Prairie Fires & Earth Mounds: The Ethnoecology of Upper Chehalis Prairies
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Camassia quamash var. ***azurea*** Glacial Heritage Prairie Preserve 4-23-04

This spring I spend my days at Mima mounds natural area preserve and glacial heritage prairie in Thurston County, Washington. I monitor camas distributions on mounds and their inter-mound swales, along north-south gradients. I record camas phenological stages and the relative abundance of other ethnobotanical species important to the Native peoples of this land. Each day, when the prairie warms up it becomes a-buzz with busy bees, pollinating future camas crops. Butterflies dance on the breeze, a pair of Northern harriers soar over mounded terrain, and meadowlarks sing happily as I count "Bud - Bud - Flower - Fruit - Fruit - Flower - Flower - Fruit . . ." My volunteer companion, Dale Pressler, records this monotonous drone. Riffle club shell fire and a remote-control toy airplane periodically shatter the serenity of our routine. But the prairie's beauty, the secrets lying dormant in these earth mounds, and my desire to complete my PhD keep me coming back, day after day, week after week.

Camas distribution is just one piece of the larger picture of how prairies nourished the peoples of the past who managed the land with fire and harvested its bounty. My research seeks to unravel more precisely when and how extensively indigenous burning practices influenced the persistence of prairies in the Upper Chehalis river basin. Adding a layer of complexity to this already difficult question, I am interested in how mima mound prairies, as sub-patches of the larger prairie/oak woodland landscape mosaic, contributed to human subsistence.

Mima mounds (variously called prairie mounds, pimple mounds or hogwallows) are patterned ground phenomena that occur within many prairie or grassland environments throughout North America (Kruckeberg 1991). In South Puget Sound prairies, they average from 8-13 meters in diameter and 0.5-2 meters in height (Washburn 1988). These soils are described as anthropogenic, in part, because of the accumulation of fine charcoal from repeat burning (Ugolini and Schlichte 1973).

I hypothesize that the peoples of the Upper Chehalis river basin not only adapted to and benefited from cedar forest proliferation and increased salmon populations between 5000 and 3000 years ago, but they also developed sophisticated prescribed burning techniques. These techniques were used to maintain the prairie and oak woodland terrestrial resources they had come to depend upon during the dryer, warmer early Holocene. These ecosystems supported a number of important animal (deer and elk) and plant resources,

including camas, acorns, and numerous other nuts, seeds, and berries. All of these resources were promoted and maintained by Native American burning practices after the climate shifted to a wetter and cooler period. Such burning practices maintained a diverse landscape mosaic of different habitat patch types at different seral stages, including the expansive prairies that were first observed by early EuroAmerican explorers.

History of the Land

The prairies we are most familiar with are the dry, glacial outwash prairies in Pierce and Thurston Counties like Fort Lewis or Mima Mounds reserve. However, prairies of the Upper Chehalis river basin also included rich, wet silt-loam soil prairies. These were where Centralia, Chehalis and Boisfort are today. Jackson prairie remnants, along highway 12 east of I-5, are signaled by common camas (*Camassia quamash* var. *azurea*), Oregon iris (*Iris tenax*) or groves of Garry oak (*Quercus garryana*). These mesic systems were more like those of the Willamette Valley in their plant composition and soil moisture regimes.

Sadly, only a shadow of these remain today. Newaukum Prairie, Fords Prairie, Jackson Prairie, and Boisfort Prairie were coveted by EuroAmerican settlers who quickly converted them to agriculture. Mapped on GLO survey maps in the 1850's, each had previously been part of the inhabited landscape that was managed for subsistence by Cowlitz and Upper Chehalis descendants. Indian place names denote these prairies as village site locations and places to hunt, fish and harvest plants. Ethnographically documented Upper Chehalis village sites are recorded along the Chehalis River from Pe El at the river's headwaters to the mouth of the Satsop River. Each village had several long-houses carved from cedar (*Duwamish et al*. 1927:534-535; Mar 2001).

In 1840 James Douglas drew a map of a string of prairies along the route from Cowlitz Landing through Grand Mound and on to the Nisqually plains (Leopold and Boyd 1999:149). This "string of pearls" is subject of Native legends. The Chehalis story of *Bluejay and his Sister Yo'I* describes five burning prairies that blue jay traveled through to visit his sister in the land of the dead (Adamson 1934:21-23; Leopold and Boyd 1999:154). One of the largest prairies was Grand Prairie, at Grand Mound, just north of where the Chehalis River bends to make its way to the Pacific Ocean.

