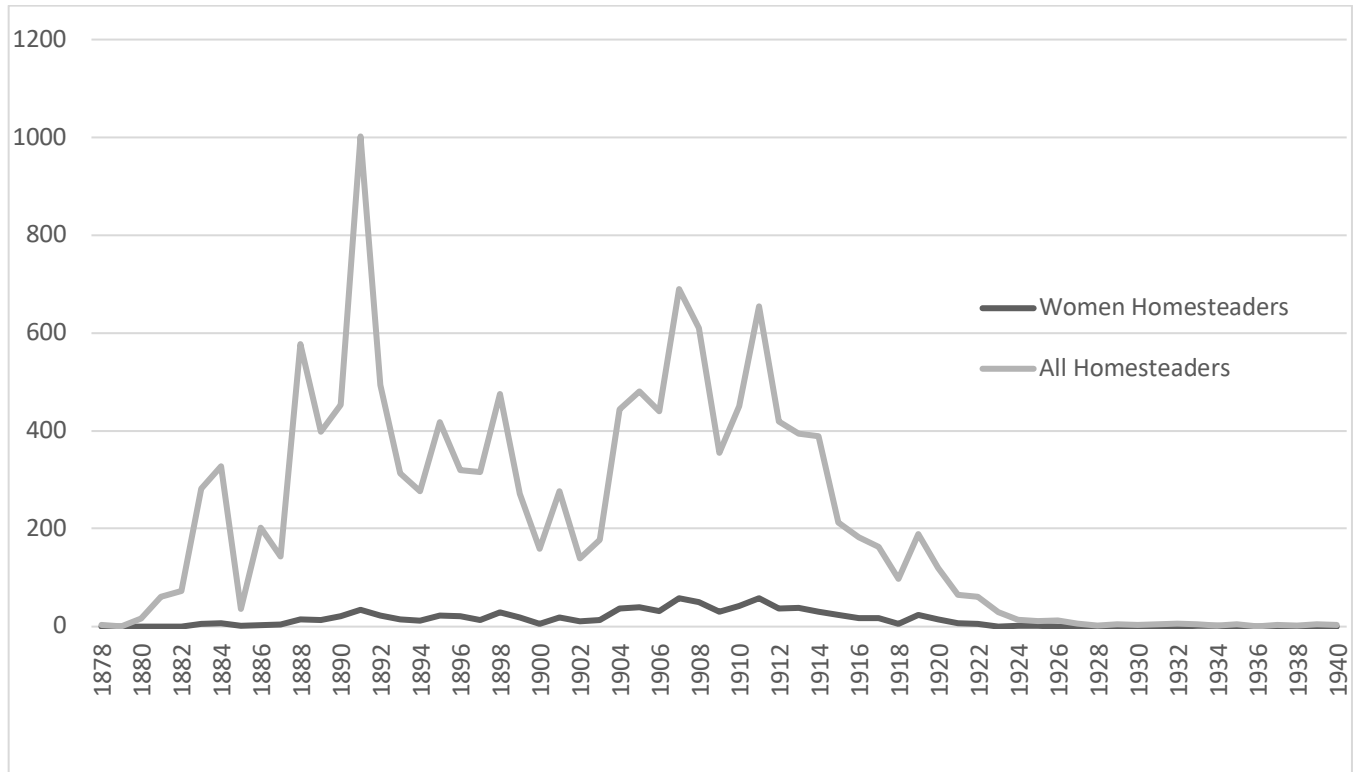
## Methods

Summary statistics for this research were collected by browsing Homestead Act (12 Stat. 392) records in the [glorecords.blm.gov](https://glorecords.blm.gov) land patents database (Bureau of Land Management 2021). Records were browsed by county and tallied by gender by year. In many cases additional research into homesteaders' gender was done through primary sources such as census or marriage records. For this study, homesteaders were classified as women homesteaders if they were apparently legally *feme sole* not listed with a male patentee or if they were identified by their family surname and their husband was later included on the patent.

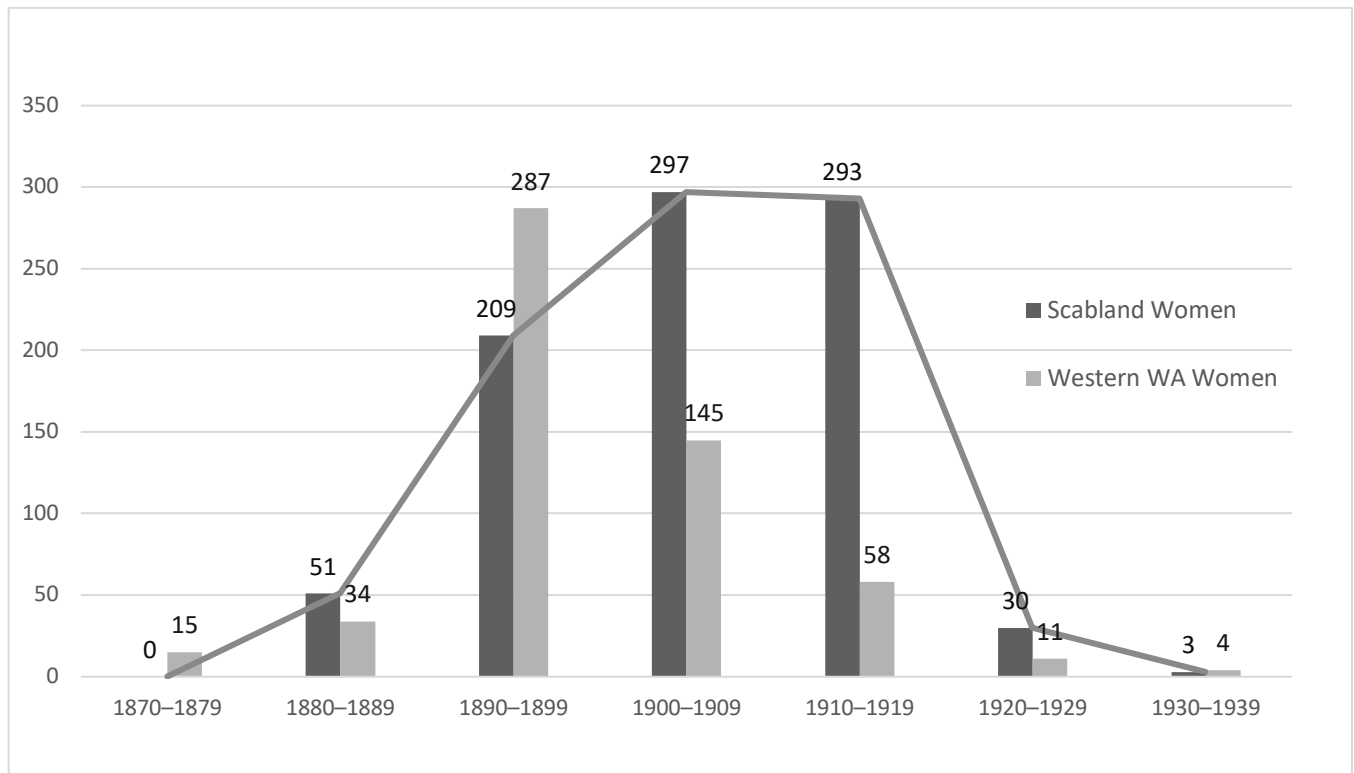
## Channeled Scablands Homesteaders, 1878–1943

Trends in women's homesteading generally follow those of all homesteaders in the Scablands, but this region's homesteading history has substantial local variations. The temporal distribution of patents in this region is bimodal, suggesting that the history of homesteading was influenced by distinct regional historical events (Figure 1). Homesteading sharply peaks in the Scablands in 1891, and then peaks again in the 1900s and declines after 1911. Women's homestead patents in the Scablands peak slightly later than they did in western Washington, but more women patented land under the Homestead Act in this region (Figure 2).

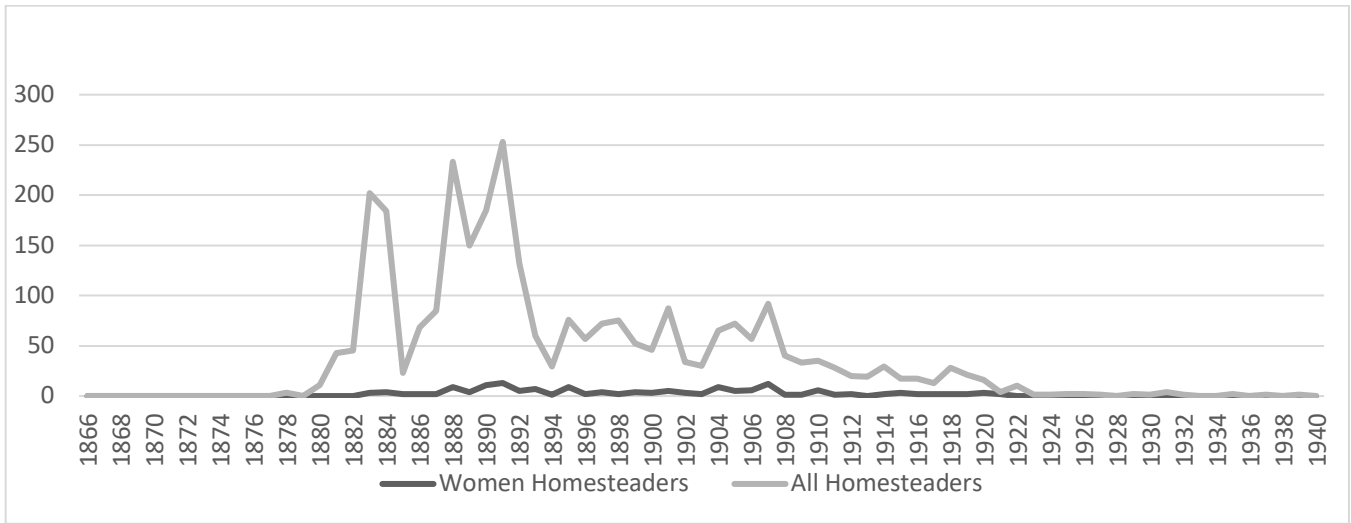
The history of homesteading in the Channeled Scablands appears to correlate with trends in the local wheat farming industry (Figures 3–7). Homesteading peaks first in Whitman County in the 1880s, at the time the wheat industry begins booming here. Homesteading peaked in Spokane and Lincoln counties in the late 1880s to early 1890s, when the local wheat industry was nationally renowned, and the local railroad system was expanding access to the region. Homesteading in Grant and Adams Counties peaks in the late 1900s to early 1910s, in line with national homesteading trends and influenced by Adams County's "Big Crop of 1897" bumper wheat crop.



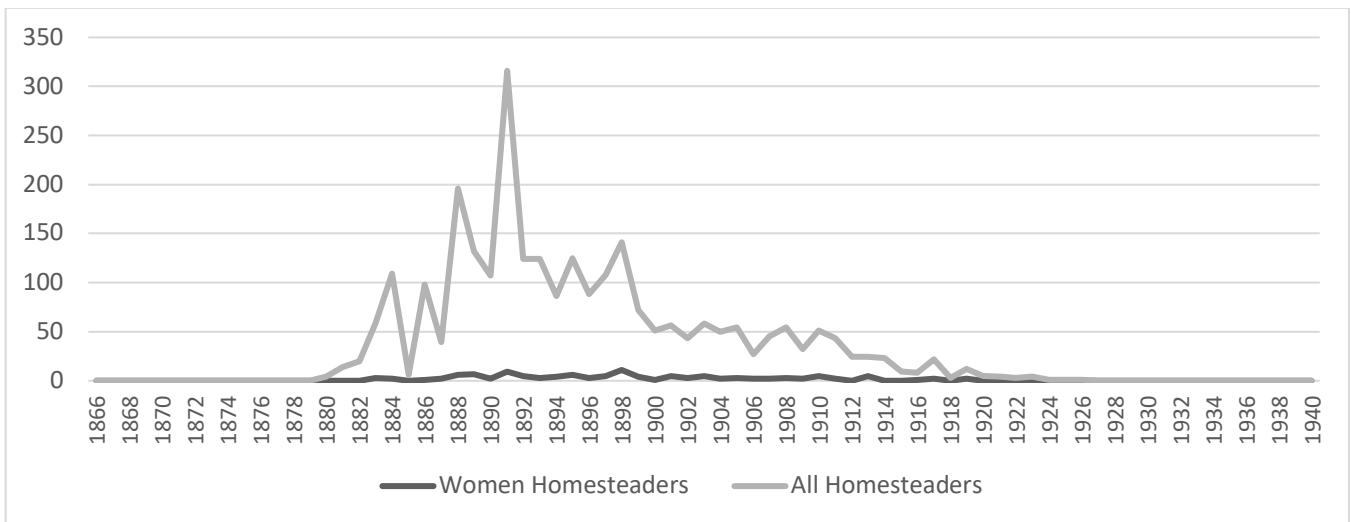
**Figure 1.** Channeled Scablands Homesteaders.



**Figure 2.** Women's Homestead Patents by Decade.



**Figure 3.** Whitman County Homesteaders.



**Figure 4.** Spokane County Homesteaders.

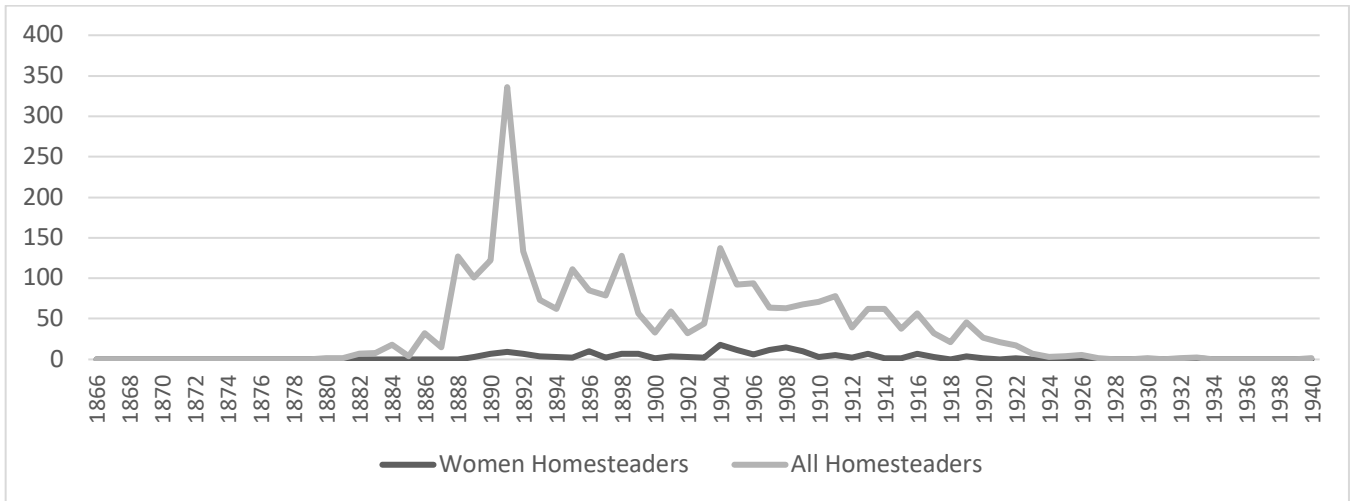


Figure 5. Lincoln County Homesteaders.

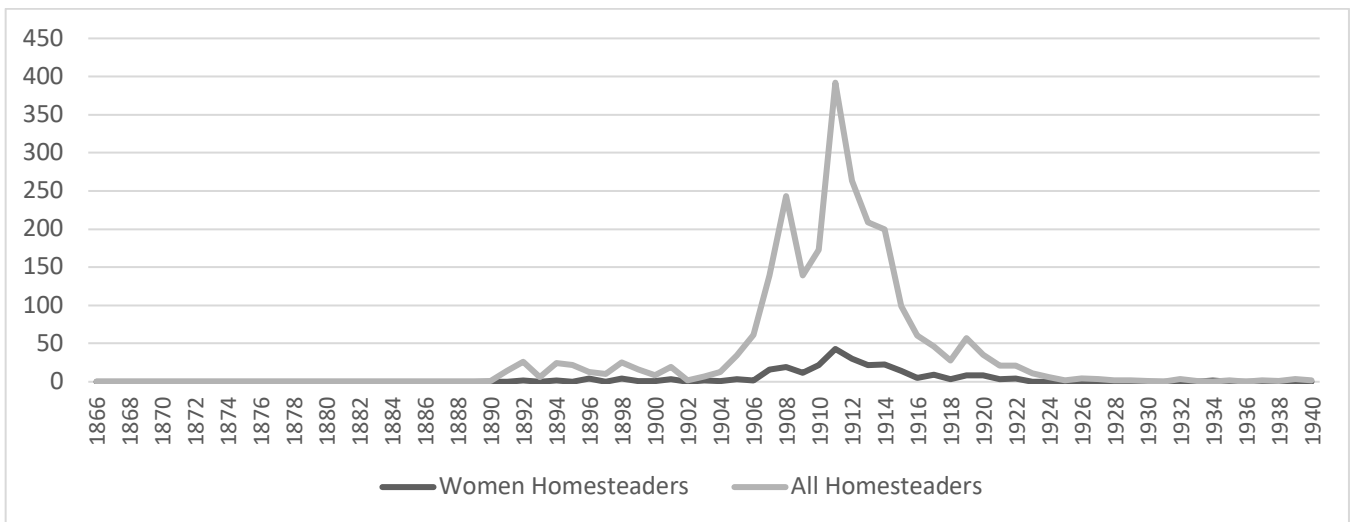


Figure 6. Grant County Homesteaders.

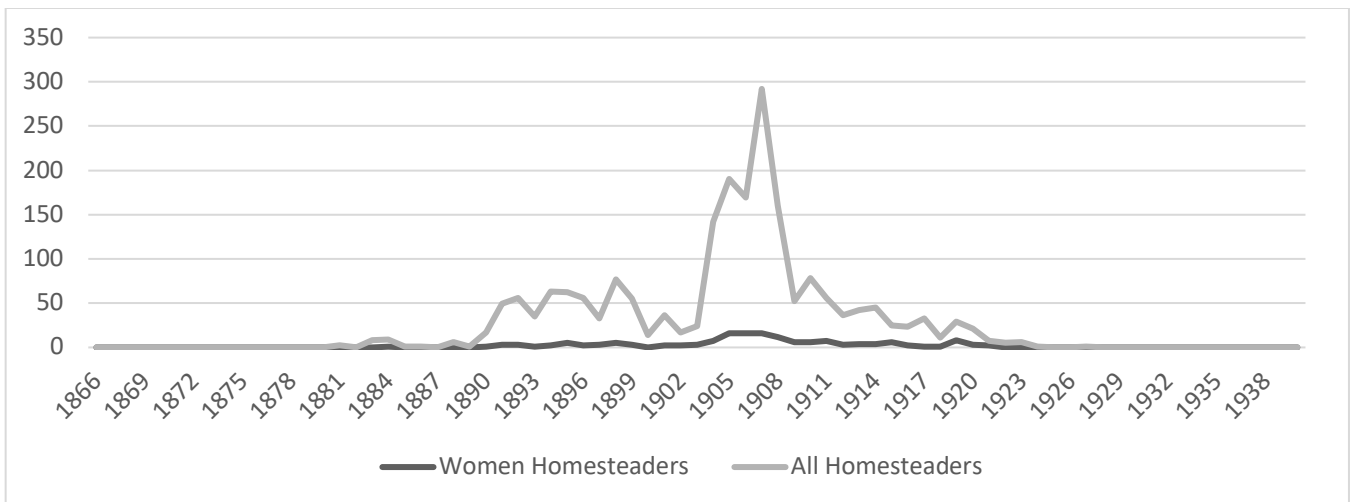


Figure 7. Adams County Homesteaders.

### Women Homesteaders by County

Women were issued 6.9% of the Homestead Act patents in the Channeled Scablands (Table 1). By county, the rate of women homesteaders ranges from 4.4% to 10.9%, which is greater than most of western Washington's counties but not as high as estimates in other parts of the West (National Park Service 2017).

**Table 1. Channeled Scabland Women Homesteader Patents by County.**

County	Women	All	Women
Western Washington	554	16043	3.5%
Channeled Scablands	883	12845	6.9%
Spokane	119	2675	4.4%
Lincoln	181	2782	6.5%
Grant	269	2471	10.9%
Adams	156	2046	7.6%
Whitman	158	2871	5.5%

### Feme Sole Homesteaders Claiming Family Lands

Although homesteads were most often claimed by individuals, homesteading was not done in isolation. To understand how common it was for women to work cooperatively with family to claim homesteads in the Scablands, an analysis was done on the peak homesteading years in each of the five Scabland counties. Statistics were collected by searching the GLO database for the women's family surnames and determining whether any family had patented lands within one Township and within five years of her patent date (Table 2).

**Table 2. Number of Family Claims Near Women's Claims in Peak Homesteading Years.**

County	Peak Year	Women	% w/ Family Nearby
Spokane	1898	11	36%
Lincoln	1904	18	61%
Grant	1911	43	51%
Adams	1906	16	69%
Whitman	1891	13	54%

In Adams, Grant, Lincoln, and Whitman counties, over half of the women homesteaders had family living nearby at the time of their patent. In Spokane county, only about a third of women apparently had family living nearby at the time of their patent. Most often only one family member patented land nearby, but in some cases as many as ten family members were homesteading in the area at the same time. Although this analysis is cursory, the data suggests that family support or the economic motivation for families to claim large tracts of land were

important factors for about half of women's homesteads in this region and family support was likely an important consideration for many homesteaders.

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2020 The Process and Practicality of Ordering Washington Homestead Land Entry Files: A Case Study of Women Homesteader Records. Poster presented at the 67<sup>th</sup> Pacific Northwest History Conference, October 20, virtual.

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# CHANNELED SCABLANDS WOMEN HOMESTEADERS

## SUMMARY STATISTICS AND SPATIAL PATTERNS FOR FIVE COUNTIES

### ABSTRACT

Western historians estimate that nearly a quarter of American homesteaders were women and that most women's homesteading occurred after 1900, shortly before American homesteading was at its peak in the 1910s. An analysis of western Washington homestead records concluded that *feme sole* women comprised only 3.5% of homesteaders, and that homesteading peaked in the late 1880s and sharply declined in 1899. How does this compare to the homesteading history of the Channeled Scablands, where the Homestead Act requirement to farm presented distinct challenges? This poster presents summary data of women's homesteading history in Washington's Channeled Scablands and explores the temporal and spatial patterns of women's homesteading history.

### GOALS

The Washington Women Homesteaders project aims to develop a historical context for Washington homestead history that includes female homesteaders. Previous studies (Mathews 2019, 2020, 2021) have established that the homesteading history of Washington may have unique local variations from that of the West in general. The goal of the present study was to summarize statistics for women homesteaders in Washington's Channeled Scablands to explore 1) how common it was for women to homestead; 2) when homesteading peaked; and 3) if spatial or temporal patterns exist in women's homesteading. The Channeled Scablands region was selected as a study area because of this region's unique American settlement history and the difficulty of farming in this area.

### METHODS

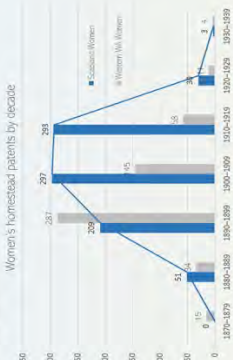
Summary statistics for this research were collected by browsing Homestead Act (12 Stat. 392) records in the [glorecoords.blm.gov](http://www.glorecoords.blm.gov) land patents database. Records were browsed by county and tallied by gender by year. In many cases additional research into homesteader's gender was done through primary sources such as census or marriage records. For this study, homesteaders were classified as women homesteaders if they were apparently legally *feme sole* not listed with a male patentee or if they were identified by their family surname and their husband was later included on the patent.

### REFERENCES

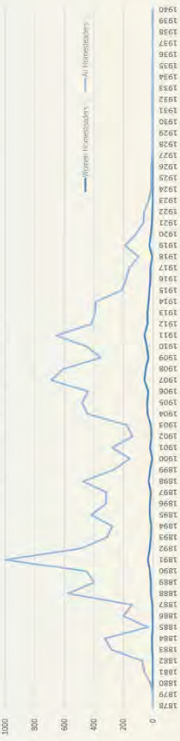
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- 2020 The Process and Practicality of Ordering Washington Homestead Land Entry Files: A Case Study of Women Homesteader Records.
- 2021 Western Washington Women Homesteaders: Summary Statistics and Spatial Patterns for Nineteen Counties.

### CHANNELED SCABLAND HOMESTEADERS, 1878-1943

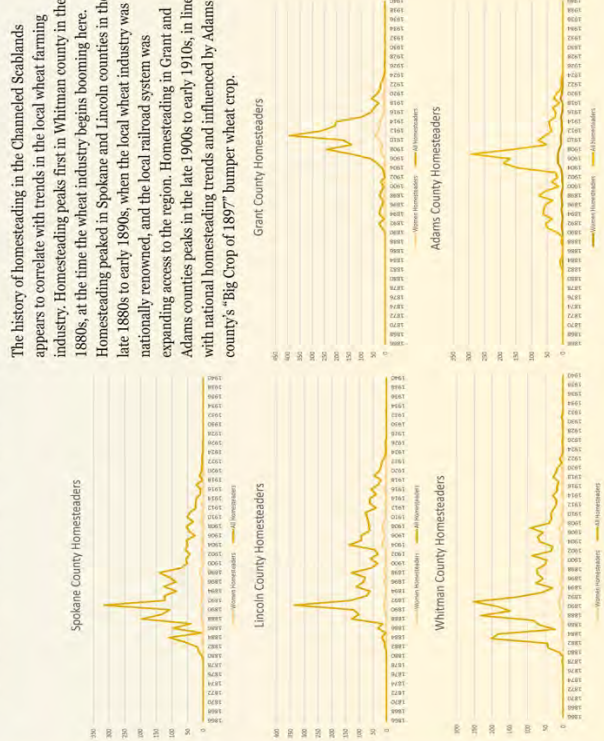
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### CHANNELED SCABLANDS HOMESTEADERS



The history of homesteading in the Channeled Scablands appears to correlate with trends in the local wheat farming industry. Homesteading peaks first in Whitman county in the 1880s, at the time the wheat industry begins booming here. Homesteading peaked in Spokane and Lincoln counties in the late 1880s to early 1890s, when the local wheat industry was nationally renowned, and the local railroad system was expanding access to the region. Homesteading in Grant and Adams counties peaks in the late 1900s to early 1910s, in line with national homesteading trends and influenced by Adams county's "Big Crop of 1897" bumper wheat crop.



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## Impacts of COVID-19 to On-Campus Students Attending a Rural University in the Pacific Northwest\*

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### ABSTRACT

Social disruption has been experienced worldwide due to COVID-19. Using oral history and online surveys sent to all on-campus students, the impacts of COVID-19 for students at a rural university in the Pacific Northwest can be gauged and thoroughly analyzed. A mixed methods approach to understanding these impacts allows for a rich and broad understanding of how students have experienced social disruption at different points in their academic career. Students that offered an oral history were led through the events of COVID-19 as they unfolded in the United States as well as local events due to COVID-19 that caused disruption. The survey offered students the opportunity to gauge the impact that COVID-19 had on different areas of their lives using Likert scale responses. Analysis offered insight into stresses due to financial instability, decreases in social and physical wellbeing, and how social disruption can lead to a change in one's perception of the passage of time.

*\*This paper was submitted to the 2022 Northwest Anthropological Conference Student Paper Competition and awarded as the runner-up in the undergraduate category.*

## Introduction

Late in 2019 the World Health Organization (WHO) announced COVID-19 as a pandemic and introduced measures for protection against the virus. Today, in early 2022, we are still living with these protocols and the social disruption they have caused. The COVID-19 pandemic and string of lockdowns that followed was unlike anything most people have ever experienced in recent times. Its influence is still impacting us today and will continue to impact us in the future. It is important that we document people's experiences related to this earth-changing event and the effects it has had for a range of people in our community and across the globe.

College students are no strangers to social change and stress. However, COVID-19 has only served to exacerbate that. To measure social disruption among students at a rural university campus in the Pacific Northwest, both qualitative and quantitative data were collected and utilized in a mixed methods approach. The first step of documentation involved an ethnography project that was conducted with five student participants during the fall of 2020. Subsequently, a survey was dispersed via e-mail to the entire student population of the university, and information regarding different aspects of life that have been impacted by the pandemic was collected. First, I will provide a general discussion regarding quantitative, qualitative, and mixed methodologies, to contextualize the multiple methods used in the research described here. Then, I will discuss specific methodology and analysis, ending with conclusions drawn from analysis of the data collected.

## Methods

### *Ethnography and Oral History*

Ethnography is defined as a "systematic approach to learning about the social and cultural life of communities, institutions, and other settings" (LeCompte and Schensul 2010:1). Through observing and sometimes participating in activities of the group one wishes to study, ethnographers can begin to see the world through a different cultural lens. By viewing the world from the perspective of those with whom they do their research, ethnographers make deeper meaning and offer a richer understanding of these different communities, institutions, and other settings. One method of ethnography is oral history.

Oral history is the process of collecting firsthand accounts of people who have experienced historical events. Oral history has broad applications and offers a duality in application, as it is both the process and the product of the interview that is conducted (Hajek and Davis 2015). This dual nature of oral history allows researchers to gain intimate insight into their research subject and/or participants. Through collecting and recording interviews, and in most cases transcribing them as well, a researcher begins to see how the information collected can be tagged. Through coding of each interview, common themes and similar experiences can be discovered and analyzed. Along with this discovery and analysis, impacts of an event or sequence of events can begin to be measured amongst a community.

In addition to providing data for researchers, oral history can also be used to document historic events through the experiences of a community. In their book, *Listening on the Edge: Oral History in the Aftermath of Crisis*, Mark Cave and Stephen M. Sloan discuss how conducting oral history interviews after a community has experienced a crisis can be helpful for interviewees. By conducting oral histories with someone shortly after they have experienced a crisis, "the process can serve to validate the individual's traumatic experience and help the survivor begin to make meaning of the event" (Cave and Sloan 2014:1-2). By having the opportunity to discuss with an impartial listener the events as they

unfolded and how they had impacted the life of the interviewee, they are able to reflect upon how much they have truly been through.

Another important aspect of conducting oral history through recorded interviews is that more than just what was said can be captured. One can hear things such as someone's tone of voice, and whether their pause in answering a question is significant and what meaning can be gleaned there. In some cases, such as with Scott Sikes' research in the Appalachian Oral History Project, we are even given insight to the daily lives of interviewees such as what was observed as research-listeners can hear the background noise of their families around them (2021).

Along with all these audio aids, a recorded oral history can be saved and reexamined later, as in the Appalachian Oral History Project (Sikes 2021). In this way, researchers can offer future evaluation for posterity, a way to create connections through time and help understand people in our past from a different point of view. Not only can recorded oral histories serve researchers in the future, but they can also serve several types of research projects. During his discussion of the Appalachian Oral History Project, Sikes states that the recorded interviews provided a "trove of data for scholars across multiple disciplines" (2021:106). Along with the ability to capture a piece of a specific time or place, recordings can serve research far into the future and among myriad scholars.

Finally, oral history can serve to "create connections among people and community across difference" (Napoli et al. 2020:30). In their discussion of oral history's tradition of being a tool for radicalism, Phillip Napoli and colleagues (2020) discuss how oral history can be used to convey deep and personal meaning of an event to those who have not experienced it, as well as how it can be a valuable teaching tool to help students understand historic events such as war and other crises. Indeed, oral history is a strong tool for conveying intimate information about a community or group of people who have experienced a historical event. Alongside this qualitative method, there are quantitative methods that can serve to further strengthen the analysis to be found in interviews.

So, oral history has multiple benefits and uses that allow for immediate therapy of the participant, a broad range of research topics to be explored, and can be archived for future research as well.

### *Surveying*

The use of surveys for collecting data is a longstanding practice in anthropology, and it affords researchers many uses that can be difficult to find in qualitative research methods. The administration of surveys or online questionnaires is a common practice for gathering information quickly and among a broad range of the population. A survey allows researchers to gauge impacts of events on communities or begin to understand a general attitude towards whatever or whomever they are researching.

There are several ways to set up a survey, and how one goes about survey development often depends first upon the questions one seeks to answer. However, determining a study's demographic is generally the first step, and this depends on a number of factors. One must consider the scope of the proposed study, as well as cultural factors that help to inform what the most appropriate demographic categories include. The customizability of how to categorize and reach the target demographic of a survey is a distinct advantage when coupled with a well-defined scope. For example, in a study regarding parents' attitudes towards influenza vaccination for their children, the demographic section of the survey was not very in depth as the researchers were able to administer survey packets directly to parents or guardians of children from several different childcare facilities (Yui Kwan Chow et al. 2012). Conversely, the purpose of a survey can be to capture a generalized idea of an entire population, such as was the case in research that Min Yang and colleagues undertook when looking into the psychological impacts COVID-19 had on

different provinces and regions of China. Through the use of an online survey, the researchers were able to gather viable responses from 5,854 people and the demographic section of their survey was substantial (Yang 2021).

Surveys, especially when distributed online, are a quick and cost-effective tool for collecting data. There are several different options for creating and dispersing a survey online that are of little or no cost to the researcher. Online surveys allow researchers to make contact with a larger portion of the population in a short amount of time. Once an online survey has been created and made available, researchers need only to wait until the designated time has passed and then they can begin analysis. In the wake of COVID-19, online surveys became an accessible and responsible tool for data collection regarding human participants. Researchers are able to recruit respondents in a number of ways and when looking specifically into the effects of COVID-19, have been able to partner with institutions such as health care facilities, or the state department of health (Vereen et al. 2021). One group of researchers even utilized different social media platforms to promote their survey when looking into how COVID-19 had impacted parent-child relations (Roos et al. 2020).

While surveys and other quantitative methods are often utilized for generalization of a population, there is still a lot of flexibility to be found when one defines said population. For example, a researcher could use a survey to understand different experiences of an entire country such as in a study by Min Yang and colleagues. Or researchers can narrow their population to parental residents in an urban city that utilize child-care centers (Yui Kwan Chow et al. 2012). The ability to narrow or widen population and even the topic of a survey allows for great control over the type and amount of information gained.

### *Mixing Methods*

Qualitative and quantitative methods have been viewed as two different “cultures” rather than two sides of the same coin that are easily comparable against one another (Goertz and Mahoney 2012). This is a great way to understand them when utilizing a mixed methods approach to research. A mixed methods approach lends itself to the beneficial attributes that both qualitative and quantitative methodologies have to offer. Mixed methodology is becoming a more popular choice for some researchers, as it allows for research that answers, “complex questions that sometimes require a variety of qualitative and quantitative methods in one study” (Hesse-Biber and Johnson 2013:103). It has been observed by Sharlene Hesse-Biber that often a mixed methods approach can fail to use a strong qualitative element in the research design. In her article, “Qualitative Approaches to Mixed Methods Practices” Hesse-Biber (2010) outlines seven different case studies that employed a more qualitative forward approach to mixed methods. The third case study she discusses follows the same mixed methods approach as this current research project: beginning with a qualitative data collection method of in-depth oral history interviews, and then using the information collected to construct and administer a survey to a broader population.

As an advocate of quantitative-centric mixed methodology, Hesse-Biber makes a case for the benefits it can have in the public sphere as well. Citing four cases that exemplify the benefits of a mixed methodology that begins with qualitative data collection, Hesse-Biber (2020) shows the wide breadth of uses available to researchers when they employ this approach in their projects.

In her article, “Transformative Paradigm: Mixed Methods and Social Justice,” Donna Mertens (2007) discusses the importance of mixed methodology in a cultural setting. Through use of qualitative methods to collect information from members of the cultural group one chooses to study, one will be able to maintain the people consisting of the study as a key component of research. Beginning with quantitative

methods, researchers can take the information gathered and transform it into data that can be viewed and used to come up with solutions for possible social issues in that cultural group. Qualitative forward mixed methods can be employed in a number of ways, even ones that would seem to preside strictly in the realm of quantitative research.

