Unearthing the History of Plant Utilization: An Analysis of Botanical Remains Collected from the Chena Townsite

Jodi Fouche[1], Justin Cramb[2], Lisa Strecker[2,3]

[1] University of Alaska Fairbanks, [2] University of Alaska Fairbanks Department of Anthropology, [3] Alaska Ethnobotany Program

History of Settlement in the Chena Townsite

The Chena Townsite (Fig. 1, Fig. 2), founded in 1902, is an abandoned gold-rush-era mining town on the Tanana River in Interior Alaska. The town was once a vibrant highlight of commerce and domestic transport, and attracted droves of miners, from varying cultural backgrounds, eager to achieve success during the gold rush. The town, now laid to ruins and rubble, is the highlight of archeological investigation. The excavation of the site, led by University of Alaska Fairbanks researcher Dr. Justin Cramb and field school students, seeks to uncover the mysteries of a town that helped establish the groundwork for commercialization and early multicultural settlement in Interior Alaska. To date, a multitude of artifacts have been collected from the site, including several unidentified seeds and fruit pits.

Fig. 1. Main Street, Chena, Alaska. *(UAF-1979-106-8), William Seil Photographic Collection, APRCA, University of Alaska Fairbanks.*

Fig 2. Sanborn Insurance Co. commercial map of Chena townsite, 1905. *University of Alaska Fairbanks.*

The town was an attractive settlement and had the unique advantage of location, conveniently located off the Tanana River and with the Tanana Valley Railroad leading to it. With this advantage, the transport of domestic goods influenced the uptick of the multicultural settlement. Records indicate that around 1920, many of the town's settlers uprooted their lives from the Chena townsite and settled into the more established neighboring town of Fairbanks. Around this time, homesteading in Fairbanks gave rise to the agricultural revolution that influenced Fairbanks' success as the major borough of Interior Alaska. Presently a ghost town, the site may leave clues as to how settlers contributed to the agricultural practices that began in its neighboring town, Fairbanks.

Introduction

Until present, much has remained unknown about how plants were utilized and cultivated by Chena settlers. My research findings will help further resolve the mysteries surrounding life at the Chena Townsite. The results that I've gathered, and am continuing to gather, will contribute to the site's research by investigating how plants were cultivated, utilized, and transported from 1902-1921. It will ultimately contribute to the existing research conducted on the Chena Townsite at UAF. My research also intends to further the incorporation of paleoethnobotanical theories, methods, and procedures – currently an understudied method - into archeological research practices in Alaska. Through this research, I aim to illuminate the implications of understanding past-people plant relationships in Alaska.

Uncovering the secrets of how Chena Townsite settlers influenced the agricultural landscape of Interior Alaska, relies partly on ethnobotanical and archeological investigation. However; a fusion of source materials, including archival and historical, provides a basis for which connections between past people and plants can be drawn. Paleoethnobotanical research seeks to understand the relationships between people and plants in the past, while environmental archeological research seeks to reconstruct past environments to understand environmental change through time. Analysis of archaeological plant remains aids us in identifying what plants were transported or cultivated in the area during that time. As I identify botanical remains collected from the site, ethnobotanical and archival sources will aid my dispelling of how the identified plants were utilized, transported, or cultivated in Chena during its active settlement period.

In 2024, as the recipient of the Paul H. McCarthy award, I conducted archival research on the past-people relationships in Chena, utilizing Alaska Polar Regions Collections & Archives (University of Alaska Fairbanks) sources. My archival research aided me in establishing a growing body of data regarding these relationships. **The process of uncovering these mysteries began here (Fig.3)…**

Methods & Materials

1 Archival Data Collection & Analysis

Alaska Polar Regions Collections & Archives (APRCA) sources were collected and synthesized to illuminate:

- What plants were Chena settlers utilizing, and how were they utilizing them?
- Accessibility: How were plants transported to and from Chena? What were the methods of transport?
- Were there agricultural or crop cultivation practices in Chena? What practices were there?
- I collected data from various APRCA sources, including photos (Fig. 3), shipping logs, and commercial company records and utilized them to:
  - Produce a botanical comparative collection
  - Draw connections between archival data and botanical remains

Fig. 3. Image titled "Vegetables Grown at Chena." *UAF-1974-044-00007, Herbert Heller Papers, APRCA, UAF.*[3]

Fig. 10. *Ribes hudsonianum* Richardson (black currant) collected on-site. 2024.

2 Building the Comparative Collection

Comparative collections serve as an essential method for identifying archeological ecofacts and are produced as data sets for the exposition and identification of botanical remains. Comparative collections house various types of samples that are collected, preserved, stored, and provide a standard for comparison, both domestically or locally.[4]

Botanical comparative collections are often composed of:

- Parts of local or domestic plant species, including:
  - **Macro-botanical:** Seeds, fruits, wood, pressed plant specimens
  - **Micro-botanical:** flowers (pollen); leaves, fruits, and roots (phytoliths)[6]
- This comparative collection currently houses macro-botanical samples that I collected from 44 different local and domestic plant species known to be in Chena or Fairbanks (1902-1921).[11, 12, 13] Of the 44 plant species, I harvested one species of berry, *Ribes hudsonianum,* on-site (Fig. 10). I then extracted and dried seeds from the fresh fruits that I harvested or purchased. Comparative species include:
  - (11) Seeds from local berry and rosehip
  - (13) Seeds, nuts, grains, nut shells, and fruits

