

Spatial and Temporal Patterns of Land Allotment on the Pawnee Reservation

By
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Cheyenne Sun Eagle

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Abstract

This research explores the patterns and consequences of land allotment for the Pawnee Nation of north-central Oklahoma. During the late nineteenth century, the federal government implemented a policy of breaking up tribal land holdings into individual parcels (allotment in severalty), leading to mass dispossession, complicated patterns of heirship, disruption of traditional patterns, and a decrease in land productivity. Although the historical and economic aspects of allotment have been extensively studied, relatively little attention has been paid to the geospatial aspects of allotment, especially the cultural and environmental factors that may have influenced allottees in their land selections. Using records of the Pawnee Indian Agency obtained from the Fort Worth Branch of the National Archives, together with censuses, Indian agent reports, the Public Land Survey System (PLSS), and environmental databases, a historical GIS of Pawnee land allotments was created. With regard to environmental considerations, it was found that stream-bottom land was selected in the vast majority of cases, while upland prairies were widely ignored. Stream bottoms, in addition to running water, offered rich soils for garden plots and agriculture, abundant timber for construction and fuel, and access to game and other food resources. Analysis of familial patterns showed that in a majority of cases examined, family members selected parcels either adjacent or in close proximity to each other. It was further found that clan associations played a major role in allotment patterns, with the four Pawnee clans generally clustered in distinct groupings on different parts of the reservation.

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Chapter 1: Introduction and Research Context

Introduction

Indian land allotment was a transformative process in which tribal lands throughout the United States were divided into smaller parcels for individual ownership, implemented through the Dawes Act (also known as the General Allotment Act) of 1887 and its supplemental legislation. This policy dominated Federal Indian policy from the late 1800s to the Indian Reorganization Act of 1934. It was intended to convert Indigenous people to yeoman farmers or ranchers on their own plots of ground, thereby rendering them less dependent on the federal government while promoting assimilation and lessening the power of tribal leaders.

To protect allotment holders from land speculators, and to ensure that they remained on their land rather than selling or leasing it, all allotted land was put in trust for 25 years, during which time it could not be sold or leased. After the 25-year trust period, an allottee would be awarded a fee patent, i.e. a deed of outright ownership from the federal government. Almost immediately it became necessary to modify the terms of the trust period to allow for early leasing by allottees such as the elderly and infirm who could not farm their own land and would benefit by leasing it to outside farmers or ranchers. In addition, some allottees sought to gain fee patents in order to be able to freely mortgage, lease, or even sell their land. The process of awarding early fee patents was accelerated under the Burke Act of 1906 that allowed for fee patents to be awarded to those deemed “competent” to manage their land and financial affairs.

Despite (or some would say because of) these measures designed to amend and correct the original allotment act, its results were disastrous, resulting in massive land loss and poverty. Native Americans were forced to attempt agriculture on the land they were allotted but were

often set up for failure by poor soils, little training, lack of equipment, and inadequate funding. Little forethought was put into the implementation of allotment goals, which ultimately led to massive failure and more dependence on the federal government. As a result, allotment and its associated policies remain a source of problems for Indigenous communities into the present day, including negative impacts on communal cohesion, divided land ownership (fractionation), and management of resources.

This research focuses on the allotment experience of the Pawnee Nation, a tribe of the central Great Plains. The Pawnee people were removed from their historical homelands in Nebraska and relocated to Oklahoma in 1875 (12 years before the Dawes Act was passed) and underwent allotment on their new reservation in 1893. As an enrolled member of the Pawnee Nation, I seek to explore the impacts of allotment on the Pawnee by analyzing spatial patterns of allotment ownership in the context of family relations and environmental factors such as soil quality, topography, and water and timber access. These are fundamental to understanding the Pawnee tribe of the present and how allotment has influenced tribal cohesion and land use. By using allotment descriptions, land surveys, and other land-related archival records in a geographic information system (GIS), these patterns and processes can be visualized and explored. In addition, ancillary land records and annual reports from the local Indian agent to the Commissioner of Indian Affairs add important historical context. Explored together, these data can reveal new insights into the processes, patterns, and consequences of allotment on the Pawnee Nation.

Research Context

Allotment

Ideology of Assimilation and Allotment

The philosophy of the allotment era had its roots in the solution to what was referred to as the “Indian Problem” in the mid- to late-1800s. An ideological shift occurred from the Removal Policy era in the early to mid-1800s to the Allotment era. By embracing a policy of assimilation, rather than conquest or removal, the United States took on a role as a paternal entity, superior and necessary for guiding Native people, who were reduced to “problems,” while the United States government was portrayed as a benevolent force (Black, 2006). The assimilation program sought to make Native people productive U.S. citizens through allotment, education, discouraging traditional customs and practices, and breaking up tribal authority (McDonnell, 1991).

Land allotment was a key component of assimilation, which involved breaking up reservations by forcing Native people to take ownership of individual land parcels, while unallotted land (the “surplus”) was sold to white settlers. Through allotment, Native people were to become yeoman farmers, working the soil to produce for the rest of the nation (Black, 2006, 2007). One of the misunderstandings, or myths that underlay allotment was that Native people held lands in common and had no concept of private ownership. However, the idea that Native peoples held land in common was not true to begin with; it has been well-documented that tribes had extensive and complicated rules of land use that included exclusivity rights for families and individuals (Bobroff, 2001). Thus, enforcing land allotment meant implementing an agricultural

system foreign to the cultural and practical norms for Native tribes, ultimately leading to vast loss of land and to abject poverty (Black, 2007).

In addition to Eastern progressives who favored allotment and assimilation as a path forward for Indians, Western politicians, speculators, and settlers constituted another highly influential group that pushed for allotment (Genetin-Pilawa, 2012). They formed a powerful bloc capable of exerting tremendous pressure not only on individual Indian agents at the local level, but on the federal government in general. Their interests aligned with much of mainstream society, which favored dispossession altogether, and even in cases where the government sent in the Army to remove white squatters and trespassers who stole timber and other resources, there were not enough military and law enforcement personnel to enforce laws and to keep trespassers and those seeking to speculate away from Native land (McDonnell, 1991).

Legislation

As Royster (1995) summarizes, the Dawes Act of 1887, also known as the General Allotment Act, represented a culmination of thought that had been forming since after the Civil War, which is when the shift in ideology from removal and isolation to assimilation occurred. Allotment ‘experiments’ had been conducted on tribes in Kansas, Nebraska, and in the Pacific Northwest during the 1850s and 1860s, as this idea came into focus as the next step in assimilation which would ultimately result in civilization and citizenship. Widespread support and a cohesive nationwide plan for allotment did not come together until the 1880s when it was decided that private land ownership was the best direct route towards their goals, and the Dawes Act was the result.

In the Dawes Act, each head of family received a quarter section (160 acres), single persons eighteen and older received one-eighth of a section (80 acres), orphans and minors also received one-eighth of a section, and children under eighteen received one-sixteenth (40 acres) (Dawes Act, 1887). Allotment sizes could be (and often were) adjusted depending on the tribe, the land available on the reservation, the physical environment, and individual agreements, Executive Orders, and Congressional legislation. On the Kickapoo Reservation in Kansas, for example, each member of the tribe, regardless of age or gender, received 80 acres of land (Gates, 1954). Under the provisions of the Dawes Act, individuals were to make their selections under the supervision of special allotting agents, and allotments, once approved, were to be held in trust for twenty-five years, after which the allottee would be issued a fee patent and the allotment would then be subject to alienation (sale or other transfer) and taxation (Dawes Act, 1887). Married women did not receive allotments, presumably under the patriarchal assumption that wives would benefit from their husbands' allotments. Numerous subsequent Congressional Acts, Executive Orders, and directives from the Commissioner of Indian Affairs modified the terms of allotment on many, if not most, reservations. For example, on the Standing Rock and Lake Traverse Reservations, married women received allotments equal in size to those of married men (although they were allotted after the main round of allotments had been completed) (McDonnell, 1991).

Resistance

Throughout this period of time, there were attempts to resist. Native people wrote speeches and petitions speaking out against allotment throughout the allotment era (Black, 2007). The Five Civilized Tribes submitted petitions against removal, and later against the Dawes Act (Campbell,

1984). They focused their efforts on creating political frameworks in opposition to the government and its policy of allotment (Genetin-Pilawa, 2012). The commentaries and speeches from this time understandably showcase guardedness and a general distrust of the government from the removal era to the allotment policies it began enforcing after 1887 (Black, 2007). There are many specific examples of resistance by tribes and individual tribal members, but their opposition was in vain (Genetin-Pilawa, 2012). For example, the Indian agent on the Kickapoo reservation in Kansas emphatically stated in his 1887 annual report that “The Prairie Band and the Kickapoos are strenuously opposed to taking their land in severalty... I am not aware that there is a single member of either tribe who favors the policy.” (Otis, 1934) Nevertheless, the Kickapoo were forced to receive allotments against their wishes.

There also were some individuals in the political arena who voiced their opposition to federal policy at the time, though they were not persuasive or strong enough to overpower mainstream thinking (Genetin-Pilawa, 2012). Groups such as the National Indian Defense Association (NIDA) fought against organizations like the Indian Rights Association (IRA) that advocated for dispossession and assimilation; and Ely Parker, the first Native Commissioner of Indian Affairs pushed against assimilationists and in favor of empowering Native people attempting to defend their interests (Genetin-Pilawa, 2012). Senator Henry M. Teller of Colorado was one of only a handful of politicians who had a clear-eyed view of the true goals of allotment:

The real aim of this bill is to get at the Indian lands and open them up to settlement. The provisions for the apparent benefit of the Indians are but the pretext to get at his lands and occupy them. ... If this were done in the name of greed, it would be bad enough; but to do it in the name of humanity, and under the cloak of an ardent desire to promote the Indian's welfare ... is infinitely worse. (as cited in Pommersheim, 2009, p. 128).

Consequences

Native people had a unique relationship with the land, which was neither addressed nor recognized by the United States government or federal policy. This lack of context in legislation, and a belief that assimilation could occur swiftly, led to the rapid dissolution of protections written into the Dawes Act. The endless desire for Indian land by non-Natives for commercial or personal ownership put pressure on authorities to allow for white settlement into allotment lands. From the late 19th through the early 20th centuries, additional policies were implemented that accelerated the loss of tribal lands.

Two major problems involved leasing and the granting of fee patents. Even though the stated goal of allotment was to have Native owners farm their own land, it soon became apparent that a combination of internal and external factors favored permitting land to be leased to non-Native farmers. Leasing started as a limited practice to enable the elderly and infirm to earn income from their land, but it eventually became a torrent, with the majority of lands remaining in Native hands eventually being leased to outsiders.

It will be recalled that the Dawes Act decreed a trust period of 25 years during which allotments could not be transferred or sold (“alienated”). Again, both internal and external pressures led to the granting of fee patents (outright ownership) on a massive scale before the expiration of the trust period, resulting in the loss of millions of acres through sales, tax forfeiture, and outright fraud (McDonnell, 1991). Throughout the early 1900s, the surrounding white populations were both exploitative and manipulative in their pursuit of land and resources from Native people. Fraudulent sales were rampant, and many speculators pushed their influence to affect policy. Courts and officials also were used to facilitate illegal land transactions (Campbell, 1984). The suspension of legal protections during the trust period made more Native

land and their resources vulnerable to speculators and settlers (Carpenter, 2006, Nash and Burke, 2006).

On the ground, two major impacts of allotment have been fractionation and checkerboarding. Fractionation, also known as “the heirship problem,” refers to the division of land among numerous descendants of the original allottee. In some cases, a single parcel may now be owned by dozens or even hundreds of individuals, all of whom own minor undivided interests in the land. Dealing with fractionation has been the subject of numerous debates, proposed solutions, and court cases, the most recent of which was the Cobell decision (Martin, 2016). Checkerboarding, on the other hand, refers to the interspersing of lands owned by tribal members with lands owned by non-Natives, resulting in a checkboard pattern of ownership. This was actually an anticipated outcome of allotment, the explicit hope being that Native land owners would benefit from the farming and husbandry examples of their non-Native neighbors, while breaking up tribal unity and authority (Shoemaker, 2015).

The End of Allotment

Between 1887 and 1934, Native land ownership decreased from 138 to 52 million acres (McDonnell, 1991). Allotment proved to be a disastrous policy that decreased the land base, as well as income for Native people to one-tenth the U.S. average by 1934 (Gregg and Cooper, 2010). The Indian Reorganization Act (IRA) of 1934 was passed in reaction to the Meriam Report of 1928 and other information that brought into focus the disastrous effects of allotment and other assimilation policies. The IRA ended allotment, made appropriations to extend reservations and return some of the land lost, allowed for business charters, and provided for further educational resources (Gregg and Cooper, 2010). The systemic impacts of allotment are

still tangible, as litigation over resources, fractionation, child custody, environmental actions, taxes, human remains custody, and economics are still ongoing (McLaughlin, 1996).

The Pawnee – Removal and Allotment

Historical

Wishart (1979) has summarized the impacts of early contact by Euro-American explorers and settlers on the Pawnee and their subsequent displacement to Indian Territory. In the early 1800s, the Pawnee were composed of four bands – the Skidi (1,000 members), Chaui and Pitahauerat (1,600 combined), and the Kitkehahki (1,400) – who settled around the Platte and Republican river valleys in Nebraska for seven to eight centuries prior to the nineteenth century (Wishart, 1979) (Figure 1.1). Their land system functioned both as private ownership and communal sharing. Fur trading had a major influence on the Pawnee. Wishart writes that the beaver, which was sacred to them, was nearly eradicated from the Great Plains by the 1830s, and that the trade itself spread diseases such as smallpox which had a destructive impact on the Pawnee; their numbers decreased from 8,000 to 10,000 down to 4,000 by the 1850s. Treaties between the Pawnee and the government began early on (in the 1830s the Pawnee ceded lands south of the Platte) and with expanding White settlement, Pawnee society had become heavily impacted by the 1840s. Further land cessions commenced in 1848 and 1857 (Kappler, 1902). The life they had known for hundreds of years was changing at a rapid pace.

Removal

In 1857, the Pawnee signed a treaty that placed them on a much-reduced reservation on the Loup River in Nebraska Territory. They were given compensation of \$40,000 for five years and then \$30,000 annually in perpetuity, along with promises of education, an agency,

equipment for agricultural and stock raising activities, and housing (Wishart 1994, p.106). However, their way of life continued to be compromised due to natural disasters, pests, and increasing reliance on annuity payments, contributing to their dwindling population into the 1860s. The new methods of farming thrust upon them were foreign – farming among the Pawnee was a role that women filled traditionally – so it was met with resistance, both as to the gendered aspect as well as regarding the methods that were being promoted.

Wishart (1994) further describes that the Pawnee had developed a reputation among whites as being dangerous, when in actuality, the Pawnees' crimes mostly involved the taking of property and similar actions, such as trespassing, stealing horses and cattle, leaving the reservation, etc. At the same time, white settlers were illegally harvesting timber and diverting water, and these violations increased into the 1870s. Settlers were heavily encroaching on Pawnee land (Figure 1.2), which increased tensions and violence, and the Pawnee complained to their agents about the aggressiveness of settlers encroaching on them; the depletion of their resources was especially detrimental to them at that time after having been weakened extensively already. Published materials at the time acknowledged that outsiders knew how valuable their land and resources were, and how much they were desired. Still, the Pawnee desperately wanted to stay in Nebraska – it was the home of their ancestors, their way of life, and their sacred sites, which would all be lost if they were to leave.

After holding out for so long and after much deliberation, the difficult decision was made to leave their ancestral homelands. Due to the conditions they were living in, including pressure from white settlers and the constant attacks from the Lakota – who were arguably posed against the Pawnee and armed by the government to encourage removal – the Pawnee Council decided on October 8, 1873 to sell their land in Nebraska and leave for Indian Territory. The reservation

they were leaving behind had at that time 278,000 acres (Wishart, 1994). Under duress, they chose to move south to join the Wichita, already in Indian Territory, with whom they had a strong cultural and linguistic relationship that heavily influenced their decision. To create a new reservation, they purchased lands from the Creek and Cherokee Tribes, who had long lived in Indian Territory after their own removal from the southeastern U.S. The Pawnee migration south began in October of 1874, and the majority had completed their journey to Indian Territory by February of 1875. Contrary to their expectations, the Pawnee were not settled with the Wichita but on land 150 miles away, which they saw as yet another betrayal (Wishart, 1994). The Pawnee received a total of \$750,000 (\$2.70 per acre) for their Nebraska reservation, but they were required to bear the costs of their move to Indian Territory, including the purchase of the new reservation.



Figure 1.1 Pawnee Prehistoric Settlement, Nebraska (<http://nebraskastudies.org/1850-1874/native-american-settlers/na-meet-the-challenges/>)

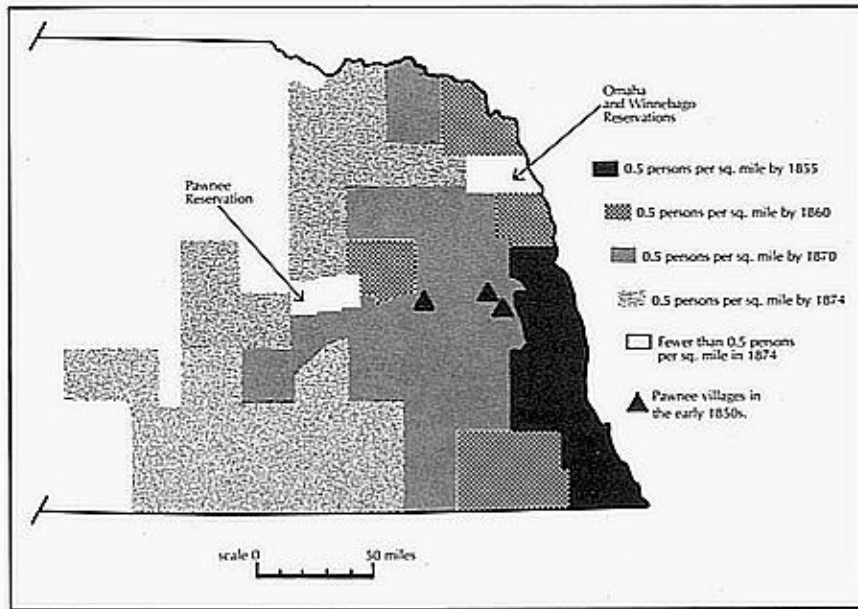


Figure 1.2 Pawnee Reservation in Nebraska and spread of settlement 1855-1874 (modified from Wishart, 1979).