In their article about Geographic Information Systems (GIS), Kwan Mei-Po and Guoxiang Ding (2008) discuss how a mixed methods approach that focuses on qualitative aspects of research can be extremely useful in social research. Through GIS and oral history, the authors suggest, researchers can get a better grasp of the lives of different cultural groups and even help in instances of land ownership debates.

In an interdisciplinary study regarding food quality in rural South Africa, researchers also used a mixed methods approach (Claasen et al. 2015). The beginning of their data collection starts with random sampling of homes in the area of study. The researchers propose to integrate quantitative methods within a more dominant framework of qualitative research. They administered questionnaires and took inventory of each household's food stores and then conducted focus group discussions based on their findings in their random sample. While they began with quantitative data collect methods, an overall theme of qualitative analysis was the basis of their research design (Claasen et al. 2015).

Another study (Cortis and Abela 2021) began by first observing employees in their work environments and noting all activities that were part of their job description and those that were not. Later, after this initial stage of research, researchers began conducting one-on-one interviews with staff about their outlook on current working conditions. After interviews were conducted, more data was collected using a quantitative method such as individual scoring of each employee and evaluating time sheets for time spent in different department. The researchers on this project brought qualitative and quantitative methods together to triangulate data regarding hidden workloads (Cortis and Abela 2021).

Often, as exemplified above, a mixed methods approach will lean more towards qualitative or quantitative methods with the other used as a support system and this is a great way to exemplify how each methodology can create a stronger defense for one's argument. In a recent study by Roos and colleagues (2020), the researchers took a mixed methods approach to understanding how the social disruption of COVID-19 through mandated lockdowns could cause disruptions in Parent-Child relationships. Through administration of several online surveys to qualifying participants that were at least 18 years of age and were primary caregivers of at least one child, the researchers were able to gather a vast amount of quantitative data. Each survey also incorporated a qualitative approach by utilizing open-ended questions where participants were able to fully express themselves regarding the questions asked. This allowed researchers to generate a large quantity of quantitative data as well as qualitative data (Roos et al. 2020). A mixed methods approach holds strength when properly executed as it allows for intimate and broad knowledge to analyzed from the data collected.

## **Methods and Analysis**

Having laid out this general discussion of (mixed) methodology, I will next explain the specific methods I utilized in this current research, both oral history and online surveys. I will first discuss the processes and procedures involved when conducting an oral history, and the subsequent analysis through the use of tagging. Then, I will discuss how a survey was created from the initial analysis of the oral histories collected, its method of dispersal and statistical analysis.

### *Oral History*

Beginning with oral history as an ethnological method, the creation of an interview protocol that complies with the standards of the International Review Board (IRB) regarding human participants is the first step. As the protocol was being shaped, matters regarding the safety of the people participating in the recorded interviews were taken into account, and it was decided that participants were to be kept confidential. Confidentiality better served the purpose of this research project by making the approval process more expedient and participant identity was not crucial to learning about the University's student experience during the pandemic. A [2020-06] form was submitted for review and approved by the IRB. The approved protocol can be viewed in Appendix A.

The questions constructed for the interview were designed to lead each participant through a chronology of events surrounding COVID-19 from the time it was declared a pandemic up to the point of their interview in early 2021. The questions were open ended so as to allow for maximum participant engagement and reflection on the series of events, as well as the impacts felt from social disruption.

After approval of the protocol by the IRB, demographics were taken into great consideration, as there were many ways to discuss the student experience. One could look specifically at students based upon their year/class standing with the university (First year, Sophomore, etc.), whether they were local or international students, or even what the experience of a student athlete may have looked like. After much deliberation about demographics, it was decided that a broad range that could be as representative of the University's entire student body would be the best approach for exploring the effects COVID-19 had to students. Different student groups and clubs on campus were contacted via email, explaining the project's goals and asking about their interest in participation. Due to lockdown protocols in place at the time, in-person networking and recruiting was not an option and, therefore, email was the main avenue of interaction with potential participants. The difficulties of recruiting participants were increased due to a lack of in-person interaction that can be useful in several different types of data collection where human participants are involved. In the end, five students were recruited and interviewed for approximately one hour through a recorded Zoom session. Zoom has been a useful tool during the pandemic as a way for students and faculty to create a semblance of normalcy during a time of abrupt social disruption, and a rather new one for ethnography.

After all interviews had been conducted, transcription was utilized to create a deeper familiarity with what had been discussed in each interview. Through the process of transcription, one can begin to discover commonalities between the participants whether they be expected or unexpected. Familiarity with the interviews afforded by the time spent typing out every word from each participant and myself allowed the beginnings of analysis to come forth and common themes to be further investigated. While pauses and tone are not expressed in my transcriptions themselves, the connection I have with each interview is deep because I was the only one conducting and then transcribing each interview. This allows me to recall things such as the general demeanor each participant had during different aspects of the interview. Tagging of the five interviews led to a deeper look at common concerns during a time of social disruption.

### *Analysis—Oral History*

Each participant in the oral history portion of the study contributed a unique experience during COVID-19. As such, their interviews reflect differences in how much one impact, or another was felt. Nevertheless, the participants still felt each impact to their social disruption regardless of age, gender, or time they had been attending the university prior to lockdown protocols. The main focus of social

disruption was found to be around four categories: financial stability, mental health, physical wellbeing, and social wellbeing. While there was a broad focus on these particular aspects of social life, the questions were open-ended and encouraged discussion as well as introspection on the part of the interviewee. I allowed the interviewees to discuss the things that came to mind when I brought up each question at whatever length they felt was appropriate so that I could gain their truthful story and learn about what impacted them most. Some felt extreme loneliness, others had a strong support system to rely on. As I transcribed each interview, I began to see how deeply impacted these aspects of social life were for each participant and what unified their experiences. An abrupt and prolonged social disruption served as a challenge for each interviewee in one way or another and is the basis that connects their stories. Along with the expected areas of impact, there was an unexpected overarching theme surrounding the disruption of social time. Of the five interview participants, four of them discussed how time was disrupted for them at length. In the first interview, time was mentioned in 26 instances, in the third it was mentioned in 21 instances, in the fourth it was mentioned in 13 instances, and in the fifth it was mentioned in 15 instances. This led me to realize how time is integrated into social structure and how social disruption leads to a disruption of time.

### *Online Survey*

In order to find whether or not these interviews informed a greater experience across the entire campus, a survey was created to gauge the aspects of social disruption discussed above and can be viewed in Appendix B. Once again working with human participants, safety of the participants was the greatest factor considered and it was decided that participants would be anonymous. Due to the anonymity of participants, a full IRB review was not necessary which also allowed for an expedient dispersal of the survey. This helped with a cohesiveness between methods, as students were kept anonymous in this portion of the study phase, and their experiences as students and people experiencing abrupt and prolonged social disruption were the focus. Data collection consisted of an online survey administered via email to all current students at the university and required participants to have an active university supported email account to access and participate in the survey.

The survey was live from November 10, 2021, to November 22, 2021, and received 56 total responses. Of the 56 responses, three responses were not included in the analysis as they were online students, and the scope of this research is strictly restricted to on-campus students.

The questions on the survey first included demographic questions in order to reveal several possible ways of examining the data and how COVID-19 may have affected some groups of students differently than others. First, demographic information was collected such as age group, year attending the university, whether the student attended the university full-time or part-time, if the student held a full-time or part-time job, and if they paid in-state or out-of-state tuition.

Next, questions related to major themes discovered in the oral history portion of the study were given. The use of a Likert-type scale of one through five was implemented to allow students to gauge for themselves the impacts to their mental health, social and physical wellbeing, and financial stability that they had experienced during the pandemic. Allowing each participant to decide for themselves how impacted they were by COVID-19 leads to answers that require reflection about the pandemic itself and how they feel about the experience overall at the time the survey was distributed. After the Likert-type questions, a qualitative element was introduced by allowing each participant an opportunity to voice any other thoughts or concerns they had about the pandemic and the University's involvement.



*Analysis—Online Survey*

Initial review of the demographic data showed a fairly even distribution across the number of years students had been attending the university. Each year category has the possibility to present a unique perspective as they all have varying lengths of experience with the university prior to COVID-19. The categories of years attending the university were split into one year, two years, three years, and four or more years. Each of these year categories were tested against one another in each Likert-type response using a Kruskal-Wallis one-way analysis of variance test using the program SPSS v. 26. Along with the Kruskal-Wallis analysis, the mode of each Likert-type response category for each corresponding year category was determined for an overall look at responses among the year categories themselves.

First, the mode of each Likert-type question has been determined according to the corresponding year attending category and is displayed in Table 1 and shows a slightly less than average response to COVID-19 social disruption impacts. While the mode is unable to allow for very in-depth analysis, it offers a cursory overview and reveals a mostly negative trend from the respondents regarding the impacts they felt in these different categories of social disruption.

**Table 1.****Mean of Responses by Impact Category and Year.**

<b>Year Attending</b>	Financial Impact	Mental Health Impact	Physical Wellbeing	Social Wellbeing
<b>One</b>	2	2	2	3
<b>Two</b>	3/2	2	3	2
<b>Three</b>	2	1	2	2
<b>Four or More</b>	2	2	2	1/2

Examination of the results of the Kruskal-Wallis tests reveals that most year attending categories did not have vastly different experiences during COVID-19 and the lockdown protocols, aside from the impacts felt on participants mental health status. The significance results were as follows: financial impact 0.427, mental health 0.046, physical wellbeing 0.942, and social wellbeing 0.314. A more in-depth view of the test results regarding the participants and their mental health can be seen in Table 2 and shows that a comparison of year two to year three and year four or more supply the biggest differences.

**Table 2.****Pairwise Comparisons of Year Attending.**

<b>Sample 1-Sample 2</b>	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. <sup>a</sup>
<b>Fourth Plus-Third</b>	-.878	5.691	-.154	.877	1.000
<b>Fourth Plus-First</b>	8.448	5.429	1.556	.120	.718
<b>Fourth Plus-Second</b>	-13.917	5.804	-2.398	.016	.099
<b>Third-First</b>	7.570	5.309	1.426	.154	.923
<b>Third-Second</b>	13.038	5.691	2.291	.022	.132
<b>First-Second</b>	-5.469	5.429	-1.007	.314	1.000
Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.					
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.					

**Discussion**

I will now discuss the four main areas of social disruption that were the focus of the interviews, as well as the Likert-type questions in the online survey. I will also elaborate on how the concept of time being disrupted came into play throughout the interviews. I will be using the qualitative and quantitative data that I have collected in tandem to discuss these impacts as they both serve the mixed methods approach that I have employed.

*Financial Stability*

Concerns with financial stability is common for college students, and COVID-19 only served to exacerbate this issue causing more stress for students. Seventy-one percent of the students that participated in the campus-wide survey were employed at least part-time. All of the interviewees were employed prior to lockdown protocols being put in place. One of the interviewees worked for a local restaurant and, while she did not lose her job, the restaurant did have to shut down and decrease hours significantly more than once during the first year of lockdown. This particular interviewee was ineligible

for unemployment because she had not been let go but was also not earning any income due to a lack of scheduling at her place of employment. During our interview, she expressed extreme distress and confusion that took place during the initial lockdown phase because she was living off campus, had rent to pay, and no way to pay it as a result of measures that had to be taken. Another interviewee who had struggled to find employment fell on especially hard times during the initial phase of the lockdowns, as she was living alone, was now unable to get a job, and had to choose between buying food or paying her bills. This interviewee expressed to me how she had to sit outside on campus somewhere just to gain access to wi-fi, she was unable to gain shelter from the buildings as they were closed due to COVID-19, but she had no other option in order to complete her schoolwork.

In fact, there is much to be said about the idea that there was no large difference in experience of financial stability across year attending groups, and that can also be seen from those who chose to respond to the optional, open-ended question that closed out the survey. Of the 18 participants that elected to respond to this open-ended question in the survey, five of them discussed financial aid issues such as having access to more grants and the university not increasing the price of meal plans and dormitory arrangements. One student simply requested that the university “provide more resources to students to assist them with any issues, whether that be financial, food, living arrangements, etc.” This request for assistance was also seen in regards to mental health facilities.

Related to students’ requests for more access to financial assistance, is the CARES Act that was initiated as relief funds for universities to help students with COVID-19 related expenses. In the online survey, students were asked whether or not they were aware of the CARES Act related to student relief as well as if they had utilized the available funds. Of the student respondent, 43% were completely unaware of the CARES Act and its capacity to assist with COVID-19 related expenses for students. As such, 54% of students did not utilize these relief funds. When discussing the CARES Act with an interviewee, they informed me that they were unaware of its availability after the first term in lockdown. As some other students have said from the open-ended section of the survey, there seemed to be a lack of communication for some students and one student stated that their first year at the university felt chaotic as they had little direction when navigating the institutions at a university.

### *Mental Health*

Mental health is a great concern for college students during regular times. When adding a crisis that includes a high death toll and social isolation it is very possible to make matters worse. In fact, “for people with preexisting mental health conditions, a pandemic can further heighten their anxious thoughts and compulsive behaviors. Previously managed symptoms can flare up, requiring additional care beyond what was sufficient pre crisis” (Schoch-Spana 2020). For one participant, this proved to especially be the case. This participant had experienced sexual assault on multiple occasions during their time at the university and was struggling with it when the pandemic started. She experienced extreme isolation as she lived alone, off campus, and very far from her family. As a result, her mental health suffered even more as lockdown began.

While the university offers mental health counseling to students and did its best to make a seamless transition to remote counseling, unfortunately as this participant relayed to me “over the summer we don’t have access to counseling at [university] so I guess that’s what like spiraled me into that phase of just drinking and smoking” and struggled most with her mental health due to compounding trauma and loneliness. Survey participants also noted that they were unsure of how to utilize the mental health facilities offered by the university stating, “there could also be more mental health outreach in

regard to making sure it is better known about the health center and the counseling center.” Along with programs being unavailable during the summer, the university is in a rural community that already suffers a lack of mental health care for residents. When asked about how they had coped with COVID-19 most interviewees felt like they had not really coped with it at all. One participant said they “haven’t really, like, reflected on the whole process so it was nice to think about that too” further exemplifying how interviewing shortly after a period of trauma can be of assistance. Another participant talked about how the time during lockdown allowed them to discover that they actually enjoyed time alone and helped them realize that their previous living situation had been somewhat of a burden for them. Four out of the five participants interviewed said they used a mixture of marijuana and alcohol. These four participants also said that their usage increased greatly during lockdown and would attribute this increase to mental health stresses felt from lockdown. All of the participants stated that they had cut back since returning to class, regarding their usage as “too much” and were glad that they had been able to successfully decrease their intake.

### *Physical Wellbeing*

Coupled with mental health, physical health was a concern among four of the five participants. These four interviewees all participated in some type of physical activity previous to the COVID-19 lockdown. Two of the participants mentioned that they had gained an unusual amount of weight during the lockdown, and another participant felt that their lack of access to the university’s gym hindered their mental and physical health.

This sentiment was shared by some of the survey participants as well, with one stating at the end of their survey that “increasing the gym hours would be nice.” While the experience of each year group may have been about the same, it cannot be denied that most participants felt their physical wellbeing suffered during the pandemic when taking into account what the interview participants said and the mode for the physical wellbeing category being rated a two out of five in all cases but second year students.

### *Social Wellbeing*

Social disruption due to COVID-19 lockdowns has had an interesting and profound impact of the social wellbeing of students. As classes were quickly transitioned to a remote setting in the Spring of 2020, it created new issues of how these students would attend class and socialize with one another as well as others outside of their school lives. One interviewee discussed how she was unable to see her mother or grandfather for quite some time, as her grandfather was immunocompromised. On top of that, this same interviewee experienced the beginning months of lockdown alone in her apartment as her roommate had been away visiting family at the time and was unable to return home for some time. This interviewee discussed with me how isolated she felt and that attempts to connect with friends and peers failed as she was restricted from most of her regular social activities. Another interviewee discussed with me how even though she lived alone, she felt even further isolated than usual, as she had relied on classes and regular gym sessions as a point of socialization, and that was out of the question at the beginning of lockdown.

It was not uncommon to get similar responses in the open-ended question of the online survey conducted. One student expressed that they would have liked “more ways to engage with other students” and explained that there was a lack of activities for students even in a virtual setting. Another student stated that it was quite difficult for them to find any information about the virtual events that had taken place and requested to make these events more visible for students so they could have some way to engage with and meet new people.

## *Time*

An unexpected topic that arose from the oral history phase of the study was that of the passing of time and how it had been disrupted. The concept of how time passes is one that can be delved into deeply and with great complexity. I will be drawing on the concept of qualitative time as discussed in depth by Nancy Munn (1992) in her literature review “The Cultural Anthropology of Time: A Critical Essay.” What I found most interesting and applicable was that in a paradigm discussed by Durkheim and his colleagues “social time consists of ‘collective representations’ or ‘categories’ that derive from and reflect the groupings and varied ‘rhythms’ of social life” (Munn, 1992:95). What happens when the “rhythms” of social time become interrupted and how might that affect a person existing in this social time? When discussing lockdown with my participants, four out of five mentioned that time felt as though it had come to a halt. In fact, this disruption of social time permeated the other aspects of social disruption discussed above. Some participants mentioned that it had become difficult to remember what day of the week it was as they lost all structure to their day and time, in a social context, began to lose all meaning. This inability to maintain a grip on days progressing is connected to a loss of financial stability as well as social wellbeing. Without a work schedule or planned social activities, it becomes easier for the days to blur together. Students were able to find some structure to their days during the Spring 2020 term as classes and schoolwork kept them mostly in check.

However, as summer began, they struggled to maintain a sense of social time as they were cut off from interpersonal interactions that helped keep their “rhythms” on track. Three participants stated that due to this disruption of social time, they began to stay up later and sleep in longer. One participant stated that she “almost, like, flip flopped my schedule where I’d just stay up, like, all hours of the night.” This type of schedule change impacted the interviewee’s mental health and social wellbeing as she was unable to socialize with friends as easily and felt even more disconnected from them.

While the impact of time on physical wellbeing is smaller in comparison to the other aspects of social disruption, it was still an impact felt. With a disrupted perception of time comes a disrupted schedule. It is not as easy to engage in physical fitness during the nighttime as students need to be considerate of housemates as well as a lack of access to fitness centers such as the university gym. In fact, one survey participant may have experienced such a schedule disruption in regard to their physical wellbeing as they commented in the open-ended portion of the survey “I think that increasing the gym hours would be nice.” This displays a lack of access at regular gym hours and could be indicative of a disruption to social time impeding their ability to maintain physical wellbeing.

Only one participant was able to recognize and try to resist this interruption to their social rhythm. When asked about their initial feelings on the announcement that COVID-19 was declared a pandemic and as the university would be going remote, their response was that they were not too worried about lockdown. The participant elaborated that as they had already made plans for the summer, they were not going to allow lockdown to let them miss it. This participant also seemed to struggle less with their mental health and isolation, and it is very possible that even though their approach may be considered risky, that this could be related to their refusal to allow such a large interruption to the rhythm of their social time.

## **Conclusion**

COVID-19 has facilitated a large social disruption to the entire population. However, the impact of this social disruption can be seen to compound with other social stressors that are commonly experienced by university students. As discussed above, an increase in financial instability was felt by students through the loss of jobs and hours scheduled to them on top of payments for tuition. A lot of

students also experienced a decrease in their mental health, physical or social wellbeing. Along with these anticipated social impacts, students' perception of time was affected due to the social disruption initiated by COVID-19 protocols. A large focus should be on mental health facilities and bringing awareness of these facilities to the students would be helpful as mental health was one of the most greatly impacted aspects observed during this research project. Aside from mental healthcare, there was also a lack of help found for students in need of financial assistance. While this does not fall squarely on the shoulders of the university, there seems to have been a lack of communication regarding assistance programs that led to a lot of the survey participants being unaware or unable to utilize funds from the CARES Act. Overall, this comprehensive, mixed-methods project has shown that students have been negatively impacted by COVID-19 regardless of age, years having attended the university, and employment status.

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## APPENDIX A.

Please state your age and major.

### **March 11th, 2020, WHO declares COVID a pandemic**

Can you tell me about your initial thoughts and feelings regarding COVID-19?

- expectations regarding COVID-19 responses and protocols?

### **March 13th, 2020, a national emergency is declared in US regarding COVID**

What was on your mind as we went into lockdown at the end of winter term 2020?

Did you have any concerns regarding:

- your mental health?
- financial stability?

Did you experience loss of a job or other income during lockdown? What was that like?

### **March 18th, [University] declares that Spring 2020 term will be completely remote**

If you live with one or more people, have those relationships changed during lockdown? If yes, how so?

If you live alone, how has it been for you to experience physical isolation?

### **Spring Term 2020 March 30 - June 12, 2020**

What was your experience like during the Spring 2020 term?

How have you coped with social distancing?

Have you discovered any new hobbies?

Have you turned to the recreational use of drugs/alcohol during lockdown?

- How many drinks a week were you having?
- What recreational drug(s) would you use and how often?

Can you walk me through what became a typical day for you in lockdown?

### **June 5th is when Phase 2 of [State Governors] reopening plan was set in motion**

**June 15th-25th confirmed cases increased exponentially. By June 25th, 297 confirmed cases in Union county.**

**APPENDIX A.** (cont.)

What are the common emotions you feel when you read/hear something regarding COVID-19 and its progression throughout the US/Union County?

Is there anyone in your life that is at high risk of contracting COVID-19?

Did you or anyone you know contract COVID-19?

## APPENDIX B. COVID-19 SURVEY.

### COVID-19 Survey

This survey explores the impacts of COVID-19 to on campus students at EOU (You must be 18 years or older). This survey takes approximately 8 minutes to complete. No personal information will be gathered in this survey. By clicking the “Fill Out Form” button you are consenting to participate. Thank you for your time and thoughtful responses!

1. Are you an on-campus or online student?

On-campus

Online

2. How old are you?

18 - 19

20 - 21

22 - 23

24+

3. Do you pay in-state or out of state tuition?

In-state

Out of state

Which of the following best describes you?

1st year attending [University]

2nd year attending [University]

3rd year attending [University]

4th year attending [University]

5+ years attending [University]

4. Are you attending EOU as a full time Student? (12+ credits)

Yes

No

5. Do you currently live in the dorms?

Yes

No

6. Are you currently employed?

No

Yes, part-time

Yes, full-time

**APPENDIX B.** (cont.)

7. How has COVID-19 impacted you financially?

1 (being most negative)

2

3 (no difference)

4

5 (being most positive)

8. How has COVID-19 impacted your mental health?

1 (being most negative)

2

3 (no difference)

4

5 (being most positive)

9. How has COVID-19 impacted your physical wellbeing?

1 (being most negative)

2

3 (no difference)

4

5 (being most positive)

10. How has COVID-19 impacted your social wellbeing?

1 (being most negative)

2

3 (no difference)

4

5 (being most positive)

11. Did you hear about the CARES Act and its benefits to students?

Yes

No

12. Did you take advantage of the CARES Act to support your college endeavors?

Yes

No

13. Did you utilize the Student Success Information & Orientation Canvas shell?

Yes

No

**APPENDIX B.** (cont.)

14. If so, did you find it helpful?

1 (not helpful)

2

3

4

5 (very helpful)

15. Is there anything else you think that Eastern Oregon University could have done to assist its students during the pandemic?

## **An Overview of Vitrophyre Use in North Central Idaho: 12,000 Years of Rock Knockin' on the Lochsa\***

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### **ABSTRACT**

Archaeological investigations in the 1990s defined the Clearwater River region of the southern Columbia Plateau as a unique cultural and archaeological entity, though it remains poorly understood. The Nez Perce have occupied this portion of north central Idaho since time immemorial. Excavations throughout ancestral Nez Perce country have revealed vitrophyre in at least 19 key sites dating back 12,000 years. Vitrophyre is a natural igneous glass, formed of pyroclastic flow deposits containing large-grain phenocrysts of ash and pumice. Much like obsidian, vitrophyre creates sharp cutting edges for tool production and retains a chemical signature that can be traced to a geographical point of origin. A combination of geochemical analysis, lithic analysis, and experimentation have provided an overview of this understudied resource and its uses. By comparing two known vitrophyre sources with archaeological samples through an ecological foraging model, vitrophyre use reflects both embedded procurement strategies and territorial restrictions of different groups since the initial occupation of the Clearwater River region. The results of the analysis, in tandem with ethnographic data, suggest a strong connection of the inhabitants of the Clearwater River region with Salish groups of the Bitterroot and Plains regions to the east.

*\*This paper was submitted to the 2022 Northwest Anthropological Conference Student Paper Competition and awarded as the runner-up in the graduate category.*

## Introduction

Lithic artifacts in north central Idaho are dominated by cherts, quartz, and fine-grained metamorphic river cobbles with occasional obsidian sourced from great distances. Vitrophyre, a natural igneous glass, was first identified in an archaeological context in the Clearwater River drainage of the southern Columbia Plateau in 1977 (Knudson and Sappington 1977). Vitrophyre is a form of ignimbrite, which are pyroclastic flow deposits that contain large-grain phenocrysts of ash and pumice that become cemented (USGS 2021). Much like obsidian, this glassy material fractures in predictable ways, creating sharp cutting edges for stone tool production, and contains a unique chemical signature that can be linked to a geographical point of origin, or a parent source. Previous research has identified at least two semi-local vitrophyre sources in north central Idaho, one along the Lochsa River in Idaho and another within the Bitterroot Divide, just across the Montana border (Munger 1993; Keating et al. 1996c; Skinner and Thatcher 2013a, 2013b). Vitrophyre has been noted at numerous archaeological sites within the region yet remains understudied as a lithic resource in the Clearwater River region, a unique cultural area where past lifeways remain poorly understood (Sappington 1994). As a local material that can be geochemically sourced, vitrophyre has the potential to shed light on lifeways over the last 12,000 years. Sourcing, or provenience, studies offer the ability to reconstruct mobility patterns, local economies, territory and resource patch ownership or access, trade and social networks, and to some extent the symbolic value or cultural preference of material goods.

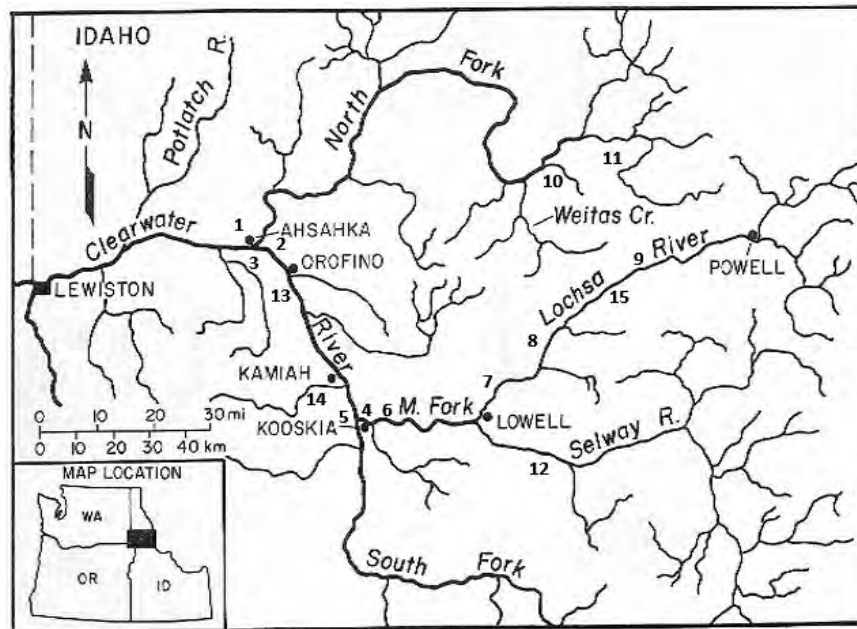
This preliminary research provides an overview of vitrophyre use in the Clearwater River region through a multipoint analysis, offering a characterization of the material through time and across space. A combination of geochemical analysis, which has not been used for vitrophyre in an archaeological context before, as well as lithic attribute analysis and experimentation are used to establish an overview of this understudied resource.

Lithic studies that draw on a cultural ecology approach provide a useful framework for thinking about artifact assemblages as functional materials that reflect some aspects of subsistence, settlement, and mobility over time. Building on these perspectives, this research expands the breadth of interpretation of material culture by incorporating concepts of perception and Indigenous perspectives into an ecological foraging model. This approach not only addresses how people interacted with their environments, but also how they interpreted these materials and landscapes. This paper finds that vitrophyre was used for long periods of time and reflects both embedded procurement strategies and territorial restrictions of different groups.

## The Research Area

The research area is southeasternmost portion of the Columbia Plateau, from the Bitterroot Divide to where the Clearwater River merges with the Snake River, including several major tributaries, the North Fork, the Lochsa, the Middle Fork, the Selway, and the South Fork (Figure 1). The Nez Perce, or *Nimiipuu* – meaning ‘The Real People’ (Slickpoo and Walker 1973:1), have an established presence in the Clearwater River region as long as people have occupied the river valley, at least 12,000 years, demonstrated through oral history, ethnographic documentation, and archaeological evidence. A sample of 19 archaeological sites (Figure 1) within the Clearwater River region, known to contain vitrophyre artifacts, were chosen to represent a range of deep time occupations, 12,000–250 years before present (B.P.). These sites were included because in each case some level of excavation

occurred, many have associated radiocarbon dates, and they represent variation in site types with a spatial and temporal range.



**Figure 1:** Location of selected archaeological sites in the Clearwater River region where vitrophyre artifacts have been recovered: (1) Clearwater Fish Hatchery (10-CW-4); (2) Ahsahka Sportsmen's Access (10-CW-5); (3) Canoe Camp (10-CW-25); (4) Kooskia Bridge (10-IH-1395); (5) *Kam'-nak-ka* (10-IH-820); (6) *Tuhkaytahs'speh* (10-IH-1009); (7) Pete King Creek (10-IH-453); (8) Beaver Flats (10-IH-871); (9) Wilderness Gateway sites (10-IH-798 and 10-IH-879); (10) Weitas Creek (10-IH-30); (11) Kelly Forks Work Center (10-CW-34 and 10-CW-92); (12) O'Hara Bar (10-IH-1948) and Rackliff (10-IH-2737); (13) Middle Clearwater sites (10-LE-34, 10-LE-102); (14) Lochsa River sites (B-T6). Map adapted from Sappington 1994.

## Vitrophyre

Vitrophyre is an extrusive igneous glass and a form of ignimbrite, or a welded tuff. Ignimbrites are formed of pyroclastic flows expelled from rhyolitic stratovolcanoes that contains large-grain phenocrysts (USGS 2021). During an eruption, micro-glass ash particles, pumice, rock, and gas combine into a hot, dense slurry. Heat and compaction cause the larger particles to become welded into a fine-grain, glassy matrix (Allaby and Park 2017). As an ash flow, pyroclastics can be deposited hundreds of miles from the original source, however the higher rhyolite content in vitrophyre usually forms a viscous lava that will not travel as far and cools rapidly in place (Sappington 1981). Vitrophyre is often found *in situ* in bedded veins or as rounded cobbles within secondary alluvial deposits (Crabtree 1967). Though vitrophyre is primarily silicone dioxide ( $\text{SiO}_2$ ), 65-85%, as a volcanic product, expelled from compositionally variable reservoirs, it also contains a distinct chemical signature (Ellis et al. 2014). This can cause chemical heterogeneity among batches and micro-settling, or phase separation, contribute to the formation of gradationally zoned ignimbrites (Ellis et al. 2014:432-433).



Vitrophyre forms a thick, vesicular pumice-like cortex and contains granules of impurities, seams, and other material flaws that can disrupt the force of percussion when detaching flakes during tool manufacturing (Figure 2). Vitrophyre from a single source can have a range of visual characteristics with various types and sizes of inclusions and can present a range of colors (Figures 3 and 4). This study examines material from two known sources, Lochsa and Montana Creek, where colors transition abruptly from an opaque light gray, (5Y 7/2), with 1–3 millimeter (mm) rectangular inclusions to a translucent olive gray, (5Y 5/2), with many tiny inclusions. More occasionally, they range from iridescent opaque grayish green, (5G 5/2), with 1 mm rounded inclusion, an opaque dark gray, (10YR 4/1), with occasional 4 mm angular inclusion, or a dull, opaque black, (N 2.5), with minimal visible inclusions (Globe 2005).



**Figure 2.** Examples of phenocryst in multiple vitrophyre samples.



**Figure 3.** Examples of Lochsa vitrophyre projectile points and preforms from the Clearwater River region. Left to right: 10-CW-30 (1662.123), 10-IH-820 (21.7/3.5), 10-IH-820 (21.2/2.13), 10-IH-1009 (1.4.0), 10-CW-30 (1662.250.01), 10-CW-30 (1662.214.02).



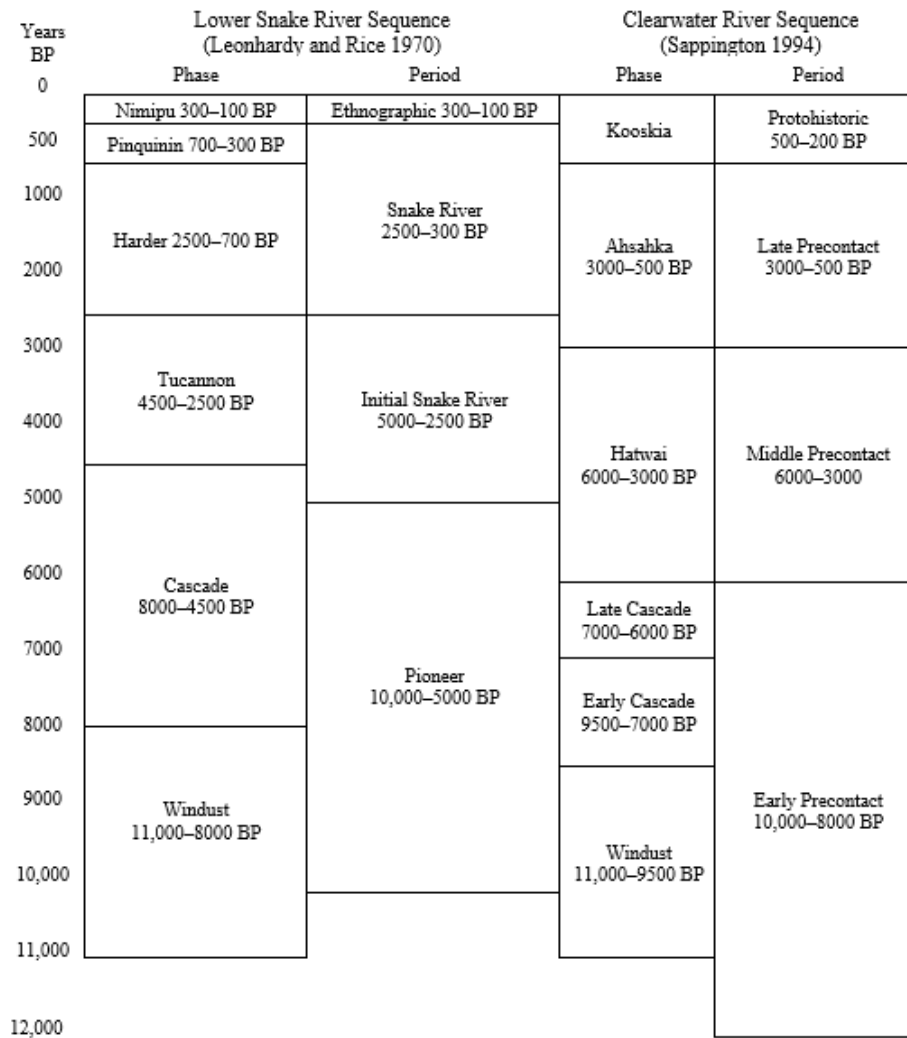
**Figure 4.** Examples of Montana Creek vitrophyre projectile points and preforms from the Clearwater River region. Left to right: 10-CW-30 (1662.355.01), 10-IH-453 (27.2.14), 10-CW-30 (1662.011.03), 10-IH-820 (26.9/4.1), 10-CW-92 (11.3).