3 Excavation & Sample Collection

Site Excavation: Excavation of the Chena Townsite took place May-July, 2024. Participation in the Archeological Field School was accompanied with the acquisition of practical skills in:

- Archeological excavation
- Archeological theory
- Standard lab methods + procedures
- Standard field methods + procedures
- Standard paleoethnobotany lab methods + procedures

Recovery Methods: I recovered botanical remains through the combination of field and lab techniques:

- **Dry Screening:** the analysis of soil sifted through a series of varying-sized screens, typically utilized during excavation[8]
- **Sorting:** all macro-botanical remains are recovered by separating them from smaller material fractions[4]
- **Floatation:** a recovery method which results in the separation of light fraction from heavy fraction,
  - Often, a method which accounts for the greatest amount of recovered remains[4]
- **Recovery methods used on-site:** Dry screening
- **Recovery methods used in the lab:** Sorting + floatation

Fig 4. Botanical reference collection. Preserved plant specimens labeled and stored in glass vials with cotton and silica for optimal preservation.

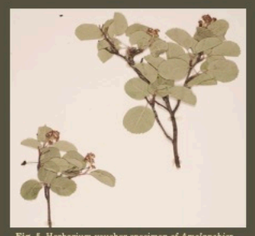

Fig. 5. Herbarium voucher specimen of *Amelanchier alnifolia* L., housed in University of Alaska Museum of the North, Herbarium.[8]

Fig. 6. (a)(c)(d) Unidentified botanical remains collected from Chena Townsite, 2024. **(b)** Botanical remain identified as *Prunus cerasifera* Ehrh. (cherry plum).

Fig. 7. Microscopic images Apiaceae seeds, *Daucus carota ssp. carota* and *Dacus carota ssp. sativus*, referenced in seed identification manual; *A Manual for the Identification of Plant Seeds and Fruits*, 2013[10]

Botanical Analysis 4

Digitization: I recorded, stored, analyzed, and sorted microscopic and scaled images of botanical remains. I utilized a wireless digital microscope for magnification and Photo Booth (Mac iOS) to capture images for storage on a MacBook Air. Digitization remained a vital method for:

- Creating a living digital comparative collection
- Creating a digital database of botanical remains collected on-site
- Microscopically analyzing the morphological traits of:
  - Comparative samples
  - Archeological samples (Fig. 6.)
- The proper identification of archeological samples, taxonomically, to the species level

Referencing: I utilized various sources as references throughout the analysis process. Incorporating a diversity of reference materials was vital in taxonomically identifying botanical remains. The source-types that I referenced are as follows:

- Botanical ID workshop
- Seed identification manuals (Fig. 7)
- Alaska ethnobotanical books
- Peer-reviewed academic papers
- Digitized herbarium specimens (Fig. 5)
- Photos of local vegetation – in proximation to the excavation site

Results

The findings from this research are aimed at further resolving the mysteries surrounding life at the Chena Townsite. The results gathered through this botanical analysis will contribute to the site's research by investigating how plants were cultivated, utilized, and transported from 1902-1921. It will ultimately contribute to the existing research conducted on the Chena Townsite at UAF. Through the integration of various source-types, the cultural context surrounding plant-usage during this early Alaska gold-rush period will enhance the overall body of research regarding colonial-driven landscape changes in Interior Alaska. Thus, this research provides overarching data on plant utilization within the settlement and the influence on agriculture in Fairbanks.

Of 46 cataloged botanical remains, I identified specimens of four taxonomic categories to date. Some of which include:

- *Juglans regia* L; walnut shell fragments (Fig. 9)
- *Prunus cerasifera* Ehrh; cherry plum pit (Fig. 8)
- *Fabiaceae* family; bean
- *Prunus avium* L; cherry pit

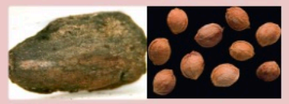

Fig. 8. (a) *Prunus cerasifera* Ehrh. pit collected on-site. (b) Comparative photo used to identify (a) through the distinguishment of key morphological characteristics.[10]

Fig. 9. (b) *Juglans regia* L. fragment collected on-site. **(a)** Magnified comparative photo used to identify **(b)** through the distinguishment of key morphological traits.

Discussion

To date, 46 botanical ecofacts have been collected from the Chena Townsite. Of the 46 botanical remains that were collected, I have identified three samples to the species level. Additionally, one sample has been identified to the taxonomic family level. Of the species that I identified, none are known to be native to Interior Alaska and there are no records of the identified species being cultivated in Interior Alaska from 1902-1920. However; a variety of archival sources highlight that all four identified species were internationally transported to Chena and Fairbanks by steamship or railroad.[11, 13] All four species were also listed in a Fairbanks cookbook (1913) as ingredients in a variety of recipes.[12] The data gathered thus far lends to the hypothesis that much of the botanical remains were deposited from plants that were transported to Chena. However; until more data is gathered, the question of cultivation or transport remains unclear.

Future Efforts

Identification and analysis of the collected remains continues as an effort to identify all identifiable remains. Some of the remains, especially those displaying considerable morphological distortion from charring, may remain unidentified through this effort. Identification of archeological botanical remains is often a complex and time-consuming task; however, with the integration of these additional sources and tools, the analysis process may be optimized:

- Ancient DNA analysis (aDNA)
- A more extensive botanical comparative collection
- Residue analysis (starch + pollen grains)
- More advanced microscopy techniques
- Mass spectrometry methods
- Additional archival + historical sources

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Fawn Carter, ***APRCA, University of Alaska Fairbanks***

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