A New Reservation and Allotment

Wishart notes that the reservation in Indian Territory (Figure 1.3) was inferior to their lands in Nebraska – rough terrain, thin soil, with little timber – and disease continued to ravage the population as their funding dwindled. By 1875, the Pawnee were in crisis. Conditions made it difficult to maintain their traditional culture and way of livelihood – the new environment, the changes to their annual cycle, and without bison for their ceremonies. Financially, after the Pawnee reimbursed the government for their support during the move to Indian Territory and the Creek and Cherokee for their land (\$177,110), they were left with only \$280,000. Thus, they netted less than \$1.00/acre for their valuable Nebraska lands; although they had wanted to hold out for a fairer payment they were too impoverished to do so and had accepted the terms in order to survive (Wishart 1994, p.202).

Under the Jerome Agreement of 1892, the new Pawnee Reservation was abolished, and the Pawnee agreed to allotment and to cede unallotted “surplus” lands. Individuals over 18 would select their own allotments, those under 18 would have their allotments selected by their father unless dead, otherwise by the mother, and allotments for orphans would be selected by the agent (Senate, 1893). Allotment sizes would conform to the Dawes Act: each head of family, one-quarter of a section; singles over 18, one-eighth of a section; orphan minors, one-eighth of a section; other minors, one-sixteenth of a section. (Morgan, 1892). Allotments were made under the direction of Special Allotting Agent Helen P. Clark in 1893. Of the original 283,020 acres on the reservation, 797 allotments were made, totaling 111,931.61 acres (Pawnee Subagency, 1893). After allotment was complete 171,088.37 acres were left as surplus (Wishart, 1994), which was sold to the Cherokee Commission. The Pawnee were paid \$1.25/acre for their surplus lands, for a total of \$212,916.71, with an \$80,000 advance to be distributed in per capita payments, amounting to about \$500 for a family of five, and the remainder (\$212,916.71) placed in trust for the tribe (Morgan, 1892), which was not paid until a Court of Claims case in 1920 (Wishart, 1994).¹ The figure of \$80,000 as an advance was arrived at because there were 800 Pawnee individuals, of which 203 were adult men. The Jerome agreement specified that individuals over 18 years of age, both male and female were to select allotments. It is apparent from the issuance of patents and the allotment schedules, that women did receive allotments separate from their husbands. There were also relatively small deviations for some allotments from the specified 160 acres that remain unexplained by the reviewed documentation.

¹ The Pawnee reservation and government were reestablished after the IRA of 1934 (Parks, n.d.).



Figure 1.3 Pawnee County, Oklahoma (<https://www.worldatlas.com/na/us/ok/c-pawnee-county-oklahoma.html>).

Research Questions

The overarching goal of this thesis is to map, analyze, and understand patterns of land allotment that occurred on the Pawnee Reservation in Oklahoma in the 1890s. To achieve that end, my research focused on two major research questions in regard to Pawnee land allotments.

1. What were the overall patterns of allotment and what strategies did families and clans employ in selecting their allotments?

It is known from previous research that, generally speaking, individuals were able to select their own allotments rather than having their allotments chosen for them. Assuming that to be the case for the Pawnee, this research first seeks to examine the patterns that resulted from Pawnee land selections and what geographical patterns resulted. Were allotments clustered or

dispersed? Was there a checkerboard pattern, i.e., allotment parcels interspersed with parcels not allotted, which would have then been available to non-tribal members?

Family ties can be seen as an extension of tribal cohesion. Given that each member of a Pawnee family was given an allotment, to what extent were family ties a factor in land selections? If so, did family members select lands that were clustered together or that were strategically placed to take advantage of locational factors such as proximity to the agency headquarters or access to resources such as water or timber? Using surnames to analyze these spatial patterns may provide insight into these relationships. Would it be possible to discern patterns beyond nuclear family relationships, such as extended family or clan membership?

2. What environmental factors likely contributed to the observed patterns of allotment?

What environmental or landscape factors may have been important in making allotment selections, and what landscape factors may have been avoided? Topography, soils, and land cover are important factors, considering that resources and agricultural productivity were immediate concerns during allotment. It also is pertinent to take into consideration where resources at the time were available, and how relief, vegetation, hydrology, timber and other environmental aspects catalyzed these decisions.

Study Area

The Pawnee Nation land is located in north-central Oklahoma. The Oklahoma Climatological Survey (2019) describes Oklahoma as part of the humid subtropical classification, demarked by long summers, short winters with periods of prolonged cold, and an overall humid environment, with influence from Gulf of Mexico air masses. It is located in the overall drainage basin of the Mississippi River; the Arkansas River, which borders the northern side of the Pawnee Nation is a

significant tributary. The terrain in this area is relatively level, at an elevation of about 870'. The area receives between 30-35 inches of precipitation on average annually. Historically, Oklahoma was dominated by tallgrass prairie and oak forest, though expansion of population and agriculture have substantially changed the landscape (Figure 1.5). Today, this area of Oklahoma is dominated by herbaceous plants, interspersed with deciduous forest, cultivated crops, hay/pasture, and small areas of urban development.

The original reservation intersected the counties of Pawnee, Payne, and slightly into Noble County on the far western side of the reservation (Figure 1.4). Much of this land has since been ceded, and the Pawnee Nation today retains an admixture of fee and trust land within its borders. The Pawnee Nation is headquartered within Pawnee, Oklahoma, in Pawnee County. While the population of Pawnee, Oklahoma itself is 16,472 (U.S. Census Bureau, 2017) the number of Pawnee tribal members is about 3,200, many of whom do not reside in the area (Pawnee Nation, 2015). The Census Bureau classifies this county as 100% rural and 0% urban; it is located some distance from Oklahoma's most populated areas, the closest being Tulsa (pop. 401,800) about 56 miles to the east. According to the Southern Plains Tribal Health Board, the Pawnee land is still a recognized reservation, though jurisdiction is subjective within those borders in regard to law enforcement and natural resources.

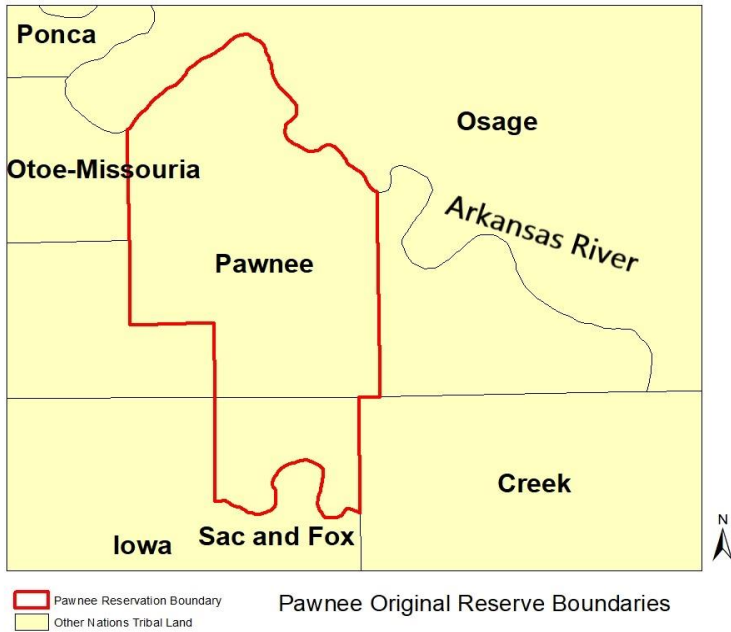


Figure 1.4 Original Pawnee Nation Reservation in Oklahoma prior to allotment and land cessions.

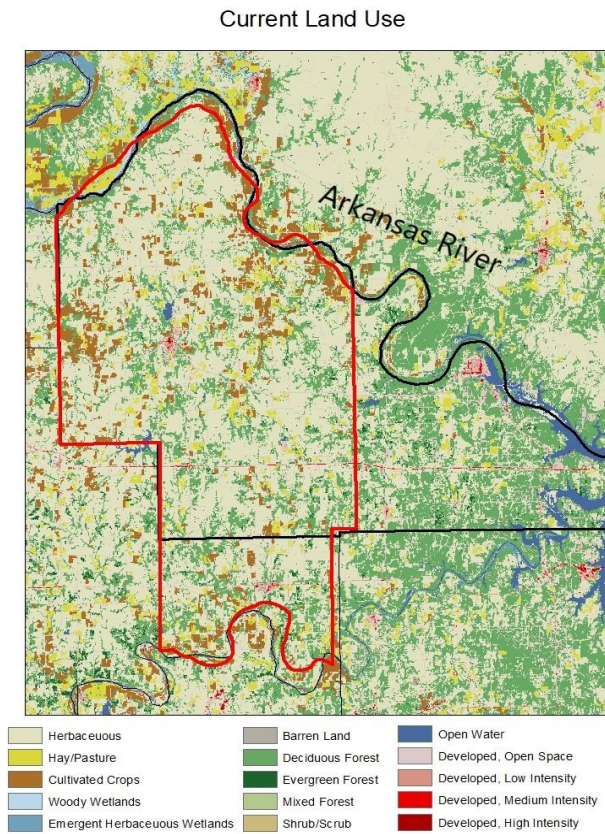


Figure 1.5 Current Land Use with Pawnee County/Reservation boundary.

In recent years, the Pawnee nation has expanded their economic development with the implementation of the Pawnee Tribal Development Corporation (PTDC), established in 2002 – a separate entity from the tribe, but wholly owned by it (PTDC, 2015). From this, several subsidiaries have been created as the corporation has grown considerably; according to the PTDC, they began with 18 employees and now employ 178 people. Under Gaming there is Stone Wolf Casino, Tee Pee Casino, and Pawnee Nation Trading Post Casino; Food and Beverage includes Howler’s Famous BBQ, and two convenience stores; and there is a Construction Management operation. All are located within Pawnee Oklahoma, except Tee Pee Casino in Yale, Oklahoma. The stated mission statement of the corporation is to develop economically for the self-sufficiency of the Pawnee Nation (PTDC, 2015).

Data

Three broad categories of data were used in the mapping and analysis of allotments on the Pawnee Reservation:

- Archival records pertaining to allotment and censuses
- Annual reports of the Commissioner of Indian Affairs
- Environmental databases

Archival Records

The data acquired for this project pertain to the Pawnee Nation during the allotment period, specifically regarding allotment, fee patents, fractionation, and leases. The majority of this data was photographed at the National Archives Branch in Fort Worth, Texas by Dr. Stephen Egbert. These datasets are part of Record Group 75 of the Bureau of Indian Affairs Preliminary Inventory of the Records of the Pawnee Agency and Subagencies (Table 1.1). Many record sets were collected, though not all were used in this research because they fall outside the scope of the research questions. Unexplored data and future directions for them, as well as the studied datasets can be found in the appendix.

Table 1.1 Archival documentation gathered at Ft. Worth, TX from the available records on the Pawnee Nation, detailing land transactions. Data marked * were used in the project while the other data provide background and supplemental information.

National Archive Records- Ft. Worth, TX, Record Group 75: Records of Pawnee Agency/Subagencies		
Name	Description	Data Source
Pawnee Schedule of Allotments*	Allotment description, name, age, sex, relation to head, complete	Pawnee Agency
Pawnee Tract Books- Patenting Information*	Description, name, patenting dates	Pawnee Agency
Contested Allotments	Compensation for allotments by building of N. Oklahoma railway	Pawnee Agency
Allotment Fragments	Incomplete allotment schedules, small portion of tribal allotments	Pawnee Agency
GLO Survey Plats	PLSS outline with drawn topography, 1893	General Land Office
Oil and Gas Lease Book	Allottee, description, heirs, oil and gas leases, dates, prices, companies	Pawnee Agency

Two primary resources were used to identify allotments, their owners, and their geographical locations: Pawnee Schedules of Allotment and Pawnee Allotment Tract Books. Both contain similar information since they were created concurrently at the time of allotment, but they differ in the way the information is organized.

Pawnee Schedules of Allotment, 1893. The Schedules of Allotment are arranged numerically by allotment number and include (in addition to the allotment number) the allottee's name, sex, age, relationship to head of household, and legal land description (Figure 1.5). The legal description of each parcel is in standard Public Land Survey System (PLSS) format, proceeding from the smallest subdivision to the largest. For example: "SW1/4 of NE1/4 of Sec 31 of Township 23S and Range 6E" or "Lots 6 & 7 of Sec 32 of Township 23S and Range 6E".

Schedule of allotments of lands in severalty made to Indians of the Pawnee Reservation in Oklahoma by U.S. Special Agents Helen C. Lake and G. S. Indian Agent John Wood, under Act of Congress Approved February 8, 1891, as amended by the Act of February 23, 1891, in accordance with instructions from the acting Commissioner of Indian Affairs March 17, 1891.

Original

No. of Allotment	Name of Allottee	Sex	Age	Subdivision	Section	Town	Range	Acres	100ths	420	Remarks			
1	Young Chief	M	45	1/2 of Sec 6	31	23rd	6E	80	1	328	head			
2	James Young Chief	M	35	1/2 of Sec 7	31	23rd	6E							
3	Edward Young Chief	M	13	1/2 of Sec 7	32	23rd	6E	102	1	192	head			
4	Sah-kah-Mah-shief	M	9	1/2 of Sec 8	6	23rd	6E	119	1	92	head			
5	Charles Wheeler	M	13	1/2 of Sec 8	12	23rd	5E	160	1	00	head			
6	Paul Chief	M	59	1/2 of Sec 19	20	71st	19	200	58	159	95	head		
7	Sho-tah-Brave Chief	M	31	1/2 of Sec 19	20	71st	19	200	42	159	90	head		
8	Henry Brave Chief	M	34	1/2 of Sec 19	20	71st	19	200	45	97	40	head		
9	Henry Brave Chief	M	5	1/2 of Sec 19	19	20th	5E	60	19	200	58	84	80	head
10	Coffin Brave Chief	M	16	1/2 of Sec 19	21	23rd	4E	160	00	160	00	head		

Figure 1.6 Excerpt from E124. Pawnee Schedule of Allotments.

Pawnee Allotment Tract Books, 1893. The Tract Books are organized geographically by section, township and range of the PLSS and include the legal description, name of the allottee, allotment number, date of approval, date of issued trust patent, and notations about issuance of fee patents (Figure 1.6).

Pawnee INDIAN RESERVATION IN Oklahoma

In Townships North of the Base Line, in Ranges East of the Indian Meridian.

DESCRIPTION OF THE TRACT.				AREA.		INDIAN NAME OF ALLOTTEE.	ENGLISH NAME OF ALLOTTEE.
SUBDIVISION.	Section.	Town.	Range.	Acres.	100ths.		
NE	7E	7	22	40		Paul Little Eagle	
NE	"	"	"	40		"	"
SE	"	"	"	40		"	"
SE	"	"	"	40		"	"
SE	7E	"	"	40		Gus Good Fox	

Figure 1.7 Excerpt from 126 Pawnee Allotment Tract Books, 1893.

Annual Reports of the Commissioner of Indian Affairs

In addition to the land allotment records from the Fort Worth Branch of the National Archives, Annual Reports from the Commissioner of Indian Affairs for the relevant years were collected for insight and historical context about the Pawnee tribe and their conditions before and after removal and during allotment. The Annual Reports contain both a general report from the Commissioner and field reports from Indian Agents and Superintendents at each of the reservations. The field reports contain valuable information regarding the status of various government programs, including allotment, and local conditions and attitudes.

Environmental Databases

These datasets (Table 1.2) were collected through various state and governmental GIS data gateways. They are publicly available GIS files that were imported to create map layers to provide context for the analysis. Many of the datasets were collected through the USDA:NRCS data gateway, including the SSURGO soil data, National Land Cover Database (NLCD) Land cover data, NRCS hydrography dataset, and the National elevation dataset. In addition, this data gateway provided some additional land ownership data such as protected areas and Indian territories of Oklahoma. Additional political datasets were gathered from ArcGIS Online. The environmental context of the area has clearly had an impact on allotment and is an important factor to consider when unraveling the story of allotment for Pawnee Nation.

Table 1.2 Dataset descriptions with the authoring source that will create the basemap and various environmental layers to examine the story of allotment, spatially.

NRCS Geospatial Data Gateway	
Description	Data Source
Federal, state, tribal areas of protected ownership, all fee land in Ok.	U.S. Department of Agriculture (USDA)
National hydrography	National Resource Conservation Service (NRCS)
National land cover dataset, by state	National Land Cover Database (NLDC)
Gridded soil survey by state	Soil Survey Geographic Database
American Indian lands by tribe, in Oklahoma	Topologically Integrated Geographic Encoding and Referencing (TIGER)
Overall Indian territories in Oklahoma	U.S. Census Bureau
National elevation dataset, 30 m resolution	U.S. Department of Agriculture (USDA)

Methods

The primary framework for mapping and exploring allotments on the Pawnee Reservation is Historical GIS, which uses geographic information systems (GIS) and historical records to map and analyze geospatial phenomena in a historical setting (see, e.g., Knowles 2016). It is a methodology of historical geography, using GIS and remote sensing. Using GIS in historical research has the potential to provide new insights and challenge existing orthodoxies by providing new avenues for viewing historical information (Gregory and Healey, 2007). GIS creates a framework that is ideal for any geographic approach, as well as allowing one to view the historical boundaries and the constraints of the physical geography (Gregory and Healey, 2007, Knowles, 2016). It is a potentially new view of history and may allow for new information about changes through history (Ng, et al. 2016).

In historical GIS, it is important to understand that the techniques used should be study area-specific, and that the analysis should respect the nature of spatial data as nonstationary and

spatially dependent (Gregory and Ell, 2007). There may be limitations to what can be done with the data, but the digitization and integration of the information through GIS are an invaluable resource in terms of a visual representation of rarely publicized information both for Natives and non-Natives. These methods are concurrent with the standards of historical research in regard to historical GIS and archival research.

Historical GIS

GIS first was used to create a base map of Pawnee allotments. Federal, state or otherwise published datasets were used to establish basic boundaries, such as the tribal land, and state and county jurisdictions. The allotment schedules were also put into a spatial database in ArcGIS to build the allotments digitally by editing publicly available PLSS shapefiles, while using a historical map as a reference. The PLSS shapefiles were modified to fit the legal descriptions of the allotments, which were adjusted for changes in surveys over time, as well as corrected for errors that now align geographically and descriptively with the PLSS information. The non-geographical allotment data (name, allotment number, etc.) also were joined as an attribute table to the base map (Gregory and Ell, 2007). Analysis of the selection and layout of allotments began here. With these basic allotment layers complete, additional historical information was then integrated for discovery of patterns, processes, and insights.