The Lochsa source was first reported by the U.S. Forest Service (10-IH-2500) along the ridge of Sherman Peak (Armstrong 1994, 2006; Keating et al. 1996). The Montana Creek vitrophyre source (24-MN-198), originally named the Fish Creek quarry, was identified by Munger (1993) during a survey of upland camps in the Bitterroot National Forest. Munger noted that vitrophyre in the western Bitterroots is likely associated with radial dike swarms surrounding the Rhodes Peak Caldera (Munger 1993:8). Welded rhyolitic ignimbrites in the central Snake River Plain, south of the research area, are thought to be the product of the Yellowstone hotspot (Ellis et al. 2014:431). In the Clearwater River, regional ignimbrites may be the result of transtensional shearing and deformation caused by the Lewis and Clark Fault Zone (Bennett 2009), located just north of the research area, or tectonic activity associated with the Bitterroot Divide that have formed hot springs in the region.

## **Cultural Setting and Chronological Sequence**

### *Regional Chronological Sequence*

Previous archaeological investigations of the region have delineated five major shifts in cultural periods within the lower Snake River region that were applied to the Clearwater River region for many years (Leonhardy and Rice 1970; Bense 1972; Rice 1972; Ames and Marshall 1980). A regionally specific sequence based on this model was refined by Sappington (1994) including the Early Precontact, Middle Precontact, Late Precontact, Protohistoric, and the Historic periods, each associated with their own temporal cultural patterns and lithic phases (Figure 5).



**Figure 5.** Diagram of regional cultural chronology sequence as for lower Snake River (Leonhardy and Rice 1970) and Clearwater River region (Sappington 1994).

**Early Precontact** (12,000–6000 B.P.): This was a period of residential mobility in which a few small communities would relocate seasonally to be near productive resources, practicing seasonal mapping on foraging (Binford 1980) with an opportunistic approach to hunting. The broad economy focused primarily on upland resources and general plant use. Generally, technology was uniform with expedient tool that show evidence of maintenance and reworking (Sappington 1996:145). The Windust phase (11,000–9500 B.P.) is characterized as short blades with convex margins with ground, straight to contracting hafting element and straight to convex bases (Sappington 1994:13–15). The Cascade phase (10,000–4500 B.P.) include lanceolate projectile points, edge ground cobbles, well-made lanceolate and triangular knives, end scrapers, and numerous modified flakes (Leonhardy and Rice 1970; Sappington 1996).

**Middle Precontact** (6000–3000 B.P.): Economic activities continued to focus on hunting and increased general plant processing, shifting toward a logistical foraging strategy (Binford 1980). The

characteristic subsistence and settlement patterns at this time are defined by Prentiss et al. (2005) and others as 'Classic Collector,' wherein residential settlements were places in ecotones with optimal access to a variety of resource patches associated with field camps, procurement sites, and some cache pits. As early as 5100 B.P. archaeological evidence shows year-round subterranean dwellings near forest boundaries (Ames and Marshall 1980). The Hatwai phase (6000–3000 B.P.) lithics includes large stemmed and corner notched projectile points.

**Late Precontact** (3000–500 B.P.): Archaeological evidence shows populations gradually increase in size and number, with small group or single-family pit house villages developing along major river systems with increased evidence of processing and storage. The Nez Perce had a salmon-oriented, delayed-return economy adapted to the seasonality of the Plateau area. Ahsahka phase (3000–500 B.P.) lithics include a variety of projectile point styles such as corner, side, basal notched and stemmed points with small corner notched points being most common.

**Protohistoric Period** (500–250 B.P.): Economic activities resembled those of the Late Precontact with hunting and fishing activities well represented and minimal plant processing. A decreased number of sites are found, likely due to increased mobility after acquiring horses and population decline due to disease and conflict (Sappington 1994:371). Kooskia phase (500–250 B.P.) lithics include a wide variety of small, triangular projectile points with side, corner, and basal notches.

### **Archaeological Sites Included in the Study**

A total of 19 archaeological sites within the Clearwater River region were examined during this research (Figure 1, Table 1). Sites in the assemblage range in date from 12,000–200 B.P. based on lithic typologies, supported by radiocarbon dates.

**Table 1. Archaeological Sites Selected for Study.**

Site Number	Site Name	Type	Cultural Sequence	Date Range (B.P.)	Citations
10-CW-4	Clearwater Fish Hatchery	Hunting or Fishing Camp	Middle to Late Precontact	(3200–1170)	Sappington 1991
10-CW-5	Ahsahka Sportsman's Access	Winter Village	Middle Precontact to Protohistoric	(3210–280)	Gaarder 1968; Sappington 1987, 1990
10-CW-25	Canoe Camp	Winter Village	Late Precontact	(666–250)	Sappington and Wegars 1988; Sappington 1990, 1994
10-CW-30	Weitas Creek	Upland Hunting Camp	Early to Middle Precontact	(12,000–4500)	Keeler 1973
10-CW-34	Kelly Forks Work Center	Upland Base Camp	Early to Late Precontact	(12,000–500)	Longstaff 2013
10-CW-92	Kelly Creek	Hunting or Fishing Village	Late Precontact	(700–300)	Knudson and Sappington 1977
10-IH-453	Pete King	Late-Summer Base Camp	Late Precontact to Protohistoric	(2925–260)	Sappington and Carley 1989
10-IH-798	Boulder Flat Terrace	Base Camp	Unknown	Unknown	Benson et al. 1979
10-IH-820	<i>Kam'-nak-ka</i>	Winter Village	Middle Precontact to Protohistoric	(4500–660)	Sappington 1997; Evans-Janke 1998, 2002
10-IH-871	Beaver Flats	Lithic Workshop	Middle Precontact	(5570–3415)	Sappington and Carley 1989
10-IH-879	Sherman Creek	Lithic Workshop	Middle Precontact	(4500–2500)	Benson et al. 1979
10-IH-1009	<i>Tukaytah'speh</i>	Hunting Camp	Middle to Late Precontact	(3700–660)	Sappington 1991, 1994
10-IH-1395	Kooskia Bridge	Permanent Village	Late Precontact to Protohistoric	(700–290)	Sappington and Carley 1983, 1987
10-IH-1948	O'Hara Bar	Seasonal Village	Late Precontact	(550–300)	Knudson et al. 1977
10-IH-2737	Rackliff	Hunting Camp	Early Precontact to Late Precontact	(12,000–2000)	Armstrong 2006, 2001

10-LE-34	US-12 Highway	Base Camp	Early to Late Precontact	(12,000– 500)	Sappington 2008, 2010
10-LE- 102	US-12 Highway	Base Camp	Early Precontact to Protohistoric	(12,000– 200)	Sappington 2008, 2010
10-LE-75	Kittle Rock Shelter	Rock Shelter	Early to Late Precontact	(12,000– 1000)	Herbel 2001; Sappington 2008, 2010
B-T6	Ginger Flats	Camp	Middle Precontact	(6000– 3000)	Danner 2017

### *Settlement and Seasonality*

Ethnographic accounts describe Nez Perce settlements as villages (*tew?yeni-kes*) and camps (*wi-se-s*) (Schwede 1970:129). The Nez Perce traditionally followed seasonal game and crops, utilizing lower canyons during the winter and upland resources in the fall and summer (Slickpoo and Walker 1973:30). In the spring and summer, families and bands would break off to upland campsite, constructing temporary structures along small streams and tributaries (Walker 1998; Stout 2003). At upland camps, groups would gather berries and root crops while others hunted large game (Slickpoo and Walker 1973; Walker 1998). In the early spring large game were occasionally hunted though most adults focused on fish gathering and processing. By November, people moved back to their winter villages and settled in until the cycle would begin again. Villages supported the greatest populations, 30–40 individuals, during the winter when families and bands would come together (Ames and Marshall 1980; Sappington 1994). Over the winter, villagers relied heavily on stored goods from the year's harvest, prepared for summer activities and trade, and socialized in large village gatherings.

### **An Ecological Approach to Lithic Procurement**

Ethnographic and archaeological studies have long looked at factors influencing raw material procurement from the theoretical orientations of cultural ecology. Those theories rely on factors including settlement and subsistence strategies, technological organization, landscapes, and raw material quality that assume optimizing behaviors during resource collection. Central place foraging models, derived from a human behavioral ecology approach normally applied to plant and animal resources, have been used to describe and explain the relationship between the effort expended at a lithic quarry and the distance from that quarry to a foraging or residential sites (Beck et al. 2002:495; Beck 2008:760).

Binford (1979) identified two basic strategies for resource procurement: direct and embedded. Direct strategies make an explicit task of obtaining raw material with no other tasks involved, generally at a cost, while embedded strategies organize and schedule procurement activities simultaneously with other subsistence tasks, thereby reducing the cost of procurement (Binford 1979:259–260; Adams and Macdonald 2015:209). These early studies suggested that generally, more sedentary groups utilized informal or expedient tools while more mobile populations are associated with formalized tools (Binford 1979; Gould and Sagger 1985; Parry and Kelly 1987; Andrefsky 1994:21).

Subsistence activities, including lithic procurement, are related to settlement and mobility patterns where optimizing behavior is expected to be reflected in the distribution of lithic materials. When the distance between a lithic source and a residential base is great, more intense reduction will be carried out at the quarry than if the residential base were positioned closer to the quarry (Beck et al. 2002). A residential site assemblage will then contain bifaces at later stages of reduction (Beck et al. 2002). As distance from procurement sites increases, stone tools tend to exhibit greater degrees of processing (Beck 2008:760). However, lithic processing and transportation costs and benefits are much harder to quantify than plant or animal resources. First, the utility and optimal transportation load of toolstone is much more subjective. For example, how can 'waste material' be evaluated when debitage can be used as an expedient tool? Second, even among more formal tools, there is variability in procurement, maintenance, and discard behavior. Lastly, the model does not adequately recognize variability in material quality or availability of alternative resources.

Over the decades several studies have suggested that opportunity for procuring high quality toolstone may impact decision making during regular subsistence tasks (Gould 1980; Sappington 1981; Gould and Saggars 1985; Bamforth 1986; Andrefsky 1994; Adams and MacDonald 2015). Adams and MacDonald (2015) for example, rank lithic quality through a series of metrics including the extent of the source, size of available material, scarcity, difficulty of terrain, and cost of extraction to give a score of attractiveness to a raw material to demonstrate that groups preferentially choose more difficult travel routes in pursuit of higher quality material. Furthermore, ethnographic evidence proposes that people went to considerable effort when traveling to adjacent sacred sites or other specialty resources such as resin and bark for sandal making (Gould and Saggars 1985:120). Exchange, resource ownership, social relationships, and ideology can offer or deny access to quality, nonlocal material which can impact patterns observed in the archaeological record. Gould and Saggars (1985:123) argue that a social mechanism of some kind, that is part of a risk-minimizing adaptation to insecurity, is required to facilitate long distances travel.

### **Ecology, Ontology, and Social Networks**

While these ecologically based theories are useful in evaluating assemblage variability relating to quarry and transportation behavior, they are missing the human and cultural components that contribute to patterns of variability. To understand the decision-making process of early inhabitants of the Clearwater River region, it is necessary to understand the engagement between people and their environment (Gibson 1979) through landscape ecology and Indigenous approaches. Ecology and economy are closely integrated into the social network of the Nez Perce. Highly mobile and centrally located, the Nez Perce were among the primary transporters of information and trade goods between groups throughout the region (Slickpoo and Walker 1973:24). Intergroup relationships in the southern Columbia Plateau are described as ecological and intertribal (Anastasio 1985). The natural environment, or ecological niche, of each group works as a spatial framework for intergroup relationships (Anastasio 1985).

A large network of well-traveled routes connected the entire region of the southern Plateau ethnographically. The trail system was a major component of the ancestral Nez Perce way of life, even featured in some of their origin stories. These trails passed through difficult terrain and tended to take the shortest, straightest line to a destination, not diverting in the presence of mountains or elevation changes (Broncheau-McFarland 1992:85). Trails were regarded as an open highway for intertribal travel and resident tribes would host traveling tribes crossing territories (Shawley 1977:7; Anastasio

1985:175). Though the region was not united by an overall social or political structure, the consensual and reciprocal relationship among groups creates the mechanisms for intergroup relations based on a shared set of norms, values, beliefs, and the individual group ecological niche (Anastasio 1985).

Considering how landscapes are perceived and categorized based on both ecological and social conditions more directly addresses the psychology of societal decision-making that examines multiple influencing factors. Further, this approach helps to avoid overly evolutionary interpretations that minimize Indigenous ideology and group identity that tend to homogenize human experiences in the past. By integrating Indigenous perspectives on identity, place, and social networks the archaeological record can explore a richer understanding of how people not only interacted with their environment, but how it was conceived of by the people themselves.

## **Methods**

### *Raw Material Collection*

The two known vitrophyre sources were located at a primary deposition location and raw samples were collected by the author from blanket deposits exposed along rocky peaks. At the Montana Creek source, samples (n=53) were collected from three locations along an exposed vein, at about 1900-meter (m) elevation. At the Lochsa source, samples (n=26) from two locations in a small clearing on the south slope of Sherman Peak, at about 1300 m elevation, were collected.

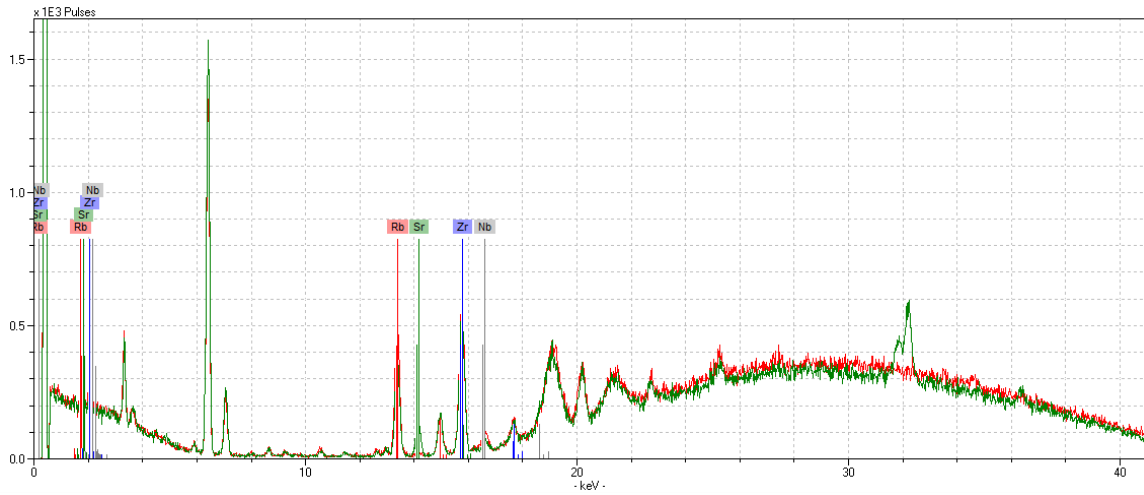
### *Lithic Analysis*

The analyses of tools and debitage are used to reconstruct patterns of lithic technology and human behavior to infer reduction stage, manufacturing technologically, and site function. Vitrophyre artifacts for 18 sites (n=3539) were examined including cores and tools (n=149) and debitage (n=3390). Among the debitage, only whole flakes (n=1815) were fully analyzed in the attribute assessment. Eight attributes were considered for analysis including length, width, thickness, mass, manufacturing technology, number of dorsal flake scars, termination type, and percentage of cortex. For tools and cores information including form and stage of production, length, width, thickness, mass, hafting length, neck width, bass width, portion of tool recovered, breakage pattern, type and percent of retouching or use wear were recorded where applicable.

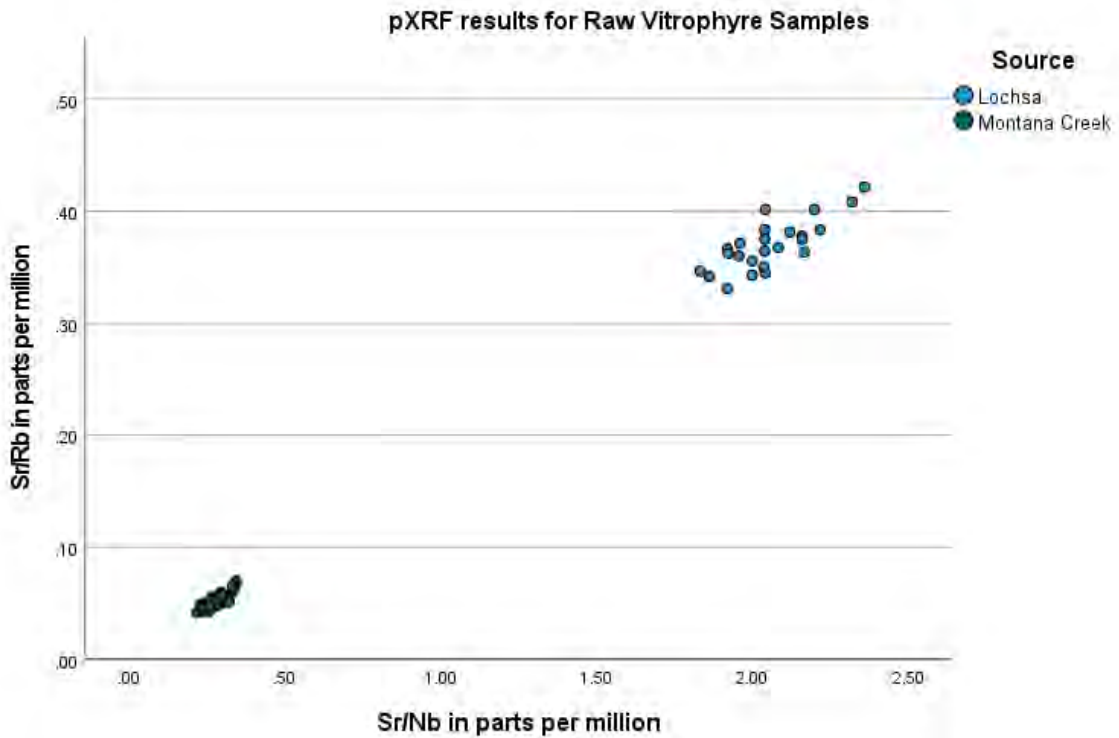
### *pXRF Method*

Analysis was conducted at the Washington State University Lithics Laboratory using a portable Bruker Tracer 5g instrument, with the standard MURR/Bruker obsidian calibration, developed by Glascock and Ferguson (2012). The calibration runs 50 kv, 35 microamps, a 3 mm colimeter, with a three-metal filter of Cu 100 um, Ti 25 um, and AL 300 um. The calibration collects ratio data of Iron (Fe), Niobium (Nb), Rubidium (Rb), Strontium (Sr), Thorium (Th), Yttrium (Y), Zinc (Zn), and Zirconium (Zr) in parts per million. For each test, the instrument was set on a mount and samples were processed for 120 seconds per sample. These data were then entered into a Statistical Package for Social Science (SPSS) program for analysis. Initial results suggested that the two sources are indeed chemically distinct from one another. Ratios of Sr/Rb, Sr/Zr, Sr/Zn, Sr/Nb, and Nb/Zr were selected as having the most impact on chemical characterization and used as variables in the statistical analysis (Figures 6 and 7).





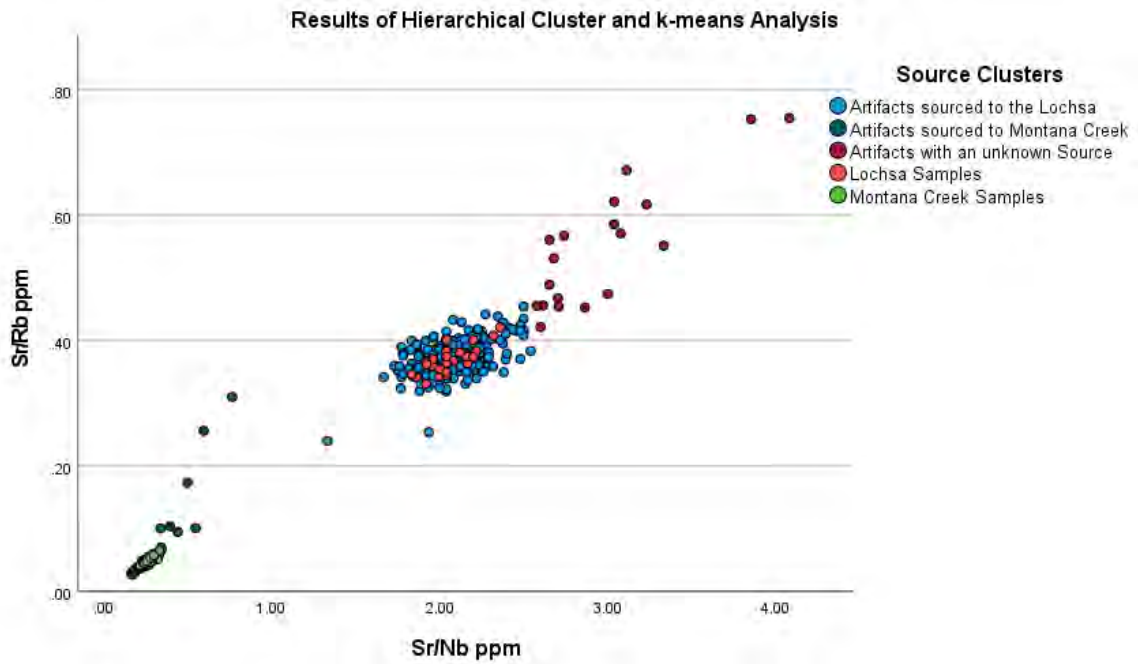
**Figure 6.** Element spectrum image of vitrophyre samples (Lochsa in red and Montana Creek in green) with elements highlighted (Rb, Sr, Zr, and Nb).



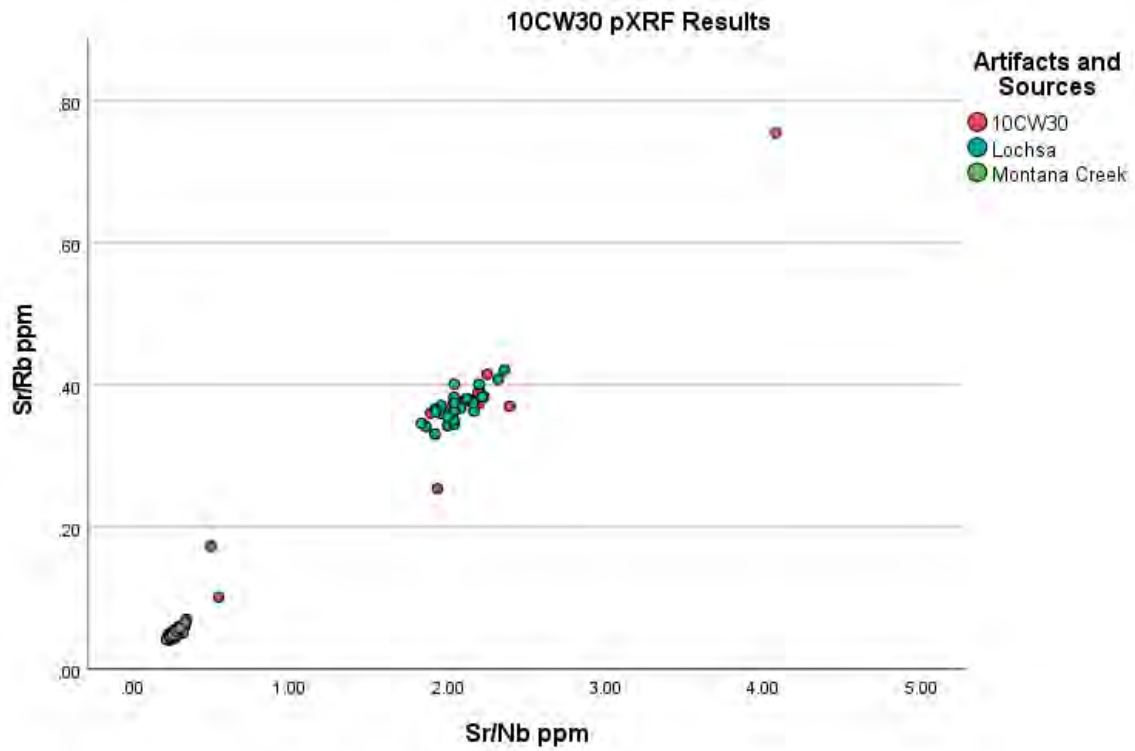
**Figure 7.** Scatterplot of pXRF results showing clustering for vitrophyre samples from the Lochsa and Montana Creek Sources.

Artifacts (n=394) from 15 sites, including tools, cores, and modified flakes (n=76) and debitage flakes (n=218) were analyzed by the pXRF. Any tool large enough to meet the minimum requirements of the instrument was analyzed (>10 mm diameter and >3 mm thickness). A stratified sample of debitage flakes that met the minimum diameter requirements were selected from each site, however minimum thickness was not always possible. The goal was to include a 20% sample of the debitage. Due to the size of each assemblage and minimum size requirements, actual sample sizes ranged from 5% to 100%.

A hierarchical cluster analysis determined the presence of four chemically distinct classifications. Next, a K-means cluster analysis assigned artifacts into these four classes: Lochsa, Montana Creek, Unknown; and one artifact that created its own cluster which was removed from the interpretation until further chemical characterization can be done. (Figures 8 and 9). Results show the artifacts (n=394) were distributed among the Lochsa source 93% (n=340), the Montana Creek source 22% (n=33), and the Unknown source 5% (n=21).



**Figure 8.** Scatterplot of vitrophyre samples and analyzed artifacts classified by the hierarchical and k-mean analysis.



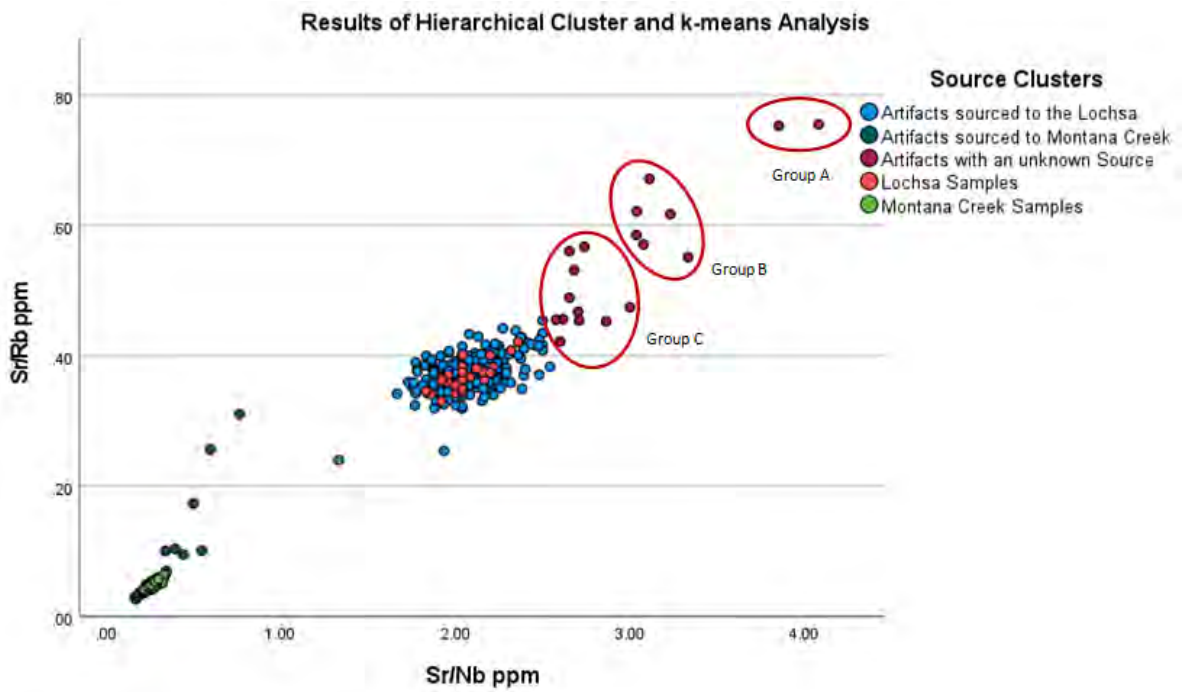
**Figure 9.** Example scatterplot of lithic distribution at a single site (10-CW-30).

*Characterizing Unidentified Sources*

Materials (n=21) from the unknown class were examined for a physical characterization (Figure 10). These items generally present as a translucent, very dark olive gray, (5Y 3/1), with several large angular inclusions and many speckled inclusions with a range of thin to rough cortex. Based on the cluster analysis, these artifacts were divided into three subgroups (Figure 11, Table 2).



**Figure 10.** Examples of vitrophyre from the Clearwater River region classified to an unknown source. Left to right: 10-IH-820 (21.1/1.15), 10-IH-871 (3.7.1), 10-IH-1009 (F4.5.6.7a), 10-IH-798 (6.0.3a), 10-IH-820 (26.5/3.62).



**Figure 11.** Scatterplot depicting potential subgrouping within the unknown classification.

**Table 2. Unidentified Vitrophyre Subgroup Distribution.**

Site	Group A		Group B		Group C	
	Tools	Debitage	Tools	Debitage	Tools	Debitage
10-CW-4	-	-	-	1	-	-
10-CW-30	-	1	-	-	-	-
10-IH-798	-	-	-	1	1 Core 1 Biface Preform 1 Point	-
10-IH-820	-	-	-	1	Preform 1 Core	1
10-IH-871	-	-	-	1	1 Modified Flake	6
10-IH-879	-	-	-	1	-	1
10-IH-1009	1 Biface Preform	-	-	1	-	-
Total	1	1	-	6	5	8

Items in Group A distinctly split from the unknown cluster. These items may represent an unidentified source coming from the southern end of the research area, possibly along the South Fork of the Clearwater River, that follow an inverted pattern of distribution compared to the Montana Creek source artifacts. Group B contains onlydebitage, including a few that are suspected to be near the instrument size limitations. Items from Group C are distributed primarily around the Sherman Creek lithic workshop. This group could represent a chemical gradation in the Lochsa vitrophyre or they could be from a more distant source discarded in favor of new material. The presence of cores, a biface preform, and a projectile point with a production error support these items as a chemical gradient of Lochsa vitrophyre but additional analysis is required to confirm.

#### *Method Limitations*

While this study has successfully classified vitrophyre, the potential limitations of the study must be noted. First, erosion and river action can secondarily deposit vitrophyre along the riverbed and alluvial terraces. We cannot be sure that any vitrophyre artifact was originally acquired from the parent source area or collected from a secondary source based on geochemical analysis alone. Secondly, the size limitations of the instrument window present bias in the representation of late-stage reduction and pressure flakes. Eerkens et al. (2007:586) demonstrated through geochemical analysis of microdebitage, that small flakes and tools tend to have greater source diversity and are generally found farther from the original source. Finally, the presence of phenocrysts in vitrophyre is of concern for accuracy of the chemical composition obtained from the pXRF. However, clear clustering across samples suggests this was not a significant issue for this assemblage.

## Data and Results

### *Lithic Analysis Results*

Broadly, the pattern in use suggests that vitrophyre is procured as cores and reduced at lithic workshops for transportation as blanks and preforms (Table 3). Several base camp sites show evidence for the use of vitrophyre as expedient, modified flakes for processing. The pattern follows a central place foraging model wherein artifacts farther from the source are more highly worked, including projectile points and preforms, while debitage is smaller, later stage reduction, exemplified at sites near Ahsahka (10-CW-4, 10-CW-5, and 10-CW-25), located nearly 75 linear miles, or roughly 120 river miles, from the closest known source. Alternatively, artifacts at residential and base camp sites much closer to the source, (10-CW-30, 10-IH-453, 10-IH-820, and 10-IH-1009), include more bifaces and preforms with all stages of reduction represented in the debitage.

**Table 3. Vitrophyre Artifacts.**

<b>Tools</b>	Count (percent)
Projectile Points	29 (19%)
Stemmed	4 (14%)
Side Notched	6 (21%)
Corner Notched	15 (51%)
Uncategorized fragments	4 (14%)
Point Preforms	14 (9%)
Bifaces	10 (7%)
Biface Preforms	15 (12%)
Biface Blanks	5 (3%)
Unifaces	3 (2%)
Perforators	3 (>1%)
Modified Flakes	33 (22%)
Cores	37 (25%)
<b>Debitage</b>	<b>3390 (96%)</b>
Shatter	170 (5%)
Whole Flakes	1815 (54%)

### *Geochemical Analysis Results*

Not surprisingly, vitrophyre in the region is dominated by the local Lochsa vitrophyre (Tables 4 and 5). Situated roughly at the center of the research area, along a major tributary and trail route, this location would have been well known. Generally, Montana Creek materials were transported into the region as finished tools, indicating some distance from the source or trade and intergroup interactions.

**Table 4. Vitrophyre Assemblage pXRF Results.**

Source, Count (Precent)	<b>Lochsa</b>	<b>Montana Creek</b>	<b>Unknown</b>
<b>Tools</b>	58 (17%)	13 (38%)	6 (20%)
Projectile Points	9 (16%)	7 (54%)	-
Point Preforms	3 (5%)	-	1 (17%)
Blanks	5 (9%)	-	-
Bifaces	5 (9%)	2 (15%)	-
Biface Preforms	10 (18%)	-	2 (33%)
Unifaces	1 (2%)	-	-
Modified Flakes	16 (28%)	3 (23%)	1 (17%)
Cores	17 (29%)	1 (8%)	2 (33%)
<b>Debitage</b>	183 (45%)	21 (64%)	14 (70%)
<b>Grand Total</b>	340 (86%)	34 (6%)	20 (5%)

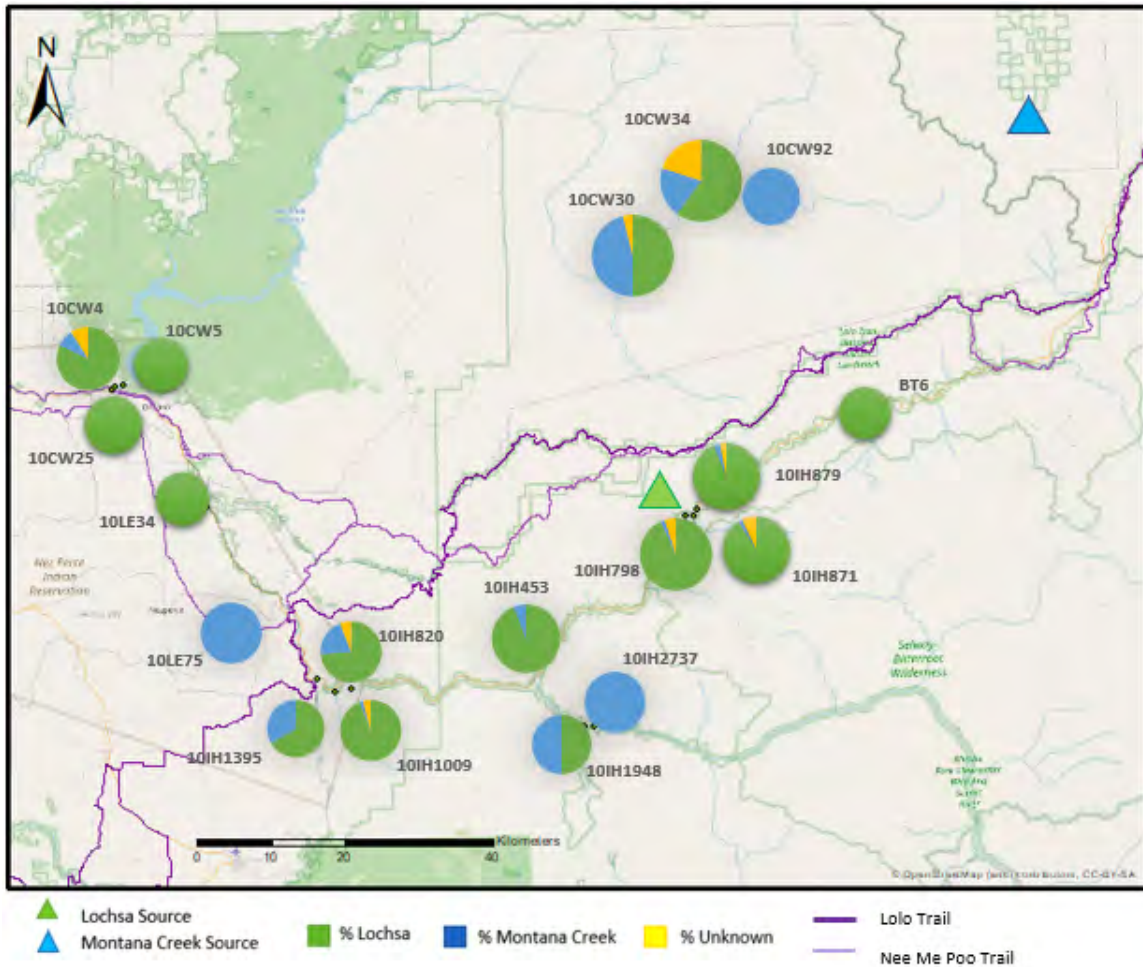
**Table 5. Vitrophyre pXRF Results by Site.**

<b>Site</b>	<b>Lochsa</b>	<b>Montana Creek</b>	<b>Unknown</b>
10-CW-4	9 (82%)	1 (9%)	1 (9%)
10-CW-25	1 (100%)	-	-
10-CW-30	12 (52%)	9 (48%)	2 (4%)
10-CW-34*	9 (60%)	3 (20%)	3 (20%)
10-CW-92	-	1 (100%)	-
10-IH-453	16 (94%)	1 (6%)	-
10-IH-798	39 (93%)	1 (2%)	2 (5%)
10-IH-820	41 (76%)	10 (21%)	3 (6%)
10-IH-871	108 (91%)	2 (2%)	8 (7%)
10-IH-879	56 (94%)	2 (3%)	2 (3%)
10-IH-1009	54 (94%)	1 (2%)	2 (4%)
10-IH-1395	2 (66%)	1 (33%)	-
10-IH-1948	1 (50%)	1 (50%)	-
10-IH-2737*	-	1 (100%)	-
10-LE-34	1 (100%)	-	-
10-LE-75	-	2 (100%)	-
BT-6	1 (100%)	-	-

\*Results derived from Longstaff (2013:373-375, Appendix 5) and Skinner and Thatcher (2013a, 2013b).