Mima Mounds and Glacial heritage preserves were once both part of a contiguous 3,200 acre prairie mapped on an 1855 GLO map. The prairie is called ***nsq'wanxtn*** in Upper Chehalis, which means "place to dry hides on a frame" (Kinkade 1991). This name has slightly different phonemic spelling in Upper Chehalis and Cowlitz and there are a total of three prairies with similar sounding names that all refer to "big prairies" where camas and wild carrots were harvested. One is at the confluence of the Newaukum and Chehalis rivers; the other is in the Cowlitz river basin near Toledo.

In David James' *From Grand Mound to Scatter Creek. . . the homes of Jamestown* (1980), the historic extent of mounded glacial outwash prairies are shown to spread across the valley floors of the Black River and Scatter Creek, from the Bald Hills on the east to the Black Hills on the west and north of Grand Mound all the way to Olympia. Grand Mound only had a few trees on it in 1855 when Fort Henness was built as a refuge for settler's who feared Indian retaliation against Isaac Steven's efforts to remove them from their homelands.

Earth Mounds: Native Origin Stories

Indian legend has it that the "many small mounds were once porpoises before the Flood" (Miller 1999:7), and that Grand Mound is where "part of a star came to earth" and "had a spring half way up the side;" but "the star was too big to live on the earth so it only left a small bit behind" (Ibid). These anecdotes, nested in long-term oral tradition, suggest possible geological origins of Grand Mound and Mima Mound features.

In Salish legends, 'before the floods' was a time when people and animals were the same and could speak to one another. After the floods, ***Xwan*** or "moon the transformer" changed everything, giving each animal and plant it's respective uses and role in the order of things (Adamson 1934; Ballard 1929; Palmer 1925). It was

at this time that people became "human," each group receiving their own language. When this happened, humans were no longer able to speak to the other animal and plant beings as they had before, but were given the right to take certain ones for food, shelter and clothing.

The idea that mima mounds formed when sediment was left behind after great glacial melt water floods is compelling. Indians believed the mounds were formed by water (Wilkes 1845). James Cooper (1859:22) surmised that eddies and whirlpools of a great estuary or river "like the Columbia" created the uniform mounds. Aerial photos show elongated mounds along the direction of flow in the ancient, oversized Black River floodplain. Braided channel patterns flow around the mounds, supporting the deposition/erosion or fluvial process hypothesis. But exactly how and when the mounds formed relative to soil development is still hotly debated (Washburn 1988). What we do know, from the pollen record, is that prairie and oak woodland savanna ecosystems formed during a dryer and warmer period, beginning around 10,000 years ago. Later, between 6000 and 5000 years ago the pollen signature shifts and a wetter and cooler climate ensues with development of conifer forests like those we are familiar with today (Barnosky 1985; Brubaker 1982; Tsukada and Sugita 1982). However, the prairies persisted in South Puget Sound. Their persistence has been attributed to Indian burning.

Ethnoecology of Mima Mound Prairies & Prairie Edges

The prairies and their oak woodland edges provided diverse and abundant food, fiber and medicinal resources. Of the 157 inventoried prairie plant species, 35% are edible and over 85% have some documented ethnobotanical use (Gunther 1945; Leopold and Boyd 1999; Moerman 1998; Norton 1979a&b; Norton et al.1984; Turner 1997, 1998; Turner and Kuhnlein 1983).

In the 1927 case *Duwamish et al. V. United States of America*, 92 year old Upper Chehalis elder, Mary Heck, testifies to the importance of prairies for subsistence. She identifies the territory of the Chehalis people as a land of plenty.

When asked what kind of food the prairies supplied, she replies "we get the sunflower roots, for one kind. They take that up and bake it and use it for food." She goes on:

> "a kind of wild onion, and lacamas was the chief food they had, like bread or something like that. Then they had other roots that were three or four times bigger in size than the lacamas, but they were just the same, the same shape, same form, only they got another name to it. They called it, ***oquilla***." She talks about having lots of "wild rhubarb" and "spinach," and all kinds of berries. "They had kinikinik berries, black berries, wild raspberries, and crabapples, salmon berries, salal berries, and another kind of berry they call ***Kamotlk.*** . . They had June berries, wild currents, blackcap raspberries and lots of blueberries" and "thimble berries grow along the edge of the prairies."

When asked if they had strawberries, she says "there was so much strawberries you can smell it from a distance." And Marion Davis, a 76 year old Upper Chehalis man, remembers "Berries; was just full of berries all over, strawberries on every prairie."