Once the geographic and attribute databases were complete, the allotments could be compared to the other records of sale, fee patenting, and other aspects to reveal their relationship to their spatial dimension. The use of layers allowed the data to be integrated from these different sources and dates (Gregory and Healey, 2007). As Gregory and Ell (2007) note, it is important to

document the decision making used in creating a historical GIS analysis; therefore, a record of metadata was kept as documentation that may facilitate future use of the information.

For the analysis, familial relationships were investigated first, using the allotment spatial database. Once all allotments were mapped, the family related data could then be explored. Family clusters could be distinguished by the mapping all surnames. To add clarity, the most frequently occurring surnames also were mapped to show their clustering and dispersal. Once census data, including band affiliations, were located close to the time of allotment, band affiliations for a significant number of allottees were also added to the database. These band relationships correspond to traditional villages and Pawnee societal relationships, according to annual reports. These band relationships were then mapped for their relationship to social ties as an allotment selection factor.

Next, the environmental factors for the Pawnee Nation were evaluated. First, the relationship between allotments and streams was explored. After the stream shapefiles were added, the near distance tool was used to evaluate their proximity relationships to allotments and compared to the remaining unallotted land of the reservation. This extended to tributaries, and to the smaller, unnamed tributaries as well. To further investigate environmental factors, land productivity was mapped and quantified by area for both allotments and unallotted land for overall vegetative productivity and range production within the two the relevant counties, Pawnee and Payne. Vegetative production was evaluated by using the National Commodity Crop Productivity Index (NCCPI) for a normal year, along with range production values from the SSURGO data. Potential Natural Vegetation by Kuchler was also reviewed for the area, in support of the environmental data and in comparison to narrative descriptions from annual reports. Lastly, a National Digital Elevation Model was included. The results yielded an

interconnected and overarching relationship between streams and the other environmental factors.

At the end of the familial and environmental analyses, a map displaying sales dates between 1904 and 1920 was included. Taken from the Pawnee Tract Books, it illustrates the widespread sales that were occurring prior to, as well as after, the Burke Act of 1906. The map was added to examine how rapidly changes took place after allotments were selected, using a visual representation.

Once the appropriate analyses were performed, the spatial patterns and how they are interconnected emerged. From this, the processes and patterns of land transactions revealed new insights into allotment and its consequences for the Pawnee reservation through the mapping and visualization capabilities of GIS. In addition, underlying causes and influences that were not considered initially in relation to allotment in depth were uncovered.

Archival Records in Support of Historical GIS

GIS analysis alone is not sufficient without textual archival sources to explore the historical context; thus, this project combined archival records with GIS analysis (Ng, et al., 2016). Archival research involves an examining of the past through historic records, interpreting events, and communicating past happenings (Torou, et al. 2010). The records of land loss, disputes, heirship, and outside interests, all support the spatial data by providing the context for social, political, and legal events. The archival records complement the analysis of allotments for an expanded interpretation of the changes the land underwent into the early twentieth century because of allotment.

Historical GIS allowed the exploration of change over time. From the beginning of allotment, through the varying dates of sale, contestation, and fee patents, a story of the allotment policy on the Pawnee nation unfolded. This was supplemented by the text from the Annual Reports of the Pawnee Indian Agents. The quantitative and qualitative data integrated context into a spatial analysis for a holistic view of Pawnee land during allotment.

Research Merit

The history of allotment is fairly well known, as are the consequences that have manifested themselves in the form of checkerboarding, fractionation, and ultimately the massive loss of land. What has not been well understood are the mechanisms of these processes and how they extended, spatially, especially at the tribal, clan, family, and individual levels. Further confounding the issue are the differences between tribes and individual political, economic, and environmental circumstances. A lack of case studies of the experience of allotment among individual tribes, with their independent factors and events, contributes to the deficit of adequately understanding these processes and the stories of how different tribal land holdings came to their current situations. This analysis is a case study of the Pawnee tribe that seeks to explicate the processes and impacts of their land allotment experience and to illuminate the spatial processes of allotment on a broader scale; thus, helping fill the gap of spatial understanding.

In this research, a comprehensive map outlining the allotment of the Pawnee tribe in the 1890s was created. Selection patterns among families and clans were analyzed to discover spatial patterns. Further, the relationships of selection and placement of allotments in relationship to the

landscape also were examined. This research, therefore, pursues an understanding of the spatial patterns of allotment and their relationship to family and tribal relationships and the environment.

Chapter 2: Family and Clan Relationships and Allotment Selections

Introduction

The first stage in examining the possible reasons behind allotment selection patterns was to examine family and other kinship relationships. It was hypothesized that family groups likely would tend to select their allotments together, creating clusters of families and extended families on the reservation landscape. In research conducted for allotment patterns on the Standing Rock Reservation for example, Meisel and Egbert (personal communication) found that many individuals selected allotments adjacent, or in close proximity, to other nuclear family members, although other family allotments occurred in more dispersed patterns, suggesting other, more complex, factors and motivations for allotment selections.

Beyond family relationships, some tribes, including the Pawnee, had well-developed clan structures that may have influenced allotment selection patterns. Bands within tribes are separate political organizations; without direct leadership, and comprise the tribe overall, which is the larger encompassing political and cultural structure (O'Neill, 2006). Clans are based on kinship, friendships, marriages, ideology or other criteria as well (O'Neill, 2006, Moore and Campbell, 1989). Regarding bands and allotment, in pioneering work on the Cheyenne, (Moore, 1987) showed how blocks of land on the Southern Cheyenne Reservation were set aside for each band, reflecting locations where the bands were already camped. These clan-based patterns were then reflected in maps of actual allotment selections (Moore 1987, p. 212). On the Standing Rock Reservation, Meisel (personal communication) found that individuals belonging to the four tribes

that were located on the reservation generally selected allotments that reflected their tribal affiliations. On the Grand Ronde Reservation, settlement patterns reflect band and tribal affiliations, geographically replicated in respect to one another after their removal (Kretzler, 2017). Since the Pawnee were known to have a strong clan structure, it was also hypothesized that clan affiliation might have played a role in the spatial pattern of allotment selection on their reservation as well.

To begin the analysis, the allotments were mapped using the Public Land Survey System (PLSS) shapefiles. They were subdivided into the appropriate parcels based on the legal descriptions, including quarter sections, half-quarters, quarter-quarter sections, and further necessary divisions (Figure 2.1). Initially, the patterns look slightly random, with the northern and western border areas more densely populated than in the center or along the eastern border. The area along the Arkansas River forming the northern boundary of the reservation appears to be almost fully filled in, aside from the very northern peak of the boundary. There also is a noticeable diagonal pattern across the center of the reservation, from the northeast to the southwest, generally, as well as other sporadic clusters throughout the reservation.

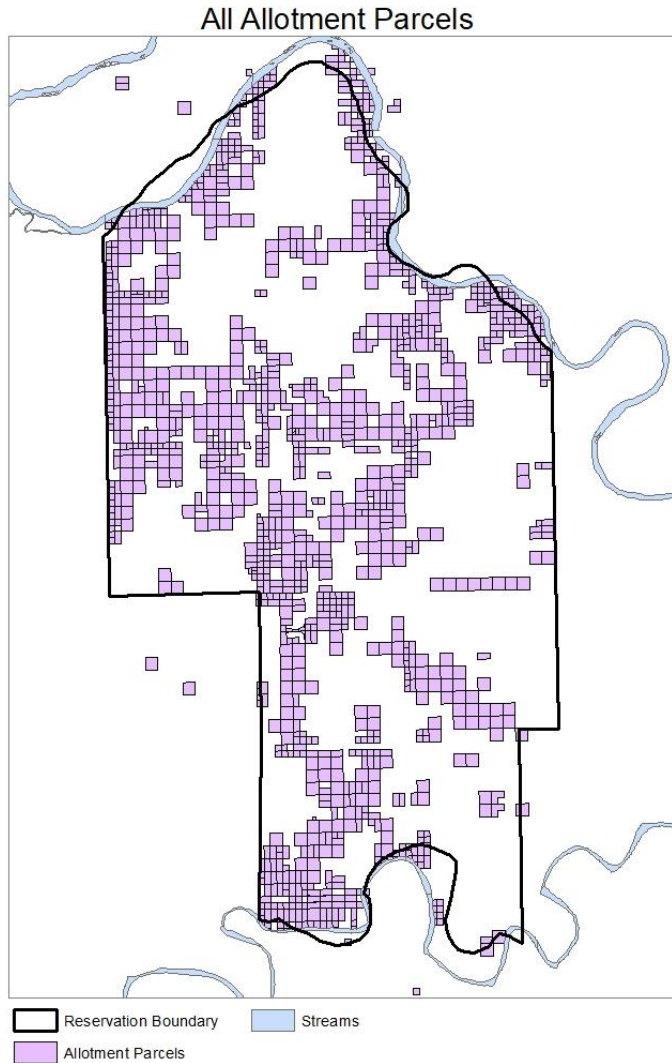


Figure 2.1 All Allotment parcels for Pawnee Nation. Discrepancies between border and river morphology is attributed to typical meandering behavior of the Arkansas River.

Family Patterns of Allotment

Familial relationships were established for this research via shared surnames contained within the allotment schedules. Additionally, census information pertaining to tribal band affiliation was included, as the clan system has traditionally been an important influence within

the Pawnee Tribe. Bands were added to the attributes of the allottees, alongside surnames and allotment numbers. This data was overlaid in the geospatial layer to integrate and establish the relationship correlation to social ties and selection.

The surnames map of allotments (Figure 2.2) was created by transcribing the entries in the Pawnee schedule of allotments and entering them in a spreadsheet database. The allotment database was then combined with a spatial database of the Public Land Survey System (PLSS), which enabled mapping and analysis of allotment patterns on the Pawnee Reservation. As is apparent from an initial overview, the distribution of parcels was spread throughout the reservation, but primarily in clusters of parcels. It is also clear from the allotment map that a substantial amount of land within the reservation boundaries was not allotted (the “surplus”) and would therefore be open to sale and settlement by non-tribal members after the appropriate legislation was passed. It also appears that several allotments lie well outside the reservation boundary yet remain unexplained by the records used in this study. It is known that in some allotment cases members of tribes were granted permission for allotments outside of established tribal boundaries, although it is unclear whether this was the case with the Pawnee. It is also possible that the initial entries were in error or that transcription errors may have occurred; however, the allotment schedules and resulting transcribed data were cross referenced during the creation of this geospatial layer for maximum accuracy.

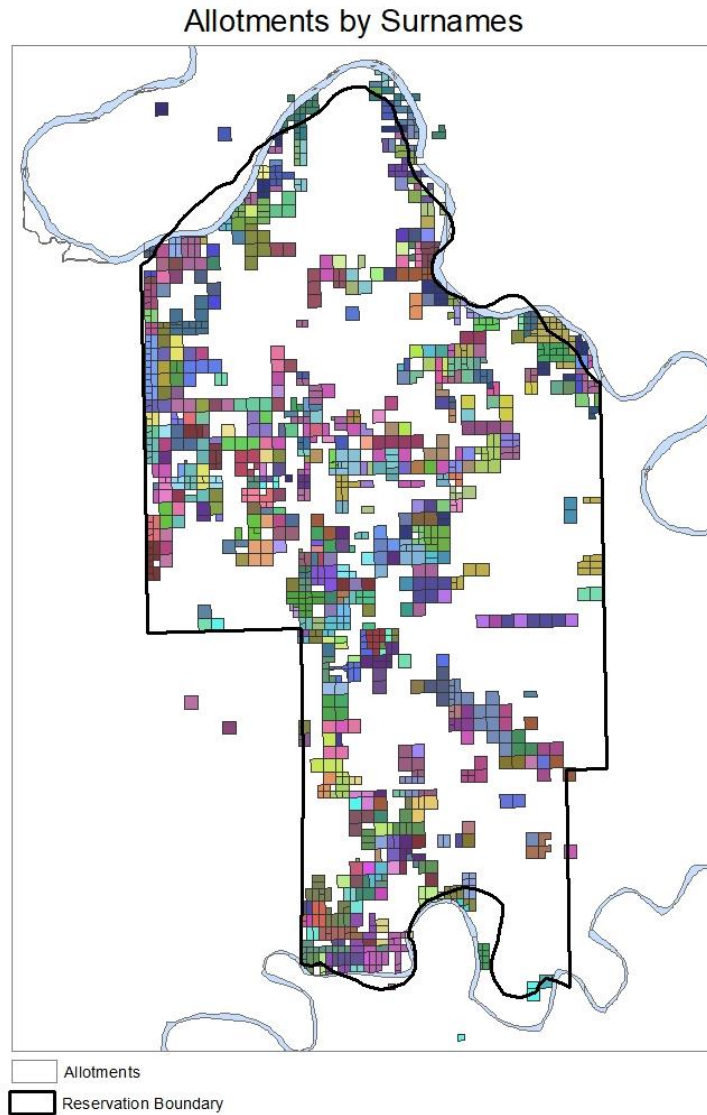


Figure 2.2 Allotment parcels mapped by family surnames.

Prominent Families and Clustering

The map of allotments by family surname was created to examine whether family members took allotments in clustered or dispersed patterns; Figure 2.2 shows the patterns of allotment by family surname. Although the map is complex because of the number of allotments

and families shown, it is apparent that many family members took allotments adjacent or near to the allotments of their relatives, creating clustered patterns. To further examine family allotment patterns, the allotments of seven of the tribe's largest families were examined. Table 2.1 displays the most common or numerous surnames of the Pawnee tribe. These are the seven surnames with the largest number of family members out of 241 total unique surnames in the allotment register, excluding the 25 tribal members who did not have a surname listed in the Schedule of Allotments. Since these are the largest families, they were chosen to investigate initial selection patterns. It was surmised that there should be some clustering or other distribution patterns that might indicate the familial relationship. A couple of caveats are in order regarding the use of surnames to determine family membership and allotment patterns. First, is the assumption that all people in a tribe with a given surname were related. Although this is probably a reasonably safe assumption with a small tribe like the Pawnee, it is demonstrably not the case with some larger tribes, such as the Lakota. Second, relatives such as in-laws and non-blood family members would not be counted, even though they may have been very close in terms of familial ties. Nevertheless, a look at surname relationships can give a rough picture of family strategies in choosing their allotments.

Table 2.1 Shows prominent families by highest seven occurring surnames.

Largest Families by Surname	
Surname	Count
Bayhülle	38
Howell	25
White	28
Pappan	21
Echo Hawk	17
Jake	17
Weeks	17

Figure 2.3 shows that some of the prominent (largest) family surname groups are highly clustered, and some less so, represented by the families in Table 2.1. For example, the Echo Hawk family in the south and the White family near the center were highly clustered, while the most numerous surname group, the Bayhille family was relatively much more dispersed, with five or six sub-clusters of allotments and a few single allotment outliers. A similar pattern in family allotment distribution was seen by Meisel (personal communication) in his work on the Standing Rock Reservation, where members of nuclear families took their allotments in a variety of spatial patterns, ranging from highly clustered to highly dispersed. Based on recorded tribal affiliations, it is possible that allottees at the Grand Ronde Reservation relayed their affiliations specifically to be close to extended family members (Kretzler, 2017). This is supported by their apparent clustering patterns and spatial autocorrelation analysis (Kretzler, 2017).

While there are apparent reasons why family members would want to take their allotments adjacent to each other, including the maintenance of family, economic ties and support, there are other factors that may explain a pattern of dispersion, such as desired parcels having been preemptively selected by other (non-family) individuals and therefore not available.

In addition, there may have been a desire to be close to (or even away from) certain people or families, or close to economically valuable locations, such as the Agency, roads, or planned railroads. Finally, spatial patterns of allotment may also be a reflection of a preference for land that reflects traditional cultural or economic values, such as stream bottom lands that provide access to shelter, fuel, and game – these values may have taken precedence over lands that were close to family members but were perceived as being of lesser value. It might be noted

that although interviews and ethnographic research are beyond the scope of this thesis, they hold promise as a potential means of answering questions about detailed rationales for land selection.

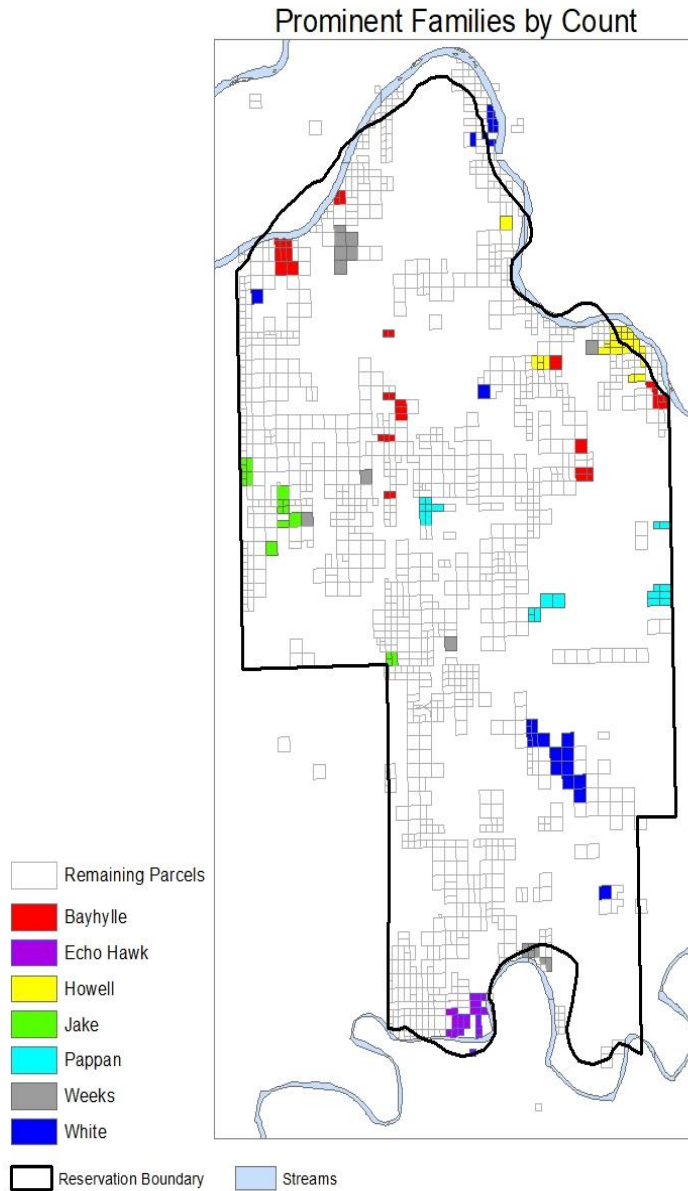


Figure 2.3 Shows the seven highest occurring surnames.