### Vitrophyre Across Time and Space

Lochsa vitrophyre is ubiquitous across the assemblage. Of the sites analyzed, 87% are majority Lochsa vitrophyre. Montana Creek vitrophyre was used more infrequently, ranging from 2% to 100%, averaging closer to 30%. However, it is clear that Montana Creek vitrophyre was broadly utilized in the region, present at all but four sites. The Nee Me Poo and Lolo trails may contribute to the distribution of Montana Creek and unknown vitrophyre, providing a through passage for groups traveling from the Bitterroots across Nez Perce territory (Figure 12).



**Figure 12.** Map of vitrophyre source distribution, represented as pie charts for each site, including major ethnographic trails.

Vitrophyre from both sources appear in all chronological periods of the Clearwater River region. The presence of Windust and Cascade phase tools indicate that both sources were being used and transported throughout the region as long as people have been occupying the Clearwater River drainage. The distribution follows the general pattern that models overall regional occupation, with the highest concentrations during the Middle and Late Precontact (Table 6).



**Table 6. Distribution of Vitrophyre Across Time.**

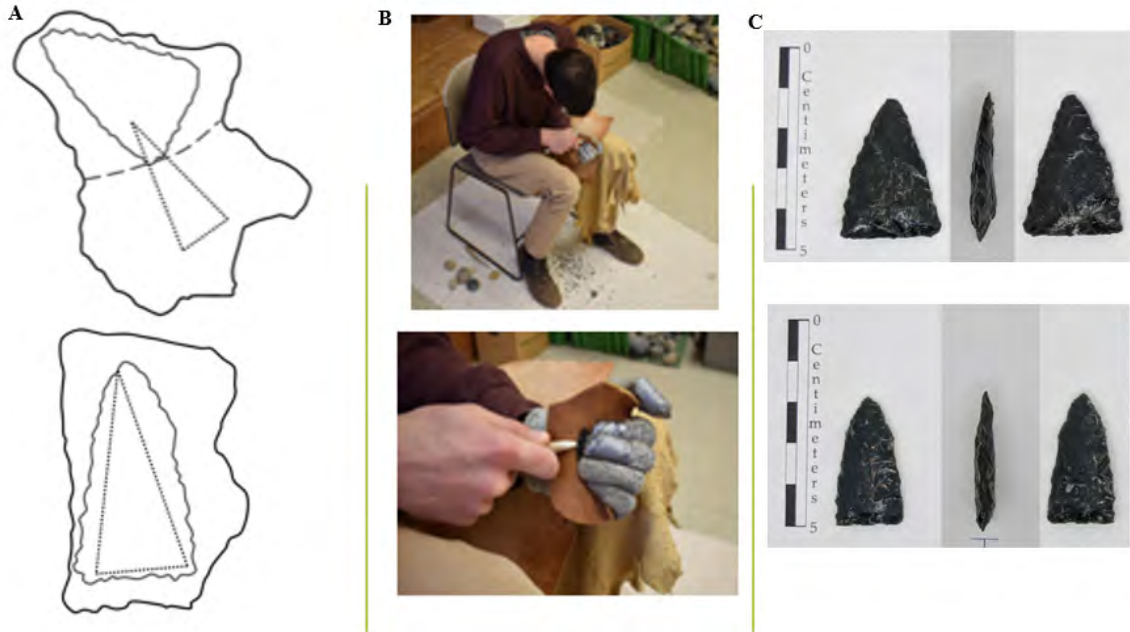
Site	Early Precontact	Middle Precontact	Late Precontact	Protohistoric	Historic
10-CW-4	-	-	X	X	-
10-CW-5	-	-	X	-	-
10-CW-25	-	-	X	-	-
10-CW-30	X	X	X	-	-
10-CW-34	X	X	X	-	-
10-CW-92	-	-	X	X	-
10-IH-453	-	-	X	X	X
10-IH-798	-	-	-	-	-
10-IH-820	X	X	X	X	-
10-IH-871	X	X	-	-	-
10-IH-879	-	X	X	-	-
10-IH-1009	-	X	X	-	-
10-IH-1395	-	-	X	X	-
10-IH-1948	-	-	X	X	-
10-IH-2737	X	X	X	-	-
10-LE-34	-	-	X	X	X
10-LE-104	-	-	X	-	-
10-LE-75	-	X	-	-	-
B-T6	-	X	-	-	-

Vitrophyre use is infrequent, but widely distributed, in the Early Precontact illustrating the high mobility and broad range foraging practices that focused on upland resources. These sites are exclusively upland base camps with the exception of a lithic workshop near the Lochsa source, which suggests Lochsa vitrophyre was known very early on. During the Middle and Late Precontact vitrophyre use becomes more intensified, reflecting denser occupations of people with smaller geographic gathering ranges. Vitrophyre use begins to drop off in the Protohistoric, becoming nearly nonexistent by the Historic period. This pattern must reflect a decrease in overall residential sites due to changes in travel, subsistence, and settlement patterns that favored denser concentrations in villages that prominently featured salmon fishing. By the Historic period, increased interactions with Euromericans would have changed the lifeway of the Nez Perce considerably. Population declines due to disease and conflict, more limited activity spheres, and greater mobility due to horses manifests as fewer residential sites. Furthermore, the introduction of Euromerican materials such as glass and guns would have been adopted.

### **An Experiment in Rock Knockin'**

The rather unassuming appearance of vitrophyre leave doubts about the quality of the material as a lithic resource. Quality, the ease with which the stone can be shaped by the knapping process, is one of the most important attributes for predicting lithic distribution (Andrefsky 1994). An experiment was conducted to evaluate the knappability of vitrophyre. Garrett Toombs, skilled

knapper, was asked to select several raw nodules and conceptualize the tool he hoped to produce, creating a sketch of the tool relative to the size of the nodule, work the material, and describe the process as the material took form (Figure 13A).



**Figure 13.** Knapping experiment. **A.** Sketch of raw nodules with intended biface shape and actual biface shape depicted. **B.** Toombs during the knapping process. **C.** Biface replication.

The average samples collected during field work are comparable to cores found in the archaeological record (Table 7). Munger (1993) surmised that vitrophyre was procured in the past by digging below the surface. It is possible that higher quality, less weathered vitrophyre can be found subsurface. The archaeological record suggests that higher quality material may have been available but not likely as larger pieces than what was observed in the field.

**Figure 7. Vitrophyre Nodules and Cores.**

Range (Average) (mm)	Length	Width	Thickness
Lochsa Samples	66-18 (36.8)	41-17 (26.5)	26-4 (13.5)
Montana Creek Samples	152-29 (76)	68-18 (36.8)	39-7 (20.2)
Archaeological Cores	14-65 (34)	7-50 (30.6)	3-39 (13.3)

Out of six tested nodules, Toombs was able to produce two bifaces in a session. The other four nodules were discarded almost immediately due to materials flaws, internal seams, and fractures. As Toombs worked, he switched back and forth between hard hammer and pressure flaking several times (Figure 13B). The two successful replications were equivalent in size and form to the complete projectile points (n=10) from the assemblage (Figure 13C, Tables 8 and 9).

**Table 8. Vitrophyre Projectile Points.**

Range (Average)	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)
Projectile Points	15-37 (29.9)	14-34 (18)	4-22 (4.9)	0.8-2.9 (2.7)
Bifaces	9-51 (31)	15-38 (28.1)	7-11 (8.7)	0.4-11.4 (6.3)

**Table 9. Experiment Results.**

	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)
Raw Nodule 2	60.2	46.7	8.5	26.2
Projectile Point 1	32.4	22.6	5.3	3.5
Percent of Reduction	46%	52%	39%	87%
Raw Nodule 6	33.2	27.4	8	11.4
Projectile Point 2	28.9	15.6	4.4	1.8
Percent of Reduction	13%	62%	45%	84%

According to an experimental study by Don Crabtree (1967), when vitrophyre is found as alluvium the exterior surface of the material is rounded and weakened from battering stress, becoming more brittle and requiring more reduction of cortex. Toombs described vitrophyre from the primary sources as being stronger and less brittle than obsidian, resisting crushing along the edges, and despite material flaws did retain consistent fracture mechanics suggesting that it may have been worthwhile to procure material at the primary source rather than from a secondary deposit and that the material is comparable to obsidian. However, the character of the material did limit the potential shape of the tools to small, chunky points.

For Toombs, the seams and inclusions did not present a significant problem in point production, but would have hindered the production of large bifaces, even given enough material, as large, thinning flakes can be difficult to produce. The average thickness of raw cores is about 15 mm. During the experiment, Toombs had to reduce cores by 39–45%. The assemblage confirms minimal evidence for large biface or prepared blade cores and several biface and projectile point retained some cortex. The discarding of two-thirds of the tested nodules during the experiment highlights the need for nodule testing and the unpredictability of the material. Because of the nature of vitrophyre, traditional stage reduction analysis is difficult to apply. Late-stage reduction may exhibit a high degree of cortex and various technological types may be used at various interchanging stages.

The nature of vitrophyre as a pyroclastic flow determines the distribution and character of the material itself, but it is the knapper who perceives its utility and transforms it into a useable tool. The visual characteristics of vitrophyre do not overtly call to the knapper. Upon inspection, large inclusions and flaws would further deter a knapper from making an explicit task of collecting raw

material. Yet, the archaeological record validates that vitrophyre was in fact modified and transported by people at a distance of 100 miles or more for over 12,000 years.

## **Discussion**

This pioneering study, intended to test the feasibility and overall utility of pXRF analysis for vitrophyre artifacts, provides an overview of vitrophyre use in the Clearwater River region. Based on these initial results, vitrophyre is indeed amenable to this methodological approach and deserves further investigation. Returning to the theoretical frameworks discussed previously, we can interpret these data through a cultural landscape ecology approach.

The quality of vitrophyre may not have been the most ideal knapping material, but none the less, would have been useful for toolstone. Vitrophyre was never quarried in the classical sense, instead the data points to opportunistic, or embedded, procurement during other subsistence tasks that drew people near a resource location, such as hunting or berry gathering in uplands areas. Geochemical analysis gives us the opportunity to discuss how materials from these two known sources moved around the landscape relative to time and location.

### *Lochsa Vitrophyre*

Vitrophyre throughout the Clearwater drainage is dominated by the local Lochsa source which was present in all regional chronological sequences from the Early Precontact into the Historic period. Lochsa vitrophyre use can be seen to model the more general settlement and subsistence patterns of the region. Early Precontact vitrophyre procurement followed an opportunistic, or 'mapping on,' resource procurement strategy. As people spent more time in the region and become more familiar with the resources available, vitrophyre procurement followed a more 'logistical' strategy, but always embedded, during the Middle and Late Precontact periods. People would have made a point of returning to productive resource patches or lithic sources, acquiring new material during other tasks—picking up cores, carrying them for miles, and using them sparingly to produce projectile points or expedient tools. The marked decrease in vitrophyre use during the Protohistoric and Historic periods probably reflects a larger disruption of Nez Perce cultural practices due to increased interactions with Euromericans.

### *Montana Creek Vitrophyre*

Montana Creek vitrophyre was used just as broadly across time and space in the Clearwater River region, but always secondarily to Lochsa. These artifacts are more often transported into the region as finished tools or preforms. Montana Creek vitrophyre is no doubt widespread in the Salish country, but its presence in the Clearwater River region may be attributed to the vast range of Nez Perce seasonal rounds or a connection to cultural groups of the Bitterroot region through trade or resource sharing. The Lolo trail extends well into the Bitterroot territory to the east and beyond Nez Perce territory to the west. The presence of a Montana Creek vitrophyre Windust phase projectile point juxtaposes to Goshen and Avonlea style projectile point at 10-CW-30 indicates a connection with Plains and Great Basin groups occupying the Bitterroot region in the Early Precontact period. The relative separation of vitrophyre sources in the region could illustrate a seasonal travel pattern or relative anonymity between groups that reflect perceptions of group territory or resources yet communal use of travel routes and camps. With deeper investigation of seasonal travel, social

connections, and the ontological perspective of the Nez Perce and Salish, more could be gleaned about how landscapes and resources were used and organized by multiple groups simultaneously.

## **Conclusions**

This study has successfully provided a preliminary overview of an understudied lithic resource in the Clearwater River region. From these results, several large themes about vitrophyre use in the region have become evident.

1. While the region is dominated by local vitrophyre, it is clear that both the Lochsa and Montana Creek sources were broadly used as a supplement to chert, since the initial occupation of the Clearwater River region 12,000 years ago.
2. The Lochsa toolstone was opportunistically procured and embedded into seasonal hunting and gathering activities at upland locations following a central place foraging model.
3. The distribution of vitrophyre use through time models the overall settlement and subsistence pattern of the region. The use of material, which requires deep knowledge of the landscape and the quality of the material, confirms the long occupation of the peoples in the region and their extensive landscape knowledge.
4. The ubiquitous distribution of Lochsa vitrophyre in Nez Perce territory suggests that this resource was a regional one. However, the presence of Montana Creek vitrophyre indicates a solid connection with Salish territory to the east, either through travel and resource sharing or social connection and trade.

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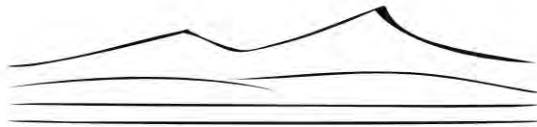


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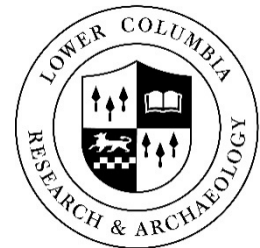
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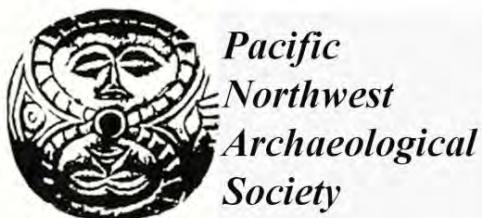
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Recording, Live Streaming, and Videotaping: Participants may not record or broadcast audio or video of sessions at NWAC.

### **INCIDENT REPORTING AT THE CONFERENCE**

Conference attendees who experience or witness harassment as defined in this Code of Conduct and/or the Northwest Anthropological Association's Policy on Harassment; and/or who are aware that a conference participant has been (or is in the process of being) sanctioned for assault or harassment by an adjudicating body and can provide documentation of the outcome; are encouraged to report such information.

The incident reporting system is not intended to constitute legal advice. In the event of any conflict between this Policy and applicable laws or institutional policy, the applicable laws or institutional policy prevails. Members and institutions are encouraged to seek their own counsel for advice regarding any specific situation. NWAA is not an adjudicating body; however, there are processes in place to support members in getting their grievances addressed when unwanted behaviors occur in the context of NWAA sponsored events and activities (e.g. conferences, editorial activities, governance events). In accordance with the Northwest Anthropological Association (NWAA) Policy on Harassment Effective February 25, 2020, the NWAA Board of Directors will:

1. Receive complaints of harassment in the context of NWAA settings and activities.
2. Discuss the complaint with the alleged harasser and give them an opportunity to respond to the complaint if the complainant wishes for the Board to actively participate in resolving the complaint.
3. Record the dates, times, and facts of the incident and the results of the resolution process.
4. Be authorized to deem a complaint to merit no further pursuit by NWAA.
5. Make clear to any complainants that the Board is not providing legal advice and that the availability of the Board is not intended to substitute for a complainant's either making use of internal institutional mechanisms for addressing complaints, for consulting expert legal advice, or for seeking formal legal redress.
6. Make clear to all parties that NWAA can only promise confidentiality within the parameters of the law.
7. Prepare an annual report containing general information about the number and types of complaints received. This report will be made available to NWAA members.

Identification with documentation of prior adjudication needs to be provided to bar an individual from participating in NWAC events. If concerns about an individual are raised but documentation of adjudication cannot be provided, the review of the complaint will follow the procedures outlined above. Reports of incidents and prior sanctions can be made via the Northwest Anthropological Association website anonymous reporting page: [www.nwaconference.com/report](http://www.nwaconference.com/report).

Please contact any or all members of the [NWAA Board of Directors](#) to discuss any concerns.

#### **ACKNOWLEDGEMENT**

By registering for NWAC, you accept the obligation to treat everyone with respect and civility. You also accept the obligation to uphold the rights of all participants and attendees (including organizers, moderators, and ombudsmen) to be free from harassment. Attendees are bound by the Northwest Anthropological Association's (NWAA) Policy on Harassment (2020) and this conference's Code of Conduct. Attendees should also be aware that they are also bound by the codes of conduct at their home institution(s).

By registering for NWAC, you commit to maintaining respectful, ethical, and professional decorum throughout the conference. The organizers reserve the right to remove any individual(s) violating this Code of Conduct without warning or refund, and to prohibit attendance at future NWAC conferences. Should the organizers have concerns about an individual's attendance at this conference creating a safety (physical or mental) issue, the organizers may bar the individual from registering for and attending this or future conferences and related events.

Individuals proven to be harassers and/or assailants will be barred from participation in this conference. Late and/or day-of registrations will be rescinded immediately should information be received documenting a proven violation. Documented harassers/assailants should be identified to NWAC organizers by survivors or other reporters as early as possible. The organizers of this conference will not conduct their own investigation(s), but will allow investigations by law enforcement agencies, the RPA, the EEOC, universities, and employers.



## *From Colonialism to Collaboration*

The 2022 Cultural Resource Protection Summit marks our 15th gathering, and as we continue to consider carefully the health and safety of our Summit family and our Suquamish hosts, it will hopefully be our 1st “hybrid” Summit, as well, with both in-person and virtual elements anticipated. The Summit family is still hard at work fulfilling the mission we have had since the Summit’s inception: *The primary goal in organizing the annual Summit has been to facilitate amongst all affected parties an open, frank discussion about the intersection between cultural resources and land use. The Summit is designed to promote collaborative cultural resource planning as an effective means of finding resolution to issues before they escalate into emotionally-charged, divisive, and expensive stalemates or law suits.*

This year, the Summit agenda includes an engaging array of cutting-edge topics that will encourage attendees to examine our ongoing journey from colonialism to collaboration, and how that necessary shift might shape innovative solutions for today’s most pressing challenges to effective cultural resource protection. Panel discussions, *lightning talks*, and experiential activities will highlight useful examples of the links between CRM and responsible land use. We will also reserve time for great food, general socializing, and the 2nd Annual Summit Book Club! We are working hard to ensure the 15th Annual Summit will be another much-needed boost for our community in a hybrid setting that is likely here to stay.

Please join us either in-person at Suquamish or virtually on Zoom for two days of engaging conversation and reflection that will help you improve your technical skills while deepening your connection to why we do this work. Then, with renewed commitment, move forward with helpful tools for collaboratively protecting and caring for our irreplaceable cultural resources.

*-Registration is now Open! Visit [www.theleadershipseries.info](http://www.theleadershipseries.info) for adjusted rates and to register online*

*-Student Rates available! Email Mary Rossi ([mary@eppardvision.org](mailto:mary@eppardvision.org)) for information- Be sure to submit a contest form, too (see next item)*

*-Free Registration opportunity! Go to the Summit website and enter to win a free registration! One award will be made in each of these categories: Tribes, agencies, consultants, and students*

## THANK YOU TO OUR 2022 SPONSORS TO DATE!



## MEETINGS

### **Tribal Caucus (Invitation Only)**

Wednesday March 9, 2022  
Time 9:00 AM to 12:00 PM

### **Northwest Anthropological Association**

Friday March 11, 2022  
Time 12:00 PM to 1:20 PM

### **Association of Oregon Archaeologists**

Thursday March 10, 2022  
Time 5:00 PM to 7:00 PM

### **Association for Washington Archaeology**

Friday March 11, 2022  
Time 5:00 PM to 7:00 PM

## SESSION SCHEDULE

Wednesday March 9, 2022	
5:30 PM to 7:00 PM	Looking Forward at the 75th NWAC Anniversary
Thursday March 10, 2022	
9:00 AM to 9:40 AM	Opening Remarks
9:40 AM to 12:00 PM	Northwest Anthropological Conference Environmental Sustainability Forum
10:20 AM to 3:20 PM	Historical Archaeology
10:20 AM to 12:00 PM	Exploring the Legacy of Donald E. Crabtree: New Directions in Lithic Studies
10:40 AM to 11:00 AM	Current Geoarchaeological Research
11:00 AM to 12:00 PM	Applications of Theory in Archaeology
11:00 AM to 12:00 PM	Heritage Management
1:00 PM to 5:00 PM	Frameworks for Social Justice
1:20 PM to 3:40 PM	Issues in Contemporary Societies
1:20 PM to 4:00 PM	Archaeologies of Northwestern Military Communities
1:20 PM to 5:00 PM	Issues in Cultural Resource Management
3:00 PM to 4:40 PM	Puget Sound Anthropology and Bellevue College, Washington
4:00 PM to 4:40 PM	Current Research in Biological Anthropology
Friday March 11, 2022	
9:00 AM to 4:40 PM	Asian Diaspora Archaeology in the Pacific Northwest
9:00 AM to 3:00 PM	Camas Contributions and Connections: Exploring the Legacy and Potential of Human-Camas Relationships
9:00 AM to 11:40 AM	Artifact Analysis
9:00 AM to 12:00 PM	Investigations of Human Relationships with the Landscape and Environment
9:00 AM to 11:40 AM	Legacy Archaeological Collections: Studies of Technology and Activity Areas
1:20 PM to 3:00 PM	Dynamic Archaeological Approaches Concerning a Progressive Arctic and Global Realm
3:20 PM to 4:40 PM	Chemical Analyses in Archaeological Research
3:00 PM to 5:00 PM	Examinations of Colonial Legacies
1:20 PM to 3:20 PM	Obsidian Hydration Dating Workshop

## AGENDA

3/9/2022, Wednesday

### Student Paper Awards Presentation

Time: 5:00 PM to 5:30 PM

#### Undergraduate Student Paper

**WINNER** Lark Cummings  
**RUNNER UP** Chesley Thompson

#### Graduate Student Paper

**WINNER** Megan McGuinness  
**RUNNER UP** Jordan Thompson

### Student Paper Awards Contestants

Kailey Alessi (University of Idaho)	<i>A Cave Through Time: Historic Archaeology at Mammoth Cave, Kentucky</i> Session 4: Historical Archaeology; Thursday March 10, 10:20 AM
Lark Cummings (Eastern Washington University)	<i>Violence, Structure, and Agency in Labor Market Segmentation Among Mexican Migrant Farmworkers</i> Session 22: Examinations of Colonial Legacies; Friday, March 11, 3:20 PM
Colby Dragon (Whitman College)	<i>"It's always 1855 here": Experiencing the Past at Fort Nisqually Living History Museum</i> Session 8: Heritage Management; Thursday, March 10, 11:20 AM
Jacen Ellis (Eastern Oregon University)	<i>Interdisciplinary Research; Researching the Woodward Mammoth</i> Session 21: Chemical Analyses in Archaeological Research; Friday, March 11, 3:20 PM
Cynthia Hannold (University of Alabama)	<i>Maintaining Identity in the Columbia Plateau through the Production of Lithics</i> Session 17: Artifact Analysis; Friday, March 11, 9:40 AM
Linda Johnson (Reed College)	<i>Marielle Is Present: Living and Dreaming through Death in Brazil</i> Session 22: Examinations of Colonial Legacies; Friday, March 11, 3:40 PM
Riza McClurkin (University of Montana)	<i>Analysis of Projectile Point Chronology Through Lithic Typology on the Miller Flats</i> Session 17: Artifact Analysis; Friday, March 11, 9:40 AM
Megan McGuinness (University of Nevada, Reno)	<i>Calculating Return Rates for Habitats in the Great Basin</i> Session 7: Applications of Theory in Archaeology; Thursday, March 10, 11:00 AM
Andrea Shiverdecker (University of Montana)	<i>Conceptualizing Fluidity in Heritage Landscapes and Cultural Identity Through the Garnet Ghost Town</i> Session 18: Investigations of Human Relationships with the Landscape and Environment; Friday, March 11, 11:40 AM    <i>A Synergy of Abandonment: Archaeological Understandings of Abandoned Norse Arctic Settlements and North American Mining Ghost Towns</i> Session 20: Dynamic Archaeological Approaches Concerning a Progressive Arctic and Global Realm; Friday, March 11, 2:00 PM
Chesley Thompson (Eastern Oregon University)	<i>Impacts of COVID-19 to On-Campus Students Attending a Rural University in the Pacific Northwest</i> Session 10: Issues in Contemporary Societies; Thursday March 10, 1:20 PM
Jordan Thompson (University of Idaho)	<i>An Overview Vitrophyre Use in North Central Idaho: 12,000 Years of Rock Knockin' on The Lochsa</i> Session 5: Exploring the Legacy of Donald E. Crabtree: New Directions in Lithic Studies; Thursday, March 10, 11:20 AM



1: Panel

**Looking Forward at the 75th NWAC Anniversary**

Time 5:30 PM to 7:00 PM

Moderator: Mary Anne Davis

Panelists: Dr. Virginia Butler, Dr. Dennis Griffin, Dr. Steve Hackenberger, Jo Reese, Dr. Laura Putsche, Mary Rossi, Dr. Robert Sappington, and Dr. Douglas C. Wilson

*Abstract*

While the Northwest Anthropological Conference has seen changes in its seventy-five-year tenure, the remaining constant is the coming together of anthropological minds and hearts of the region. From the first Meeting of Northwest Anthropologists at Reed College in 1948, to this year's virtual pandemic platform, we persist. To ring in the auspicious anniversary of this meeting, we turn to local contributors to speak about their experiences of anthropology in the region, this conference, and their hopes for anthropology into the future. Join in afterwards for a virtual mixer - bring your own brews/beverages, brats, and benches to an informal screen-side social.

**Post-Plenary Social**

Time 7:00 PM to ...

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3/10/2022, Thursday

2: Address

**Opening Remarks**

Time 9:00 AM to 9:40 AM

3: Forum

**Northwest Anthropological Conference Environmental Sustainability Forum**

Time 9:40 AM to 12:00 PM

Chairperson(s): Mary Petrich-Guy and Molly Swords

*Abstract*

Please join the 75th Annual Northwest Anthropological Conference Environmental Sustainability Subcommittee for this open forum workshop addressing NWAC's environmental impacts.

In 2021 the United States rejoined the Paris Climate Agreement, an international treaty aimed at limiting global warming to address environmental, social, and economic ramifications. The United States Nationally Determined Contribution sets an economy-wide target of reducing its net greenhouse gas emissions by 50-52 percent by 2030. In recognition of conference contributions to carbon emissions and other issues related to global warming, the Environmental Sustainability Subcommittee and forum participants will brainstorm sustainability strategies for future NWACs. Following the conference, the Environmental Sustainability Subcommittee will incorporate achievable initiatives into a proposal to present to the Northwest Anthropological Association Board of Directors for adaptation in future NWAC meetings.

4: General Session

**Historical Archaeology**

Time 10:20 AM to 3:20 PM

- 10:20 *A Cave Through Time: Historic Archaeology at Mammoth Cave, Kentucky*  
Kailey Alessi ([she/her] Department of Culture, Society and Justice, University of Idaho)
- 10:40 *Archaeological Investigations of "Alaska" at Tule Lake Segregation Center in Northeastern California*  
Caitlin Bishop, MA ([she/her] California State University, Chico and National Park Service JACS Grant)
- 11:00 *From Imari to the Texian Campaign: A Preliminary Analysis of Ceramic Artifacts from the Martinez Adobe Site, Pinole, California*  
Ericha Sappington, MA (ArchaeoLogical Research Consultants)
- 11:20 *Commensality at the Coloma, MT Mining Community*  
Jenn Ogborne, PhD (Historic St. Mary's City)
- 11:40 *Changing Conceptions of History in Fur Trade Archaeology in the Pacific Northwest*  
Douglas Wilson, PhD ([he/him] Portland State University/National Park Service)
- 12:00 **Lunch**
- 1:20 *Moscow High School: An Idaho Ceramics Analysis*  
JayCee Iannelli (University of Idaho)
- 1:40 *College life and archaeology: exploring the trash from a college dormitory*  
Gréta Kühne ([she/her] University of Idaho)
- 2:00 *Women Homesteaders of Washington's Channeled Scablands: Summary Statistics and Spatial Patterns for 5 Counties*  
Beth Mathews, MA ([she/her] Antiquity Consulting)
- 2:20 *49ers and 49th: Sociopolitics and the Prospect of Gold in the Boundary Country of Washington Territory and New Caledonia*  
Jamie Litzkow, MA ([she/her] Bureau of Land Management, Spokane District)
- 2:40 *Results of Pedestrian Survey at Equality Colony (1897-1907) Near Bow, Skagit County, Washington*  
Emma Dubois, BA ([she/her/hers] Equinox Research and Consulting International Inc.)
- 3:00 *Investigating the Built Environment of Fort George Wright, Spokane, Washington: A Historic Archaeological Approach*  
Conlan Vance, MA ([he/him] Eastern Washington University)

5: Symposium

**Exploring the Legacy of Donald E. Crabtree: New Directions in Lithic Studies**

Time: 10:20 AM to 12:00 PM

Chairperson(s): Robert Lee Sappington

*Abstract*

Donald E. Crabtree (1912-1980) is widely known as the Dean of American Flintknapping. His efforts and experiments in flintknapping have greatly enhanced our understanding of the manufacture of stone tools. The Alfred W. Bowers Laboratory of Anthropology (AWBLA) at the University of Idaho houses the Crabtree Collection, a unique representation of his global impact and his lifelong work with lithic technology consisting of over 10,000 artifacts, correspondence, and related papers. Crabtree's work and the lithic tools he created emulated the knowledge of Indigenous people throughout the world, including North and South America, Europe, Australia, and Japan. Crabtree paved the way for experimental archaeology, and he would be amazed with how the field has developed. His work covered replication, sourcing, and most of what we understand as required for lithic studies today.

In this symposium, presenters will discuss Crabtree and the efforts the personnel at the AWBLA are making in the preservation of the collection. We also welcome other papers on lithic studies and technology as we look at the ongoing legacy of Crabtree.

10:20 ***A Look at Donald Crabtree's Influence on Archaeology Through his Correspondence***

Chloe Dame ([she/her] University of Idaho)

10:40 ***The Donald Crabtree Collection and the University of Idaho***

Tim Mace, MA ([he/him] University of Idaho)

11:00 ***Creating Digital Accessibility of the Donald Crabtree Collection***

Allison Fashing ([she/her] University of Idaho)

11:20 ***An Overview Vitrophyre Use in North Central Idaho: 12,000 Years of Rock Knockin' on The Lochsa***

Jordan Thompson, BS ([she/her] University of Idaho)

11:40 ***Discussion***

6: General Session

**Current Geoarchaeological Research**

Time: 10:40 AM to 11:00 AM

10:40 ***Geoarchaeological and Geophysical Investigations at Fern Ridge, Foster, and Detroit Reservoirs, Upper Willamette Valley and Western Cascade Mountains, Oregon***

Teresa Wriston (Desert Research Institute), JD Lancaster (Desert Research Institute), Molly Casperson (US Army Corps of Engineers, Portland District), Loren Davis (Oregon State University), Jillian Mahoney (San Diego State University), James B. Fuddy, Jr. (San Diego State University), and Alex Nyers (Northwest Archaeometrics and Northwest Research Obsidian Studies Laboratory)

7: General Session

**Applications of Theory in Archaeology**

Time: 11:00 AM to 12:00 PM

- 11:00 *Calculating Return Rates for Habitats in the Great Basin*  
Megan McGuinness ([she/her] Great Basin Paleoindian Research Unit, University of Nevada, Reno)
- 11:20 *The Human Ecodynamics of Northern Māori Fisheries*  
Reno Nims, MS ([he/him] University of Auckland; Portland State University)
- 11:40 *Hunting Social Networks in the Salish Sea: Before and After the Bow and Arrow*  
Adam Rorabaugh, PhD, RPA ([he/him] Simon Fraser University, Washington State Department of Fish and Wildlife)

8: General Session

**Heritage Management**

Time: 11:00 AM to 12:00 PM

- 11:00 *Bringing Back the Forgotten: Calispell Valley Archaeological Project*  
Tara McLaughlin (Kalispel Tribe)
- 11:20 *"It's always 1855 here": Experiencing the Past at Fort Nisqually Living History Museum*  
Colby Dragon ([she/her] Whitman College)
- 11:40 *The Role of Women in Modern Milwaukie History 1950-2015*  
Emilia Gonzalez-Clements (Milwaukie Historical Society) and Stella Tompkins, BA ([she/her] Partners for the Common Good)

9: Training

**Frameworks for Social Justice**

Time: 1:00 PM to 5:00 PM

Chairperson(s): Brandy Rinck

*Abstract*

This symposium is a training workshop by Richard Kim of Cultures Connecting. The workshop will engage participants in interactive activities and dialogue to explore the dynamics of difference while challenging them to grow their awareness of self and knowledge of others. Most people who perpetuate “-isms” do so because of their lack of understanding rather than ill-intent. This workshop focuses on understanding and honoring diversity by exploring our socialization around those differences that we may not fully realize. Using culturally relevant professional development, participants will be guided through deep consideration of race and racism to better explore areas of power, privilege, and oppression (i.e., gender, sexual orientation, class, religion, ability, language, age) in their own lives and in the lives of others. By using their expanded awareness of self and knowledge of others, participants will develop skills to work more effectively across cultures. Real life examples applicable to anthropology and cultural resources management will strengthen teachings of actionable skills and new strategies for equitable engagement.