To the question "was the prairies the place where they got the most of their camas roots that they ate?" Mary Heck answers, "they abounded with all kinds of roots they used for food." She identifies three kinds of "camas" that grew on the prairies. "There was a little kind and a big kind, and then there was a kind that was not used for food, but used rather for medicinal purposes." She likely is describing common blue camas (*Camassia quamash*), Giant camas (*Camassia leichtlinii*) which is less common and tends to bloom a few weeks later, and death camas (*Zygadenus venenosus)* a poisonous relative of the edible camas that was used by some healers as a purgative.

Thelma Adamson's interviews with Upper Chehalis and Cowlitz descendants in 1926 and 1927 also reveal that roots of wild sunflower *(Balsamorhiza deltoidea)*, tiger lily (*Lilium columbianum*), wild carrots (*Perideridia gairdneri*), camas *(Camassia quamash and C. leichtlinii),* Indian rice-root or chocolate lily (*Fritilaria affinis,* syn. *F. lanceolata*) and false onions *(Brodiaea* sp*.)* were gathered from the prairies near Rochester and Grand Mound (Miller 1999). Wild sunflower roots were mashed to make a kind of root beer.

Strawberries (*Fragaria virginiana*), serviceberries (*Amelanchier alnifolia*), and other berries were gathered in June, and berries were eaten fresh or dried and stored for winter. Acorns and hazel-nuts were harvested in the fall. Acorns were stored in vine maple baskets and placed in black mud to leach out the tannins (Miller 1999:20; Duwamish et al. 1927:531). Bracken fern (*Pteridium aquilinum*) rhizomes were harvested, roasted and pounded into flour to make a kind of bread (Miller 1999; Norton 1979b). Large quantities of roots, berries and acorns were processed and stored for winter along with smoked salmon and other meats, including deer, elk, bear, and small mammals.

Camas was by far one of the most abundant and important prairie plants. Its importance as a staple to the inland, upriver Salish people is well documented in archival and ethnographic records (Gibbs 1877; Cooper 1859; Adamson 1926-27; Haeberlin and Gunther 1930). Large quantities of camas were harvested, processed in pit or earth ovens, and stored for winter. Surplus camas was even traded from western Washington prairies to groups east of the mountains (Gibbs 1877:170). The diverse and abundant prairie resources were managed and maintained by frequent, low intensity fires.

Prairie Fires: Traditional Ecological Management

In 1859 James Cooper writes:

> *A few remarks are necessary upon the origin of the dry prairies so singularly scattered through the forest region. Their most striking feature is the abruptness of the forests which surround them, giving them the appearance of stands which have been cleared and cultivated for hundreds of years. From various facts observed I conclude that they are the remains of much more extensive prairies, which, within a comparatively recent period, occupied all the lower and dryer parts of the valleys, and which the forests have been gradually spreading over in their downward progress from the mountains. The Indians, in order to preserve their open grounds for game, and for the production of their important root, the camas, soon found the advantage of burning, and when they began this it was only those trees already large enough that could withstand the fires.*

Cooper's observations may reflect both the longer-term process of forest encroachment that occurred during the later half of the Holocene and a more recent phenomena of forest encroachment resulting from native population declines caused by small pox epidemics in the late 1700s and early 1800s.

But Upper Chehalis recall that burning was done every 2 to 3 years "or when needed" to keep the understory of forests clean, and to replenish camas prairies and berry grounds (Marr et al. 2001). The extent to which the whole prairie landscape was burned at this interval, however, is not exactly known. It is possible that only parts of the prairie were burned every 2-3 years, and that some kind of "patch rotation" was practiced. This would allow a prairie patch that had burned and been harvested more time to recover before it was burned again. Then a new prairie patch would be burned to promote the next season's crop of camas or berries. Each patch would be harvested in the spring or summer, and then left to rest.

Family use rights may have regulated the location of burns, or the quality of the plants triggered when it was "time to burn." The season of burning would vary depending upon the purpose. For example, fall burns may have promoted greater browse for deer and elk, whereas, spring burns may have increased edible forb production (Leopold and Boyd 1999:152).

Mary Heck recalls "there was all kinds of game here, and right in this prairie [at Oakville] was deer just like what sheep and cattle is now on this prairie; right here on this prairie." As to whether there was elk, she says that during the time of her father "there was elk right here in this prairie."

Ironically, the persistence of dry gravel-outwash prairies today is due, in part, to the fact that EuroAmerican farmers thought them "second rate soils," only good for grazing. But to the Upper Chehalis peoples, these prairies were places tied to their origin stories and critical for hunting and wild plant-food cultivation. These prairies are the threads that remain of the rich tapestry once woven by fire and ice and later maintained by people. They are artifacts of human interaction, and that is not a bad thing. If they are to

persist, they need human tending and care. What can these ancestral lands teach us if we are willing to listen?

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