Band Affiliation and Allotment Patterns

From the time of contact in the nineteenth century, the presence of four separate Pawnee bands has not changed; whether earlier internal changes may have occurred regarding band membership or characteristics is not known (Wishart, 1979). Historically however, the bands of the Pawnee were linguistically similar and politically independent, based on an intricate kinship network, especially the Skeedee (Wishart, 1979). Based on the descriptions from Lewis and Clark these bands were spatially distributed with the Skidi on the Northern side of the Loup river, Chowee and Pet-a-how-er-at on the south side of the Platte, and the Kit-Ka-Hock band in the Republican Valley (Wishart, 1979)² It is not surprising, given the long-standing structure and identities of bands within the Pawnee Nation, that band cohesion and settlement patterns would continue throughout the process of the sale of the reservation, removal, and allotment on their new reservation.

The likelihood of allotment patterns reflecting band divisions was suspected after it was discovered that the allotment schedules designated separate parcels for cemeteries for each band within the Pawnee Reservation (Figure 2.4). The four cemeteries were named for the four bands and were located separately throughout the reservation. From north to south, the cemeteries were spread throughout the reservation and tending to be located towards the interior, rather than near the borders. The allocation of separate cemetery parcels for each of the four bands provided a strong indication that the bands were still a part of Pawnee life, society, and politics. In turn, their distribution is most likely indicative of an overall pattern in reference to the bands, and by extension the complex mix of relationships that compose them. Based on the locations of the

² The names of the Pawnee bands are frequently spelled differently depending on the source, e.g., Skeedee, Skidi, or Skiri; Chauj, Cawi, Chowee, or Tsawi, etc.

cemeteries for each of the bands, it was decided to further examine allotment selection in relation to band affiliation.

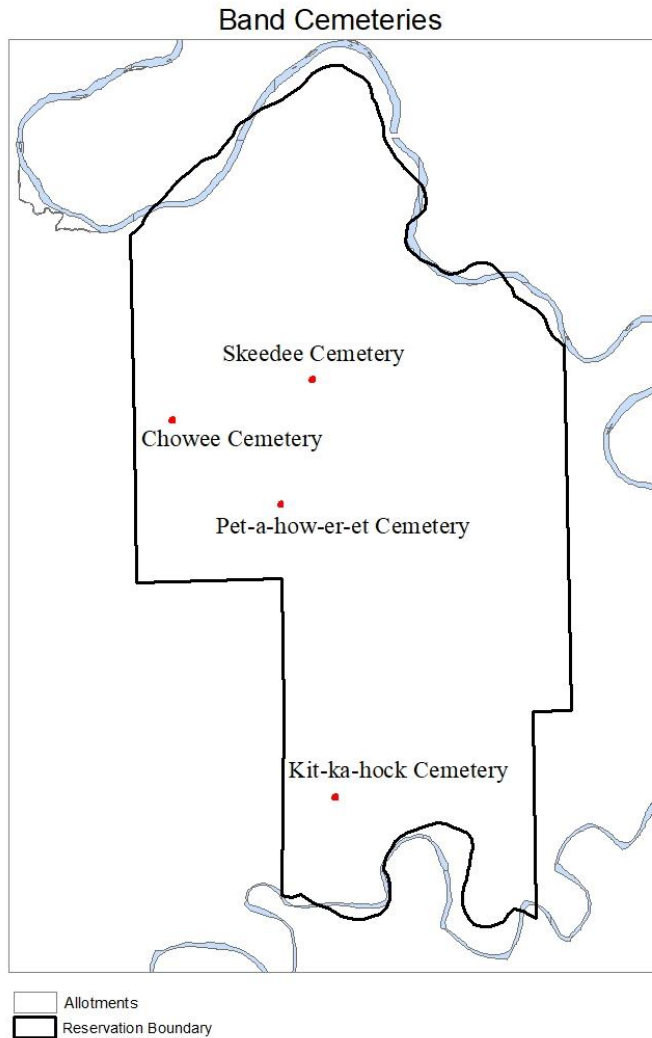


Figure 2.4 Pawnee Nation cemeteries separated by band.

To determine band affiliation for individual tribal members, the Pawnee Indian Census of 1905 was referenced and added to the geospatial database (Figure 2.5). As part of the assimilation program of the U.S. government, annual Indian censuses were taken starting in 1887 and continuing through approximately 1940. Information collected for each census increased over

time, but generally included a person's name, marital status, gender, age, and family relationship.

The censuses have been photographed and transcribed and are available via Ancestry.com and

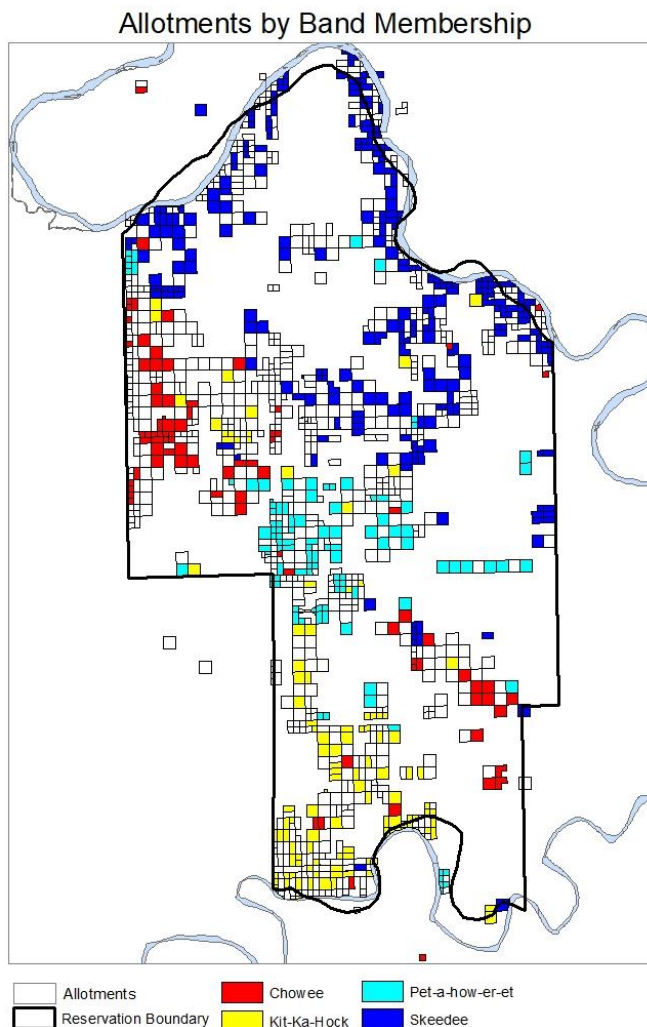


Figure 2.5 Shows band affiliations for Pawnee Nation by 1905 census.

FamilySearch.org. Fortunately, on the 1905 Pawnee census a majority of the tribe's members were grouped by their band affiliation. Since some tribal members were not listed with a band affiliation on the 1905 census and, given the time lag between allotment and the census (and the births and deaths occurring during the intervening years), not all allottees could be linked to a

band. It also is important to note that one's surname does not necessarily affiliate one with a particular band, i.e., different individuals with the same surname may belong to different bands. Notwithstanding these caveats, the band affiliation for those allottees for whom an affiliation was listed in the 1905 census were added to the attribute table for the allotment database and a map of allottees by band affiliation was created.

As is apparent from Figure 2.5, members of each of the four bands had a portion of the reservation where they were clustered, with some intermixing apparent. Unsurprisingly, the allotments of band members generally correspond to the vicinities of the band cemeteries. The Skee-dee land selections were located mostly in the north with many allotments along the Arkansas River and an additional cluster near the Agency in the center of the reservation, while the Chowee allotments ran across the center of the reservation in a diagonal pattern from northwest to southeast. Interestingly the Pet-a-how-er-at band occupied the center of the reservation and intersected the diagonal Chowee pattern of allotments. Finally, the Kit-ka-Hock generally were concentrated in the southwestern portion of the reservation, with some members selecting allotments in the northwest among the Skee-dee and Pet-a-how-er-at. Based on these observed patterns, it is reasonable to assume that one's band affiliation was an important factor, at least in the Pawnee tribe, when selecting allotments.

To examine the relationship of the clusters of band allotments to the location of the Pawnee Agency in the center of the reservation, the Central Feature tool in ArcGIS was employed to map the most centrally located allotment for each band (Figure 2.6). Then, for the centrally located features of each band, the distance to the Agency was measured (Table 2.2). For three of the bands (Chowee, Pet-a-how-er-at, and Skee-dee), the distance from the centrally located allotment to the Agency ranged between 7 and 8.5 Km, or roughly equal in distance.

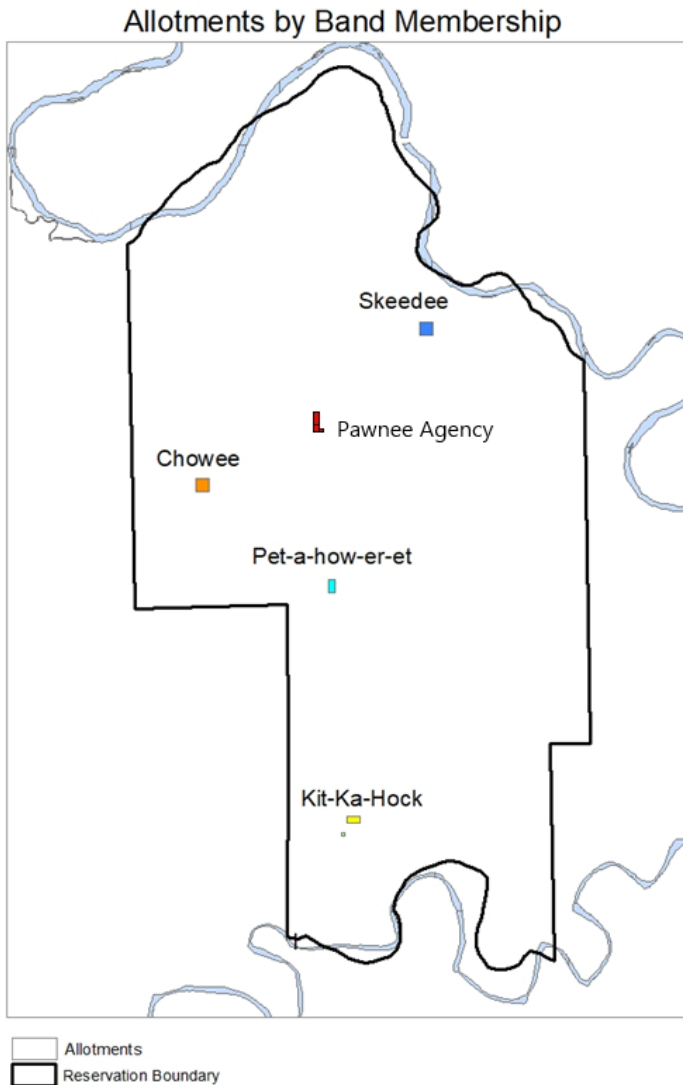


Figure 2.6 Each of the bands by most centrally located polygon.

However, the central allotment of the Kit-Ka-Hock band in the South lay over 23.5 Km from the agency, over 14 miles. The extent to which distance to the Agency influenced allotment selection is difficult to determine with any certainty, though a farther distance may have caused difficulty for some Kit-Ka-Hock and other allottees that were far removed. On the other hand, it might be considered that perhaps the Kit-Ka-Hock band members and others who selected allotments more distant from the Agency preferred relative isolation from the influence of the Agency.

Table 2.2 Shows distance from each band's most centrally located polygon to the Pawnee Agency.

Band	Distance to Pawnee Agency (Km)
Chowee	7.09
Pet-a-how-er-et	8.52
Skeedee	7.52
Kit-Ka-Hock	23.58

Band affiliation was a part of the Pawnee identity and lifestyle, a structure they maintained through their removal and allotment selections, as noted earlier. In terms of allotment selection, it would seem that the influence of the bands determined the general area of the reservation a family or clan would have selected, e.g., the Skeedee in the north and around the Agency. Much like the Confederated Tribes of the Grand Ronde community in Oregon, their allotment selections were very much based on historical and cultural relationships, strengthening these ties in opposition to the goals of allotment policy (Kretzler, 2017). There were exceptions of course, and not every allottee settled with their affiliated band. For example, the Weeks family cluster in the southeastern section of the allotments had members belonging to various bands. The intersection of family and band affiliation and loyalty contributed to a mix of factors influential in selection to some degree for individuals, in addition to the many other, e.g., environmental, factors that were persuasive in allotment selection.

Insights from Indian Agent Reports

For many years, the Commissioner of Indian Affairs issued a lengthy annual report summarizing the results of work both at headquarters in Washington, DC and at field offices at the various agencies, schools, and superintendencies. A key part of the annual report was a report from each of the Indian agents in the field, summarizing progress and challenges on the various reservations. Although it may be thought that the agents had a motive to cast events at their

agencies in the best possible light, downplaying problems while accentuating successes, many of the agents were sometimes surprisingly candid in their assessments of conditions and provided important insights. So, while some of the information may have been exaggerated or overstated, the agents often had freedom in the formatting and commentary of their reports, which has provided a rich resource of first-hand accounts, though they must be viewed through the social contextual lens of the Indian agent's relationship to his wards. To further understand the history, process, and patterns underlying allotment on the Pawnee reservation, the annual reports of the Pawnee Indian agent were reviewed.

According to Indian Agent C.H. Searing at the Pawnee Agency in 1877, after the Pawnee had been fully removed by 1875, two of the bands in 1877 were settled very close to the Agency initially, with two of the other bands having moved two to three miles southeast and northwest, respectively. Unfortunately, the agent did not specify which bands were which but emphasized that the two bands closest to the agency should be moved west of the Agency by about ten miles (Report of the Commissioner of Indian Affairs for 1877, p. 95). In that same year, 600 acres were broken in four localities for farms for each of the four bands (Report of the Commissioner of Indian Affairs for 1877, p. 95). The following year, all the bands had withdrawn farther from the Agency and deeper into their reservation; two of the bands having cloth lodges while the remaining two had houses erected for them on selected allotments, again without specification of which bands. Each band had begun cultivation under the supervision of the Agency farmer for large-scale farming, in addition to the cultivation of garden crops. (Report of the Commissioner of Indian Affairs for 1878, p. 63).

By 1880, more individuals had taken up allotments³ and individual farms, but without legal claim to their homes (Report of the Commissioner of Indian Affairs for 1880, p. 79). The band farms were located in the northern part of the reservation that led down toward the Arkansas River, and were on lower ground (and hence better soil) than the “government farm”, which was close to the Agency, meaning the band farms produced better yields. (Report of the Commissioner of Indian Affairs for 1880, p. 79). The band farms were being run by individuals in each band under their own management (Report of the Commissioner of Indian Affairs for 1880, p. 79).

In 1881, the Indian agent reported that the tribe understood the rich quality of stream bottom soils for cultivation, but that the band farms were an obstruction to progress as land was owned in common, with some individuals benefiting from farm produce without contributing to its production (Report of the Commissioner of Indian Affairs for 1881, p. 88). Bands were an extension of the village system, with each band acting as its own village, which was reinforced by the existence of the band farms.

Another important aspect from the 1881 report was the agent’s description of the climate; it was subject to torrential rain followed by extensive drought, meaning cultivation would have to accommodate the “temperamental” climatic conditions in order to be successful, especially if it was on the prairie uplands (Report of the Commissioner of Indian Affairs for 1881, p. 88). Through descriptions of failure in future reports, it was most likely these climatic conditions that inhibited growth and allowed for only minor to moderate and sporadic success, agriculturally.

³ It was not uncommon for agents on some reservations to divide up parcels of land for homes, garden plots, and cultivation prior to formal allotment, but these early “allotments” had no deeds or other formal legal standing.

The agent went on to report that resistance to separate land allotments was stemming not only from individuals, but also chiefs, traditional doctors, and priests who were fighting to retain influence through the existing tribal system, which led him to suggest allotment of land in severalty for all (Report of the Commissioner of Indian Affairs for 1881, p. 88). In this vein, he criticized those who allowed and encouraged the band farms to be implemented because of this perceived negative influence.

By 1882, more local allotments had been taken up by individuals, who were described as more advanced or accepting of white ways; this may have been a reference to the Skeedee who were later described as being more progressive than the other bands in future reports (Report of the Commissioner of Indian Affairs for 1882, p. 78). Also reported this year was that there was an overall shift towards breaking up the village system, which was being resisted by the more traditional members and chiefs, with speculation that it was due to their loss of power over the younger men in the tribe (Report of the Commissioner of Indian Affairs for 1882, p. 78). In 1883, 80 additional individuals were allotted, and applications made for surveyed lots, leading the agent to plead for assistance in the severalty process (Report of the Commissioner of Indian Affairs for 1883, p. 77). Throughout this time, the Pawnee were cutting timber, with help from the Agency and carpenters to build more housing for families, arguably diminishing further the village system previously in place (Report of the Commissioner of Indian Affairs for 1883, p. 77). By 1886, the agent noted that the villages had been mostly dispersed and the people were described as having spread throughout nearly the entire reservation, and he viewed the Pawnee as most likely the easiest tribe to lead into allotment than any other tribe in his charge (Report of the Commissioner of Indian Affairs for 1886, p. 137).

In 1890, the Indian agent at the Pawnee agency created a breakdown and description of the four Pawnee bands. In his view, the Skeedee (located in the north and around the Agency) were the most assimilated, with buggies and houses, while the Chowees had many less English-speaking and dressing people (Report of the Commissioner of Indian Affairs for 1890, p. 197). The agent also contended that the Kit-Ka-Hock and Pet-a-how-er-at bands were much like the Chowees (Report of the Commissioner of Indian Affairs for 1890, p. 197). Nevertheless, consistently the agents increasingly described the agreeability of the Pawnee tribe, their willingness to listen and adapt, especially in comparison to neighboring tribes or other tribes under the agents' charge. This interpretation of relative progressiveness, along with the consensus of the tribe by this point for allotment, most likely greatly influenced the next few years and the landscape of the reservation.