Presented by Richard Kim, M.Div. ([he/him] Cultures Connecting)

10: General Session

**Issues in Contemporary Societies**

Time 1:20 PM to 3:40 PM

- 1:20 *Impacts of COVID-19 to On-Campus Students Attending a Rural University in the Pacific Northwest*  
Chesley Thompson ([she/her] Eastern Oregon University)
- 1:40 *Climate Change, COVID, and Coffee*  
Julia Smith, PhD ([she/her] Eastern Washington University)
- 2:00 *Re-Examining Principles in Architectural Design: The Importance of Social Connectedness*  
Ann Wozniak, AIA, NCARB, LEED AP BD+C, NCIDQ ([she/her] Boise State University)
- 2:20 *The Black Cabinet: Visual Ethnography of a Writing Center*  
Jessi Boyer (Boise State University)
- 2:40 *Xiongnu Chiliad Notions*  
Penglin Wang, PhD ([he/him] Central Washington University)
- 3:00 *"Bare Life": Policy Response to the Influx of Rohingya in Bangladesh*  
Sayema Khatun, MS ([she/her] University of Wisconsin, Milwaukee)
- 3:20 *"How Thin the Line Is": Safeguarding Orthodoxy at a U.S. Islamic School*  
Aaron Weiss, PhD (The College of Idaho)

11: Symposium

**Archaeologies of Northwestern Military Communities**

Time: 1:20 PM to 4:00 PM

Chairperson(s): Katrina Eichner

*Abstract*

There has been a recent uptick in the archaeological exploration of military occupation in U.S. northwestern states, coupled with a renewed focus on how forts contributed to racial/ethnic, gendered, and classed relations throughout the region. With the establishment of an American presence in the 19th and 20th centuries, the U.S. Army employed a diverse population of troops and camp followers who interacted with ancestral Native communities and other Euro-American, Chinese, and Canadian settlers. Recent scholarship recognizes these sites as settler colonial sites enmeshed in multiple identity discourses and contexts that demand sophisticated and nuanced consideration. Throughout this session we will highlight the innovative, ongoing work that historical archaeologists are conducting throughout the American west, highlighting the collaborations they have established with descendant communities, local tribes, and historically marginalized stakeholder groups.

- 1:20 *Preliminary Archaeological Research at Fort Sherman, Idaho*  
Katelyn Kitch ([she/her] University of Idaho) and Katrina Eichner, PhD ([she/her] University of Idaho)
- 1:40 *Examining the Historical and Archaeological Record at Fort Hoskins and Fort Yamhill*  
Mairee MacInnes (University of Idaho)

- 2:00 ***Fort, Camp, and College: Exploring the Cultural Heritage of Fort George Wright at the Mukogawa US Campus, Spokane, WA***  
Amanda Gardner (NWMAC; AHS) and Brian Buchanan, PhD (Eastern Washington University)
- 2:20 ***Material Expressions of Social, Cultural and Economic Values Amongst 19th Century U.S. Army Commissioned Officers: Examples from Fort Yamhill and Fort Hoskins, Oregon 1856-1866***  
Justin Eichelberger, PhD (National Park Service, Lake Roosevelt National Recreation Area)
- 2:40 ***Segregation Under Duress: Social and Physical Space at Miner's Fort, a Rogue River War Fortification on the Oregon Coast***  
Mark Tveskov, PhD (Southern Oregon University)
- 3:20 ***The Doctor's Lithics: Exploring the disconnections of Euroamerican experimentation in stone tool manufacturing on a western military fort.***  
Mark Warner, PhD (University of Idaho)
- 3:40 ***Discussant***  
Laurie Wilkie

12: General Session

**Issues in Cultural Resource Management**

Time: 1:20 PM to 5:00 PM

- 1:20 ***Bring the Inside Outside and the Outside Inside***  
Ashton Satterlee, MA (Appaloosa Museum and Heritage Center Foundation INC.) and Lauren McCearry (Appaloosa Museum and Heritage Center Foundation INC.)
- 1:40 ***Hanford Site Q & A***  
Keith Mendez, MA ([he/him] Hanford Mission Integration Solutions) and Stephanie Simmons, MS, RPA ([she/her] Hanford Mission Integration Solutions)
- 2:00 ***A Review of Precontact Sites on Northwest Oregon Bureau of Land Management, Following the 2020 Labor Day Fires***  
Bryce Danner, MA (Bureau of Land Management, Northwest Oregon District)
- 2:20 ***Sink or Swim, Archaeology and Aquatic Restoration on the Malheur National Forest***  
Emily Modelski, MA ([she/her] Malheur National Forest, Blue Mountain Ranger District)
- 2:40 ***Greenwood Cemetery, Cle Elum, WA: History, Mapping and Ground Radar***  
Natasha Lipsky ([she/her] Central Washington University), Jamie Mickus (Central Washington University), Steven Hackenberger (Central Washington University), Nicole Jastremski (Central Washington University), Patrick McCutcheon (Central Washington University), and Karisa Terry (Central Washington University)
- 3:00 **Break**

- 3:20 ***DStretch Analysis of Portable Rock Art: Its Current Uses and an Experimental Application to Stone Artifacts from WWU's Jorgensen Collection***  
Brinn Marri, BA ([she/her] Western Washington University, Antiquity Consulting) and Jerrica Croft ([she/her] Western Washington University)
- 3:40 ***Sustainable Solutions for Environmentally Responsible Stewardship of Collections***  
Natalie Bankuti-Summers, MA, RPA ([she/her] Washington State Parks and Recreation Commission, Stewardship Program)
- 4:00 ***Engaging Youth in Archaeology and Cultural Resources – Examples from the Kalispel Natural Resources Department***  
Kendra Maroney, MA ([she/her] Kalispel Tribe of Indians)
- 4:20 ***Afternoon Creek Rockshelter 45WH698 (Newhalem WA) prehistoric artifacts: a path forward***  
Slobodan Mitrovic, PhD, RPA (Sauk-Suiattle Indian Tribe)
- 4:40 ***Supporting Traditional Plant Gathering: Lessons Learned from the Pasco Pump Lateral 5.8 Wasteway Project***  
Karina Bryan, MA ([she/her] Bureau of Reclamation)

13: Symposium

**Puget Sound Anthropology and Bellevue College, Washington**

Time: 3:00 PM to 4:40 PM

Chairperson(s): Nancy Gonlin

*Abstract*

Early in 1966 Bellevue Community College first opened its doors from a high school to serve the burgeoning population of the East Side of Seattle with evening classes. One anthropologist was recruited on a part-time basis, while another, Mr. John Osmundson, an archaeologist, was hired part-time to teach NW history. A year and a half later, Osmundson and cultural anthropologist, Dr. David Jurji, were hired as full-time faculty to play a critical role in developing and presenting curriculum that satisfied the college's mission of delivering an affordable and broad liberal arts education to the general populace. Fifty-six years after its initial opening, as an accredited, public, open-access, community-based, and coeducational institution, Bellevue College remains a primary provider of higher education in Western Washington for over 27,300 students, 44% of whom are full-time. Today, six Bellevue College anthropologists offer the most diverse curriculum of any community college in the state with 19 transferrable courses. We boast experts in each of the four fields of anthropology, making it possible for our students to earn an "Anthropology Concentration," consisting of a core course in each of the four fields, in addition to their AA degree. Currently, faculty see their role as greatly expanded from the initial foray into anthropology. Technological and pedagogical changes accompanied by theoretical and societal shifts have dramatically impacted anthropology on a national and local level. Bellevue College anthropologists reflect upon their changing roles and responsibilities through individual case studies and their contributions to anthropology in the Puget Sound.

- 3:00 ***Archaeology's Evolution at Bellevue College, Washington***  
Nancy Gonlin, PhD, RPA ([she/her] Bellevue College)
- 3:20 ***Project-Based Learning of Linguistics at Bellevue College, WA***  
Katharine Hunt, PhD ([she/her] Bellevue College)

- 3:40 ***Intersectionality: Connecting with Students and Current Events***  
Stephanie Brommer, PhD ([she/her] Bellevue College)
- 4:00 ***Diversity as Concept and Practice: Reflections on the Teaching of Anthropology***  
Jaime Holthuysen, PhD ([she/her] Bellevue College)
- 4:20 ***From Bones to Clones: The Evolution of Biological Anthropology at Bellevue College, WA***  
Anthony Tessandori, MA ([he/his] Bellevue College)

14: General Session

**Current Research in Biological Anthropology**

Time: 4:00 PM to 4:40 PM

- 4:00 ***Factors influencing intestinal parasites in black-and-white ruffed lemurs (*Varecia variegata*) in Mangevo, Ranomafana National Park, Madagascar***  
Eliette Noromalala, MS ([she/her/hers] Primate Behavior and Ecology Program, Central Washington University), A.K. Binder ([she/her] Primate Behavior and Ecology Program, Central Washington University; Department of Biological Sciences, Central Washington University), A.L. Baden ([she/her] Department of Anthropology, The Graduate Center of the City University of New York; The New York Consortium in Evolutionary Primatology; Department of Anthropology, Hunter College of the City University of New York), G.A. Stryker ([she/her] Department of Biological Sciences, Central Washington University), and K.I. Gabriel ([she/her] Primate Behavior and Ecology Program, Central Washington University; Department of Psychology, Central Washington University)
- 4:20 ***Examination of Late 18th and Early 19th Century Identity Through Burial at the Silo of Charlemagne in Roncesvalles, Spain***  
Maddie Philips (University of Idaho)

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3/11/2022, Friday

15: Symposium

**Asian Diaspora Archaeology in the Pacific Northwest**

Time 9:00 AM to 4:40 PM

Chairperson(s): Chelsea Rose and Renae Campbell

*Abstract*

This marks the fourth annual session highlighting Asian diaspora research in the Pacific Northwest. Papers will cover a range of topics from project updates to new research findings and represent the variety of institutions, agencies, and individuals working to inventory, interpret, preserve, and promote the history and contributions of the Asian diaspora in our region and beyond. The papers will be followed by a reflection and facilitated discussion on the work happening in the region and where we can go from here.

- 9:00 ***Japanese Gulch Village and the Tactics of Consumption in a “Knife-Fork Land”***  
Renae Campbell ([she/her] Asian American Comparative Collection, University of Idaho)



- 9:20 ***The Churn: Overlapping Asian Diasporic Communities in Oregon's Blue Mountains at the Dawn of the 20th Century***  
Don Hann ([he/him] Oregon Chinese Diaspora Project, Malheur National Forest [retired])
- 9:40 ***Tunnel Vision: Archaeology and Remote Sensing at the Oregon and California Railroad's Buck Rock Tunnel***  
Chelsea Rose ([she/her] Southern Oregon University Laboratory of Anthropology), and Terrance Christian ([he/him] Bureau of Land Management, ORWA)
- 10:00 ***Once Again Revisiting the Chelan Falls, Washington Chinese Store and the Alleged 1875 Massacre of Chinese Miners***  
Eric Gleason, BA ([he/him] Friends of The Dalles Chinatown)
- 10:20 **Break**
- 10:40 ***A Golden Thread: Reconnecting Boise Idaho with Chinese Mining History and Heritage***  
Pei-Lin Yu, PhD ([she/her] US Army Corps of Engineers, Walla Walla District), Jordan Bennett, Renae Campbell, Stephen Cox, Clint Cuzzo, Gayle Dixon, Nicole Herzog, Andy Louie, Terry Panhorst, Carol McDonald, and Morgan Zedalis
- 11:00 ***Small Towns And Mining Camps: An Analysis Of Chinese Diasporic Communities In 19th-Century Oregon***  
Jocelyn Lee (Stanford University)
- 11:20 ***"Oregon Chinese Diaspora: Artifact Analysis of Several Mining Camps on the Malheur National Forest"***  
Tatiana Watkins ([she/her] Malheur National Forest, Oregon Chinese Diaspora Project, University of Idaho)
- 11:40 ***Artifact As A Stethoscope***  
Sam Roxas-Chua Yao [he/him]
- 12:00 **Lunch**
- 1:20 ***The Bones About It: An Analysis of the Dalles Chinatown Faunal Assemblage***  
Katie Johnson ([she/her] Southern Oregon University Laboratory of Anthropology)
- 1:40 ***Chinese fishers at Point Alones, David Starr Jordan, and the building of the Smithsonian's Fish Collection***  
J. Ryan Kennedy ([he/him] University of New Orleans) and Brian M. Kemp ([he/him] University of Oklahoma)
- 2:00 ***At Home in the Valley - Chinese Agricultural Laborers at 35MA417***  
Cathy Bialas ([she/her] Historical Research Associates, Inc.) and Jessica Curteman ([she/her] Oregon Department of Transportation)
- 2:20 ***Archaeological Excavations in Downtown Portland at Site 35MU197***  
Michele Punke (Historical Research Associates, Inc.) and Janna Tuck (Historical Research Associates, Inc.)
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- 2:40 ***Searching for Salem's Early Chinese Community***  
Kimberli Fitzgerald (City of Salem)
- 3:00 **Break**
- 3:20 ***Longevity The Archaeology of a Chinese Gift Store and Restaurant in Eugene, Oregon's, Market District***  
Marlene Jampolsky ([she/hers] Museum of Natural and Cultural History, University of Oregon), Chris Ruiz ([he/him] Museum of Natural and Cultural History, University of Oregon), and John C. Krier ([he/him] Museum of Natural and Cultural History, University of Oregon)
- 3:40 ***Tracking "Thunder" in Portland's Chinese Restaurants***  
Laurie A. Wilkie (UC Berkeley), Jeffrey A. Seckinger (UC Berkeley), and Kelly N. Fong (UCLA)
- 4:00 ***Protection of Body and Soul: Inscriptions and Motifs of Chinese Spiritual Items***  
Christine McFarlane (Asian American Comparative Collection, University of Idaho)
- 4:20 ***Discussant***  
Douglas Ross ([he/him] Albion Environmental)

16: Symposium

**Camas Contributions and Connections: Exploring the Legacy and Potential of Human-Camas Relationships**

Time: 9:00 AM to 3:00 PM

Chairperson(s): Molly Carney and Katy Matthews

*Abstract*

*Camassia* sp. is a genus of blue to white flowering, bulbous perennial plants commonly found from the Pacific coast to the eastern margins of the Rocky Mountains. These edible bulbs were a readily available plant food source for the people who have lived in these regions since time immemorial, with people frequently traveling hundreds of kilometers to harvest, trading the bulbs far outside its habitat, and storing specially prepared camas for meals throughout the year. Even William Clark, newcomer to this land, recognized the importance of this plant by noting the significance of "Quawmash roots as a great present." In this session we aim to take a closer look at this genus, exploring the ways people interacted with camas in the past and how we can facilitate those interactions in the future. We welcome papers from practitioners, activists, and scholars across backgrounds, bringing together a deep perspective on this plant and its contributions to life throughout the greater Northwest.

- 9:00 ***Growing the Camas Collaborative: Restoring camas prairies to support indigenous communities throughout western Washington***  
Sarah T. Hamman, PhD ([she/her] Ecostudies Institute), William Thoms ([he/him] Confederated Tribes of the Chehalis Reservation), and Joyce LeCompte, PhD ([she/her] Camassia Resource Stewardship)
- 9:20 ***Coast Salish Native Agriculture: Increasing the Presence of Camas on the Swinomish Reservation***  
Joyce LeCompte, PhD ([she/her] Camassia Resource Stewardship), Todd S. Mitchell ([he/him] Swinomish Indian Tribal Community Department of Environmental Protection), Jen Willup ([she/her] Swinomish Indian Tribal Community Department of Environmental Protection), Dean

Dan ([he/him] Swinomish Indian Tribal Community Department of Environmental Protection), and Nicole Casper ([she/her] Swinomish Indian Tribal Community Department of Environmental Protection)

9:40 ***Restoration Strategies for Propagation of *Camassia quamash* on the Weippe Prairie***  
Katy Matthews (Nez Perce National Historical Park)

10:00 ***Camas Nursery Protocol***  
Mary James (University of Idaho)

10:20 **Break**

10:40 ***Plant-Pollinator-People Entanglements: Study of Camas-Bee Interactions in the West Kootenay, British Columbia***  
Rowan Rampton (University of Calgary), Brenda Beckwith (Selkirk College, Kootenay Native Plant Society), and Valerie Huff (Kootenay Native Plant Society)

11:00 ***Camas as a keystone cultural species and the long-term indigenous ecological management of camas places***  
Linda Storm, PhC ([she/her/hers] U.S. Environmental Protection Agency and University of Washington) and Rue Hewett Hoover ([she/her/hers] Wetland Biologist, Nez Perce Tribe)

11:20 ***Kalapuyans and Camas***  
David Lewis (Oregon State University)

11:40 ***Soil chemistry and its applications determining historic camas cultivation***  
Emma Lowther ([she/her] University of Victoria)

12:00 **Lunch**

1:20 ***Plant Management in the Precontact Pacific Northwest: A Camas Case Study***  
Molly Carney ([she/her] Washington State University)

1:40 ***Use of a Species Distribution Model to Examine Camas in Southern Idaho***  
Royce Johnson (Boise State University)

2:00 ***Assessing the Taxonomic Value of Camas Microfossils and their Potential to Inform the Archaeological Record of Western North America***  
Tiffany J. Fulkerson (Washington State University), John C. Blong (Washington State University), Molly Carney (Washington State University), Tiffany Kite (Washington State University), and Shannon Tushingam (Washington State University)

2:20 ***Discussion***

17: General Session

**Artifact Analysis**

Time 9:00 AM to 11:40 AM

9:00 ***Analysis of Projectile Point Chronology Through Lithic Typology on the Miller Flats***  
Riza McClurkin ([they/them/theirs] University of Montana Department of Anthropology)

- 9:20 ***Discussion of the Analytical Contribution of 1/8-inch (0.32 Centimeter) Lithic Debitage at the Sunrise Ridge Borrow Pit Site (45PI408), Mt. Rainier National Park, Washington***  
David Davis ([he/him] Central Washington University) and Patrick T. McCutcheon, PhD ([he/him] Central Washington University)
- 9:40 ***Maintaining Identity in the Columbia Plateau through the Production of Lithics***  
Cynthia Hannold, MA ([she/her] The University of Alabama)
- 10:00 ***Recent Advances in Obsidian Hydration Dating***  
Alexander Rogers, MA, MS, RPA (Maturango Museum [emeritus])
- 10:20 **Break**
- 10:40 ***Chemical Sourcing and Technological Analysis of Volcanic Glass Lithics from the Grissom Site (45KT301)***  
Nikolai Simurdak, BS ([they/them] Central Washington University) and Patrick T. McCutcheon, PhD ([he/him] Central Washington University)
- 11:00 ***A Can of Worms? Part II***  
William Schroeder, PhD, RPA
- 11:20 ***The Implications of Salish Spindle Technology***  
Kim Simmons

18: General Session

**Investigations of Human Relationships with the Landscape and Environment**

Time: 9:00 AM to 12:00 PM

- 9:00 ***Living Landscapes of SGang Gwaay: Strengthening the Land and People in a Changing Climate***  
Jenny Cohen, MA ([she/her/they/them] Parks Canada), Camille Collinson, Nadine Wilson, Mary Hart, and Ian Sellers
- 9:20 ***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 Past Plant Food Significance***  
Dale R. Croes, PhD ([he/him] Washington State University) and Bethany K. Mathews, MA, RPA ([she/her] Antiquity Consulting)
- 9:40 ***Salmon in Tseil-Wat: an application of ZooMS on archaeological salmonid remains from təmtəmixʷtən (Tum-tumay-whueton)***  
Meaghan Efford, MA ([she/her] University of British Columbia, Institute for the Oceans and Fisheries)
- 10:00 ***A Field of Possibili-Tea: Native Medicine in an Economic Landscape***  
Faith Webster, MS ([she/her] Quinault Indian Nation, Department of Natural Resources), Justine James, Samantha Chisholm, David Ryan, Lia Frenchman, and Naomi Brandenfels
- 10:20 **Break**

- 10:40 ***Reinterpreting Indigenous Contributions to the 1855 Pacific Railroad Survey at One of Oregon's Newest Heritage Trees***  
David-Paul Hedberg, MA ([he/his] Outdoor History Consulting) and Mike Boero (USFS, Descutes National Forest)
- 11:00 ***Cultural Histories & Culturally Modified Trees of the Youngs Rock Rigdon Project, Middle Fork Ranger District, Willamette National Forest***  
Stephen Todd Jankowski, MS (Willamette National Forest)
- 11:20 ***Fruit trees, orchards and historic sites: Documenting fruit trees on historic sites and how they contribute to site evaluations***  
Rene Burk, MAIS ([she/her] Oregon State University)
- 11:40 ***Conceptualizing Fluidity in Heritage Landscapes and Cultural Identity Through the Garnet Ghost Town***  
Andrea Shiverdecker, MA, PhD Student ([she/her] University of Montana)

19: Symposium

**Legacy Archaeological Collections: Studies of Technology and Activity Areas**

Time: 9:00 AM to 11:40 AM

Chairperson(s): Steven Hackenberger

*Abstract*

Faculty, research affiliates, and students continue to collaborate on curation and study of legacy archaeological collections. In the symposium we share updates on the Tryon Creek Site, Hells Canyon (35WW288). An overview and history are shared (Hackenberger). Excavations lead by Frank Leonhardy (University of Idaho) in the early 90s were sponsored by the Hells Canyon NRA and the Wallowa-Whitman National Forest. We also include contributions to the study of the Sanders Site collection (45KT315) excavated by William Smith (Central Washington University) in the early 70s. Two studies revisit the lithic debitage and technological indicators (Miller-Atkins, Crow), one project focuses on bone tools (Walton), and three presentations cover stratigraphic and spatial analysis of artifact types (LaPlante, Walton, Wyatt). The technology studies include advances in artifact identification (platform and raw material type; bone tool and breakage), and the assemblage and activity area studies (artifact types and features) provide new insights into changes in subsistence and food processing.

- 9:00 ***Legacy Archaeological Collection Studies, Hells Canyon and Yakima Uplands: Symposium Introduction***  
Steven Hackenberger, PhD ([he] Central Washington University)
- 9:20 ***Heat-Treatment and Debitage within Hells Canyon: An Exploratory Analysis from Tryon Creek (35WA288)***  
Galen Miller-Atkins, MA, RPA ([he/him] Statistical Research, Inc.)
- 9:40 ***Lithic Raw Material Types within Tryon Creek (35WA288, House 2)***  
Raelynne Crow, Undergraduate Student ([she/her] Central Washington University) and Aidan Gallagher (Independent)

10:00 ***Analysis of the Bone Tool Assemblage of the Tryon Creek Site (35WA288) in Hells Canyon, Oregon***

Lauren Walton, MS ([she/her] Statistical Research, Inc.), Brandon McIntosh PhD Candidate ([he/him, they/them] Statistical Research, Inc.), and Steve Hackenberger, PhD ([he/him] Central Washington University)

10:20 **Break**

10:40 ***Legacy Archaeological Collections: Studies of Technology and Activity Areas***

Noella Wyatt ([she/her] Central Washington University)

11:00 ***Activity Area Analysis for the Sanders Site (45KT315), Yakima Uplands***

Emily LaPlante, Undergraduate Student ([she] Central Washington University) and Steven Hackenberger ([he] Central Washington University)

11:20 ***Discussion***

20: Symposium

**Dynamic Archaeological Approaches Concerning a Progressive Arctic and Global Realm**

Time: 1:20 PM to 3:00 PM

Chairperson(s): Andrea Shiverdecker

*Abstract*

Diversity and excellence are synergized together in a collaborative explorative discussion panel into contemporary and forward-thinking archaeological methodologies and approaches to at risk arctic communities. Graduate students from the University of Montana have joined to share current research endeavors into the arctic climate and its results on communities and archaeological records, while producing revolutionary processes to aid archaeological understandings and processes globally. Presentations vary from statistical analysis and spatial organizations, establishing changes in wealth and cooperation of house pit 54 in Bridge River, BC; to an introduction of a universal theoretical research model to assist archaeologist globally in the study and understandings of landscapes of abandonment. Indigenous lifeways and methods for increased advocacy and awareness are drawn upon, while highlighting the strengths of the diverse future of archaeological findings from the University of Montana's Department of Anthropology graduate scholars under Dr. Anna Prentiss.

1:20 ***Uncovering Cooperation in Housepit 54, Bridge River, British Columbia***

Megan Denis, MA, PhD Student ([she/her] University of Montana)

1:40 ***Modern Impacts on Traditional Subsistence Hunting in the Canadian Arctic***

Riza McClurkin ([they/them/theirs] University of Montana Department of Anthropology)

2:00 ***A Synergy of Abandonment: Archaeological Understandings of Abandoned Norse Arctic Settlements and North American Mining Ghost Towns***

Andrea Shiverdecker, MA, PhD Student ([she/her] University of Montana)

2:20 ***Issues in Culture Heritage Studies and Anthropology: Reflecting on the Challenges Posed by the 'Inconvenient Indian'***

Alysha Edwards, Graduate Student ([she/her] University of Montana)

2:40 ***Panel Discussion***

21: General Session

**Chemical Analyses in Archaeological Research**

Time: 3:20 PM to 4:40 PM

- 3:20 ***Interdisciplinary Research; Researching the Woodward Mammoth***  
Jacen Ellis ([he/him] Eastern Oregon University)
- 3:40 ***A Pilot Study to Determine Protein Residue on Low-Fired Ceramic Sherds***  
Joanne Mack, PhD (University of Notre Dame), John Fagan, PhD (Archaeological Investigations Northwest), Cam Walker, PhD (University of Oregon Natural History Museum), and Jack Swisher, BA (University of Oregon Natural History Museum)
- 4:00 ***New Evidence of Ancient Tobacco Use from Two Upper Skagit Valley Sites***  
William Damitio, MA (Washington State University), Kim DiCenzo, Shannon Tushingam, Mario Zimmermann, Sam Neunzig, Anna Berim, and David Gang
- 4:20 ***Historic Bottle Contents Analysis from an Early 20th Century Privy Sample in Arlington, Washington***  
Meghan Caves ([she/they] University of Idaho)

22: General Session

**Examinations of Colonial Legacies**

Time: 3:00 PM to 5:00 PM

- 3:00 ***Unrequited Justice - Navigating Settler Colonial Violence and Gendering***  
Dianne Baumann, PhD ([she/her] University of Idaho)
- 3:20 ***Violence, Structure, and Agency in Labor Market Segmentation Among Mexican Migrant Farmworkers***  
Lark Cummings ([he/him] Eastern Washington University)
- 3:40 ***Marielle Is Present: Living and Dreaming through Death in Brazil***  
Linda Johnson (Reed College)
- 4:00 ***Interpellation as Coping Strategies: Responses to Colonialism and Social Identities***  
Andrea Shiverdecker, MA, PhD Student ([she/her] University of Montana)
- 4:20 ***Toward an Ethnohistory of Paper in the Indigenous Pacific Northwest***  
Robert Walls (American Indian Studies Research Institute, Indiana University)
- 4:40 ***Skinwalker***  
Nicholas Kager [he/him/they/them]

23: Workshop

**Obsidian Hydration Dating**

Time: 1:20 PM to 3:20 PM

*Abstract*

The goal of this workshop is to provide insight into the theory and methods of obsidian hydration dating (OHD). It should help enable the archaeologist to perform OHD analyses, and enable the manager to ask the right questions. The workshop will cover the basic principles of obsidian hydration and the models employed in dating; how to develop an appropriate effective hydration temperature (EHT); various methods of computing a hydration rate; guidelines for data analysis; and numerous cautions. The workshop includes working through a numerical example of an OHD analysis. Mathematics will be kept to a minimum, but cannot be avoided entirely. Electronic copies of key references will be provided.

Presented by Alexander (Sandy) Rogers, MA, MS, RPA (Curator Emeritus, Maturango Museum)



## ABSTRACTS

Kailey Alessi ([she/her] Department of Culture, Society and Justice, University of Idaho)

### ***A Cave Through Time: Historic Archaeology at Mammoth Cave, Kentucky***

Mammoth Cave, located in southern Kentucky, is the longest known cave in the world, with 420 miles of mapped passages. In addition to being a geological wonder, it has been visited by humans for thousands of years. Many projects have focused on the prehistoric archaeology of the Historic Entrance to the cave, but none have focused exclusively on the historic archaeology of this site. This presentation will seek to shed some light on the overlooked history and archaeology of the cave's historic period. The chronology of human modifications at the Historic Entrance, from saltpetre mining in the early 1800s to the development of tourist infrastructure during the twentieth century will be considered. The synthesis of historic documents and archaeological site reports allows for a greater understanding of how people modified and interacted with the cave environment during the nineteenth and twentieth centuries.

Natalie Bankuti-Summers, MA, RPA ([she/her] Washington State Parks and Recreation Commission, Stewardship Program)

### ***Sustainable Solutions for Environmentally Responsible Stewardship of Collections***

It has been established that the landscapes which humans inhabit are negatively impacted by waste materials and, though it may be a relatively small impact, cultural resource collections management does contribute to it. The topic of 'sustainable collections' usually regards to the ethical obligations we have as archaeologists when it comes to collections, however, in this presentation I will be exploring sustainable collections in regards to environmental impact by examining alternatives to the physical elements of collections management such as housing, conservation, and facility homeostasis. With this presentation, I will explore the ways in which facility managers can maintain their facility's humidity and temperature using alternative electricity sources such as hydro electric or solar power. Additionally, I will introduce various replacements for materials such as ethafoam, plastic artifact bags, and other materials that collections managers, academics, and field archeologists alike use to maintain stable housing for the artifacts they are charged with preserving. I will create a case study utilizing a collection of artifacts from the Washington State Parks and Recreation Stewardship Collections Facility. The analysis of this collection's housing procedures will highlight the cost of traditional methods and materials used in museology, whose numbers will then be compared to estimates of the cost to conduct an equivalent project with the more sustainable replacements outlined above. The goal of this presentation is to influence any stewards of artifacts of cultural patrimony to begin making changes in the ways in which they conserve their collections in an environmentally responsible way.

Dianne Baumann, PhD ([she/her] University of Idaho)

### ***Unrequited Justice - Navigating Settler Colonial Violence and Gendering***

Conversation about violence by and against American Indian peoples too often focuses on men as perpetrators while ignoring the complexity of settler colonialism and gender's intersection with violence. This article scrutinizes the entangled roles of settler colonialism and gendering in influencing this epidemic of violence. Through personal story, anecdote, and the harsh realities of unrequited justice I examine how some Blackfeet citizens, and by extension, American Indian peoples, navigate colonial gendering and violence. While this article contains elements of pain, the focus centers pushing beyond 'survivance' to an understanding of 'thrivance' and what it entails, including the need to create communities of support, while identifying and upending the distressing strategy of 'settler moves to innocence'. This article contributes to gender studies, feminist studies, and settler colonial studies; but most importantly it recognizes and connects how healing and understanding are key to whole and harmonious American Indian communities.

Cathy Bialas ([she/her] Historical Research Associates, Inc.) and Jessica Curteman ([she/her] Oregon Department of Transportation)

***At Home in the Valley - Chinese Agricultural Laborers at 35MA417***

As part of archaeological investigations for an Oregon Department of Transportation interchange project, Historical Research Associates, Inc. (HRA) recently excavated a farmstead on French Prairie next to I-5 revealing the occupation of Chinese families and laborers. Research is ongoing, but initial analysis of their domestic debris provides a window into the home life of Chinese hop laborers living in the Willamette Valley in the early 1900s. HRA sampled residential foundation remains and discovered a small cache of personal domestic items including Asian ceramics, medicine and liquor bottles, and gaming pieces.

Caitlin Bishop, MA ([she/her] California State University, Chico and National Park Service JACS Grant)

***Archaeological Investigations of "Alaska" at Tule Lake Segregation Center in Northeastern California***

Tule Lake Segregation Center in Newell, CA was a place of incarceration for over 18,000 Japanese Americans yet remains one of the most understudied sites from WWII. This research focuses on an area of the segregation center known as "Alaska", which was built to accompany the incoming incarcerated that were further displaced after the Loyalty Questionnaire was conducted by the War Relocation Authority in 1943. Approximately ten acres of Alaska including Blocks 81, 82, parts of Blocks 83 and 56 were surveyed in May 2019. Non-invasive methods of pedestrian survey, ground penetrating radar, and analyzing a preexisting collection from 1970 were utilized to establish site integrity. Determining the integrity of this historic incarceration site will inform Heritage Management Plans for stakeholders and agencies that currently own divisions of the original segregation center and support this research (USBR, BLM, NPS JACS grant, and the Tule Lake Committee). Preserving culturally sensitive sites like Alaska within Tule Lake Segregation Center is imperative to reclaiming the narrative of the Japanese American incarceration experience and accurately representing our nation's history.

Jessi Boyer (Boise State University)

***The Black Cabinet: Visual Ethnography of a Writing Center***

"Pedagogical conventions of university writing centers overlap with the context-driven disposition of anthropologists, particularly ethnographers. This paper assumes the insider/outsider perspective of a first-year writing center intern learning writing center theory and practice in the new remote-services paradigm. A result of the COVID 19 crisis was the move to virtual writing tutoring worldwide. Consequently, much of the culture previously associated with writing centers has been rendered invisible to newcomers, who can be regarded neither as total outsiders nor as true insiders.

A comparative analysis of artifacts representing the Boise State Writing Center's online and physical spaces is approached through metaphorical binary: the abandoned versus the disembodied. This approach provides perspective on the centrality of physical space in writing center pedagogy and design. This critical reading of online vs. in-person tutoring experiences revisits issues historically addressed in terms of spatial geography: accessibility, and community, and student-centered practice."

Stephanie Brommer, PhD ([she/her] Bellevue College)

***Intersectionality: Connecting with Students and Current Events***

Applying the framework of intersectionality to the holistic field of anthropology recognizes the impacts of social structures and institutions on individual identities, allowing Bellevue College anthropology students to make connections that personally resonate with their lives. As inequalities and injustices of race, gender, sexuality, and class currently in the news are addressed in the classroom, Bellevue College students, ranging from teens to midlife, can apply intersectionality to recognize the complexities and intersections of individual and group privileges and oppressions, as well as their own human experiences. In the evolution of anthropological thought and practice, this framework, coined 33 years ago in 1989, has informed and shaped the discipline in ways that resonate with the identity politics, social injustice,

systemic racism, and gender diversity and fluidity recognized today. Conceived through the work of Black women scholars and activists, intersectionality addresses power relations and social inequalities experienced through the intersections of multiple identities. Teaching the lens of intersectionality is a key tool feminist anthropologists bring to their students.

Karina Bryan, MA ([she/her] Bureau of Reclamation)

***Supporting Traditional Plant Gathering: Lessons Learned from the Pasco Pump Lateral 5.8 Wasteway Project***

The Bureau of Reclamation and Tribal partners developed creative mitigation in response to the Pasco Pump Lateral 5.8 Wasteway Project, a new construction project north of Pasco that adversely affected a historic property of traditional religious and cultural importance known as Tamántawla. The original inhabitants of Tamántawla used the area as both a residential site and as a resource gathering area. Because much of the area has become private property, access to the landform and the associated traditional resources has been greatly curtailed. Reclamation's action further reduced the integrity of Tamántawla and diminished access to traditional resources by disrupting the Columbia River shoreline. Based on this understanding, Reclamation and Tribal partners developed a plan to mitigate adverse effects by finding ways to enhance Tribal member access to traditional resources. The resulting three-pronged approach aims to provide Tribal members with the information they need to continue traditional gathering practices in the lower Columbia Basin. Part one is development of a traditional plant foods atlas to provide Tribal members with locations of traditional plant resource stands and notes on access, developed by Reclamation and managed by each of the Tribes. Part two is development of a traditional plant foods identification app to aid practitioners with identify resources in the field. Finally, and in collaboration with the Tribes, Reclamation undertook a traditional plant foods inventory of 500 acres of Reclamation land in Franklin County to provide additional location, stand quality, and access information about traditionally gathered resources available for Tribal use.

Rene Burk, MAIS ([she/her] Oregon State University)

***Fruit trees, orchards and historic sites: Documenting fruit trees on historic sites and how they contribute to site evaluations***

Fruit trees are living artifacts, and features. Orchards contribute to historic site's integrity and setting. Fruit trees are poorly documented by archaeologists, because they are not arborist or botanist. Therefore, the extent of rare varieties is unknown across the nation on historic sites.