In 1892, the Pawnee were granted United States citizenship and agreed to the legislation that would allot their land in 1893 (Carlisle, 2010). In the Annual Report for 1893, the agent reported that the tribe had also agreed to a surplus lands act to sell the surplus remaining after allotment, as well as the appointment of a special allotting agent, Helen P. Clark and assistants; 797 allotments were selected and recorded, as previously noted (Report of the Commissioner of Indian Affairs for 1893, p. 262). By 1894, however, the Indian agent was displeased with the result of citizenship, i.e., his perceived loss of authority and unrest among the tribe. He also described a character change as the result of their constructing a new village across Black Bear Creek, where alcohol was available, adding to behavioral issues (Report of the Commissioner of Indian Affairs for 1895, p. 260). Interestingly, he also blamed some of the change on the breaking up of the reservation with the sale of surplus lands, which was, ironically, one of the stated goals of allotment. In addition, several thousands of acres of allotted lands had already been leased, with

issues arising regarding the lessees. In 1896 the agent continued to believe citizenship was premature, remarking that the Pawnee were not ready, and that the problems they faced would have been less severe if the original reservation boundaries had still been in place (Report of the Commissioner of Indian Affairs for 1896, p. 265).

Through these agent reports over time, it is evident that band affiliation had perhaps the greatest influence in determining settlement patterns on the Pawnee reservation, with agents noting from the beginning that the bands settled in separate groups, starting with traditional village settlements. These began near the Agency and eventually branched off into the separate parts of the reservation that can be seen in the 1893 allotment patterns. Over time, even though the culture and attitudes surrounding bands changed, as did the village system, remnants of the band patterns are visible in the selected allotments. Importantly, not all the allotments happened at once, and some were taken prior to the Dawes Act legislation, but the establishment of bands in separate areas of the reservation is highly visible on the initial allotment map. Unexpectedly, it appears that the early communal farms established by each of the bands had a large influence on settlement, community, and most likely allotment selection overall. The government/Agency farm itself eventually became more of an agricultural teaching tool due to its lack of productivity (Report of the Commissioner of Indian Affairs for 1880, p. 79).

Chapter 3: Environmental Factors

Introduction

The location of the new Pawnee reservation was geographically much different from their ancestral homelands in Nebraska. Allotment selections were undoubtedly influenced by the unique and unfamiliar environmental conditions in Oklahoma. The new reservation was centered on Black Bear Creek, a tributary to the Arkansas River, which was surrounded by prairie uplands. The northern border was the Arkansas River itself, with the Cimarron River bordering on the south. At the time of survey, it was determined that the majority of the reservation land was suited to stock-raising and grazing, with cultivation suitable along the stream bottoms (Report of the Commissioner of Indian Affairs for 1879, p. 71). There were rocky hilltops, and the riparian areas had timber suitable for building materials – species included varieties of oak, with groves of red cedar on the Cimarron (Report of the Commissioner of Indian Affairs for 1880, p. 79). Selecting allotments would require strategies based on the surrounding environments and the needs of the allottees, as well as familial and clan relationships, as discussed in the previous chapter.

This chapter examines the relationship between allotment selections and a variety of environmental factors, including hydrography, soil productivity, elevation, and natural vegetation. As with the previous chapter, GIS mapping and analysis methods were employed to explore patterns and visualize relationships. It was hypothesized from the outset that stream bottom lands would be highly valued and would be associated with dense patterns of allotment selection. Stream bottom lands not only provide access to running water, they also tend to be associated with highly fertile soils and, in prairie regions, with riparian woodlands that provide

fuel and building materials, as well as habitat for game species. Previous research studies of allotment preferences by the Nez Perce (Greenwald, 2002), Kickapoo (Egbert and Smith, 2017) and Standing Rock tribes (Meisel, pers. comm., 2019) have all shown strong preferences for stream bottom lands over upland prairies. Most notably, allottees of the Cheyenne-Arapaho Reservation in western Oklahoma (which is relatively close to the Pawnee reservation) discernibly chose stream bottoms along the Canadian and Washita Rivers (Berthrong, 1979).

Hydrography

The major streams (Figure 3.1) within the Pawnee Nation are key to understanding the spatial distribution of allotments. Used as natural borders, the streams defined the expanse of the reservation. The Agency was centrally located on Black Bear Creek, one of the larger streams on the reservation. Availability of water for cultivation and personal use were important aspects to life after removal, especially considering the cultural expectations of government officials. Descriptions of communal efforts at crop cultivation began early, with the development of gardens, and establishment of band and government farms as noted in chapter 2. Based on the climatic conditions of the reservation, placement of fields to maximize growth was extremely important. Unsurprisingly, according to Indian agent reports from various years, growing conditions near streams were more favorable for crop success. Running horizontally through the center of the reservation is Black Bear Creek, with Skeedee Creek branching off to the north, near where the Agency can be seen in its central location. Other major tributaries are Camp Creek running diagonally to Black Bear Creek, and Salt Creek that meets with the Cimarron in the South. Observing these larger stream systems allows for a foundation for understanding the basic hydrography; however, a closer look at the detailed hydrography show many smaller, unnamed

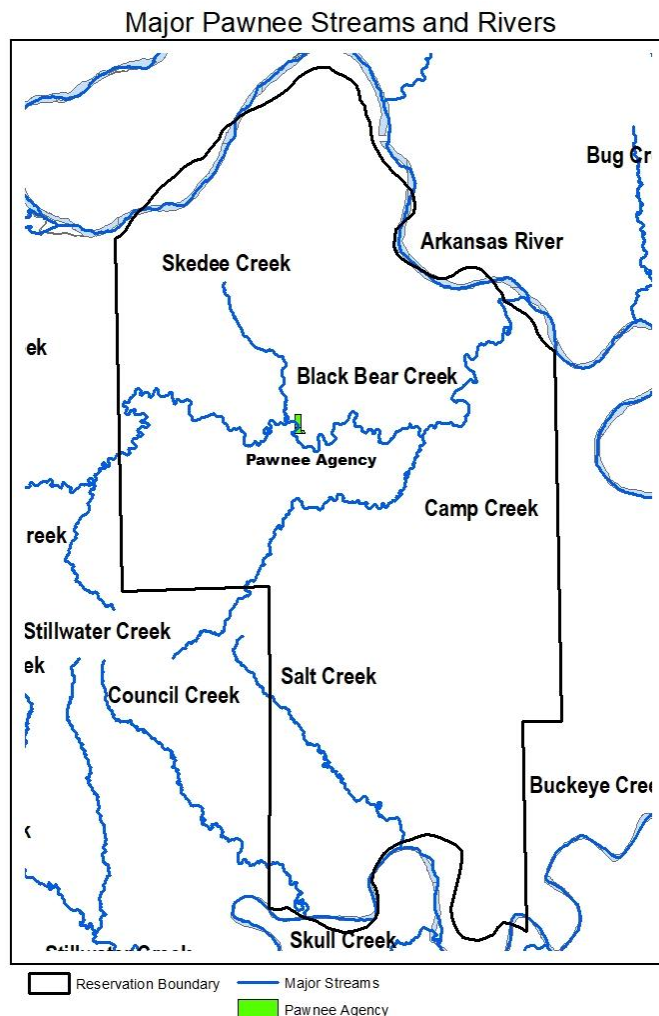


Figure 3.1 Shows major streams in Pawnee Nation.

tributaries branching from these creeks and rivers that also contribute to the full extent of water resources available on the reservation. These smaller streams were sufficient for the uses and needs of individuals and were just as desirable for settlement and agriculture. These streams also contribute to the magnitude of the major streams, making them important water resources. Figure 3.2 displays the smaller streams, which coincide with a majority of allotment selections; very few allotment parcels were not in contact with one of these streams or at least in very close proximity. This pattern coincides with pre-allotment settlement descriptions by Indian agents and confirms the hypothesis that the need to be near water would be a predominant factor in selecting

allotments. The selected parcels clearly follow the pattern of the streams, even the smaller ones. When the smaller streams are excluded from the map, some of the patterns of selected land at first appear to be random, but with the complete hydrography, however, it is clear why some of the clusters of allotment appear in diagonal, curved, or other patterns. It is apparent from Figure 3.2 that tracts on or near water were more valued and desired, while the upland prairies were mostly left open.

The importance of riparian areas was not new to the Pawnee, of course. Traditionally, the Pawnee were settled around the Loup and Republican riverine systems, the beaver being a

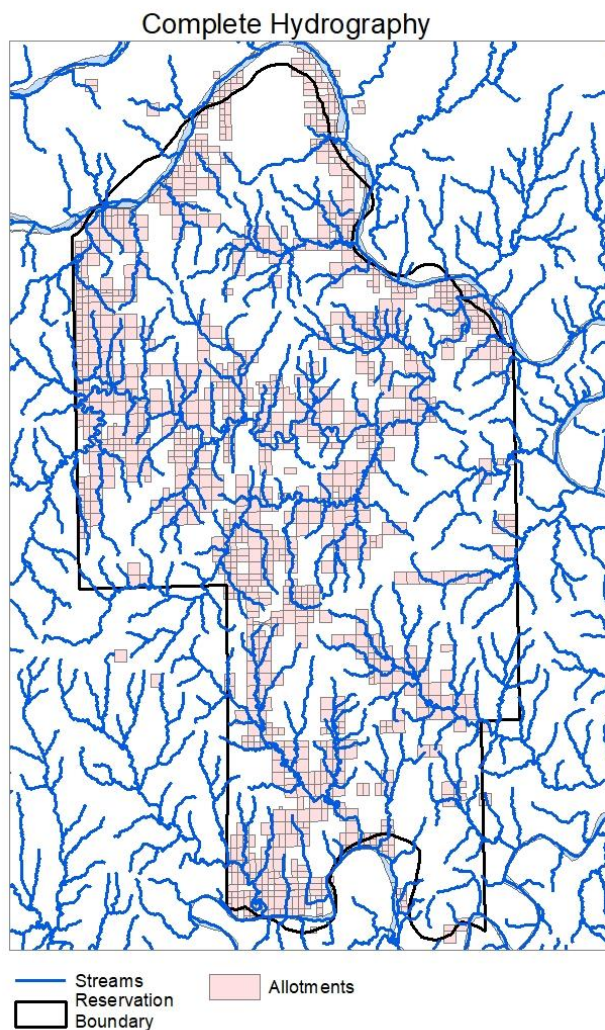


Figure 3.2 Shows complete hydrography for Pawnee Nation.

sacred, culturally significant animal (Wishart, 1979). As noted in the introduction, this settlement pattern is common for Native communities, as riparian zones provide a water source, game, fuel, and rich soil. The plant life and biodiversity are rich in these areas, providing rare cultural resource species, as well as transportation, shelter, building materials, and more. (National Research Council, 2002). According to Annual reports from the Commissioner of Indian Affairs, the riparian zones in the Pawnee reservation provided clusters of timber that were important for building materials for both residents and interlopers (timber theft by surrounding non-Natives was an ongoing reported problem throughout the years, just as on their former lands in Nebraska). The reports also clarify that the stream bottom lands had more fertile soil and water resources than the prairie uplands and produced better crops. The riparian zones were also in a better position climatically to counteract periodic dry spells and droughts, since this area of Oklahoma is subject to wide annual variations, especially regarding precipitation. In combination, stream bottom areas were preferable for selection in terms of what they provided and secured for the Pawnee people. Taking the complete hydrography into consideration, the presence of smaller tributary streams significantly clarifies the relationship between allotment selection and water resources.

To quantify this relationship, allotments were ranked by their proximity to streams. Proximity was calculated using the Near tool in ArcGIS which calculates distance and additional proximity between the input features (allotments) and the closest feature in a second layer (in this case, streams). The breaks between rankings were calculated using the natural breaks in the data, in meters. Figure 3.3 and Table 3.1 show each allotment parcel ranked by proximity to the streams, in five classes. The allotments in red, or those with the closest ranking to the streams

(between 0 and 67.18 M) are by far the most numerous, and many do have a tributary flowing through the parcel.

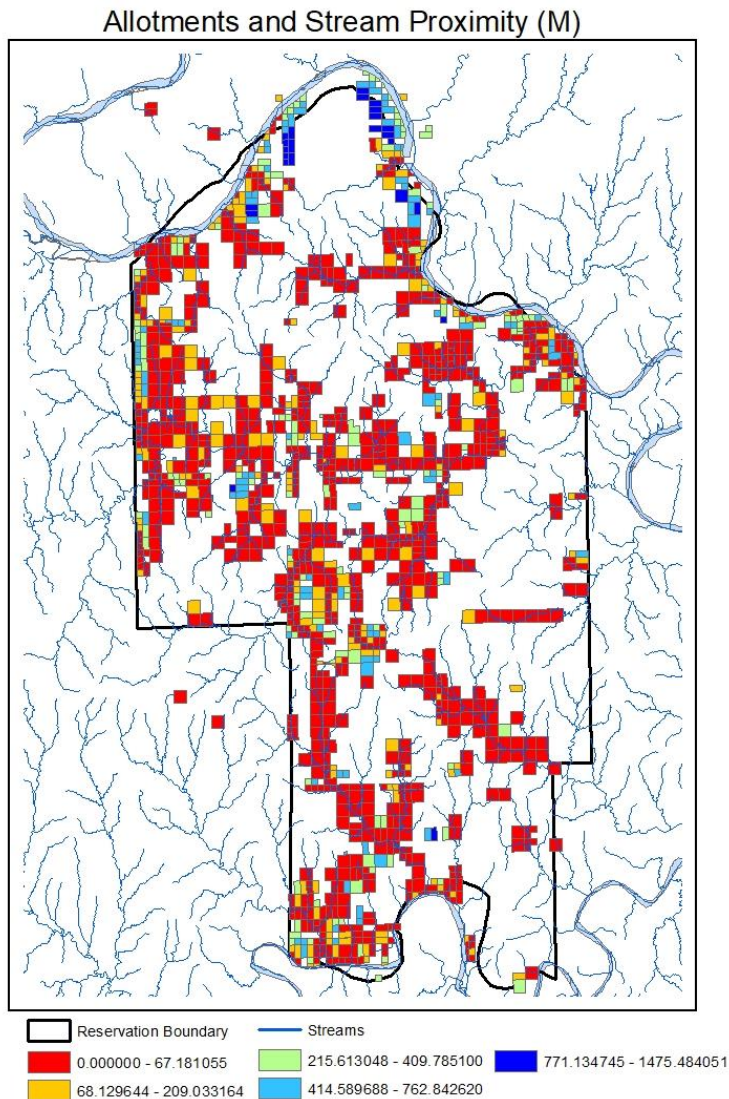


Figure 3.3 Shows the allotments and their affiliated rankings in regard to stream proximity.

The second most numerous allotments are in orange and are the second highest ranking in proximity (68.12-209.03 M) from the streams. The cooler colors, green, light and dark blue are the farthest from the streams and account for a very small portion of the allotments. It should be

noted that the Arkansas River-bordering allotments are in the lower category due to shift in river morphology.

Table 3.1 Shows percentage of allotments for each range of distance from streams.

Allotment Stream Proximity (M)	Allotment Percentage
0.00-67.18	73%
68.12-209.03	13.1%
215.61-409.78	7.2%
415.58-762.84	5.2%
771.13-1475.48	1.5%

It is apparent from the results (Table 3.1) that the majority (73%) of all the allotments intersect a stream or are in close proximity to one, i.e., directly adjacent or in direct contact. The last three rankings contain the lowest percentage of total allotments at 7.2%, 5.2%, and 1.5%. This evidence strongly suggests that stream-intersecting parcels were the most desired; this is logical given the comparative bounty of streams and riparian zones compared to the drier, less fertile, and harsher conditions of the prairie uplands. It may also stand to reason that land along some of the smaller tributaries may have remain unclaimed as allotments due to the meandering of the river and creeks between time of allotment selection and the creation of the geospatial data. The stream shapefiles are modern, and it would be impossible to trace every minute shift in a meandering system from 1893 to the present.

Soils

Specific classifications of soils on the Pawnee Reservation are variations of mollisol and alfisol soil classifications. This is typical for the region, as mollisols are typically associated with grassland regions, and alfisols have clay subsoil accumulations, but still are fertile (Bailey, 2000).

To relate allotment selections to soil characteristics, productivity measures were extracted from the Soil Survey Geographic (Soil Survey Staff, NRCS, USDA) database.

SSURGO data for this area includes information for productivity based on the National Commodity Crop Productivity Index (NCCPI), produced by the USDA. A comprehensive rating of 1.00 to 0.01 is given based on various soil and climactic impacts that would influence crop production, with higher values indicating higher crop productivity (Figure 3.4).

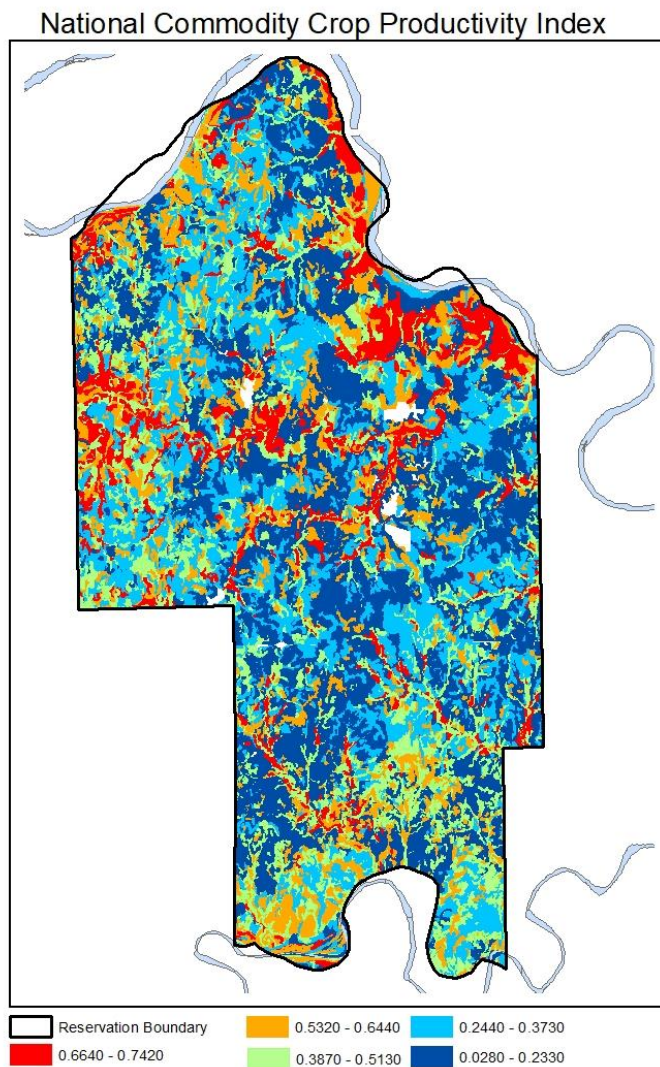


Figure 3.4 Shows NCCPI estimates for Pawnee Nation.

These parameters include slope, toxicity, pH, erosion factors, barriers, frequency of precipitation, average temperatures, and nutrients. In Figure 3.4, the soil values are displayed in five ranges, red being the highest and dark blue being the lowest productivity estimates.