Rena Campbell ([she/her] Asian American Comparative Collection, University of Idaho)

***Japanese Gulch Village and the Tactics of Consumption in a "Knife-Fork Land"***

Japanese Gulch Village was home to a community of Japanese millworkers and their families between 1903 and 1930. Located just outside of Mukilteo, Washington, residents had access to a wide range of options for acquiring goods. This presentation uses Japanese-manufactured ceramics, recovered from the site in 2007, to explore the ways that village residents negotiated among purchasing options to respond to local prejudice, increase communal wellbeing, and pursue individual desires formed within a changing transpacific context.

Molly Carney ([she/her] Washington State University)

***Plant Management in the Precontact Pacific Northwest: A Camas Case Study***

Throughout western North America, there are numerous oral histories and substantial ethnographic evidence illustrating how plant species, communities, and even landscapes were extensively managed and manipulated. Camas (*Camassia* spp.) is one such plant, common from throughout western North America, with numerous records describing its role as a staple food for many communities. Deep time supporting archaeological evidence for such management practices, however, has remained elusive. In this presentation I draw on niche construction and traditional ecological knowledge to investigate Holocene relationships between people and plants in two Northwest valleys. I integrate

paleoethnobotanical, palaeoclimatological, and geoarchaeological methodologies and datasets to demonstrate people began deliberately managing camas by 3,500 BP by selectively harvesting mature plants. These findings confirm and expand upon Indigenous traditional ecological knowledge as well as offer an alternative explanatory framework to management studies globally.

Meghan Caves ([she/they] University of Idaho)

***Historic Bottle Contents Analysis from an Early 20th Century Privy Sample in Arlington, Washington***

During the summer of 2021, I visited the Burke Museum of Natural History and Culture in Seattle, Washington, to reanalyze a privy assemblage excavated by Northwest Archaeological Associates, Inc. (NWAA). As part of the recorded Teager/Weimer site (45SN409), the privy was excavated in 2008 as mitigation preparing for the City of Arlington's wastewater treatment facility upgrade. I requested samples of contents from four bottles that had not been a part of the original contents analysis conducted by the Department of Medicinal Chemistry at the University of Washington included in NWAA's report. The samples were analyzed at the University of Idaho Department of Chemistry, which has completed numerous historical artifact residue and contents chemical compositional analyses. The results of archival research on these four vessels and the results of contents analysis are presented here, revealing unique and interesting insights into container reuse, patent medicine marketing, and consumer practices at the turn of the 20th century in Western Washington.

Jenny Cohen, MA ([she/her/they/them] Parks Canada), Camille Collinson, Nadine Wilson, Mary Hart, and Ian Sellers

***Living Landscapes of SGang Gwaay: Strengthening the Land and People in a Changing Climate***

In December 2018, a hurricane-force storm caused significant damage at SGang Gwaay Llnagaay, a UNESCO World Heritage Site and Haida Heritage Site on a small island at the southern end of Haida Gwaii, British Columbia. Archaeological mitigation and excavation by a team from Parks Canada Terrestrial Archaeology and Gwaii Haanas National Park Reserve, in partnership with the Haida Watchmen program and Haida Gwaii Museum, has focused on areas directly impacted by fallen trees. These include wooden house remains and a variety of activity areas around the village site. Preliminary results of our ongoing archaeological investigations have revealed significant insights into 19th century Haida household activity and the broader cultural landscape of the island dating beyond 5,200 YBP. Taking into account relative sea-level history, Haida knowledge systems, and current climate change issues, these insights will support community planning as part of a larger multidisciplinary cultural and ecological restoration project.

Dale R. Croes, PhD ([he/him] Washington State University) and Bethany K. Mathews, MA, RPA ([she/her] Antiquity Consulting)

***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 Past Plant Food Significance***

Three Central Northwest Coast wet sites have begun to highlight the significance of berries and nuts, particularly salal and acorns, to ancient subsistence practices. At the Ozette site (45CA24), located on the Olympic Peninsula of Washington, mudslide encased houses dating to approximately 300 years ago produced flotation samples of 250,000 seeds of Salal (*Gaultheria shallon*; and/or its close look-alikes of genus *Vaccinium*). At the Sunken Village site (35MU4), located on Sauvie Island, Oregon, over 100 hemlock-lined acorn leaching pits dated to 150-700 years ago have been recorded. It is estimated that these leaching pits may represent processing of 2,500,000 acorns (*Quercus garryana*) in a season. Finally, at the Q<sup>w</sup>u<sup>w</sup>g<sup>w</sup>əs site, located at Mud Bay on Eld Inlet, Washington, reanalysis of macrobotanical artifacts lead to the discovery that acorns were also abundant in the site midden. Acorn remains were seven times more common than hazelnut (*Corylus cornuta*) remains here, indicating that acorns might have been the most ubiquitous plant food at this south Salish Sea site. In this paper we argue that salal and acorn ecofacts from the Central Northwest Coast represent substantial resources in the diets of this region.

Raelynne Crow, Undergraduate Student ([she/her] Central Washington University) and Aidan Gallagher (Independent)

***Lithic Raw Material Types within Tryon Creek (35WA288, House 2)***

The Tyron Creek (35WA288) assemblage from Hells Canyon is curated and studied at Central Washington University under an agreement with the USFS. Debitage analysis was originally conducted in the early 90s by University of Idaho students working with Dr. Sappington. A reevaluation of the raw material anddebitage categories and counts in House 2 demonstrates the overall reliability of the first analysis. Our re-evaluation was done by reviewing catalog data, Excel spreadsheet data, and sample bags ofdebitage. We illustrate the distribution of selected raw material types across levels and occupation zones. In previous studies this was done by counts and relative frequency; for the first time we map types ofdebitage by density according to the volume of excavation units produced by Dr. Leonhardy's interest in cultural stratigraphy and features.

Lark Cummings ([he/him] Eastern Washington University)

***Violence, Structure, and Agency in Labor Market Segmentation Among Mexican Migrant Farmworkers***

Medical anthropologists have long used the concept of structural violence to investigate the suffering of marginalized groups. Following Paul Farmer (1999, 2004), anthropologists such as Nancy Scheper-Hughes (1992), Philippe Bourgois (2001, as well as Bourgois and Scheper-Hughes 2003) and Seth Holmes (2012) have critically analyzed the ways that unfair political economic structures create injury and illness with comparable effects to a gunshot or a stab wound. This research has expanded beyond the concept of structural violence to include a whole spectrum, or violence continuum. As productive as this research has been, it has primarily emphasized patterns of violence that move downwards from social structure, thus leading to an overly deterministic approach that conceals the role of agency. This paper uses the case of the migrant farmworker experience in labor markets to advocate for a renewed analysis of the violence continuum that appreciates the role of violent practices in the production of structure, as well as vice versa, in a process of mutual causality that has not been emphasized. This concept of violence is first outlined in detail, and subsequently explored through examination of labor market segmentation among migrant farmworkers in the United States adding to the work already done by medical anthropologists using the traditional version of the violence continuum paradigm (Holmes 2012).

Chloe Dame ([she/her] University of Idaho)

***A Look at Donald Crabtree's Influence on Archaeology Through his Correspondence***

Donald Crabtree, a famed, self-educated flintknapper and experimental archaeologist, intensely influenced the field of archaeology through many avenues including frequent flintknapping demonstrations, friendly correspondence with enthusiasts, other archaeologists, and flintknappers, a lithic technology field school, constant research and more. To understand Crabtree's impact on the archaeology field, this paper details the work of Crabtree's mentee and fellow archaeologist Emma Lou Davis through their correspondence. After attending Crabtree's lithic technology field school, Davis and Crabtree formed a professional relationship. Davis sought archaeological advice on her own research and partnership on future Paleoindian projects. Eventually their professional relationship developed into a true friendship. This was not an uncommon story as many of Crabtree's correspondents included other archaeologists who went on to have prolific careers. Such relationships provided a road to share knowledge and advice, drew more academic interest to the field, encouraged deeper research, and fueled an appreciation for archaeology and flintknapping.

William Damitio, MA (Washington State University), Kim DiCenzo, Shannon Tushingam, Mario Zimmermann, Sam Neunzig, Anna Berim, and David Gang

***New Evidence of Ancient Tobacco Use from Two Upper Skagit Valley Sites***

Analysis of residues from ancient stone smoking pipes have provided evidence of the past use of a variety of plants in both the Interior and Coastal Northwest. Reconstructing the temporal and geographic

distribution of the use of native tobacco species (*Nicotiana* sp.) has been of particular interest due to the plants' importance to the Indigenous peoples of the region. Previous research has demonstrated ancient Indigenous tobacco use as far north the central Columbia Plateau, while pipes tested from nearer the coast have consistently tested negative for tobacco. In this paper, we present the results of chemical residue analyses of fragments of two pipes from pre-Contact sites in the Upper Skagit Valley. Nicotine, an alkaloid produced by all tobaccos, was detected in residues extracted from both fragments, strongly suggesting that the pipes were used to smoke tobacco prior to their deposition. Metabolomic analysis has not yet been able to provide a species-level identification, however, research on these specimens is ongoing. We are particularly interested in characterizing additional smoke plants and additives to tobacco-based smoking mixtures as suggested by the region's ethnographic and ethnohistoric record. The newly confirmed nicotine positives push the earliest archaeological evidence of ancient Indigenous tobacco utilization further west and north than we have yet seen and is the first such evidence within the Cascade Range. These data contribute to a developing picture of a long term and widespread relationship between the Indigenous peoples of the Northwest and tobacco.

Bryce Danner, MA (Bureau of Land Management, Northwest Oregon District)

***A Review of Precontact Sites on Northwest Oregon Bureau of Land Management, Following the 2020 Labor Day Fires***

The temperate forests of the western Cascades are some of the most difficult landscapes to identify archaeology sites in the Pacific Northwest. Although devastating, the 2020 Labor Day fires gave a unique chance for Northwest Oregon Bureau of Land Management archaeologists to perform surveys in the Cascades with visibilities considered more typical in the desert. In 2021, surveys were undertaken to make way for several timber salvage harvests across much of the district. During one of the post-fire surveys, along the Molalla River, Oregon, we documented a site, consisting of several leaf shaped projectiles with use-damage, as well as multiple other tools that are consistent with Early Archaic (8,000-6,000 years B.P.) assemblages. While research is ongoing, this site appears to represent hunting locations, with people utilizing the diverse landscape to constrict and kill large game. This presentation will discuss the post-fire surveys and explore the preliminary research for this and other sites.

David Davis ([he/him] Central Washington University) and Patrick T. McCutcheon, PhD ([he/him] Central Washington University)

***Discussion of the Analytical Contribution of 1/8-inch (0.32 Centimeter) Lithic Debitage at the Sunrise Ridge Borrow Pit Site (45PI408), Mt. Rainier National Park, Washington***

The unknown potential for information via attribute analysis of 1/8-inch (0.32) cm mesh-sized lithic debitage from a high-elevation site with a lithic assemblage that consists of mainly debitage is largely missing from the programmatic literature. The Sunrise Ridge Borrow Pit Site (45PI408), located on the slopes of Mount Rainier, WA provides the ideal opportunity to evaluate the analytical contribution of 1/8-inch mesh-sized lithic artifacts in relation to  $\geq 1/4$ -inch ( $\geq 0.63$  cm) mesh-sized lithic artifacts in a mountain environment. The results of the attribute analysis of all 0.32 cm mesh-sized lithic debitage ( $n = 9,086$ ) were combined with and compared to the results of the analysis of just the  $\geq 0.63$  cm ( $n = 3,672$ ) mesh-sized lithics at 45PI408. Data resampling was employed to investigate specific instances of change in sample representativeness. As predicted by the programmatic literature, results include increases in pressure flake platform type, obsidian raw material type, and terminal reduction class type. The combined lithic size class sample changed certain descriptions and places researchers on more solid statistical and interpretative ground. Results support previous site interpretations and are consistent with expectations set forth in regional land use models.

Megan Denis, MA, PhD Student ([she/her] University of Montana)

***Uncovering Cooperation in Housepit 54, Bridge River, British Columbia***

There is a significant amount of literature regarding the theory of cooperation, as well as ethnographies and data from modern populations that clearly show cooperation, yet it is difficult to tease that

information out of the archaeological record. My dissertation will focus on Bridge River's Housepit 54 in British Columbia, Canada. Times of fluctuating resource availability should result in the inhabitants of the house utilizing different approaches to social organization. By examining different measures of wealth and privatization, it may be possible to determine the level and mechanisms of cooperation the ancestors of the modern St'át'imc Nation engaged in at different times in the village's history. If successful, this method could be used in other areas of the world to similarly determine when cooperation was a beneficial strategy and which mechanism was the most useful.

Colby Dragon ([she/her] Whitman College)

***"It's always 1855 here": Experiencing the Past at Fort Nisqually Living History Museum***

Stories about the past are rooted in time and place. Living history is a type of immersive storytelling that affirms history's groundedness in time and place by offering a chance to imagine and experience what life would have been like in the past. Based on interviews and ethnographic fieldwork conducted at Fort Nisqually Living History Museum (FNLHM), a reconstructed nineteenth century Hudson's Bay Company trading outpost, this project examines how living history interpreters portray historic lifeways, rendering the past more intelligible to themselves and to others. Drawing on anthropological theories of performance, embodiment, and placemaking, living history is revealed to be a cultural performance of embodied placemaking. Living history creates embodied, historical places out of our modern landscape through an immersive trifecta of the built environment, movements of interpretation, and sensorial experiences.

Emma Dubois, BA ([she/her/hers] Equinox Research and Consulting International Inc.)

***Results of Pedestrian Survey at Equality Colony (1897-1907) Near Bow, Skagit County, Washington***

Founded in 1897, Equality Colony was intended to promote socialism as an ideal economic model and to provide its members the opportunity to live in a community that acted as an exemplar of those values. Since the colony's dissolution in 1907 the land has been used for farming, gravel extraction, and residential development. While the approximate location of the community is known, there are no standing structures to indicate a more precise location. This poster presents the archaeological survey results of four properties near Bow, Washington that were once part of Equality Colony. The project goals were to locate physical remains within the colony's estimated boundary, determine the artifacts' ages, and explore their potential relationships to Equality. About 11.3 acres were surveyed and 15 diagnostic artifacts were observed and mapped. Some artifacts, such as ox shoes, are especially likely to be associated with Equality Colony.

Alysha Edwards, Graduate Student ([she/her] University of Montana)

***Issues in Culture Heritage Studies and Anthropology: Reflecting on the Challenges Posed by the 'Inconvenient Indian'***

In present day cultural heritage studies (anthropology), we can recognize the progress made towards meaningful and ethical research through inclusive relationships in academia with communities that traditionally, would be the subject of research in anthropology and archaeology. Recognizing this, while my experience in academia is limited, here I offer observations and critiques to what are considered 'issues in cultural heritage studies'. Here it can be argued, the issue is within anthropology- as a discipline struggling to move beyond traditional styles of academic research, where the Aboriginal desire for representation and consultation has challenged and continues to challenge what is or was considered the study of culture. Here, I discuss political and theoretical issues relevant to heritage ownership, representation, Indigenous knowledges, the 'crisis of accumulation', and the growing development of Indigenous studies and the implications for anthropology.

Meaghan Efford, MA ([she/her] University of British Columbia, Institute for the Oceans and Fisheries)

***Salmon in Tsleil-Wat: an application of ZooMS on archaeological salmonid remains from t̓əmt̓əmíxʷt̓ən (Tum-tumay-whueton)***

Salmon have been some of the most important populations of interest to Tsleil-Waututh communities for millennia, for food, ceremony, and community. The Inlet is an important spawning habitat of chum salmon (*Oncorhynchus keta*) and chinook salmon (*Oncorhynchus tshawytscha*), and archaeological and ecological evidence demonstrates that chum could be found in abundance in the Inlet until recently. This paper reports a new analysis of salmon remains from Tsleil-Wat in Tsleil-Waututh Nation, now also known as Burrard Inlet in British Columbia, Canada. The remains come from excavations performed in the 1970s and 80s at t̓əmt̓əmíxʷt̓ən (Tum-tumay-whueton), an important village site for the Nation. Using ZooMS (Zooarchaeology by Mass Spectrometry), we unpack which species were not only preferred by t̓əmt̓əmíxʷt̓ən residents but also stewarded by them over millennia. The consistent overrepresentation of chum compared to other salmonids in the archaeological record at t̓əmt̓əmíxʷt̓ən through the years illustrates the intentional and sustainable harvest of a species that has a lower fat content (improving preservation by smoking) and less pressure from other predators, including killer whales. Archaeological, ecological, and Tsleil-Waututh sciences come together to tell the story of salmon in Tsleil-Wat from before European contact and the following colonization of the area starting in approximately 1792 CE. This work is performed at the direction of and with permission from Tsleil-Waututh Nation through their Cumulative Effects Monitoring Initiative.

Justin Eichelberger, PhD (National Park Service, Lake Roosevelt National Recreation Area)

***Material Expressions of Social, Cultural and Economic Values Amongst 19th Century U.S. Army Commissioned Officers: Examples from Fort Yamhill and Fort Hoskins, Oregon 1856-1866***

During the 19th century the U.S. Army officer corps was comprised of a collection of highly educated socio-cultural and socio-economic elites. Although individual officers may have held their own individual social, cultural and economic values each officer tended to behave in accordance with a set of shared norms distinctly defined by the socio-cultural and military hierarchies. These shared norms were used to create and maintain a socio-economic class within this military hierarchy that was reflected in their material cultural. This paper examines how commissioned officers and their families used this material cultural to express and reinforce these values at Fort Yamhill and Fort Hoskins, two mid-19th century U.S. Army posts in Western Oregon.

Jacen Ellis ([he/him] Eastern Oregon University)

***Interdisciplinary Research; Researching the Woodward Mammoth***

This presentation will explore the benefits and limitations of interdisciplinary research between anthropology/archeology and physical science professions, such as chemistry, through discussion of research on the Woodward Mammoth. In addition, there will also be provided a range of generalized data and minor interdisciplinary research into the Woodward Mammoth, which was donated to Eastern Oregon University in 2019. The research project discussed in this presentation entails strontium analysis and determining whether it can be measured within the tusk of the Woodward Mammoth, as well as identifying if there is a large enough difference of the strontium ratio between the tusk and the soil surrounding it. With this research being multidisciplinary in nature, it was relevant to consider what the differences and similarities are between such interdisciplinary research and other more monodisciplinary research. Especially when dealing with a myriad of different ideas, theories, and themes pertaining to whichever specific research structure is being conducted. Specifically, the relationship between chemistry and archeology/anthropology is the most relevant in evaluation.

Allison Fashing ([she/her] University of Idaho)

***Creating Digital Accessibility of the Donald Crabtree Collection***

After being hidden for decades, the Donald E. Crabtree Comparative Collection has finally received its time to shine. In May 2021, the University of Idaho Library and the Alfred W. Bowers Laboratory of



Anthropology were awarded one of the Council on Library and Information Resources (CLIR) grants for Digitizing Hidden Special Collections & Archives. This project includes the 2D and 3D digitization of artifacts associated with the life of Crabtree, who was born and raised in Southern Idaho and became fascinated by stone tools very early on in his life. From a young age, Crabtree began attempting to recreate what he saw and never stopped, creating and experimenting with flintknapping until he died in 1980. At the end of the grant term in 2023, a website hosted by the U of I Library's Center for Digital Initiatives and Learning (CDIL) will give visitors a chance to have a "Virtual Lithics Lab" experience with this collection, look into the life of Donald E. Crabtree, and engage with the questions and challenges associated with flintknappers appropriating the knowledge, skills, and techniques of Native and Indigenous people.

Kimberli Fitzgerald (City of Salem)

***Searching for Salem's Early Chinese Community***

Did Salem, Oregon, have a Chinatown during the late 1800s? A local advisory committee made up of local historians and key stakeholders including representatives from the Chinese Consolidated Benevolent Association, the Hoy Yin Association, Friends of the Salem Pioneer Cemetery, Willamette University, and members of Salem's Chinese community completed a three-year investigation to answer to this question. We not only discovered that Salem did in fact have a Chinatown, represented for many years by community leader George Lai Sun, our archaeological team uncovered a funerary table in Salem's Pioneer Cemetery, one of the only physical remnants of the early Chinese Community in Salem. The project committee then worked with Salem's Chinese community to reinstate the funerary table's use in the Qingming festival. Through the outreach associated with this project and the renewed celebration of the Qingming festival, many of Salem's Chinese-American citizens have found a way to meaningfully connect to the long history of Chinese people in Salem.

Tiffany J. Fulkerson (Washington State University), John C. Blong (Washington State University), Molly Carney (Washington State University), Tiffany Kite (Washington State University), and Shannon Tushingham (Washington State University)

***Assessing the Taxonomic Value of Camas Microfossils and their Potential to Inform the Archaeological Record of Western North America***

Archaeologists in western North America have often relied on indirect evidence for geophyte ("root") use (e.g., earth ovens, groundstone tools) to construct sequences of resource intensification and support hypotheses about the relationships between central place storage, sedentism, and population growth. Far fewer have attempted to use direct microbotanical data to explore these dynamics, despite the capacity for plant microfossils to illuminate key aspects of diet and human-plant interactions that may otherwise not be visible in the archaeological record. In the Northwest, camas (*Camassia quamash*) is widely regarded as one of the most highly valued and nutritious foods and figures prominently into Late Holocene settlement-subsistence models, yet very little is known about the geophyte on a microscopic level and its capacity to be identified through microfossils. In this presentation, we describe our work towards understanding the microfossils that are produced by camas and the diagnostic potential of starch grains, phytoliths, and calcium oxalate crystals for identifying camas in the archaeological record, which could contribute to a more comprehensive and multiscalar understanding of human-camas relationships through time. We conclude by discussing the critical importance of community collaboration and Traditional Ecological Knowledge for informing archaeological and paleoethnobotanical work, as well as the capacity for paleoethnobotanical research to contribute to current-day health and food safety and security programs and conservation efforts.

Amanda Gardner (NWMAC; AHS) and Brian Buchanan, PhD (Eastern Washington University)

***Fort, Camp, and College: Exploring the Cultural Heritage of Fort George Wright at the Mukogawa US Campus, Spokane, WA***

In the spring of 2021, Eastern Washington University began a multi-year investigation of Fort George Wright at the Mukogawa US Campus. It was founded in the late 19th century as a regimental headquarters and named after George Wright, a notorious military leader that committed numerous atrocities against native peoples of the region in the late 1850s. Unlike earlier forts in the region, Fort Wright's elegant neo-Georgian buildings and formalized landscape reflects the changing nature of the military and the region by the 20th century. The site operated, at various times, as a fort, a jail, a center for the CCC, a convalescent center during WWII, and a location of higher education. These diverse functions left a lasting imprint on the physical nature of the fort and the social fabric of the Inland Northwest. This paper presents how the archaeological remains at the fort reflect the complex history of the region.

Eric Gleason, BA ([he/him] Friends of The Dalles Chinatown)

***Once Again Revisiting the Chelan Falls, Washington Chinese Store and the Alleged 1875 Massacre of Chinese Miners***

Scattered historical sources tell the story of an early Chinese Store and small rural Chinese community located on the left bank of the Columbia River opposite the mouth of the Chelan River, a site now covered by waters impounded behind the Rocky Reach Dam. A single newspaper report from 1892 tells of an 1875 massacre of numerous Chinese miners at their nearby placer mines by several local bands of Native Americans. In this paper we attempt to add clarity to the story of the store and the massacre.

Nancy Gonlin, PhD, RPA ([she/her] Bellevue College)

***Archaeology's Evolution at Bellevue College, Washington***

Archaeology as a science is relatively new, yet profound changes, especially within the past few decades, have occurred within this field of anthropology that has been traditionally a white Eurocentric male pursuit. For the first time in its history, there are higher numbers of women archaeologists than men and diversity across the board has increased, as registered by the Society for American Archaeology. Some of the changes are due to legislation, such as NAGPRA, while other shifts are seen in the social sciences in general. Research agendas are becoming decolonized and now oriented to include descendant communities and other interested parties. Pedagogy goes beyond methodological, descriptive, and sensational finds to consider activism, environmentalism, and social justice. At Bellevue College, expanded offerings on the indigenous heritage of the Americas as well as a course which considers the impact of our species from a global evolutionary perspective align well with the institution's mission of diversity and sustainability. Advances in technology permit students to actively engage on a tactile level through the 3D printing of artifacts; sophisticated computer programs have facilitated visualization of remains; communications allow students to see professionals in the field; and archaeoacoustics enhance the entire sensory experience. Disappearing modern nights stand in stark contrast to dark nights of the past, another dimension that is incorporated into the college's archaeology offerings. The evolution of archaeology on an international basis is reflected in the microcosm of Bellevue College, Washington.

Emilia Gonzalez-Clements (Milwaukie Historical Society) and Stella Tompkins, BA ([she/her] Partners for the Common Good)

***The Role of Women in Modern Milwaukie History 1950-2015***

The Milwaukie Historical Society (Oregon) identified a gap in the archives concerning women and their contributions to the town and its environs from 1950 to the present. This paper presents the findings from a research project centered on women identified by the society board. Oral history interviews were conducted for three distinct purposes: 1) gather historic information about the community, 2) identify collaborators' personal and professional contributions, and 3) collect perspectives and suggestions on the Milwaukie Historical Society and Milwaukie Museum. Of the 18 potential collaborators, 12 agreed to

participate. Two elder women were identified as "heritage-keepers" because of their deep roots in the town and their long-term volunteering in both the society and museum. The rest were selected as "movers-and-shakers" because of their public participation in the life of the community. Project deliverables included a book, archival materials for future researchers, data for a museum display, and a Women's History Timeline to be coordinated with the official Milwaukie Historical Timeline on the town's website. The impacts of these women's contributions are highlighted.

Steven Hackenberger, PhD ([he] Central Washington University)

***Legacy Archaeological Collection Studies, Hells Canyon and Yakima Uplands: Symposium Introduction***

Faculty, research affiliates, and students continue to collaborate on curation and study of legacy archaeological collections. In the symposium we share updates on the Tryon Creek Site, Hells Canyon (35WW288). This symposium introduction shares an overview and history of excavations lead by Frank Leonhardy (University of Idaho) in Hells Canyon and excavations of the Sanders Site (45KT315) by William Smith (Central Washington University). Numerous undergraduate and graduate research projects have been completed on both collections, and other collections housed at CWU. Drs. McCutcheon and Lubinski have supervised many of the collection projects. My concentration has been on Tryon Creek where I collaborated with Dr. Leonhardy, and on the Sanders Site where I have completed follow-on studies with Dr. Smith. Active study and management of these collections, supported by agencies and tribal cultural resource programs, are vital for our discipline and Native American cultural heritage.

Sarah T. Hamman, PhD ([she/her] Ecostudies Institute), William Thoms ([he/him] Confederated Tribes of the Chehalis Reservation), and Joyce LeCompte, PhD ([she/her] Camassia Resource Stewardship)

***Growing the Camas Collaborative: Restoring camas prairies to support indigenous communities throughout western Washington***

Over the past 200 years camas prairie cultural ecosystems and the Indigenous stewardship practices that maintained them have been severely disrupted, due to initial Euro-American colonization and ongoing settler colonialism. This has resulted in the alienation of Tribal communities from the camas prairies, the invasion of non-native species, the expansion of intensive agricultural production, and land conversion related to urban development. It is estimated that just three percent of the historic camas prairie ecosystems remain today. The fragmented prairies and woodlands that do remain exist within a patchwork of private and public land ownership, making access for Tribal stewardship difficult, if not impossible. The Camas Collaborative was formed in 2018 by a transdisciplinary group of ecologists, educators, anthropologists, archaeologists, historians, ethnobotanists, and conservationists from academic, Tribal, non-profit and government agencies to identify the primary challenges to both harvesting camas and integrating Tribal priorities and practices into prairie management. Over the past four years we have held two collaborative workshops to learn about barriers to harvest and stewardship of camas prairies and hosted 10 camas harvesting days on public lands with over 150 attendees. In partnership with the Chehalis Tribe, we supported a Tribal restoration crew and worked with Tribal members to return fire and native seed to Chehalis Tribal lands. This work inspires us to rethink our understanding of historic and current human relationships with camas prairies and support active Indigenous stewardship of the important cultural resources that exist there.

Don Hann ([he/him] Oregon Chinese Diaspora Project, Malheur National Forest [retired])

***The Churn: Overlapping Asian Diasporic Communities in Oregon's Blue Mountains at the Dawn of the 20th Century***

Chinese born emigrants engaged in placer gold mining were a significant percentage of the population in Grant County, Oregon in the late 19th century. By the first decades of the 20th century they made up a much lower percentage of the population, but small Chinese companies and numerous individuals persisted. In 1907 the first documented Japanese railroad workers entered the county as employees of the Sumpter Valley Railroad. They prospered working for the railroad and associated timber companies until

the backlash against Japanese Americans that occurred during the second World War. The skills and labor provided by Chinese and Japanese emigrants were critical to the success of the mining and timber industries, which were the largest employers and economic drivers in eastern Oregon. The differing strategies employed by Chinese and Japanese emigrants to navigate the challenging, and often hostile, social and legal environment of the United States in the early 20th century will be discussed.

Cynthia Hannold, MA ([she/her] The University of Alabama)

***Maintaining Identity in the Columbia Plateau through the Production of Lithics***

With a few notable exceptions, lithic studies have focused broadly on artifact typologies and methods for manufacture and use while neglecting analysis about the individuals and groups who produced and utilized them. Great work has been done over the past fifty years in Columbia Plateau archaeology, yet much of this archaeology continues to be tied to functionalist perspectives. Using a 2019 dataset from my analysis of net sinkers at sites along the Lower Snake and Clearwater rivers as well as several archaeological experiments performed to identify manufacturing techniques for notched, perforated, and grooved stone sinkers, I look at ways in which identity may have been created and maintained through the manufacturing processes of these tool types. Further, I identify some theoretical frameworks employed in other regions to interpret lithic, and subsequent social, production and reproduction. This approach highlights human-centered methods of analysis that can significantly contribute to our understanding of past life in the Columbia Plateau.

David-Paul Hedberg, MA ([he/his] Outdoor History Consulting) and Mike Boero (USFS, Descutes National Forest)

***Reinterpreting Indigenous Contributions to the 1855 Pacific Railroad Survey at One of Oregon's Newest Heritage Trees.***

An early scientific survey in the Pacific Northwest, the U.S. Pacific Railroad Survey of 1855 not only charted the feasibility of railroad routes over Oregon's Cascade mountains but also cataloged the geology, flora, fauna and interactions with Indigenous peoples of the region. The expedition and its official report furthered the United States' pursuit of empire and conquest of the west and led to an exaggerated characterization of the American scientists as conquering heroes. Like most of these euro-american expeditions, Indigenous people offered critical information, hospitality, goods, and services to the explorers. Seldom are these Indigenous people credited or named— both in official reports and in historical interpretations. However, a growing body of ethnohistorical scholarship aims to recenter Indigenous contributions to these expeditions by offering a critical reading of the information in these historical scientific reports and crafting a contextualized interpretation with archeological and ethnographic sources.

In 2021 the Oregon Heritage Tree Program, in cooperation with the U.S. Forest Service, listed a Ponderosa Pine that was blazed by one of the members of the 1855 expedition in its registry. Seeking a fuller historical interpretation of the expedition, and the tree, a careful analysis of historical documents revealed multiple unnamed Indigenous people that guided the expedition through the Cascades and along pre existing Indigenous trails. Through an official plaque at the tree and a short documentary film, a reinterpretation of the expedition and the tree reveals this deeper history to the public.

Jaime Holthuysen, PhD ([she/her] Bellevue College)

***Diversity as Concept and Practice: Reflections on the Teaching of Anthropology***

For over half a century, the Anthropology Department at Bellevue College has educated students on various cultures, languages, past civilizations, and our shared human history. The greater Seattle area, in particular the “Eastside,” where the college resides, has undergone tremendous change. From the post-war boom to the surge in the tech industry, the influx of residents reflects an increasingly globalized world. The current student population demonstrates a diverse makeup in terms of race/ethnicity, and over 6% of students are international students coming from 57 countries outside of the United States. Our students bring their unique experiences and perspectives, and these contributions in turn shape our campus. As one

of the primary goals of anthropology is to demonstrate the value and necessity of diversity, our discipline is perfectly positioned to create a meaningful and reflexive experience, to have students think critically about the world that surrounds them. Essential questions are: how can we truly incorporate concepts of diversity in teaching pedagogy and practice, while also making anthropology relevant to students' everyday lives? These central themes will be discussed using case studies of two popular cultural anthropology courses at Bellevue College: American Life and Culture, and Food, Drink and Culture. Insights from an educator perspective, incorporating student experience and feedback, inform an examination of how Bellevue College's Anthropology Department has grown ideologically and pedagogically in tandem with a changing student population.

Katharine Hunt, PhD ([she/her] Bellevue College)

***Project-Based Learning of Linguistics at Bellevue College, WA***

The Anthropology Department at Bellevue College, unlike departments at many community colleges, has offered a class in linguistics for several years. The course has evolved over time from having a primary focus on structural linguistics to instead having a greater emphasis on cultural and social aspects of language. This change in focus has resulted in the course attracting more students and students from a wider range of majors. The majority of those enrolled will not be majoring in anthropology or linguistics, and are taking the course to fulfill a humanities or social science requirement. However, many are attracted to this particular class because of their own language experiences. Typically more than 50% of students in the course are bilingual, come from bilingual families, or have partners whose families are bilingual. Integrating an individual research project into the course has proved to be a successful strategy for ensuring that the course engages these students while also meeting the needs of anthropology majors. Students with bilingual backgrounds typically choose to incorporate their own linguistic experiences into the project, as they survey or interview family members and friends about topics such as code-switching, language loss, linguistic identity, and family dynamics around language use. The projects allow students to reflect on and validate their personal experiences with language and connect their research findings with course themes.

JayCee Iannelli (University of Idaho)

***Moscow High School: An Idaho Ceramics Analysis***

Moscow High School is a community institution with a well-known history and (semi) monumental buildings. Lost are the lives of the people who occupied the high school grounds before the current high school's existence. Before the current building was constructed there were at least eight houses that stood on what is today the Moscow High School grounds. These homes' material remains have been buried beneath the current high school grounds. Archaeologists tested in the vicinity of five of those structures revealing a series of surprisingly complex site formation processes as well as recovering a considerable domestic assemblage associated with the late 19th to early 20th century residents.

Mary James (University of Idaho)

***Camassia Nursery Protocol***

*Camassia quamash* also known as common camas, is a Native bulb culturally significant to many Indigenous Peoples of the northwestern United States. Camas is one of many traditional first foods and to many Indigenous Peoples camas is not just a plant, but a relative. Camas reconnects the relationship of cultural heritage and thus allows for the restoration of Indigenous People mentally, emotionally, physically and spiritually through traditional ecological knowledge (TEK). Camas is not only culturally significant, but also ecologically significant, as it plays a role significant in the ecosystem. Camas ecosystems have deteriorated over many decades due to the introduction and expansion of agricultural practices on Native prairies in the Inland Northwest. Extreme events such as climate change, wildfire, pollution, and erosion also contribute to the further decline of these important ecosystems. Restoration of these depleted lands is needed to protect this sacred relative. This study is examining how the length of time camas bulbs stay in cold storage during dormancy, affect bulb development the following growing

season. Through this research, I am working to create a camas growing protocol to aid nursery propagation of common camas and assist with accelerating restoration across thousands of acres in the Northwest. When completed, it will be distributed to Indigenous Native plant nurseries that can be used towards efforts in camas restoration.