As is readily apparent, a general pattern is visible for the major streams in terms of higher productivity being associated with stream bottom soils, though for the entire reservation the highest rating is only 0.74, which is not quite the ideal soil (1.0). When the complete hydrography is overlaid (Figure 3.6), the pattern becomes clearer, even with streams that are much smaller tributaries.

In Figure 3.5 the opacity of the soil was reduced to accentuate the stream presence. Throughout the Black Bear Creek drainage and along the Arkansas River border, most of the highest producing soils follow these major streams. In the south, Salt Creek and Camp Creek also display richer soils, especially in comparison to the prairie uplands that are devoid of streams. Even for streams that don't contain soils within the highest productivity estimates, they still have a gradient of relatively highly productive soil that gradually degrades in quality as it radiates away from the water.

In Figure 3.6, which shows soil productivity overlaid with allotment parcels, the selection for streams and their associated soils is apparent. Upon arrival at the reservation, band village settlements slowly dispersed away from the Agency, as noted in the previous chapter, and the band farms were located in stream valleys, as were personal gardens because of their higher productivity. The benefit of richer more fertile soil was well known and was a major contributing factor in the subsequent selection of individual allotment parcels.

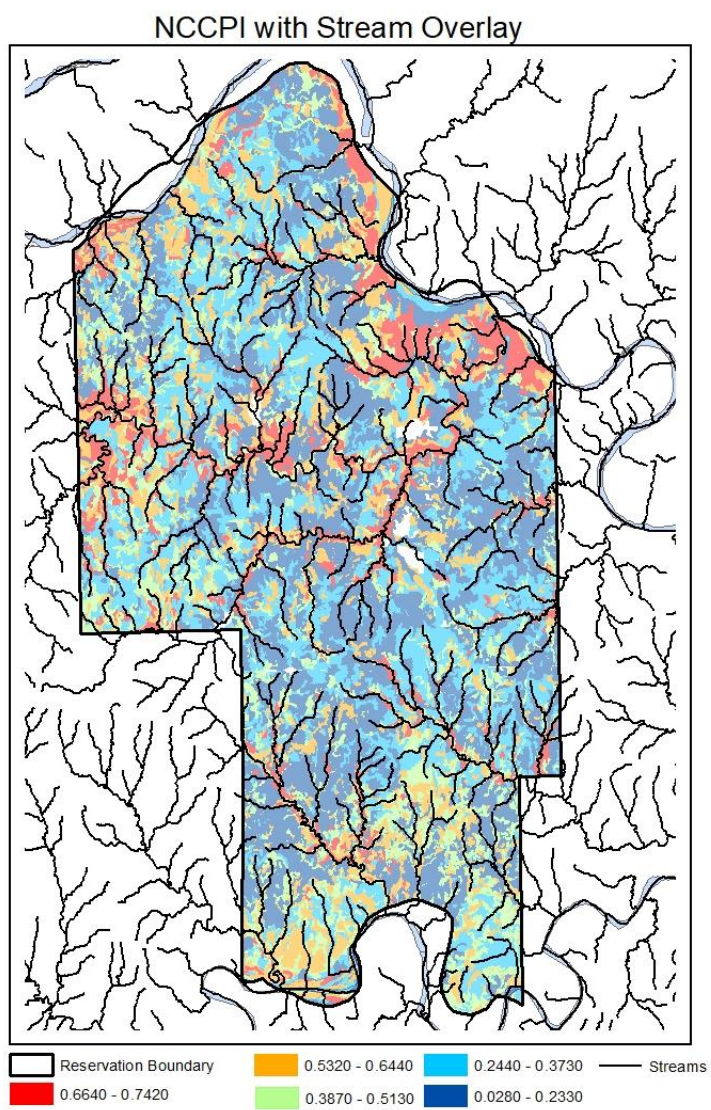


Figure 3.5 Shows NCCPI estimates with stream overlay.

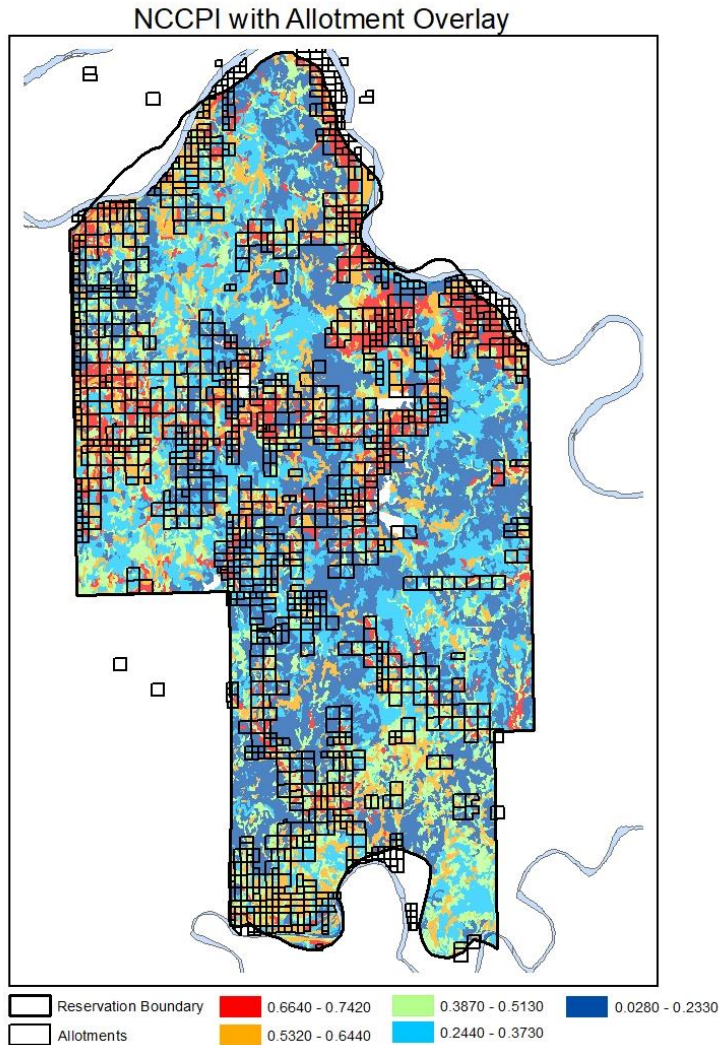


Figure 3.6 Shows NCCPI estimates with allotment parcel overlay.

Crop production was an important supplement to government-issued rations and a source of winter storage of food; it also aligned with the desire of the government and the encouragement of Indian agents for the Pawnee to pursue as far as possible, yeoman farming.

To compare the soil productivity of selected versus non-selected land on the reservation, calculations for the intersection of allotment parcels in relation to crop productivity were produced with the Calculate Geometry function in ArcGIS, using the area of each defined soil productivity range compared to the overall area. The measurements for crop productivity for the

entire reservation were compared to the measurements for just the allotted land to compare selected versus non-selected land. As is evident from Figure 3.6, the dataset is incomplete for all allotments, so calculations for allotments exclude those not present in the data. Ranges for the allotments vary slightly because they are calculated only from the data in those parcels.

Table 3.2 Displays the percentage of reservation and allotments that are included within each NCCPI range, calculated using normal breaks to classify them in GIS.

NCCPI Range	Reservation Percentage	Allotment Percentage
0.664-0.742	9.5%	17.9%
0.532-0.644	14.8%	18.6%
0.387-0.513	18.7%	20%
0.244-0.373	24.5%	18.4%
0.028-0.233	32.5%	25.1%

As Table 3.2 shows, the two high productivity categories account for around 25% of all reservation land but over 36% of all allotments, showing a strong preference for parcels with productive soils. Conversely, the two lowest categories of productivity represent 57% of all reservation land but only around 43% of allotments. Soil productivity represents a complex amalgamation of factors, which would not necessarily be readily apparent without an analysis of this dataset – so it would appear that selection for fertile soils was associated with its understood relationship to stream proximity.

Range Production

In addition to soil productivity for crop production, it was also decided to examine soil productivity for rangeland, since much of the Pawnee reservation consisted of prairie. Range productivity data for this area includes a measurement of dry vegetation in pounds per acre per year. The SSURGO data used for this analysis was for a normal year, as opposed to a favorable one, to better represent more typical conditions. Unfortunately, the ranges between the Pawnee

county and Payne county SSURGO data are very different. Payne County's yields are much higher, so the differences in the data between the two were too great to merge, therefore each county was evaluated separately. The Payne county line begins south of where the Eastern reservation line indents to the West (Figure 3.7).

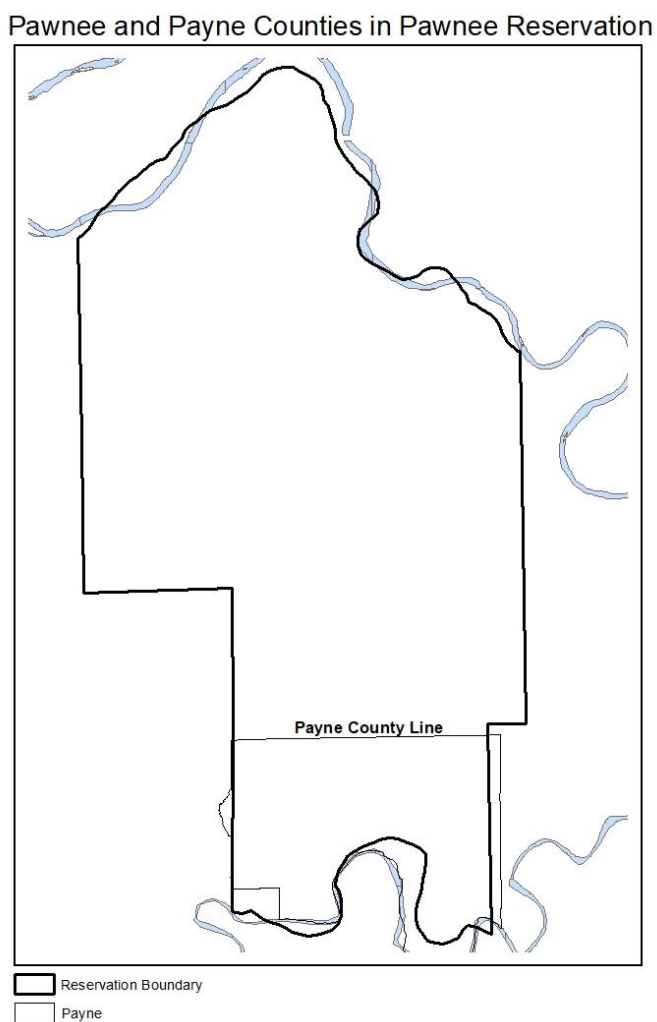


Figure 3.7 County line division in Pawnee Reservation.

As with the other soil datasets, there are areas of missing data, here left blank. It is also important to note that “range” in this context includes all vegetation – stems, woody, leaves, and fruit dried – not only vegetation that is palatable to range animals.

After mapping the overall range production for the reservation (Figure 3.8), percentage calculations were made, again using the Calculate Geometry function to compare the areas for each category of production compared to allotments. The area calculated only includes what the data cover, i.e., all allotments within the defined reservation boundary, excluding the sections of missing data.

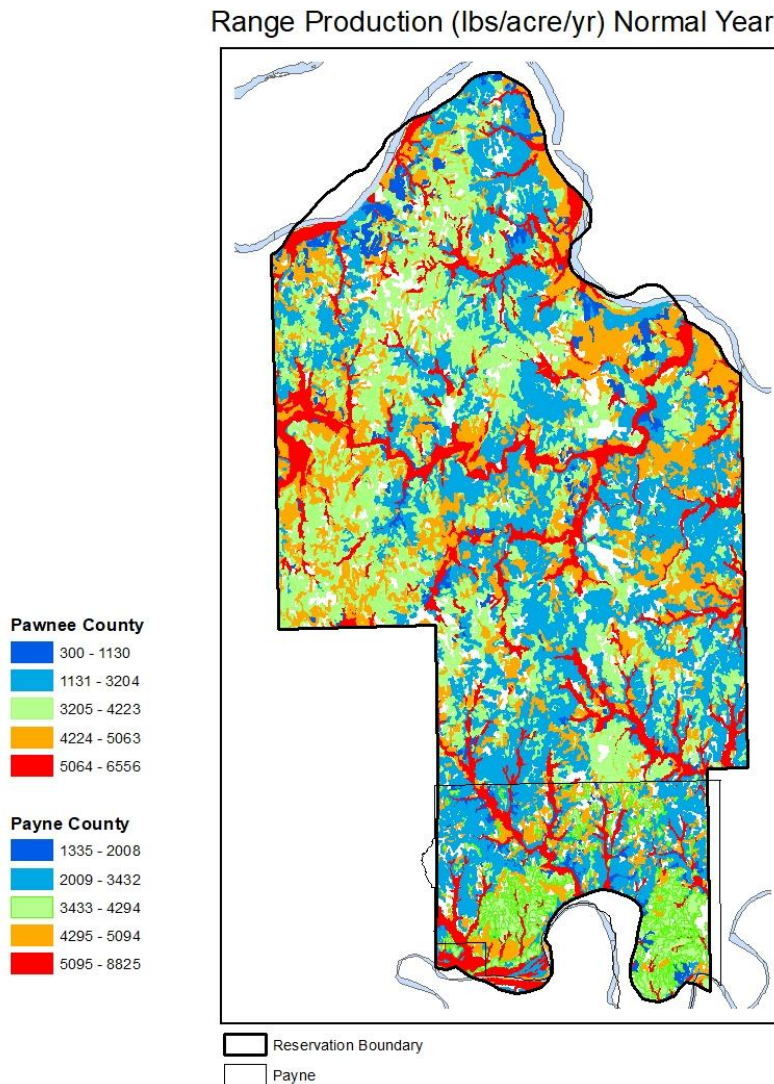


Figure 3.8 Shows range production in Pawnee and Payne Counties.

As might be predicted, the better the soil quality, the higher the range productivity, resulting in a gradient from high to low between stream bottom soils and dry/upland soils, generally. For the Pawnee County portion of the reservation, the highest occurrence is for the second productivity

category, in orange, at 33.5% (4224-5063). For Payne county, the second and third ratings are almost equal at 32.8% and 32.9% (2009-3432) and (3433-4114), respectively. The county line separation is represented in Figures 3.7 and 3.8, as well as in the range production values in the tables below (3.3-4). The range production values for the two counties vary slightly, but the pattern does not change; production is higher closer to streambeds. The highest producing range sections are the least commonly occurring but are the highest selected for allotment in Payne County. For Pawnee County, the highest producing rangeland consists of just 13.8% of the reservation and was selected for 23% of the allotments in that county. For both counties, the lowest producing areas make up the least amount of land as well as the lowest percentages of selected allotment land. It would appear that selection in this case was still a reflection of stream proximity – the best range lands are also those closer to the streams and are therefore a proxy measure of the stream bottom land’s value as a producer of many valuable resources.

Table 3.3 Shows Range Productivity for a normal year (lbs/acre/yr) for Pawnee County.

Range Productivity Pawnee	Reservation Percentage	Allotment Percentage
5064-6556	13.7%	23%
4224-5063	20.8%	25%
3205-4223	29%	22.8%
1131-3204	33%	25.3%
300-1130	2.8%	3.9%

Table 3.4 Shows Range Productivity for a normal year (lbs/acre/yr) for Payne County.

Range Productivity Payne	Reservation Percentage	Allotment Percentage
5095-8825	16.1%	28.5%
4115-5094	14%	18.4%
3433-4114	33%	25.7%
2009-3432	33%	23.4%
1335-2008	4%	4%

Figure 3.9 displays the range production for both counties with allotments overlaid. It is reminiscent of the NCCPI map (Figure 3.7), as both depict vegetation potential for the soils.

Range Production (lbs/acre/yr) Normal Year with Allotments

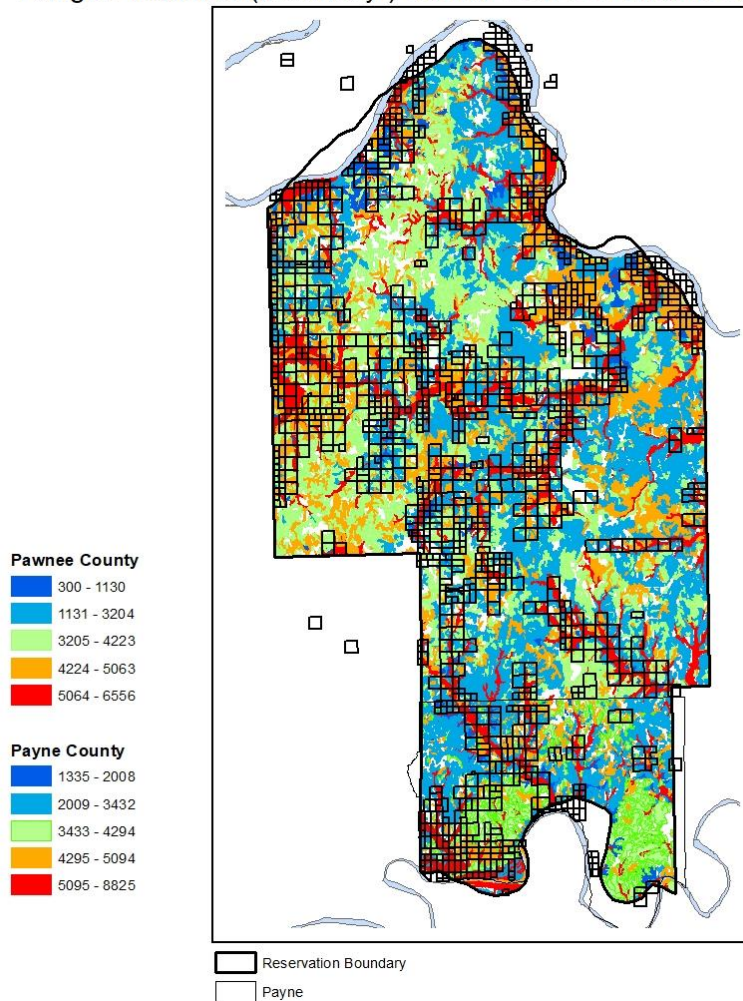


Figure 3.9 Show Range Production values with allotment overlay.

Elevation

Elevations on the Pawnee Reservation (Figure 3.10) range from 182 M to 415 M above sea level, with three general relief types: (1) shale, sandstone, and limestone eroded into hills, (2) sloping alluvial terraces, and (3) level floodplains (Galloway, 2009). The relationship between elevation and the major streams present is apparent. The minor streams are not as ostensible

since their elevations do not change much from the floodplains of the streams they flow into. The pattern of allotment selection is aligned more closely with the changes in hydrology and its associated soil productivity than with elevation.

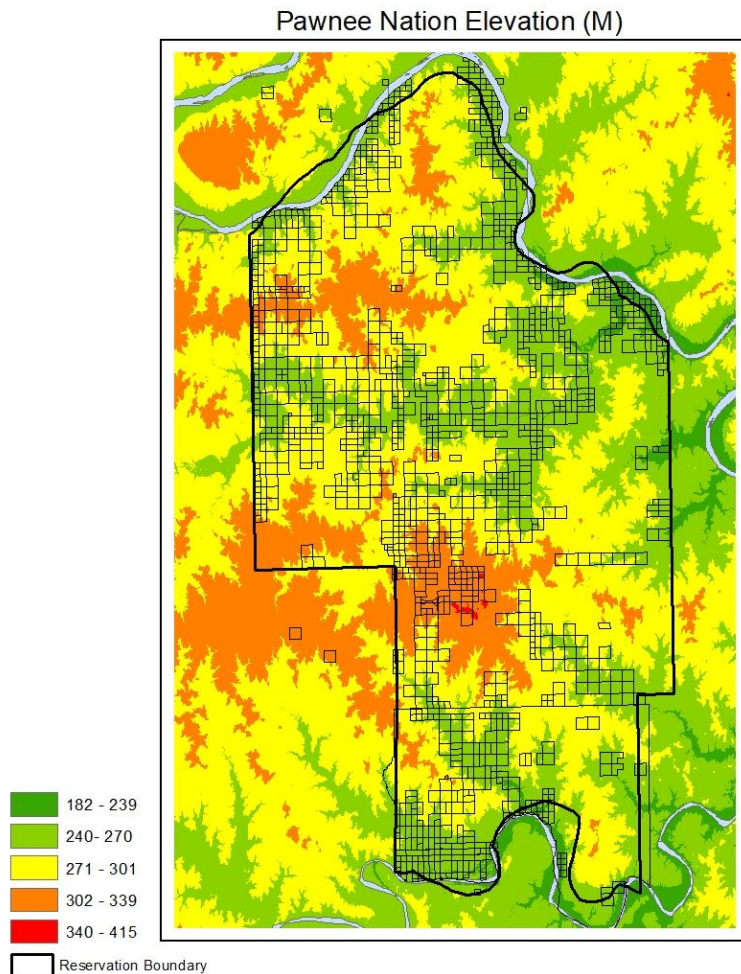


Figure 3.10 Shows USDA digital elevation model with allotment overlay.

Potential Vegetation

The Pawnee reservation is situated in north-central Oklahoma on an ecotone. Potential vegetation for the region can be seen below (Figure 3.11) as mapped by Kuchler (1964). The western side is part of the Red Prairies, the Bluestem Hills in the center, and the eastern portion

is in the Cross Timbers (Galloway, 2009). The cross timbers are the only large-scale source of timber, though not suited for commercial timber harvest. Most likely due to their commercial undesirability, the cross timbers consist largely of ancient forest that had not changed much since European settlement and represent Oklahoma's natural undisturbed deciduous forest species that can survive on the harsh and rocky terrain (Stahle, et al. 2007). The timber available to the Pawnee in their riparian areas consisted mostly of low-stature oak species and red cedar that also was not highly valued or sought after, commercially (Stahle, et al. 2007). It was the building material available to the Pawnee however and, as noted previously, also was harvested locally by non-Native settlers stealing timber (Stahle, et al. 2007).

Kuchler's representation of Pawnee county and the reservation area does show prairie to the west, with Wheatgrass, Bluestem/Grama, and Buffalograss, adjacent to the Bluestem Hills, and Oak/Cross Timbers to the east (Figure 3.11).

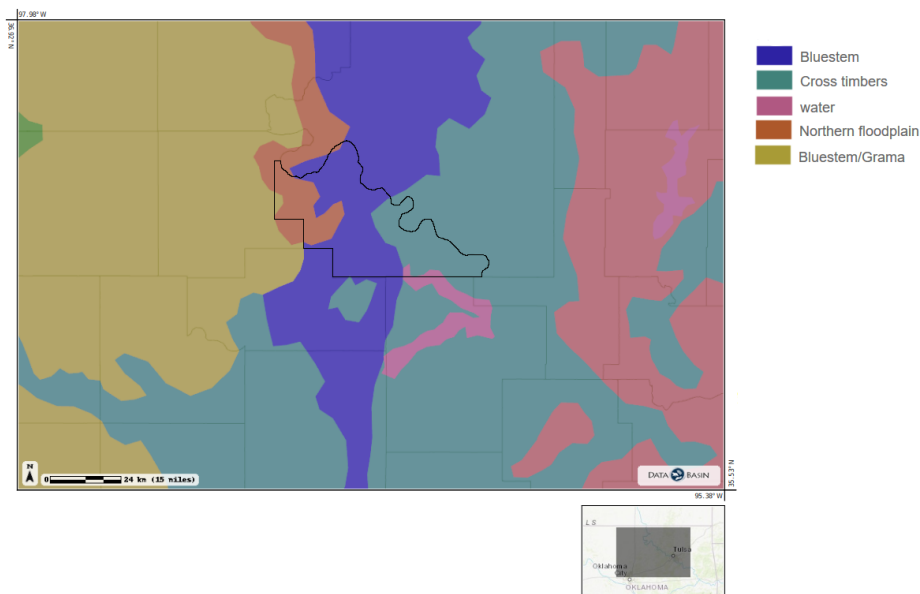


Figure 3.11 Shows Kuchler's Potential Vegetation, with Pawnee County outline.

The natural vegetation reflects the harshness of the environment in this area. The environmental differences and required adjustment between this region and the ancestral homelands of the Pawnee in Nebraska were no doubt immense. It is telling of the difficulty in which they found themselves when presented with agricultural expectations and allotment selection. The natural vegetation of this area shows that even the most fertile regions of their reservation, the riparian zones, produced subpar timber. The precipitation patterns that contribute to periodic extensive droughts were harsh for cultivation conditions, leaving the best alternative for the Pawnee to select allotments in stream bottom areas that provided more moisture, richer soils, and better crops. Aside from the Cross Timbers areas, the prairies would produce crops only when precipitation was adequate, and the bluestem hills are characterized by rocky terrain and shrubby vegetation (Stahle, 2007).

Consistently, the environmental patterns, and the consequent patterns of allotment, relate back to stream bottoms, which are environmentally distinguishable from the surrounding land. They provide open water sources, and while the overall taxonomy of the soils does not change much throughout the region, the richness of them increases sharply in relation to proximity to stream bottoms. In turn, the production of crops is higher, building materials are present, as is range vegetation for stock raising. Ironically, all these factors also were in line with the demands of the government and with the traditional values, practices, and environmental knowledge of the Pawnee. Arguably, streams and their associated soils and natural vegetation were the most important environmental factor for allotment selection among the members of the Pawnee Nation. This further confirms the concentrated pattern of allotment selection along stream bottoms in the semi-arid environment of Oklahoma, notably by the Cheyenne and Arapaho on their reservation in western Oklahoma, as noted by both Berthrong (1979) and Moore (1987).

Lands Sales as a Confirmation of Relative Land Values

Included in the Pawnee records of allotment are details about land sales and fee patenting that occurred after allotment. This began by the early 1900s, after the first legislation that dramatically shortened the original 25-year trust period. The Burke Act of 1906 allowed for liberality in deciding competency and hence the awarding of early fee patents, disregarding the 25-year trust period specified in the Dawes Act (McDonnell, 1991). The earliest recordings of sales in the Pawnee land records begin in 1904. They are not complete records, and they only detail what happened up to 1920. Figure 3.12 shows the allottees that were involved in land sales and fee patenting. In some of the records only part of one allotment parcel or only one allotment parcel of several held by the allotment holder was sold, though the allottee may have had other allotment parcels under their name. Hence, the allotments may be overrepresented on the map in respect to sale, since it may include some partial allotments belonging to the same person that were not sold or were sold at a later date. There are many cases of an allottee selling one portion and selling more land in later records – these allotments are not separated on the map. Still, the take away of this representation is that much of the land was lost early on. The majority of these records reflect the early 1900s, and dates were broken into 3 to 4-year periods, up until the 1920s when the records end. Each color through the gradient on the map represents an approximate time period. It is well known that land loss and sales occurred far beyond that time frame.

The key impact visible on the map is that the majority of the fee patents and land sales began early, scarcely more than ten years after allotment. The Pawnee Agent's report from 1903 is the first mention of sales, where \$15,000 was made from selling allotments; and by 1904 selling allotment parcels had become rampant (Report of the Commissioner of Indian Affairs for 1904, p. 302).

By 1905, 101,523 acres of the 112,860 acres originally allotted remained in Pawnee hands; an additional 39,500 acres were subject to sale at that time (Report of the Commissioner of Indian Affairs for 1905, p. 314) (Figure 3.12). This means that although the Pawnee had sold less than a quarter of the land that could have been sold, the developing trend was clear (Report of the Commissioner of Indian Affairs for 1905, p. 315).

Additionally, the agent reported on the value of allotments in regard to land quality and

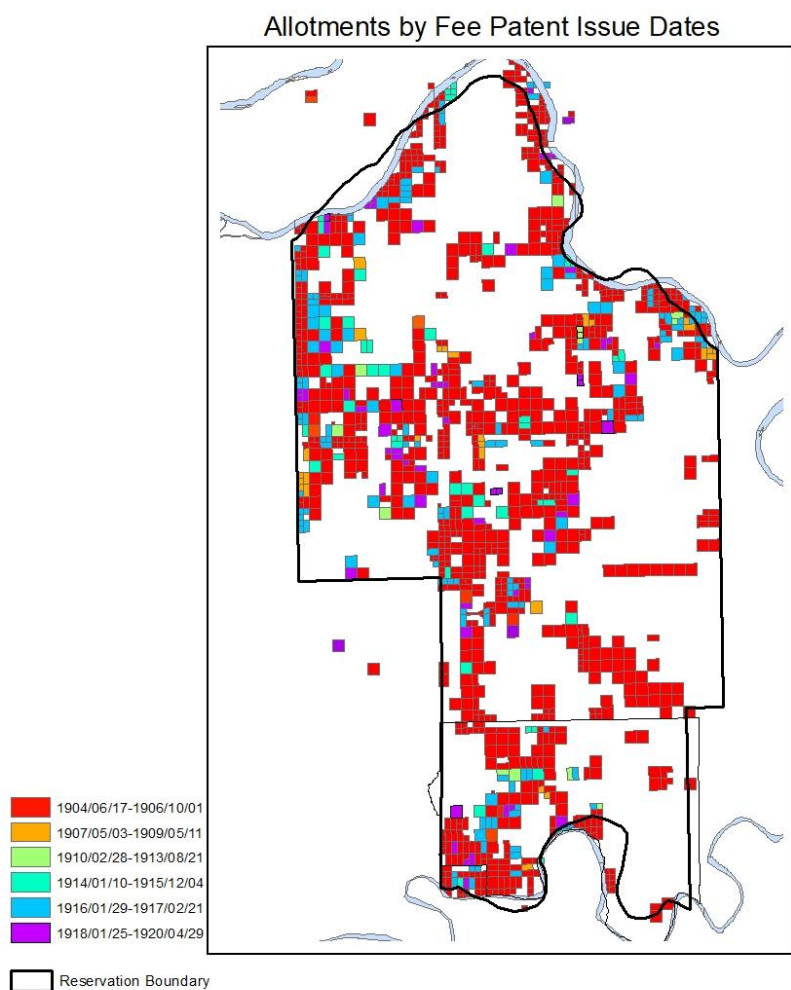


Figure 3.12 Shows allotment sales from 1904-1920.

stream proximity. Stony uplands were valued at around \$600 for a quarter section, and were only suitable for pasture/range, while a stream bottom quarter could fetch up to \$6,800, a further

testament to the driving force of stream proximity for allotment selection, and by extension, pressure from neighboring whites for valuable Pawnee land (Report of the Commissioner of Indian Affairs for 1905, p. 315). Unfortunately, the selection of allotments in 1893, while rich in its complexity, is only one snapshot in time of an ever-changing nexus of spatial circumstances. Undoubtedly, not long after this period, things began to change for the Pawnee, and have continually done so, characterized by the loss of land due to white encroachment, loss of tribal cohesion, as well as fractionation and checkerboarding issues.

Chapter 4: Conclusions

Principal Conclusions

After the Pawnee Tribe was removed from its Nebraska homelands to a new reservation in Indian Territory (later Oklahoma) in 1875, it was forced to undergo allotment in severalty in 1893 under the terms of the Dawes Act. The focus of this research was on the spatial patterns and impacts of allotment and how they related both to familial patterns and the physical environment. The specific questions researched were:

- What were the overall patterns of allotment and what strategies did families and clans employ in selecting their allotments?
- What environmental factors likely contributed to the observed patterns of allotment?

Digitization of archival records and GIS analysis methods in the context of historical GIS have created gateways to the exploration of historical and contemporary storytelling in regard to indigenous geography, landholdings, and spatial relationships. New insights were gleaned from this research, especially the establishment of clan relationships definitively as a factor in allotment selection.

Family and Clan Relationships

Family surnames as listed on the allotment rolls were used to study patterns of allotments within families. Maps were created of allotments for all shared-surname families, as well as allotments by the seven largest shared-surname families. It was found that allottees with the same surname frequently, although not always, chose allotments adjacent to each other. Large clusters of adjacent or nearby allotments can be seen throughout both maps, although dispersed patterns were also observed for some families. In addition, there are families whose allotments showed both clustering (although on a small scale) and dispersion. There are limitations, however, to using shared family surnames to map family relationships. It is possible, for example, that not all who shared a surname would be related to each other. Other family relationships not explained by surnames alone might include in-law relationships, unofficial adoptions, uncertain parentage, or other events that could impact an individual's legal surname. These situations usually would not be documented in historical records. At best, the shared-surname maps of allotments provide an incomplete spatial record of how related family members selected their allotments based on those relationships.

Being able to map band affiliation based on the 1905 census was highly enlightening, showing clear settlement patterns within the reservation that were further corroborated by annual reports from the Indian Agent. Although band membership information was incomplete due the time gap between allotment (1893) and the census (1905), it still appeared that band affiliation had an even stronger correlation with allotment selection patterns than surnames. This is important because surnames do not strictly correlate to an individual's band affiliation. This may be attributed in part to marriages; individuals may have been considered members of a new band after marriage, i.e. part of a new family, and therefore influencing their allotment region. There

were outliers with both family and band selections, but it can be definitively concluded that social ties between family and band affiliation were both noteworthy factors in allotment selection on the Pawnee Reservation.

Environmental Factors

Environmental factors also played an important role in selection. The various stream sizes in the drainage system were highly revealing of allotment patterns throughout the reservation. The larger creeks overlaid with allotments showed how the allotment selections followed their paths, mostly consisting of the larger creeks that are named tributaries. However, when the even smaller, unnamed tributaries were added, many more patterns were revealed with allotments strongly corresponding to their paths as well. This was further corroborated when it was shown that 73% of the allotments either directly intersected streams or were within 67 meters from a stream, and that another 13% of allotments fell within the next closest distance class from streams (68-209 m). The annual reports of the Indian agents regularly described the fertility of stream bottom lands relative to areas of upland prairie, and that they were the main producing areas of available timber for building materials.

As additional environmental factors were investigated, it became clear that all of the significant environmental relationships related back to streams and by extension, to allotment selections. Soil productivity for the reservation was analyzed via the SSURGO National Crop Productivity Index (NCCPI) for a normal year, with a finding that stream-adjacent soils had NCCPI values that were far higher than other areas. This higher NCCPI rating primarily followed the larger tributaries like the Black Bear Creek area and the border along the Arkansas River. The same pattern followed for range productivity values, which supported the fertility assessment narratives from the annual reports.

The topography of the reservation would have played a foundational role in the distribution of environmental resources relevant to allotment selection. Although the topography of the reservation was relatively level, the local relief was important; as survey maps showed, the

upland prairies were rocky hilltops that would have been mostly devoid of resources of value to the Pawnee for agriculture, while fertile stream bottoms were found in lowland areas.

Potential vegetation maps described the expanse of the reservation as mostly prairie and ancient cross timbers. The species found here are able to survive in the harsh and rocky conditions of the reservation landscape, as well as the harsher climatic conditions. In relation to streams, once again the timber was found growing along riparian areas, with grasslands appearing on uplands and surrounding areas. The potential vegetation of the reservation area reveals that the Pawnee tribe had little chance of being successful in terms of Dawes goals, especially on upland areas, even if adequate training and equipment had been provided.

Examination of the sales of land allotments revealed other dimensions of the impacts of allotment and its aftermath. It rapidly became obvious from my analysis that land ownership by the Pawnee was generally very brief, as sales to non-tribal members were occurring even before federal legalization of such transactions. Before 1904, annual reports from agents also detailed leasing to outsiders, as their influence encroached on allotments. From these records, it can be concluded that the opening of reservation land after allotment was detrimental to land ownership and tribal functionality. Rampant leasing and liberal fee patenting with the passage of the Burke Act in 1906 quickly changed the scene of tribal ownership into one of checkerboarding and mostly non-Native-owned land. The change happened virtually in the blink of an eye, considering that the tribe was relocated in 1875 and the majority of sales had occurred by 1906; in the span of 31 years, the Pawnee Nation had lost not only their lands in Nebraska but the majority of their new reservation in Oklahoma, living on the few remaining allotments interspersed with non-Native individuals. Encroachment and desire for land had fueled their

dispossession on both reservations, including the loss of surplus lands and the resulting checkerboarding pattern within their territory.

From the amalgamation of spatial records as well as eyewitness accounts from Indian Agents, a story of vast change emerges. Though never fully realizing the expectations of their government overlords, the Pawnee attempted to adjust as well as possible in new and strange surroundings, as they were forced to adapt to new ways of life for survival. Many cultural changes are evident through Indian Agent descriptions, in addition to the rapid and constant spatial changes – from arrival and clustering around the Agency and Black Bear Creek, to gradually spreading throughout the reservation, to allotment and the ensuing loss of land thereafter. Selection of allotment location therefore, played an important part in the spatial history of the Pawnee Nation in Oklahoma.