Marlene Jampolsky ([she/hers] Museum of Natural and Cultural History, University of Oregon), Chris Ruiz ([he/him] Museum of Natural and Cultural History, University of Oregon), and John C. Krier ([he/him] Museum of Natural and Cultural History, University of Oregon)

***Longevity The Archaeology of a Chinese Gift Store and Restaurant in Eugene, Oregon's, Market District***

Recent construction in downtown Eugene revealed Chinese ceramics associated with a Chinese restaurant and gift shop, operated by Wing Kee Westfall and Marie Westfall from about 1912 to 1928. In local newspaper advertisements and articles, the couple appears to have successfully marketed their businesses to a largely Euro-American clientele. American consumers began to embrace exoticized Asian goods and food during the nineteenth century, practicing a form of orientalism. Conversely the American public rejected many Asian immigrants, enacting restrictive Chinese exclusion laws, codified in the 19th and early 20th century. Notably, merchants were often the only group of Chinese immigrants that were continued to be allowed into the country. The Westfalls appear to have created two thriving businesses in a community that was almost exclusively Euro-American. In addition, Marie Westfall's story illustrates the changing roles of Chinese women in the United States and abroad.

Stephen Todd Jankowski, MS (Willamette National Forest)

***Cultural Histories & Culturally Modified Trees of the Youngs Rock Rigdon Project, Middle Fork Ranger District, Willamette National Forest***

A cultural resource inventory was conducted on 6700 acres for the proposed Youngs Rock Rigdon Project EIS, Middle Fork Ranger District, Willamette National Forest. In total, 4,903 acres completed where the vast majority of new sites and site addenda are comprised of archaeological features. More specifically, 80 new culturally modified trees (CMTs) were identified. In review of these, 54 CMTs are identified as from the pre-contact era and 26 are identified from the historic era. Also, 136 new rock features were identified being primarily from the pre-contact era and appear to be related to indigenous occupation, activities, or traditions. Lastly, six new lithic scatters and two historic era sites were identified. This presentation focuses on CMTs located from survey results.

Katie Johnson ([she/her] Southern Oregon University Laboratory of Anthropology)

***The Bones About It: An Analysis of the Dalles Chinatown Faunal Assemblage***

The 1880s Wing Hong Hai Company store marks the last remaining building from The Dalles Chinatown. Excavations at the site recovered over 20,000 artifacts related to the site's history as a Chinese laundry, merchandise store, and residence. The analysis of the faunal materials from the site provided rich information related to the daily lives of the men who lived and worked at the site, allowing researchers to enter into broader discussions of what it was to be a Chinese American in late 19th century Oregon.

Linda Johnson (Reed College)

***Marielle Is Present: Living and Dreaming through Death in Brazil***

Following her assassination, Marielle Franco rose to martyrdom for many Afro-Brazilian women who aligned themselves with several of the identities she represented as a councilwoman in Rio de Janeiro—mother, queer, Black, favelada, woman. The struggle for representation undertaken by Franco herself and the women she inspired challenged the state's symbolic power and encouraged community involvement. In place of focusing on the violent act of her assassination and anchoring the argument on the rallying power of the violence committed against her, this paper focuses on her convictions and the actions she took which created lasting bonds with other feminist activists. Rather than let these bonds be dissolved by

death and the damaging narratives into which it can be integrated, the environments Black feminists create to preserve and respect the connections they have made to Marielle are explored through digital ethnography and first-hand captured images of spaces erected in her memory. In particular, the occupation of a city stairwell with radical Black feminist street art will be documented with research conducted through January 2022. The occupiers' graffiti questions the authority of the government in Black spaces and talks of revolution. Despite the city government's consistent attempts to reclaim the space, the activists assert two essential truths: Marielle is still present and they will not be silenced. Does their destabilization of state narratives constitute a project of decolonization? What would such a project look like for sub-citizens marked with death?

Royce Johnson (Boise State University)

***Use of a Species Distribution Model to Examine Camas in Southern Idaho***

Camas (*Camassia quamash*) is well documented as a traditional food source throughout the Northwest United States and Canada. Research on the Northwest Coast has provided a vast amount of literature about the importance of camas as a traditional food source and the potential for impressive rates of return. This research on the Northwest Coast has been used as an analogue to talk about the use of camas in Southern Idaho. However, differences exist in the environment and the foraging patterns between these two areas. This paper examines those differences and how they can affect the productivity and use of camas. These differences demonstrate a need for a more critical evaluation when looking at the use of camas in Southern Idaho during prehistory.

Nicholas Kager [he/him/they/them]

***Skinwalker***

Since time immemorial, my people have walked these lands. "Schint" means human being in snchitsu'umshtsn, Coeur d'Alene language. "Schitsu'umsh" means those who are found here. "Coeur d'Alene" means "heart of an awl." "Indians" is the generic Eurocentric term for 500+ individual Indigenous Sovereign Nations. Deemed "domestic dependent nations," with the federal/tribal relationship resembling "that of a ward to his guardian" by this nation's first "chief justice" the problematic John Marshal. We have been called "merciless Indian savages" by President Thomas Jefferson in the lauded document The Declaration of Independence. For the last 500 plus years my people have clung to existence through plagues of disease, invaders, forced religion. My ancestors have stared into the very eye of genocide; my living seed is proof of their will. My ancestors and I come from this land. We can feel its sacred energy and marvel in awe at its ferocity and generosity. We are no strangers to duality. In the wake of colonization, our souls struggle to find balance. I am a Skinwalker, for I walk in both worlds. Because of the ongoing genocide against my people, I was estranged from them since birth. I was raised as a "suyapi," a white person. I am Schint and I am a citizen of the United States. I am Nicholas Robert Kager and I am Schitsu'umsh and a member of the Coeur d'Alene nation. In this paper I will speak on my shifting identity and that of those dearest to me.

J. Ryan Kennedy ([he/him] University of New Orleans) and Brian M. Kemp ([he/him] University of Oklahoma)

***Chinese fishers at Point Alones, David Starr Jordan, and the building of the Smithsonian's Fish Collection***

In 1880, David Starr Jordan led an ambitious U.S. Fish Commission survey of California's coastal fisheries to catalog the fish species and fishing communities found throughout the Pacific Coast. Jordan, a world-renowned ichthyologist and scientific racist, paid particular attention to Chinese fishers, who he blamed for decreasing fishing productivity. However, despite lobbying to curtail Chinese fishing activities, Jordan happily procured specimens from Chinese fishers to build his scientific collections, including specimens now housed in the Smithsonian's Fish Collection. And when promoting Stanford University's newly built Hopkins Seaside Laboratory in Monterey Bay, California, Jordan advertised that a "constant stream of objects of interest comes in from the Chinese fishing camp at Point Alones."

Ongoing zooarchaeological and ancient DNA research focused on the Chinese community at Point Alones now sheds light on the lives of Chinese fishers and their complicated relationships with scientists like Jordan. This paper presents data documenting the diversity of fishes caught by Chinese fishers at Point Alones, including Wolf-eel (*Anarrhichthys ocellatus*), a species never before identified at a California archaeological site. Further, comparison of the species identified at Point Alones and those housed in the Smithsonian's Fish Collection from Jordan's 1880 survey hints at the long-unrecognized yet critical role that Chinese fishers played in building the nation's early scientific collections. Ultimately, this research aims to highlight how Chinese fishers' expert knowledge, gained through years of fishing California's waters, was foundational not only to their economic success but also to scientific understandings of the numerous species they caught.

Sayema Khatun, MS ([she/her] University of Wisconsin, Milwaukee)

***"Bare Life": Policy Response to the Influx of Rohingya in Bangladesh***

After the atrocious military crackdown unleashed in Myanmar on August 25, 2017, 723,000 Rohingya fled to Bangladesh and more than 43,000 Rohingya parents are reportedly lost. UNICEF said the children currently living in the refugee camps witnessed a "hell on earth" during and after the crackdown and aid groups warned of a humanitarian catastrophe in the camps. The UNHCR described the situation as the "world's fastest-growing refugee crisis" and eventually Bangladesh has become the host of one of the largest refugee camp settlements in the world overnight. The unprecedented crisis, followed by a massive humanitarian response Bangladesh had ever experienced after the liberation war of 1971, forced Bangladesh to allow another influx of international aid agencies, UN bodies, and NGOs for emergency humanitarian operation. As Redfield and Bornstein argue, the recurring dramas presented in the international media feature as "humanitarian crises," creates mediated experience of "distant suffering" (Redfield & Bornstein 2011: 4) which activates an extensive complex of interstate entities and nongovernmental organizations (NGOs) seeking to supply aid to the victims, appear to be at play in full scale. Viewing this huge number of death and chronic near-death situations as "Thanatopolitics" Agamben's idea of "bare life" in a "state of exception" appears to be a particularly useful analytical tool for understanding the aftermath of this industrial-scale death. Following Akhil Gupta's take on Agamben (2012: pp.1-25), and Ananya Vajpeyi's expansion of it (2007), I adopt this framework for studying evolving policy through which refugees and relief camps were set and operated jointly in GO-NGO engagement as a humanitarian response. Assuming this might slowly facilitate the restoration of Rohingya's rights as a human subject, I undertake an empirical study to examine it.

Richard Kim, M.Div. ([he/him] Cultures Connecting)

***Framework for Social Justice***

Cultures Connecting's mission is to provide culturally relevant professional development and consulting services to individuals and organizations committed to excellence through equity and social justice. This training includes workshops that will help participants increase awareness of self and others, while expanding their knowledge of common challenges when relating across differences in values, beliefs, attitudes, biases, privileges, stereotypes, communications styles, perspectives, and experiences that may be different than their own. Facilitated conversations in large group and in breakouts with other participants during the workshops will increase everyone's understanding of how the many diverse people participating in the Northwest Anthropology Community understand and experience racism, power, privilege, and oppression. Participants should come away from this training with increased awareness, greater knowledge, and strategies for effectively engaging across cultures. This workshop will help participants explore ways they can take actions to dismantle institutional racism in their places of work and within their individual communities. The Association for Washington Archaeology, who are sponsoring this training, hopes that workshop participants will be inspired to make positive changes to create cultures of respect and to promote justice in their work. Future conversations around race, racism,



diversity, equity, and inclusivity in Washington Archaeology will build off the information provided and obtained during this training workshop.

Katelyn Kitch ([she/her] University of Idaho) and Katrina Eichner, PhD ([she/her] University of Idaho)

***Preliminary Archaeological Research at Fort Sherman, Idaho***

Fort Sherman was a late 19th century military fort established on the ancestral lands of the Coeur d'Alene tribe at hñch'mqinkwe, the largest village in the region. The army's goals in the northern Idaho were to remove indigenous people in order to facilitate American settlement in the West and to protect expanding railroad and telegraph construction along the northern border. The historic remains of the fort are currently located on North Idaho College grounds. Through collaboration with NIC and the CdA tribe, military residences were excavated by the University of Idaho's IPA field school in June 2021. This paper presents the preliminary results of the excavations at the Non-Commissioned Officer's quarters and the Married Men's quarters and focuses on the cross-cultural interactions that took place in the at the fort.

Gréta Kühne ([she/her] University of Idaho)

***College life and archaeology: exploring the trash from a college dormitory***

In 2014 the University of Idaho conducted a brief archaeological project on campus prior to the construction of a new university building. While that project was occurring, campus facilities inadvertently uncovered a small area of trash, deposited some time in the early 20th century. The assemblage consisted primarily of ceramics and glass, noting, in particular, the presence of several patent medicine bottles and Japanese and Chinese porcelains. While the context for recovery was not optimal, the trash was clearly associated with one of the university dorms and represents a small, but interesting piece of student life at the University of Idaho.

Emily LaPlante, Undergraduate Student ([she] Central Washington University) and Steven Hackenberger ([he] Central Washington University)

***Activity Area Analysis for the Sanders Site (45KT315), Yakima Uplands***

The Sanders Site, excavated in the 1970's by Dr. William Smith (CWU) is located on the Yakima Army Training Center (YTC) in Johnson Canyon. The tools, features and associated faunal remains from this site give insight into diet, hunting, food processing, environment, and seasonal use of this area. The heaviest occupations with features and activity areas date to 3000 years ago during the Frenchman Springs Phase, a time period marked by significant changes in climate and food resources. This research builds on prior studies by examining evidence of features and mapping artifacts in the activity area for Block 1504, a roughly 10x10 meter area. By conducting spatial analyses, I want to learn more about the butchering and cooking of specific animals, such as Bighorn. We are also learning about other types of food processing and stone tool making around hearths. These analyses should help us learn more about the beginning of semi-sedentary settlement and connections between river sites and upland base camps. This poster outlines methods and shares research progress on the spatial analyses. Results will also include an ancillary evaluation of excavation sample sizes for this site and similar sites.

Joyce LeCompte, PhD ([she/her] Camassia Resource Stewardship), Todd S. Mitchell ([he/him] Swinomish Indian Tribal Community Department of Environmental Protection), Jen Willup ([she/her] Swinomish Indian Tribal Community Department of Environmental Protection), Dean Dan ([he/him] Swinomish Indian Tribal Community Department of Environmental Protection), and Nicole Casper ([she/her] Swinomish Indian Tribal Community Department of Environmental Protection)

***Coast Salish Native Agriculture: Increasing the Presence of Camas on the Swinomish Reservation***

The Swinomish Department of Environmental Protection (DEP) is committed to the health and welfare of the Swinomish Indian Tribal Community (SITC). A key component of this work is safeguarding access to First Foods for current and future generations. In this presentation, we discuss development and implementation of the DEP's "Generations Camas Management Plan," a holistic approach to increasing access to, and consumption of camas. In 2020 the DEP began planting 36,000 camas bulbs in the

Swinomish agricultural lands to test the viability of camas production in different soil moisture regimes, and the effectiveness of non-toxic treatments to control weeds in the test plots. This cultivation approach is inherently regenerative, and mimics habitats created and maintained through the cultivation practices of ancestral Swinomish. The DEP is also experimenting with culinary methods of camas preservation and preparation to simplify the cooking process and increase its appeal to the modern palate. In 2022 we will expand the project to better understand and plan for the effects of climate change on camas growth and reproduction in the SITC agricultural lands and other camas populations on the reservation.

Jocelyn Lee (Stanford University)

***Small Towns And Mining Camps: An Analysis Of Chinese Diasporic Communities In 19th-Century Oregon***

Chinese Diaspora archaeology has focused historically on urban contexts or in-depth case studies, with minimal comparative studies. To expand such research, this paper will present a multisited analysis in Oregon using archaeological assemblages from the Jacksonville Chinese Quarter and four remote Chinese mining camps, museum material collection from a Chinese store in John Day, and store ledgers written in Chinese and English dating to the late-19th century. By situating the research in the framework of race, this paper seeks to understand the ways that race and racialization impacted market access and affected consumption choices for Chinese immigrants in different classes. Chinese communities had well established organizations in a complex network which contributed to controlling market access as well as serving to protect Chinese immigrants from impacts of racialization. These networks helped Chinese immigrants maintain a connection not only to other Chinese communities, but also to the homeland through various services including transfer of goods and people.

David Lewis (Oregon State University)

***Kalapuyans and Camas***

Camas was a primary food of the Kalapuyans of the Willamette Valley. Beginning in the 1830s settlers began taking land and farming the valley, by 1851 all of the land was claimed by settlers. The farming plowed up camas fields and tribes began to starve. Camas lost its primary status for more than 100 years and native peoples adapted to American lifeways, recently tribal descendants are working to understand the role that camas played in tribal lifeways. Studies are commencing to understand when Camas became prominent, how to prepare the camas, and we are beginning to explore how intentional our people were in spreading the food around our lands. Genetic studies are proposed to begin to understand how related surviving fields are in the region, why camas have different colors in the valley and the role camas may have played in trade, and seasonal encampments.

Natasha Lipsky ([she/her] Central Washington University), Jamie Mickus (Central Washington University), Steven Hackenberger (Central Washington University), Nicole Jastremski (Central Washington University), Patrick McCutcheon (Central Washington University), and Karisa Terry (Central Washington University)

***Greenwood Cemetery, Cle Elum, WA: History, Mapping and Ground Radar***

We are investigating the history of the Greenwood Cemetery, mapping graves, and conducting ground penetrating radar surveys (GPR). The cemetery, near South Cle Elum, was an active burial place from 1903 until 1923 when it was abandoned due to flooding. Some bodies were relocated to the new cemetery which is the Laurel Hill Memorial Park. The graveyard is now officially under the care of the City of Cle Elum and is maintained with the help of the Roslyn Ronald Cle Elum Heritage Club. We are mapping marked and unmarked grave features and trying to distinguish between graves with remains and graves without remains. A photographic record of features and markers has been compiled. Graves will be matched using burial records by name as possible. Several survey grids (20x20 meters) are placed around graves located in clusters between large trees. GPR transect lines are collected for each grid using a pulse EKKO Pro “Smartcart” with 500 MHz transducers. Radar images of features are represented in profile and slice views. Using the data and images we can predict whether burials may be intact or removed. We

are working with the Roslyn Heritage Club, collecting oral history, and will be using genealogy to locate decedents. We are presenting in local high schools and inviting students to dive headfirst into history, archaeology, and careers. Our project is supported by the CWU Dr. Corrine Farrell Merit Scholarship Program.

Jamie Litzkow, MA ([she/her] Bureau of Land Management, Spokane District)

***49ers and 49th: Sociopolitics and the Prospect of Gold in the Boundary Country of Washington Territory and New Caledonia***

The existence of placer gold in the tributaries of the Upper Columbia was generally known among fur traders, naturalists, missionaries, and indigenous peoples well before the boundary country gold rushes of 1858-1859. News of such discoveries, however, was withheld for a myriad of reasons, primary among them was the calculated weaponization of such knowledge as a strategy for the appropriation of native space via westward expansion. The resultant sociopolitical pressures of these gold rushes had devastating effects on Native American and First Nations peoples that reverberates through the present day.

Emma Lowther ([she/her] University of Victoria)

***Soil chemistry and its applications determining historic camas cultivation***

Soil chemistry mapping has a long established history of identifying archaeological sites and is particularly useful when typical archaeological markers—artifacts, house depressions, or midden deposits—may be low or absent. Phosphorous, calcium, and soil pH are all known to be affected by human settlement. Under long-term cultivation archaeological soils also begin to show lasting changes in their physical and chemical attributes, e.g. terra preta in the Amazon basin and plaggic soils in northern Europe. Cultivated camas meadows offer the possibility of applying these methods to test if cultivated fields can be distinguished by their chemical signatures from adjacent uncultivated soil. This research tested physical and chemical properties of soil in a known cultivated camas meadow in Lekwungen territory. The results were not clear cut and indicate the exciting challenges in studying Indigenous landscapes that were designed to enhance—rather than change—the functioning of Northwest Coast ecosystems.

Tim Mace, MA ([he/him] University of Idaho)

***The Donald Crabtree Collection and the University of Idaho***

A lifetime of interest, passion for knowledge, and drive to create, lead to an extraordinary collection. Personal documents, photos, books, and thousands of lithic specimens are now housed at the University of Idaho in care of the Alfred W. Bowers Laboratory of Anthropology. How did this collection come to the University of Idaho? What kind of legacy does this provide for the lab and students at the university?

Mairee MacInnes (University of Idaho)

***Examining the Historical and Archaeological Record at Fort Hoskins and Fort Yamhill***

Between the years 1856 to 1866, the Forts of Hoskins and Yamhill monitored and policed the newly created reservations. As with any bureaucratic institution, a plethora of records were left behind. As historical archaeologists, we rely on both documentary and archaeological evidence to piece together the story of an archaeological site. This work intends to examine how the archaeological and historical records compare and contrast with each other? While originally I was planning to do a case study on clothing at Fort Yamhill and Hoskins, using both digitized historical administrative records and the archaeological data and artifacts, lab closures mean I have not had access to the latter half of the datasets. In some ways, this is perhaps fortunate, because through researching ways around this I discovered that Justin Eichelberger's 2019 Dissertation already addresses many of the subjects I was interested in and has proven an invaluable source of data and information. As such I have turned to more examining how the larger historical and archaeological datasets and sources intersect and relate.

Joanne Mack, PhD (University of Notre Dame), John Fagan, PhD (Archaeological Investigations Northwest), Cam Walker, PhD (University of Oregon Natural History Museum), and Jack Swisher, BA (University of Oregon Natural History Museum)

***A Pilot Study to Determine Protein Residue on Low-Fired Ceramic Sherds***

Using Crossover Immunoelectrophoresis (CIEP) to determine protein residue on a sample of ten Siskiyou Utility Ware sherds, Salmonidae (*Oncorhynchus*) protein residue was found on three of the ten sherds. All ten sherds had been recovered from professionally excavated archaeological sites located along the Upper Klamath and Middle Rogue Rivers in Southwest Oregon. Siskiyou Utility Ware dates to within the last 2000 years within Southwest Oregon (Jackson and Klamath Counties) and north-central California (Siskiyou, Shasta, and Modoc Counties). Additional sherds from north-central California and Southwestern Oregon will be analyzed within the next year.

Kendra Maroney, MA ([she/her] Kalispel Tribe of Indians)

***Engaging Youth in Archaeology and Cultural Resources – Examples from the Kalispel Natural Resources Department***

The Covid-19 pandemic has drastically changed in-person interactions and typical outreach and educational events. The Kalispel Natural Resources Department and Cultural Resources Program strived to stay engaged in education throughout this difficult time and focused on delivering stand-alone content to share with local youth. The goal was to produce materials that integrated the Tribe's Salish language with natural and cultural resources to reflect Kalispel values. Bi-lingual information cards, activity books, and posters were created. These items were distributed to the Kalispel Language Survival School, the Camas Early Learning Center, as well as to the local schools and made digitally available to promote use at home or in the classroom. These efforts are examples of how archaeology, natural resources, language, and culture are connected and shared within a community.

Brinn Marri, BA ([she/her] Western Washington University, Antiquity Consulting) and Jerrica Croft ([she/her] Western Washington University)

***DStretch Analysis of Portable Rock Art: Its Current Uses and an Experimental Application to Stone Artifacts from WWU's Jorgensen Collection***

Due to rock art generally not being a prominent focus of archaeological research in the Pacific Northwest, methods for studying rock art are significantly lacking compared to other regions. For our paper, we chose to research the use of the mobile application DStretch, an image enhancing software, in the study and analysis of rock art in Pacific Northwest archaeology. Through the lens of previous research into both Pacific Northwest rock art (specifically portable rock art) and DStretch itself, we aim to provide a thorough context for future research in the region. We then applied all of this to our own analysis of portable rock art (both known art and potential new finds) from the Jorgensen collection at Western Washington University. Our study concluded that DStretch was quite useful in visualizing etched and/or painted art on stone artifacts. Combining this conclusion with what we have learned about the work others have done with DStretch in the Pacific Northwest, we can conclude that DStretch is a quite useful tool in lab (and field) research on art/decoration on stone artifacts.

Beth Mathews, MA ([she/her] Antiquity Consulting)

***Women Homesteaders of Washington's Channeled Scablands: Summary Statistics and Spatial Patterns for 5 Counties***

Western historians estimate that nearly a quarter of all American homesteaders were women and that most women's homesteading occurred after 1900, shortly before American homesteading was at its peak in the 1910s. An analysis of western Washington homestead records concluded that female sole women comprised only 3.5% of homesteaders, and that homesteading peaked in the late 1880s and sharply declined in 1899. How does this compare to the homesteading history of the Channeled Scablands, where the Homestead Act requirement to farm presented distinctive challenges? This poster presents summary

data of women's homesteading history in Washington's Channeled Scablands and explores the temporal and spatial patterns of women's homesteading history.

Katy Matthews (Nez Perce National Historical Park)

***Restoration Strategies for Propagation of *Camassia quamash* on the Weippe Prairie***

*Camassia quamash* (camas) is a plant that is well-known throughout its native habitat in the Pacific Northwest of the United States, despite the growing decline of its preferred habitat type across the region. This plant requires specific site conditions to ensure a successful growing season. Its habitats, often referred to as camas prairies, were important traditional harvest sites for many Indigenous cultures. In the 19th century federal land policies removed many tribes and first nations from their ancestral homelands and transferred ownership of those lands to early Euro-American settlers. Ultimately, these land uses proved particularly destructive to wetland prairies, including camas prairies. The decline of wetland areas across North America has resulted in significant loss of a habitat type that provides valuable ecosystem functions, while also reducing and degrading culturally significant landscapes. Camas' cultural and ecological significance make it an ideal species to focus on for wetland restoration projects. Weippe Prairie, a well-recognized traditional harvest area used by the Nez Perce people within the Palouse Bioregion, of north-central Idaho, provides an ideal site to both study and restore camas prairie habitat. This study identified site characteristics and evaluated different restoration techniques to aid in creating a restoration protocol that can be used to rehabilitate camas prairies across the Pacific Northwest.

Riza McClurkin ([they/them/theirs] University of Montana Department of Anthropology)

***Analysis of Projectile Point Chronology Through Lithic Typology on the Miller Flats***

The Miller Flats are located in Hinsdale County, south of Lake City, Colorado and have been more or less continuously used for about 10,000 years. In early July of 2019, our team of archaeological field school students did surface surveys of the Miller Flats and identified tips and bases of twenty-two projectile points of various raw materials. We identified points, when possible, based on bifacial flake scarring and general shape while bases specifically were identified by their notches, ears, or stems. I served as lithic illustrator for our group, and I plotted and drew each projectile point specimen we found in the field. Of the twenty-two points we located, and I drew, eight were diagnostic to type, and ranged in age from 9,500 to 200 years old. This paper discusses those projectile points and the archaeological chronology they represent as well as the backgrounds of typology and the arguments as to its usefulness and accuracy.

***Modern Impacts on Traditional Subsistence Hunting in the Canadian Arctic***

The tradition of arctic hunting is long and well documented, as both a means of food and an intrinsic link to culture. However, within the last centuries, that way of life has been threatened, and on many levels. While killing prey animals is the source of Arctic peoples' entire livelihood, many people in western cultures see hunting as either a kind of sport or as murder. Most harmful is the idea that taking any animal life is at best unnecessary, and that the rights of animals trump the rights of arctic communities and their traditions.

Christine McFarlane (Asian American Comparative Collection, University of Idaho)

***Protection of Body and Soul: Inscriptions and Motifs of Chinese Spiritual Items***

The relationship between inscriptions and symbolic meanings appearing on Chinese artifacts and the artifact type on which those inscriptions and symbols appear has been the subject of little study. This research examines four common intentions inscribed and/or symbolized on Chinese objects, "long life," "wealth," "protection from harm," and "general good fortune," to make connections between the objects associated with each of the intentions of spiritual wishes and protection. An investigation of historical and contemporary documents, artifact analysis, and examples from curated collections explores the correlation between Chinese folk religious and mythological symbols and their appearance on amulets, talismans, and personal spiritual items. This research further considers who would have used these

objects, and the change of symbols used over time. It also provides an index of what imagery/phrases are prominent on certain spiritual objects.

Megan McGuinness ([she/her] Great Basin Paleoindian Research Unit, University of Nevada, Reno)

***Calculating Return Rates for Habitats in the Great Basin***

Today, the Great Basin hosts the same habitats that existed during the terminal Pleistocene/early Holocene. Though the distribution and size of these habitats have changed, similar food resources that occur there today would have been available to early people. Researchers have established calculations for important resources; however, analyzing which resources were more favorable to people within these habitats has yet to be done. This paper looks at four habitats—wetlands, riparian zones, lakes, and uplands—and seven food resources found in the Great Basin. Within each habitat, I quantify resources to form an abundance rate or a proxy of caloric return rates multiplied by resource density. Lake habitats have the highest abundance rate based on predictable and abundant food resources available throughout the year. This information offers a way to predict the habitats that people should have initially settled and later expanded into as human populations increased during the terminal Pleistocene/early Holocene.

Tara McLaughlin (Kalispel Tribe)

***Bringing Back the Forgotten: Calispell Valley Archaeological Project***

As the world expands into the digital age, where everything is readily available with the swipe of finger, it only makes sense to move archaeology in the same direction. Numerous collections, like that of the Calispell Valley Archaeological Project (CVAP), have become largely forgotten due to the inaccessibility of information. Bringing attention to zombie sites by implementing digital databases and open source materials provides researchers and students previously unknown information, thus expanding their knowledge and ours. The purpose of digitalization is to make information more readily available to those who need or want to develop upon it. Our purpose as conservationists is to share our knowledge and engage others in collaborative outcomes.

Keith Mendez, MA ([he/him] Hanford Mission Integration Solutions) and Stephanie Simmons, MS, RPA ([she/her] Hanford Mission Integration Solutions)

***Historic Preservation of Locke Island within the Hanford Reach, Benton County, Washington***

Due to unforeseen circumstances, the presentation “Historic Preservation of Locke Island within the Hanford Reach, Benton County, Washington” has been replaced with a general Q & A about cultural resource management at the Hanford Site. The Hanford Site in Benton County, Washington is home to the U.S. Government’s legacy of nuclear fuels production from the Manhattan Project and Cold War and is currently the focus of major environmental cleanup efforts. Keith Mendez and Stephanie Simmons have combined over 20 years of experience working with the Hanford Site Cultural Resources Program. Their experience includes implementing regulatory compliance and historic preservation as contractors to the US Department of Energy. Please submit questions for Keith and Stephanie in the audience chat.

Galen Miller-Atkins, MA, RPA ([he/him] Statistical Research, Inc.)

***Heat-Treatment and Debitage within Hells Canyon: An Exploratory Analysis from Tryon Creek (35WA288)***

Tryon Creek (35WA288) is an ancestral Nez Perce dwelling within present-day Hells Canyon National Recreation Area in northeastern Oregon. The site consists of several household features located on an alluvial terrace 40 meters west of the Snake River. House 2 represents the least impacted and most thoroughly excavated of the pithouse features. House 2 consists of multiple occupation events, ranging from 1600-500 B.P. While some earlier efforts have focused on Tryon Creek’s place within the wider region as well as qualitative spatial analyses of the faunal and lithic components, little research has focused primarily on fully exploring the lithicdebitage within House 2. Previous research has shown that flake attributes such as platform width and thickness may vary with mobility and resource procurement strategies. Here, these attributes are thoroughly explored within one unit of House 2. Special attention is

paid to how the frequency of heat-treatment and flake production cost/benefit may vary by raw material type. Several significant differences are found between levels and occupation events but it remains unknown as to the role post-depositional processes may play.

Slobodan Mitrovic, PhD, RPA (Sauk-Suiattle Indian Tribe)

***Afternoon Creek Rockshelter 45WH698 (Newhalem WA) prehistoric artifacts: a path forward***

The upper Skagit River, as a geographical entity, has been claimed by one Northwest tribe largely on the basis of a single text, without taking notice of other documents. Elements of confirmation bias and circular reasoning were very much at play in the process. These are the same elements that surface in the context of the pivotal ethnography that created the snag in the first place, June Collins's Valley of the Spirits. In her book she had lumped together the (federally) acknowledged entities of Sauk-Suiattle Indian Tribe and Upper Skagit Indian Tribe under one name – Upper Skagit. This generated much confusion.

Collins's view has been influential for over fifty years in the so-called 'gray literature' – numerous cultural resource management reports to state and federal agencies for which the research criteria have a different focus. Her text is the only book-length ethnographic account of the Skagit River drainage, and as such gets freely cited. The most recent case in point is one tribe's exclusive claim to the prehistoric artifacts found close to Seattle City Light facilities in Newhalem, WA.

Collins's major work is also due a more charitable reading, because her book does well as a general survey, covering the major anthropological points of interest through first-hand accounts (household, kinship, language, myth, oral histories, spirituality, subsistence, etc.). The moderate view would be that the undue name-lumping can be easily resolved by regarding the term 'Upper Skagit' as a toponym rather than (exclusively) as an ethnonym.

Emily Modelski, MA ([she/her] Malheur National Forest, Blue Mountain Ranger District)

***Sink or Swim, Archaeology and Aquatic Restoration on the Malheur National Forest***

The Forest Service is a multi-use agency that works to maintain and improve the health, diversity, and productivity of the nation's forests. This requires collaboration with other federal agencies and resource specialists to plan and implement projects on Forest Service managed lands. Sometimes this means protecting archaeological resources through avoidance and sometimes it means mitigation. This poster looks at some of the Aquatic restoration projects on the Malheur National Forest, reinstating floodplain function and resiliency, and how we as archaeologists protect our cultural resources or mitigate for potential effects to Historic Properties. In the past, restoration has included heavy equipment use, tree tipping, removal of sections of railroad grades, and planting riparian plants. While site avoidance is preferable during these projects, it isn't always possible, and mitigation provides an opportunity to meet restoration goals and adhere to the National Register of Historic Places (NHPA) section 106. This includes identifying contributing and non-contributing elements to the NRHP, consulting with the State Historic Preservation Office (SHPO), and allowing removal of non-contributing elements while protecting contributing elements for avoidance. This may also include site testing and/or funding for archaeological research projects on the Forest. The goal of this poster is to provide an example of what working for a federal agency as an archeologist looks like and how we collaborate with other specialists to reach our mutual goals while representing our resources.

Reno Nims, MS ([he/him] University of Auckland; Portland State University)

***The Human Ecodynamics of Northern Māori Fisheries***

Archaeological fishbone assemblages are created by the dynamic interactions between fish stocks and human fishers, both of which are enmeshed in broader, dynamic socioenvironmental contexts that are continually transformed and sustained by people and non-human entities. To understand the archaeological history of fisheries, it is therefore necessary to carefully consider multiple factors that could have influenced the historical trajectories of fish stocks and fishing practices. In this paper I

simultaneously evaluate the roles that climate change, human harvest pressures, and Māori fishing methods played in shaping the Māori fisheries of northern North Island, Aotearoa / New Zealand from the earliest Polynesian arrivals (ca. thirteenth century) to the start of the nineteenth century. Integrating paleoclimate records, fisheries biology, archaeological landscape histories, and archaeological assemblages of fish remains – while carefully controlling for recovery and identification biases where appropriate – demonstrates that Māori fishing practices were much more variable after 1500 cal CE despite the apparent resilience of earlier fishing practices. Weaving all available lines of evidence together ultimately suggests that multiple, historically contingent factors affected the local trajectories of northern Māori fisheries over time.

Eliette Noromalala, MS ([she/her/hers] Primate Behavior and Ecology Program, Central Washington University), A.K. Binder ([she/her] Primate Behavior and Ecology Program, Central Washington University; Department of Biological Sciences, Central Washington University), A.L. Baden ([she/her] Department of Anthropology, The Graduate Center of the City University of New York; The New York Consortium in Evolutionary Primatology; Department of Anthropology, Hunter College of the City University of New York), G.A. Stryker ([she/her] Department of Biological Sciences, Central Washington University), and K.I. Gabriel ([she/her] Primate Behavior and Ecology Program, Central Washington University; Department of Psychology, Central Washington University)

***Factors influencing intestinal parasites in black-and-white ruffed lemurs (*Varecia variegata*) in Mangevo, Ranomafana National Park, Madagascar***

Ecological factors such as feeding behavior and climatic seasonality might influence intestinal parasite infection and patterns in non-human primates. Here, we examined if frugivory levels and climate (i.e., temperature and rainfall) were associated with parasite patterns in black-and-white ruffed lemurs (*Varecia variegata*). Feeding data using 5-min focal sampling, climate data, and fecal samples from *V. variegata* (n=23) at the Mangevo site were collected from March through May 2019. Microscopic examination of fecal flotation and sedimentation were done to identify and count parasites. Nematoda (*Callistoura vauceli*, *Strongyloides* sp.) Ciliophora (*Balatidium* sp.), Coccidia (*Emeria* sp.), and Amoebozoa (*Entamoeba* sp.) were identified in fecal samples with nematodes being the most prevalent. Non-parametric Wilcoxon signed-rank tests revealed significant differences between March and May for percentage of frugivory, parasite species richness, larval nematode counts, *Callistoura vauceli* and *Strongyloides* sp. egg counts, minimum and maximum temperature, and average rainfall ( $W_s \geq 57$ ,  $ps < .05$ ). Spearman correlations conducted on data from March through May revealed that larval nematode counts were negatively correlated with frugivory and with minimum temperature ( $\rho_{hs} = -.346$  and  $-.353$ , respectively,  $ps < .05$ ). *Callistoura vauceli* egg count was negatively correlated with maximum and minimum temperatures ( $\rho_{hs} = -.347$  and  $-.461$ ,  $ps < .05$ ). There was a trend for lower minimum temperatures to be associated with increases in parasite species richness ( $\rho = -.277$ ,  $p = .08$ ). Temperature and frugivory played an important role in parasite infection, particularly larval nematode counts. Currently, we are using Polymerase Chain Reaction to evaluate a full-year period.