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Appendix

Future Directions

There are many aspects of the Pawnee allotment process that deserve further examination. To begin with family relationships, it would be useful to further establish family relationships beyond shared surnames by searching the allotment records in combination with contemporary censuses to determine the relationships of various family members to the head of household. Many of the records clearly include extended family relationships, including sibling relationships between allottees, relationships by marriage and former marriages, the varying parentage of certain children, and other extended relationships that would provide the basis for a more in-depth exploration of families and the allotment strategies they employed. While this would be time consuming and tedious, the transcribed records would make relationships clear in a way that would be applicable to GIS analysis.

If possible, it would also be useful to locate any earlier records of band affiliation for years closer to the allotment dates and add them to the attributes in the GIS database. Combined with the 1905 records currently in the database, a more detailed record of band relationships could provide more thorough and complete results for their impact on allotment selection. In addition, gaining a better understanding of what determined an individual's band affiliation would provide supplemental information to the relationship between families and their affiliations.

Communication with contemporary Pawnee people, including gaining an understanding of their perceptions of their land holdings, the history of removal, and the allotment time period are missing components to the work. In that light, it would be highly useful to interview individuals willing to contribute, possibly interviewing both Native and non-Native individuals

on mixed land ownership within the reservation, with relevant questions about how jurisdiction and tribal sovereignty are still operating for the Pawnee. Queries into their current land ownership status and their experiences with the Cobell Buyback Program (Martin 2016), would also add to the story of Pawnee allotment and bring it up to the present. The onsite and ethnographic side of this research would create a more holistic development altogether, with better inclusion of Pawnee voices, thereby allowing individuals who are to an extent the subjects of this research to voice their perspectives.

Collection and evaluation of additional environmental data on the reservation is another possibility for expanded research, especially through investigation of the network of streams in relation to allotment parcels, especially in comparison to how the region has changed since the time of allotment. It would be pertinent to assess the smaller unnamed tributaries on the reservation as an area of interest, since they clearly impacted the patterns of allotment. GPS data could be used to accurately locate the former allotments in relationship to current stream courses. In addition, the condition of the flow in the Arkansas River should also be considered. It is well known that the Arkansas River does not have the same discharge as it did in the past, due to drawdown of the river upstream in eastern Colorado and southern Kansas for irrigation and other uses. White settlers have historically exploited the upstream Arkansas River for agricultural purposes, especially in more arid places. The effect has been so extensive that much of the river functions now as an ephemeral stream, flowing only occasionally. Considering the impact the Arkansas River seemingly had on allotment selection, this would make an investigation into the stream network a worthy endeavor. To recreate the current-day allotment locations by their legal descriptions in relationship to the meandering of streams and other environmental conditions for comparison would give more closure to the history that has elapsed between the two periods.

Finally, although this research drew extensively on allotment data from the National Archives, a wealth of data gathered for Pawnee allotment remains unexplored. The profusion of data available and recorded at the National Archives in Fort Worth, Texas, was far more than could be processed in a thesis project timeline. Data used were selected based on the feasibility of including it in the time provided, though much more could be added to the story of the Pawnee in Oklahoma. Data and questions that might be further explored in expanded research are discussed briefly, below.

Annotated Tract Books

The annotated tract books (Figure A.1) detail transactions that happened in the years following allotment, including sales, leases, heirship, exchange of land between allottees, the awarding of fee patents, and many others. These were clearly working records, and they consist of entries in pen and pencil, written in different hands that often overlap or are crossed out. There is rich detail, but it is difficult to decipher and sometimes to even tell which allotment entry is being referenced. In the future, if the annotated tract books were to be deciphered to provide the added details of land transactions, cancellations and other events, it would shed light on the specific events that occurred after allotment; including leasing and sales, and the separation of an individual's land sales when they sold pieces of their allotments separately. This would improve the land sales map, providing more details, and giving a more in-depth view of a complex spatial history.

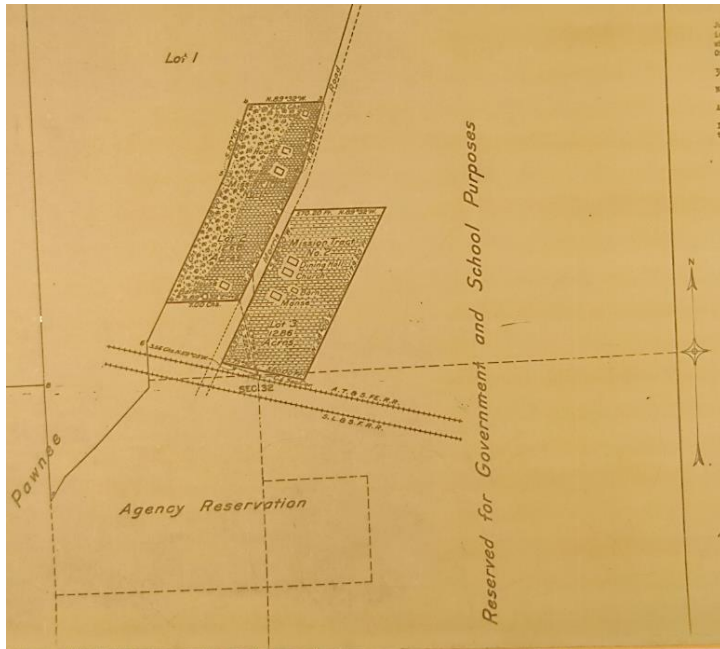


Figure A.2 Allotment for Home Mission Board of the Southern Baptist Convention.

Other examples include supplemental maps for 1926 under the order of the Indian Office without explanation, and others for fee patenting of heirs for deceased Ponca allottees. An example can be seen in the amended allotment map for Alice C. B. Eagle (Figure A.3). As with the Annotated Tract Books, the supplemental survey maps associated with allotment would provide a richer account of the allotment process in its entirety.

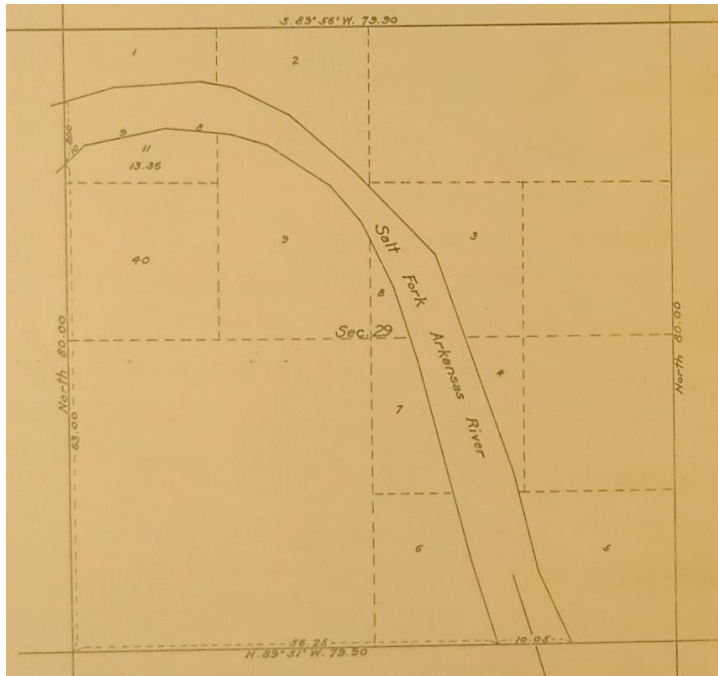


Figure A.3 Amended allotment for Alice C.B. Eagle, Ponca, No. 310.

Oil and Gas Lease Records

As with numerous other tribes in Oklahoma, Pawnee lands often were rich in oil and mineral resources, which made them subject to pressure for mineral leases from outside interests. Included in the National Archives records are oil and gas leases on Pawnee lands. These records detail the allottee, legal description of allotment(s), the lease number, the company to whom the resources were leased, and any written additions, like additional leasing, cancelled leases, and leases for the allotments of minors (Figure A.4). Although well beyond the scope of this study, as with leases for agricultural purposes, the story of Pawnee allotment would not be complete without a full account of the geospatial and economic history of oil and gas leases. Questions that might be examined include: Why were so many leases canceled soon after they were executed; and to whom did the mineral rights belong to then and now? Finding any corroborating

records that would better explain the events regarding oil and gas in the area would provide important context on an important aspect of Oklahoma's history, and by extension, the Pawnee.

ALLOTMENT No.	NAME BY WHICH ALLOTTEE IS KNOWN		SEC.	AGE	SUBDIVISION	SEC.	T.	R.	ACRES	100ths
	FAMILY SURNAME	FIRST NAME								
810	Edger	Wichita			NE/4 of SW/4	1	30	19	5	40 00
					SE/4 of SW/4	2	30	19	5	40 00
						3				
						5				
Oil and Gas Lease # 367 executed by Edger Wichita in favor of Lagoon Oil and Gas Company for entire allotment approved by the department 2-7-16.										
Edger Wichita conveys for \$1.00 consideration on restricted form non-competent deed, the SE/4 SW/4 40 acres to his minor children, Daphne Moore and Verne Moore. Approved by the department 8-19-19-										
<i>Oil & Gas lease # 368 assigned in toto by the lessee, Lagoon Oil & Gas Co., to Waite Phillips Company, of Tulsa, Okla., Approved June 29, 1922.</i>										
<i>Oil & Gas lease # 382 cancelled in toto on February 27, 1926</i>										
<i>Oil & Gas lease # 407 executed by Edger Wichita, covering the NE/4 of SW/4 of Sec. 30-19N-5E in favor of The Twin State Oil Co. for 10 years. Approved May 18-1926</i>										
<i>Oil & Gas lease # 408 executed by H.M. Tidwell, Agent for Daphne & Verne Moore minor grantees of Edger Wichita, covering the SE/4 of SW/4 of 30-19N-5E, in favor of The Twin State Oil Co. for ten years. Approved May 18-1926</i>										

Figure A.4 Oil and gas lease records excerpt.

Contested Allotments and Railroad Damages

The allotment period coincided with a major boom in railroad construction, so it was frequently the case that railroad rights of way impacted the allotment process and allotment holders. On the Pawnee Reservation, the East Oklahoma railway, later known as the Atchison, Topeka, and Santa Fe railway passed through from the southwest corner of the Pawnee Nation's boundary and passed through to the east (Figure A.5) (Wilson, n.d.); this was an extension of the larger 'Frisco' railway network that rapidly spread throughout Indian Territory, disturbing various tribes during this time period (Millard, 1902). A second railroad line passed through the reservation from north to south, with the route shown in Figure A.5. Since the north-south rail line was constructed after allotments had been made, the railroad company was required to

compensate the allotment holders. An extract of the record of damages paid to allotment holders can be seen in Figure A.6. According to the annual report, the railroad damages totaled \$8,269.12 in 1902 (Report of the Commissioner of Indian Affairs for 1902, p. 297). Figure A.7 shows the locations of the allotments for which damages were paid. Further exploration of the impacts of the railroad might focus on the right of way of the East Oklahoma Rail line, how it was acquired, and what, if any, compensation was paid to the Pawnee Tribe.

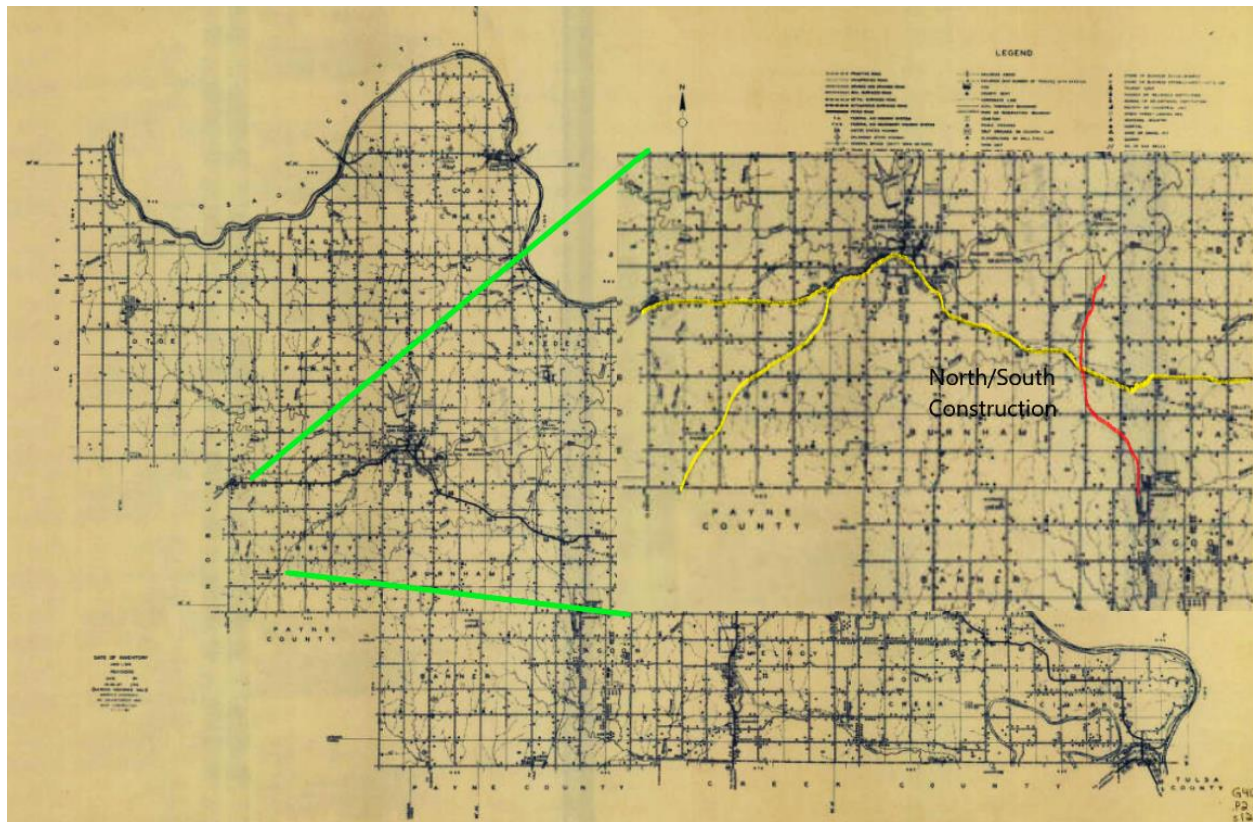


Figure A.5 Railroad construction in Pawnee county with inset showing horizontal construction in yellow, and the recorded damages, or vertical construction in red.

Schedule of Damages paid to Pawnee Indians by reason of the extension of Section 20 Line Lure of the Eastern Oklahoma Railway over and across the below described allotments as per award made by Henry L. Camp and Geo. B. Harry and approved by the Secretary of the Interior in Office letter of May 8, 1902, and 25527. Pawnee Agency, Oklahoma, June 30, 1902.

Allotment Name of allottee	Name of allottee	Duration of land	See	Name of allottee	Length of allotment in feet	Price per acre	Value of land taken	Value of land taken	Value of land taken	Total	Signature of allottee	Reference to	Remarks
406	Del-wa-ah-ah-ah-ah	Helen Maria	A.C. 14	12-21x 56	Ed. Richard Maninger	19668	25 00	625	78675	43 25	Ed. Richard Maninger	X	Right of Way 20 ft wide
212	Chay-ah-ah-ah-ah	Chay-ah-ah-ah	A.C. 14	20-20x 66	John White, daughter	2503	14 00	1155	161 10	23 90	John White	X	Right of Way 20 ft wide
501	Not used	Blanco Bill	A.C. 14	31-20x 66	Robert Mathews, son	2836	25 00	1238	319 75	5 25	Robert Mathews	X	Right of Way 20 ft wide
					Lula Bill, widow						Lula Bill	X	
416	Not used	Mad Bear	A.C. 14	12-21x 56	Mad Bear	1628	12 50	1025	125 50	14 50	Mad Bear	X	Right of Way 20 ft wide
216	Del-ah-ah-ah-ah	Lucian White	A.C. 14	17-20x 66	Charles White, son	2684	6 00	1155	69 70	15 10	Charles White	X	Right of Way 20 ft wide
491	Not used	Clay White	A.C. 14	20-20x 66	John F. Clay, son	2654	12 00	1255	151 92	38 65	John F. Clay	X	Right of Way 20 ft wide
					Nichols Blaine, husband	2648	13 00	1255	158 08	21 72	Nichols Blaine	X	Right of Way 20 ft wide

Figure A.6 Railroad damages for Pawnee Nation, excerpt.

Parcels Listed as Impacted by Eastern Oklahoma Railway

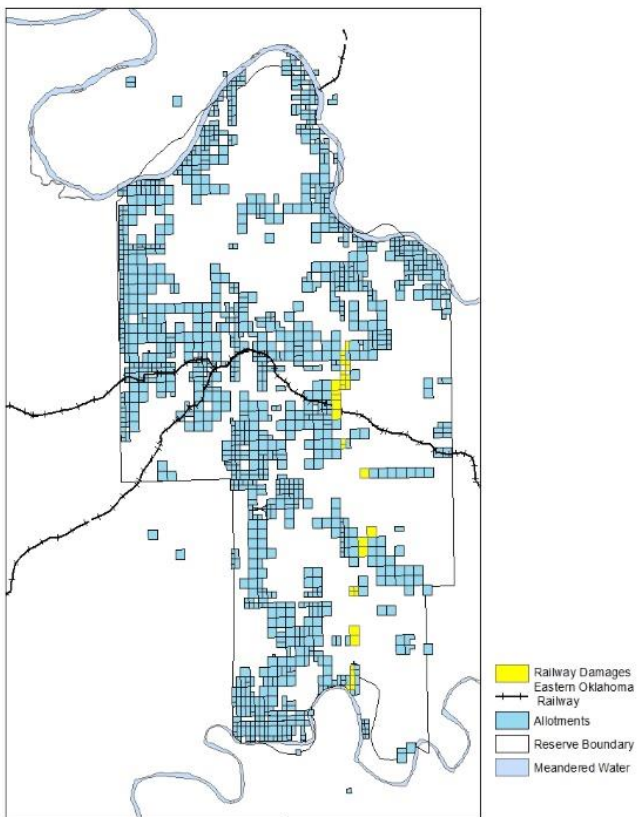


Figure A.7 Map showing allotments recorded in railroad damages records.

With adequate resources, many more discoveries and connections could be made with both the currently available data and future collection of data in the archives and in the field. This would provide meaningful information for the Pawnee Nation, as comprehensive spatial studies into allotment mechanisms and impacts are largely missing, especially considering the impact that this policy has had on Indigenous peoples throughout North America. Creating representations of spatial histories increases knowledge of indigenous geographies, and could help to inform reformation policies, such as the Cobell Buyback program or other future initiatives. The further development of the field of historical GIS also will be an important part of recreating spatial histories for analysis. There are many more avenues and opportunities for advancement of this type of research in the future.