Jenn Ogborne, PhD (Historic St. Mary's City)

***Commensality at the Coloma, MT Mining Community***

In the late nineteenth and early twentieth centuries, many companies in the American West specializing in extractive industries provided their employees with housing and boarding arrangements, sometimes for additional fees or as a part of their employment contracts. These provisions were part of larger processes and changing policies associated with managerial capitalism, focusing on the control or the manipulation of laborers' daily lives. The control of the food supply within company towns, its importation and subsequent distribution, created new sets of dependent relationships between the company elite and laborers; not only were workers dependent on their employers for their wages, but also for their basic food needs. These communities can therefore offer interesting perspectives. from which to explore the idea of commensality, the act of coming together to eat. Nuanced exploration of food purchasing records of companies and individuals combined with artifacts excavated in a boardinghouse-related midden



provide the basis to reconstruct commensal groups established in the Coloma mining town in the 1890s and early 1900s. While feasting is often the approach taken when discussing commensality, particularly in the context of labor, the examination of daily commensality offers a different kind of insight into the different permutations of asymmetrical company-employee social relationships that occurred in this period.

Maddie Philips (University of Idaho)

***Examination of Late 18th and Early 19th Century Identity Through Burial at the Silo of Charlemagne in Roncesvalles, Spain***

The years around 1800 were a time of turmoil throughout Europe, as the newly created French Republic attempted to enforce republican ideals through warfare across the continent. This presentation examines articulated ossuary burials contemporary to the period, from Roncesvalles, Spain, to understand how burial practice is affected by the confluence of identity and relationships. Specifically examined are the themes of cultural expectations surrounding death, and the conflict between those expectations and necessity during times of instability. Previous scholarship suggests that many social hypotheses can be better understood through bioarchaeological analysis, but few sources have looked at sites from this era with the same use patterns or historical significance, since the ossuary is popularly thought to have been specifically constructed on Charlemagne's behalf after his military loss, immortalized in the Chanson de Roland. To understand how historical context intertwines with an individual's identity to influence their treatment in death, this research examines skeletons dating from this era in an area that hosted several military conflicts. By examining this site, one can view how the conflict between personal relationships and efficiency affected burial practices. In turn, this examination helps to clarify the effects of political instability on cultural and social structures.

Michele Punke (Historical Research Associates, Inc.) and Janna Tuck (Historical Research Associates, Inc.)

***Archaeological Excavations in Downtown Portland at Site 35MU197***

Historical Research Associates, Inc. (HRA), conducted archaeological testing and evaluation of previously recorded archaeological site 35MU197 in downtown Portland, Oregon. The site's location at the margins of New Chinatown and Portland's first Japantown led to a sort of Venn diagram of occupation, where people of Chinese, Japanese, and European origin intersected, living and working side-by-side during the late 1800s and early 1900s. The presentation will discuss the history of the site and discuss how its archaeological record illustrates the historic-period use of the location.

Rowan Rampton (University of Calgary), Brenda Beckwith (Selkirk College, Kootenay Native Plant Society), and Valerie Huff (Kootenay Native Plant Society)

***Plant-Pollinator-People Entanglements: Study of Camas-Bee Interactions in the West Kootenay, British Columbia***

The plight of pollinators has received much attention in recent years, with much focus on "Saving the Bees." However, the native bees most in need of saving cannot be saved by planting seed mixes composed entirely of introduced garden plants. These bees may only be saved through provision of suitable habitat containing healthy populations of the particular native floral resources they are coadapted with. To accomplish this, humans, plants, and pollinators are required in concert to create functioning ecosystems. This study, based in south-central British Columbia, examines how native bees support the reproduction of a culturally important food plant, *Camassia quamash* (common camas, itxwa), and how the plant management actions of Indigenous Peoples may have contributed to maintaining the conditions needed for plants, pollinators, and humans to exist in perpetuity.

Alexander Rogers, MA, MS, RPA (Maturango Museum [emeritus])

***Recent Advances in Obsidian Hydration Dating***

Major advances have been made in in the past decade in understanding and applying the basic science of obsidian hydration dating (OHD). Drawing on advances in geochemistry and glass science, mathematical models for OHD have been developed and published which are based on the physics and chemistry of obsidian hydration. Although MS Excel is adequate for computation in many cases, computer codes have been assembled and published which ease the burden of computation for large data sets. If these improved methods are used, OHD is capable of reliably placing obsidian artifacts within the correct archaeological period, and of answering interesting anthropological questions. In this paper we address three significant aspects of these advances: the form of the age equation; the role of intrinsic water within obsidian in determining the hydration rate; and the ability to compute age accuracy as well as age itself. Finally we briefly summarize an example of OHD application in eastern California.

***Obsidian Hydration Dating Workshop***

The goal of this workshop is to provide insight into the theory and methods of obsidian hydration dating (OHD). It should help enable the archaeologist to perform OHD analyses, and enable the manager to ask the right questions. The workshop will cover the basic principles of obsidian hydration and the models employed in dating; how to develop an appropriate effective hydration temperature (EHT); various methods of computing a hydration rate; guidelines for data analysis; and numerous cautions. The workshop includes working through a numerical example of an OHD analysis. Mathematics will be kept to a minimum, but cannot be avoided entirely. Electronic copies of key references will be provided.

Adam Rorabaugh, PhD, RPA ([he/him] Simon Fraser University, Washington State Department of Fish and Wildlife)

***Hunting Social Networks in the Salish Sea: Before and After the Bow and Arrow***

Archaeologists have paid substantial attention to the social transformations coinciding with the widespread adoption of bow and arrow technologies. Social network analysis (SNA) is used to examine stone tool assemblages from the Salish Sea. SNA while widely applied a wide range of problems in lithic technologies has been an underutilized approach in the Pacific Northwest. Based on an application of cultural transmission theory, ethnography, and Coast Salish ontology, that haft styles reflect corporate group connections. Changes in the social networks are examined as reflected in haft styles from 3500 to 1000 BP, a time of shifts towards large plank house villages and the emergence of hereditary forms of social inequality in the region. Five social networks were constructed, each covering a 500-year period, to assess shifts in regional connections through time. There appears to be increased elaboration of social networks throughout the Salish Sea until 1600 BP, when the bow and arrow become widely adopted. These data suggest SNA of lithic haft styles shows a shift in hunting organization from a collective corporate group level activity to an individualized pursuit. The findings show the utility of SNA to address oscillations in Salish Sea society over time. New directions for future studies to examine shifts in corporate group relations in other aspects of precontact Coast Salish society are also provided.

Chelsea Rose ([she/her] Southern Oregon University Laboratory of Anthropology), and Terrance Christian ([he/him] Bureau of Land Management, ORWA)

***Tunnel Vision: Archaeology and Remote Sensing at the Oregon and California Railroad's Buck Rock Tunnel***

This public archaeology project is reconstructing the social, economic, and technical history of the Oregon and California Railroad's Siskiyou Line, as it is revealed through the story of the abandoned Buck Rock Tunnel. Using archaeology and remote sensing, this landscape-scale investigation has identified portions of the original tunnel, railroad grade, and associated work camps, providing a better understanding of the ways Chinese migrants accessed, lived and worked at this remote site. Because the Buck Rock Tunnel was abandoned mid-construction, we can glean otherwise invisible technical insights about the tunneling methods and technology employed by laborers and project engineers. This

information allows for the historical discussion of railroad construction to shift from the high-level realm of financiers and capital to the story of the people on the ground; helping to humanize the industrial aspects of railroad construction by providing insight into the people who made it possible, namely, Chinese railroad workers.

Sam Roxas-Chua Yao [he/him]

***Artifact As A Stethoscope***

Sam Roxas-Chua Yao is one of three resident artists in the Creative Heights artist residency and curatorial project, awarded by the Portland Chinatown Museum. In “Artifact as a Stethoscope” Roxas-Chua Yao will share highlights from his recent trip to Astoria, The Dalles, and John Day, Oregon. As a poet, open-form calligrapher, and sound artist, Roxas-Chua will present his observations. He will share the experiences he gathered using a variety of communication methods, such as audio field recordings, calligraphy using ink made from collected material, and poetry inspired by site surveys and subject matter experts. Also, the presentation will include photography and video. Sam’s unique way of expressing his observations using such tools as hydrophones and contact mics, assist him in conveying possible new layers in the story of the artifact. This is his stethoscope. His approach to translating inanimate objects into art will be an insightful experience for us all.

Ericha Sappington, MA (ArchaeoLogical Research Consultants)

***From Imari to the Texian Campaign: A Preliminary Analysis of Ceramic Artifacts from the Martinez Adobe Site, Pinole, California.***

The Martinez Adobe site (CA-CCO-355) is located in California, northeast of San Francisco. This site was originally developed in the early 1830s as a cattle ranch called El Rancho Pinole and was home to the family of retired Spanish commandant Don Juan Ygnacio Nicanor Martinez. The family resided in three small adobes that were known collectively as Los Adobes of Pinole Viejo from 1836 to the 1870s. An archaeological investigation was conducted at the site between 1974 and 1978, and the artifacts collected include ceramic tablewares and other vessel types whose origins have been traced to Asia, England, and France. Those of English and French origin can be attributed more specifically to manufacturers in the Staffordshire region of England, and Montereau, France. Imari-style ware with a hand-painted floral design and a matching set of British transferware printed with images depicting the Texian Campaign are among the more unique pieces in the artifact assemblage. The presence of these ceramics on a mid-nineteenth century site in northern California that was occupied both before and after the time period of early California statehood are of significant archaeological interest and have the potential to be useful in a more comparative analysis of contemporary California sites.

Ashton Satterlee, MA (Appaloosa Museum and Heritage Center Foundation INC.) and Lauren McCearry (Appaloosa Museum and Heritage Center Foundation INC.)

***Bring the Inside Outside and the Outside Inside***

Creating a native plant garden, Spotted in the Wild: Native Palouse Prairie Plants has helped expand the Appaloosa Museum to incorporate more of the outdoor space for public learning. The landscape of the Palouse helped shape the qualities the Nez Perce need in the Appaloosa. Showing a little bit of what the area that the Appaloosa horse was bred in creates a more immersive experience. Being able to explain the importance of the native plants and their connection to the past and present is important. This has also allowed for more public involvement, with the ability of the public to name the garden. All of this has brought up some interesting things. From the public misunderstanding what native means, to how to incorporate the garden with the rest of the museum. Working through these issues has been and still is ongoing. Here we discuss the challenges and rewards of this new adventure. Bringing the inside outside and the outside in is harder than first thought.

William Schroeder, PhD, RPA

***A Can of Worms? Part II***

In 2021, based on archival and recently published research, a revised food and beverage can typology and chronology was presented at NWAC. As canning technologies evolved over time, so did can opening technologies. There are empirically discernible differences between puncture- or lever-knife-type and rotary-type openings on cans. For example, rotary-type openers left a cleaner circumferential cut as opposed to the jagged edge resultant from the use of a lever-knife-type opener. If terminus ante and post quem dates, United States Patent and Trademark Office records, and empirically discernible differences or characteristics on opened cans are observed and accepted, then a can opener and opening technology chronology is possible, yet it may not be ‘clean cut.’ Due to technological overlap and time lag, shelf-life, and consumer habits, cans of various types may have been opened, contents consumed, and subsequently discarded after the production of such a can type ceased. Nevertheless, it is possible to perform an applied archaeological exercise using antique and vintage can openers on contemporary cans in order to observe, describe, and distinguish characteristics of cuts made by various common household and commercial can openers so that one may diagnose the age of a can or cans in an historical archaeological context with better accuracy. Case in point: a can opened by means of a rotary-type opener can only have been accomplished after 1920, not before. This paper presents preliminary results from such an experiment and provides additional archival and biographical information about the inventions and their inventors where possible.

Andrea Shiverdecker, MA, PhD Student ([she/her] University of Montana)

***A Synergy of Abandonment: Archaeological Understandings of Abandoned Norse Arctic Settlements and North American Mining Ghost Towns***

Landscapes of abandonment create an awe of mystique for humans from all walks of life. The most asked question is, ‘What caused this place to be abandoned?’. Taking an evolutionary theoretical concept of how colonialist commodification through imperialist capitalism created a World System Theory, the Table of Historical Abandonment model is born. This four-prong approach simplifies the causations of not only settlement sustainability, but of the culminating internal and external factors that ultimately lead to abandonment in a historical archaeological context. This model can provide insight into avenues of research into unknown realms of historical archaeology by making missing avenues of thought known as a needed echelon to be explored. A synergy is created between what is known of the abandoned mining Garnet Ghost Town outside of Missoula, Montana and what were the causations for the Norse abandonment of Greenland, showing an introductory exploration into the development and utilization of the Table of Historical Abandonment Model.

***Conceptualizing Fluidity in Heritage Landscapes and Cultural Identity Through the Garnet Ghost Town***

The role of defining what constitutes heritage has been a question that has been debated since the ideas of culture became known to humans. Labeling heritage sites and fitting their cultural value on the parameters set forth by organizations such as UNESCO and the Department of the Interior comes at a discourse in relation to the vastness of identifying significances to heritage sites. From members of the community to visitors from foreign countries, the identifying ties and relevance to heritage sites is as diverse as the people visiting them. By breaking down and analyzing the evolution of cultural identities and cultural relevance at the Garnet Ghost Town of Garnet, Montana; a new concept in bringing awareness to fluidity in heritage landscapes and cultural identity is explored. From Indigenous lands to a turn of the century mining boom town and then abandoned, Garnet continues to evolve through its identity to include the site becoming a dark tourism hotspot for those who identify with cultural and historical relevance of believed to be paranormal activities. As the dynamics that play into how humans identify and feel interconnectedness to heritage landscapes is recognized for its fluidity of the attributing cultural identity for these landscapes, their prevalence for preservation and protection and redefining the current

parameters on what makes a heritage landscape becomes a necessity for exploration and realignment for inclusivity of the broad spectrum of cultural identities.

***Interpellation as Coping Strategies: Responses to Colonialism and Social Identities***

As we look to understand notions of ideology and social identities, Marxist theorist Althusser explored how one internalizes a subject's identity when encountering varied cultures through processes of social interactions, which are thus embodied in major social and political ideologies. Through literary exploration into Lisa Stevenson's ethnography *Life Beside Itself*, ideas into how Interpellation is used as a coping method for balancing unequal social identities resulting from the long history and implications of colonialism is traversed. How are social identities of negative connotations used as ways to not only subjugate, but used as ways of social understanding and a balancing of previous implications of colonialism? What can anthropologists learn from the various theoretical expansions on interpellation in order to prepare oneself for these social interactions?

Kim Simmons

***The Implications of Salish Spindle Technology***

There are numerous ethnographic, academic and archaeological information sources for how the diverse spindles of Salish Sea peoples were used to produce yarn for weaving. These sources often are focused on explaining the artifact and artistic result within a regional scope.

Global communities of people who practice fiber and textile traditions like processing and spinning plant and animal fibers can give context and technical precision to the discussion. As practitioners the focus is understanding the traditional techniques and the technology or toolkit. With this viewpoint and within a more global context the innovation of these Salish Sea textile traditions are illuminated and will be specifically discussed.

Nikolai Simurdak, BS ([they/them] Central Washington University) and Patrick T. McCutcheon, PhD ([he/him] Central Washington University)

***Chemical Sourcing and Technological Analysis of Volcanic Glass Lithics from the Grissom Site (45KT301)***

The Grissom site (45KT301) is a large site with archaeological remains spanning pre-contact to historic periods. Past research by Vassar (2012) and Parfitt (2013) sought to understand stone tool type variation, distribution, and diversity across space and time in the site. This has included an effort to chemically source lithics made from volcanic glass using x-ray fluorescence. Volcanic glass deposits have unique chemical fingerprints that are identified through the presence and quantity of trace elements, allowing stone tools made of volcanic glass to be sourced to their depositional origin. Combined with technological analysis, chemical sourcing reveals patterns of trade and exchange by showing how volcanic glass sources are represented in the site. This project filled gaps left by previous research and completed source analysis, showing extensive movement of distant sources into the site and heavy processing of two local sources. Since Parfitt's (2013) work, two new sources have been identified and source diversity within the Grissom site can be understood more clearly. Concentrations of bifaces, cores, and flakes from different sources indicate variance in the technological use of those sources. Representation of sources across the site, alongside non-volcanic glass lithic artifact counts, also demonstrate areas of intensified tool production and variation in production dependent on toolstone material and volcanic glass source.

Julia Smith, PhD ([she/her] Eastern Washington University)

***Climate Change, COVID, and Coffee***

Coffee production faces a group of challenges that before COVID were daunting, including climate change, increased pressure from diseases and pests, and the ways in which small farmers are struggling around the world. COVID has intensified all of those and added more stresses, as farmers struggle to get their coffee harvested, rosters struggle to get samples of coffee they might buy, and consumers stay home.

The specialty coffee market, largely supported by sales in coffee shops of coffee by the cup, has been particularly hard hit. Many roasters may not survive this crisis; coffee producers are struggling to make ends meet in this volatile and insecure market. This talk explores those issues and how farmers are responding to them in Latin America, using data from producing countries like Costa Rica and Colombia, as well as consuming countries like the United States.

Linda Storm, PhC ([she/her/hers] U.S. Environmental Protection Agency and University of Washington) and Rue Hewett Hoover ([she/her/hers] Wetland Biologist, Nez Perce Tribe)

***Camas as a keystone cultural species and the long-term indigenous ecological management of camas places***

The genus *Camassia* includes multiple species and subspecies of wild edible plants that have been tended, harvested, managed and maintained for thousands of years by multiple North American indigenous peoples. *Camassia* spp. are cultural keystones that reflect the long-term interactions between people and plants in the places where they grow. My research focuses on the complex co-evolutionary relationships between people and plants, with a specific case study which reconstructs the historical ecology and ethnoecology of the Upper Chehalis River basin prairies. These camas prairie places include both wetland and dryland ecosystems, including wet meadows and Mima mound prairies. Coast Salish peoples' long-term indigenous traditional ecological management of the land led to production of abundant and diverse ethnobotanical wild plants for foods, fibers, and medicines as well as sustained ecosystems and habitats upon which many other animals relied upon for food and forage. The legacy of long-term camas cultural ecosystem tending with highly sophisticated fire management, harvesting and processing techniques, maintained biodiversity on species, patch, and landscape scales. In the Georgia Basin-Puget Trough-Willamette Valley ecoregion, without ongoing indigenous management, these places become dominated by later successional stage forest. Today, many Pacific Northwest tribes are recovering and restoring their camas places and incorporating traditional foods into their diets for health and well-being. This presentation will share about the historical ecology and cultural significance of camas places and provide examples of current Pacific Northwest tribes' restoration of their culturally significant camas places.

Anthony Tessandori, MA ([he/his] Bellevue College)

***From Bones to Clones: The Evolution of Biological Anthropology at Bellevue College, WA***

The past fifty years have introduced major changes in the heart and substance of biological anthropology. These changes have shifted our view on human evolution with a wide array of new species. Important species such as *A. afarensis* and *H. ergaster* were yet to be discovered. New discoveries and models of genetics and evolution have changed our view of the human genetic tree and human diversity. Many of the foundational theories and mathematical models were established prior to 1972. The application and experimentation occurring post-1972 have provided meaningful material for biological anthropology classes. This paper will focus on what we did not know in 1972 that is now standard subject matter of biological anthropology today.

Jordan Thompson, BS ([she/her] University of Idaho)

***An Overview Vitrophyre Use in North Central Idaho: 12,000 Years of Rock Knockin' on The Lochsa***

Archaeological investigations in the 1990s defined the Clearwater River region of the Southern Plateau as a unique cultural and archaeological entity. Excavations throughout the region have revealed vitrophyre to be an important lithic resource for the ancestral Nez Perce, discovered in at least 17 key sites dating back 12,000 years. Vitrophyre is a natural igneous glass, formed of pyroclastic flow deposits containing large-grain phenocrysts of ash and pumice. Much like obsidian, vitrophyre creates sharp cutting edges for tool production and retains a chemical signature that can be traced to a parent source. A combination of ongoing lithic analysis, geochemical analysis, and simple experimentation have provided an understanding of this understudied resource and its uses to gain insight into past human behavior. By comparing vitrophyre sources at two known locations with the archaeological record, we can explore how

people interacted with and interpreted their environments, tracing resource procurement, settlement, subsistence, and social activities.

Chesley Thompson ([she/her] Eastern Oregon University)

***Impacts of COVID-19 to On-Campus Students Attending a Rural University in the Pacific Northwest***

Social disruption has been experienced worldwide due to COVID-19. Through the use of oral history and online surveys sent to all on-campus students, the impacts of COVID-19 for students at a rural university in the Pacific Northwest can be gauged and thoroughly analyzed. A mixed methods approach to understanding these impacts allows for a rich and broad understanding of how students have experienced social disruption at different points in their academic career. Students that offered an oral history were led through the events of COVID-19 as they unfolded in the United States as well as local events due to COVID-19 that caused disruption. The survey offered students the opportunity to gauge the impact that COVID-19 had on different areas of their lives using Likert scale responses. Analysis offered insight into stresses due to financial instability, decreases in social and physical wellbeing, and how social disruption can lead to a change in one's perception of the passage of time.

Mark Tveskov, PhD (Southern Oregon University)

***Segregation Under Duress: Social and Physical Space at Miner's Fort, a Rogue River War Fortification on the Oregon Coast***

Miner's Fort was located at the mouth of the Rogue River on the southern Oregon Coast. In 1856, some 100 people were besieged within the fort by Indigenous forces as part of the Rogue River War. Archaeology, geophysical survey, ethnohistory, and oral history revealed the architectural structure of the fort, the spatial distribution of material remains therein, and the complex identities and negotiations of those trapped inside. Settler families, African-Americans, armed militiamen, and local Indigenous people all found themselves under extreme duress in the close confines of the fort. This paper presents this story through the lens of recent scholarship on frontier fortifications that emphasize their critical role in shaping the course of, and discourse over, settler colonialism.

Conlan Vance, MA ([he/him] Eastern Washington University)

***Investigating the Built Environment of Fort George Wright, Spokane, Washington: A Historic Archaeological Approach***

This presentation will discuss an investigation into the built environment of Fort George Wright in Spokane, Washington. This fort was active from 1898 until 1957, when it was declared surplus by the United States government. It was bought by the Sisters of the Holy Names in 1960, renovated, and turned into Fort George Wright College. In 1990, Mukogawa Women's College bought it and turned it into a satellite campus for English language instruction and immersion. A quantitative methodology was developed to analyze the spatial organization of the built environment of Fort George Wright and compared these results to other regional military fortifications to create an empirical database. This was to see if social stratification affected these built environments and if so, in what ways? To see if the built environment of Fort George Wright reflected late Victorian ideals of social division, a spatial analysis of the fort's plan at different periods was conducted using Visibility Graph Analysis. The results of this analysis were compared to similar studies of contemporary fortifications in Washington State. This investigation demonstrated that an analysis of the physical arrangement of space at Fort George Wright can provide insights into how individuals might have perceived and utilized their space.

Robert Walls (American Indian Studies Research Institute, Indiana University)

***Toward an Ethnohistory of Paper in the Indigenous Pacific Northwest***

This presentation will suggest how we might consider an ethnohistory of paper as material culture, a tool increasingly used at the intersection of settler and Indigenous societies in the Pacific Northwest during the nineteenth and early twentieth centuries. While studies have focused on wood, rock, metal, glass, textiles and ceramics in trade, art, and religion, there has been surprisingly little attention given to paper. Yet,

arguably, no fabricated substance has impacted the life of Indigenous people in the past two-hundred years more than this relatively fragile and perishable material form. Paper has been integral to the wider settler-colonial project, used for both dispossession and administration—as in treaties, land transaction documents, jargon dictionaries, school resources, and territorial maps—and to implement radical change—as in the scriptural books and ephemera of Christian missionizing. My presentation will enumerate a few select examples of the use of paper in contexts of trade and intercultural communication, and its role in transforming ancient culture and territory into documents that were then deposited in distant settler archives and now subject to discussions regarding digital reproduction. However, my goal is to suggest future pathways for research, on more local levels, by briefly illustrating examples of how Indigenous people used paper to create meaningful objects and connections for their own designs, from political resistance and reformulations of identities to artistic innovations. It is high time that anthropologists recognized paper and its connections to Indigenous lifeways and the evolving materiality of power in the Northwest.

Lauren Walton, MS ([she/her] Statistical Research, Inc.), Brandon McIntosh PhD Candidate ([he/him, they/them] Statistical Research, Inc.), and Steve Hackenberger, PhD ([he/him] Central Washington University)

***Analysis of the Bone Tool Assemblage of the Tryon Creek Site (35WA288) in Hells Canyon, Oregon***

Previous investigations of the Tryon Creek site (35WA288) in Hells Canyon, Oregon, have focused on the spatial patterns of various cultural materials in an effort to define task-specific activity zones. To date, little attention has been paid to the composition and distribution of bone tools across the site or how these data may illuminate discrete behavioral patterns and relationships to other activities represented at the site. This paper describes the probable function and distribution of bone tools across the site, and compares the distribution to the wider assemblage in order to gauge the manner in which bone tools fit into previously conceived activity zones.

Penglin Wang, PhD ([he/him] Central Washington University)

***Xiongnu Chiliad Notions***

As a dominant power in ancient Inner Asia Xiongnu organized its armed forces by decimally multiplying a basic unit of ten fighters up to a division of ten thousand and thus appointed each echelon's commander with its corresponding numeral. This practice was illustrated with the first recorded Xiongnu ruler titled Touman (頭曼 ?-209 BCE) meaning 'ten thousand' as reflected in Altaic languages. This presentation investigates the chiliad origin of the titles of the eighth, tenth, and twelfth rulers across three generations of the Xiongnu royal family: Xulihu (响犁湖), Hulugu (狐鹿姑), and Xulüquanqu (虛閭權渠). A careful and thoughtful phonetic analysis of the three Chinese-transcribed titles shows their considerable similarity and common origin in the chiliad numeration represented by Greek khilioi 'thousand' having a connection with Mongolic hilegü ~ hilügü ~ hülegüü 'too much or many' and hilegüken 'in excess'. Morphemically, the three titles consist of the common root xuli-, hulu-, and xulü- and the suffix -hu, -gu, and -quanqu (-quan-qu). The root is from Greek khilioi, which was diffused into Mongolic and suffixed with -gü ~ -güü, with the -gü suffixed further with -ken. Like Xiongnu Touman for a myriad commandership, these three rulers could serve as chiliad commanders, which then got stuck to their title or name. The name recurred to Kitan as Hulie (湖烈) or Keling (頰領) and to Mongol as Hülegü (Hulagu, Hulegu, 旭烈兀 xuliewu).

Mark Warner, PhD (University of Idaho)

***The Doctor's Lithics: Exploring the disconnections of Euroamerican experimentation in stone tool manufacturing on a western military fort.***

A salvage excavation of the front porch of the Ft. Boise (ID) surgeon's quarters resulted in the unexpected recovery of a small amount of lithic debitage. Given the context that they were recovered in the presence of obsidian flakes originally posed something of an interpretive challenge. Further archaeological analysis



and documentary research indicates that the debitage was likely produced by members of the doctor's household. Such a finding raises a second question of understanding this behavior as it implies some profound cognitive dissonance on the part of the makers. On the one hand, they are part of the military presence whose mission is subjugating indigenous peoples in the 19th-century west, but yet simultaneously the doctor and his family are actively investigating the material technologies of the Indians whose lives are being destroyed.

Tatiana Watkins ([she/her] Malheur National Forest, Oregon Chinese Diaspora Project, University of Idaho)

***Oregon Chinese Diaspora: Artifact Analysis of Several Mining Camps on the Malheur National Forest***

In the late nineteenth century, members of the Chinese diaspora operated mining companies that occupied many gold-bearing deposits in Grant County, Oregon, including within the confines of the now Malheur National Forest. One of the many companies that leased claims was the Ah Yee Mining Company, operating in the late 1860s and early 1870s. Data recovery of camps associated with this company and area underwent excavation in the summer of 2021. This paper analyzes the artifacts recovered from each site and the narratives built based on the evidence provided. This project also aids in confronting misconceptions to present an accurate record of Chinese and Chinese American contributions to Oregon's early history.

Faith Webster, MS ([she/her] Quinault Indian Nation, Department of Natural Resources), Justine James, Samantha Chisholm, David Ryan, Lia Frenchman, and Naomi Brandenfels

***A Field of Possibili-Tea: Native Medicine in an Economic Landscape***

'Indian Tea', 'Swamp tea', 'Labrador Tea' (*Rhododendron groenlandicum*) is a traditional medicinal resource for the peoples of the Pacific Northwest. This resource is being adversely impacted by logging practices and climate change. This case study, at the Quinault Indian Reservation, looks at the conflicting priorities of conservation of a tribally important medicinal plant and critical tribal income from logging.

This story shows how the Section 106 process, when used to identify resources, can also create opportunities for education and outreach. This is an ongoing case study, and the outcome is unknown; it has the potential to form new traditional knowledges in climate change adaptation that could be integrated into modern natural resources management practices.

Aaron Weiss, PhD (The College of Idaho)

***"How Thin the Line Is": Safeguarding Orthodoxy at a U.S. Islamic School***

Based on interviews conducting during 18-months of ethnographic fieldwork at a U.S. Islamic school, this presentation will examine a variety of religious understandings among its community members and select struggles to establish differing beliefs as normative. Certain Muslims disagreed on where to draw the boundaries of religious orthodoxy and which sources of knowledge were authoritative, at times censoring books espousing competing perspectives. Colliding hermeneutical positions coalesced into an interpretive equilibrium, the general ideological climate of the school.

Laurie A. Wilkie (UC Berkeley), Jeffrey A. Seckinger (UC Berkeley), and Kelly N. Fong (UCLA)

***Tracking "Thunder" in Portland's Chinese Restaurants***

When Fawn and Wai Sue Louie of Berkeley, California, started their Chinese restaurant supply business in 1952, one of their earliest customers was in Portland, Oregon: Chinese Village Restaurant, located at 520 S.E. 82nd Ave. To date, 11 other Chinese restaurants in Portland have been identified as F.S. Louie Company customers. This contemporary archaeology project uses archival and material collections to discuss the social, familial, spatial and temporal relationships that materialize to explore how these Portland restaurants developed a business relationship with a California-based supply company.

Douglas Wilson, PhD ([he/him] Portland State University/National Park Service)

***Changing Conceptions of History in Fur Trade Archaeology in the Pacific Northwest***

The first archaeologists to practice historical archaeology in the Pacific Northwest conducted work at fur trade fort sites. These projects were often couched within the framework of nationalism and colonialism prevalent at the time. Many of the earliest archaeological practitioners recognized and documented a tribal presence, but often relegated this presence to an "other" or their interests were more attuned to promoting a broader scientific research ambition for a region. This divergence contributes to the separation of historical and precontact archaeology that still plagues archaeological practice in the Pacific Northwest. This paper explores the close connections between the earliest terrestrial and maritime fur trade sites and the indigenous landscapes in which they were (and are) embedded. Through exploring the context of sites, I argue that archaeologists may break down more effectively the essentialized conceptions of colonialism to allow more nuanced interpretations. Fundamental to this is to expose the long historical connections between past and present peoples associated with colonial places.

Ann Wozniak, AIA, NCARB, LEED AP BD+C, NCIDQ ([she/her] Boise State University)

***Re-Examining Principles in Architectural Design: The Importance of Social Connectedness***

Although the mechanisms behind social interaction and cooperation are extensively studied in the behavioral ecology and anthropology fields, they have not been readily applied to architecture. The evolutionary need for cooperation suggests that humans have evolved psychological mechanisms that allow adaptive responses to pro-social environments. Moreover, research suggests environments that encourage human interaction and connection are favored by humans, asserting our evolved psychology links human evolutionary history to positive fitness related outcomes. Incorporating social connection design elements into the built environment can create healthier and more favorable responses for building occupants.

Teresa Wriston (Desert Research Institute), JD Lancaster (Desert Research Institute), Molly Casperson (US Army Corps of Engineers, Portland District), Loren Davis (Oregon State University), Jillian Mahoney (San Diego State University), James B. Fuddy, Jr. (San Diego State University), and Alex Nyers (Northwest Archaeometrics and Northwest Research Obsidian Studies Laboratory)

***Geoarchaeological and Geophysical Investigations at Fern Ridge, Foster, and Detroit Reservoirs, Upper Willamette Valley and Western Cascade Mountains, Oregon***

River valleys often expose important archaeological sites but are challenging for cultural resource managers given that evidence of their past use can be destroyed by channel path or flow changes, obscured by dense vegetation, or deeply buried. Within reservoirs, these challenges are compounded by seasonal inundation, shoreline alterations, and variation in artifact and feature exposure, erosion, and/or movement.

We are using an interdisciplinary approach to model and search for submerged archaeological sites in the river valley reservoirs of the Upper Willamette Valley and Western Cascade Mountains managed by the Portland District of the US Army Corps of Engineers (USACE). This ongoing project is multi-phase and includes review of previously recorded archaeological sites in the Upper Willamette Drainage Basin, creation of an archaeological research design and context, geomorphological mapping, modeling archaeological landscape sensitivity, sub-bottom profiling (i.e., sonar), and coring at the Fern Ridge, Foster, and Detroit Reservoirs. In addition, we are testing the capability of Water Column Noise (WCN) in the sub-bottom profiling data to identify submerged archaeological sites in substrates that vary from very rocky to fine-grained deposits.

Ongoing core and sediment sample analyses will also provide information about the age and character of the landforms, periods of past landscape stability, and paleoenvironmental information. This geoarchaeological and geophysical data will inform and calibrate the archaeological sensitivity of our

landscape model with the goals of helping the USACE manage and protect archaeological sites as well as providing stratigraphic and environmental contexts for future research.

Noella Wyatt ([she/her] Central Washington University)

***Legacy Archaeological Collections: Studies of Technology and Activity Areas***

The Tyron Creek (35WA288) assemblage from Hells Canyon is curated and studied at Central Washington University under an agreement with the USFS. In prior studies, only projectile points from House 2 were analyzed. In this study, an examination of projectile point styles within Houses 5 and 8, as well as the two trenches, were considered. Further, during this process, point types previously analyzed were re-examined to clarify styles based on base type, as well as reviewing material types. This re-evaluation was done by reviewing the separate Inventory and Field Forms and individual bags of lithics. Many artifacts were found within the collection that maintained enough form to determine base types even though incomplete, thus adding to the total numbers of point types found in the collection. It is the purpose of this study to include many points that were previously not recognized. This study will compare base and material types instead of sizes located within levels and occupation zones.

Pei-Lin Yu, PhD ([she/her] US Army Corps of Engineers, Walla Walla District), Jordan Bennett, Renae Campbell, Stephen Cox, Clint Cuzzo, Gayle Dixon, Nicole Herzog, Andy Louie, Terry Panhorst, Carol McDonald, and Morgan Zedalis

***A Golden Thread: Reconnecting Boise Idaho with Chinese Mining History and Heritage***

Boise is the largest town in Idaho, where thousands of Chinese joined the gold mining rush in the 1860s-1880s. From Boise's now-vanished Chinatown to Garden City (named for extensive Chinese gardens) the city has a storied history. Yet as of 2019 there was no Boise museum exhibit dedicated to the story of Idaho's Chinese miners. This paper describes the inspiration, creation, and collaborative development of a new exhibit on Chinese gold miners at the Idaho Museum of Mining and Geology, inspired and informed by one of Boise's oldest Chinese gold mining families.

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# SHOSHONE-PAIUTE RELIANCE ON FISH AND OTHER RIPARIAN RESOURCES

DEWARD E. WALKER, JR.

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PAMELA GRAVES

*JONA MEMOIR 22*

## SHOSHONE-PAIUTE RELIANCE ON FISH AND OTHER RIPARIAN RESOURCES

Deward E.  
Walker, Jr.

M.J.  
Walker

Pamela  
Graves



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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.

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