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Land-Use and the Fort Lewis Prairies

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Abstract

Human land use is at once responsible for the very existence of the western Washington prairies of the Puget trough and for their extensive degradation. Lessons learned from studying the results of various land uses may point the way to recovery of the prairies to something approximating their pre-1800 condition. Native American land use is likely responsible for existence of the prairies and for much of their character. Their manipulation of the land included frequent use of fire, along with various techniques for cultivating native plants. Their use of fire retarded the advance of conifers onto the open plains. Agricultural techniques may have been responsible for some of the distribution of native plants and perhaps even for introduction from the interior of food plants now thought to be native. Later arrivals have used the land in a greater variety of ways, many of which have been destructive of traditional prairie characteristics.

Among the most destructive have been the suppression of fire and the introduction, both intentional and accidental, of plants which have out-competed native prairie vegetation. Other destructive uses include accelerating development, introduction of livestock and allowing it to overgraze, draining of former wetlands, and various military training activities. Establishment of Fort Lewis in 1916 likely retarded the destruction by ending development on the prairies. Various mission changes have had varying impacts on the prairies, but the overall result is easy to see in many places, where subdivisions have begun to arise outside installation boundaries, and where continued heavy grazing has caused displacement of native grasses. Fort Lewis authorities have in recent years begun to reintroduce the use of fire in the prairies as means of controlling Scotch broom. Some incidental consequences may include the retardation of conifer invasion and suppression of other invasives that are not adapted to cyclic burning.

Introduction

There is much conjecture about the origin of the prairies of the Puget trough. Even so, there can be little objection to the notion that human use of the prairie land has caused the prairies to endure and to take the shape that characterizes them today. This paper attempts to

survey the changing character of human land use and its effects on the shape of the prairies remaining at Fort Lewis.

The Nisquallies

The present-day Nisqually Indians represent part of the legacy of Native Americans known to have populated the Nisqually delta long before the white

settlers arrived. Derived from a much greater group known as the Salish people, they comprise but one of a large number of tribes descended from the Salish. By the 13th century A.D., evidence suggests the Salish were firmly in control of an area that had been dominated by the earlier Marpole culture. Before arrival of the whites, Nisqually villages existed at several places on and near Fort Lewis.¹

Modern-day residents of the area have come to think of the Salish as living off the “spontaneous product of nature” until the white settlers came. In popular lore the Indians moved easily across the land leaving it as their forbears had found it. This presumes the landscape was left entirely to natural processes until whites began to shape it to their needs.

Such an attitude reveals itself in writings published early in this century. Early newspaperman and historian Clarence Bagley wrote, “Lying in the northern angle formed by the Nisqually river and the Sound is one of the world’s beauty spots. No grand park of human creation rivals its charm of undulating plain; its silvery lakes with pebbly beaches, nestling among detached or winding groves whose vivid green of oak, maple, alder and dogwood brightens the somber hues of the prevailing evergreens. The old gray oaks, with silver-threaded mosses pendant from every gnarled limb, are almost coeval with the snow-capped mountains off toward sunrise. Here and there big pines and firs, parents of the younger brood that crowd each other for breath of air and ray of sunshine, stand sentinel guard over all

¹ Haeberlin, Herman Karl, and Gunther, Erna. The Indians of Puget Sound.

this loveliness. Evergreen cones are all about, whose lower branches caress buttercup, larkspur, violet, strawberry blossom, and other sweet flowers amid the grasses at their feet and whose tops are already reaching to the shoulders of their progenitors.”²

Lyrical though it is, this piece assumes the beauty they beheld was the handiwork of God unassisted by humans.

Careful thought and an examination of various records indicate this view is flawed. The most obvious example is the invasion of the prairies by conifer forests. Since suppression of fire became national policy, evergreen forests have taken over thousands of acres of western Washington prairie. One could infer that without human intervention, nature would have replaced the prairies with forests thousands of years ago.

There is another way to determine whether indigenous peoples manipulated the environment before the Europeans arrived. The food cycle for the Nisquallies, and indeed for many of the Salish groups, was one in which they depended primarily upon the fruits of Puget Sound and its associated streams and rivers.³ They spent winters along the shores where salmon and shellfish were there for the taking and the water mass moderated temperatures. During the spring and summer they moved to established village areas on the prairies to gather the resources available there.⁴

² Meeker, Ezra. Pioneer Reminiscences of Puget Sound.

³ Haeberlin and Gunther. *ibid.*

⁴ *ibid.* See also Eells, Myron. The Indians of Puget Sound: the Notebooks of Myron Eells, edited by George Pierre Castile.

The food resources of the prairies were largely dependent upon deliberate burning. Fire benefits prairie forbs in several ways. One of the primary benefits is that fire eliminates competition. By removing seasonally dead vegetation, fire increases the likelihood that the radicles of germinating seed will reach mineral soil. Moreover, burning releases nutrients.

Settlers and early surveyors found three particular plants in abundance in areas inhabited by the Nisquallies and other Salish people. Bracken fern (*Pteridium aquilinum* L.), and camas lilies (*Camassia quamash* L.) existed on the prairies, and nettles (*Urtica dioica* ssp. *Gracilis* var. *Lyalli* (Wats.) Hitchc.) thrived in riparian areas that ran through the prairies. All three of these were crucial to Salish culture.

University of Washington historian Richard White says the best evidence for prairie burning was the abundance of bracken and camas, which dominated large areas.⁵ Both were so plentiful that they were staples of the Indian diet. Natives ground bracken rhizomes into flour that they used for bread, and they ate the camas bulb fresh, dried, or preserved. This abundance was not likely the product of chance but of the result of burning. Indeed, records maintained by Hudson's Bay Company document prairie fires almost every year in late summer and early autumn.⁶

Bracken here, as throughout much of its range, is a major pioneer of burned-over

or otherwise disturbed land. Once established, the dense rhizome network allows the colony to easily survive the burning of the tops after they have died back in the fall. Thus, when fire removes the dead bracken tops and competing plant species, the bracken spreads into ever larger areas. Fire may even trigger rhizome growth. Since the Salish valued bracken as a food source it is likely they set fire to the dead tops to increase its area.

Fire benefits camas in less direct ways. Its top growth, too, dies off in late summer, and burning does not damage its deeply buried bulbs. On the other hand, because it is a bulb plant, burning does not encourage its spread, it merely reduces competition. It takes direct human intervention to expand the plant's range. (Who is to say the Salish or even the Marpole did not introduce the camas to the Puget trough?) The very act of harvesting probably helped the accidental spread of camas when natives accidentally split, dropped or discarded bulbs. White argues that the Salish would soon discover this and add cultivation to their repertoire of agricultural practices. Indian testimony verifies some cultivation was followed.⁷ For instance, they dug in plant refuse around tiger lilies and wild carrot.

After the potato reached the Puget Sound region, Salish tribes adopted its cultivation with no particular help from the whites.⁸ They correctly assumed that soils rich enough to support a vigorous growth of nettles would be good for growing potatoes. Wherever there is human settlement over extended periods of time, decomposing waste enriches

⁵ White, Richard. Land Use, Environment, and Social Change: The Shaping of Island County, Washington.

⁶ Journals of Occurrences at Muck Station and Tlithlow Station. Journals maintained by clerks employed by the Puget Sound Agricultural Company.

⁷ White. Ibid.

⁸ *ibid.*

the local soils. Plant refuse, human and animal excrement, ashes from fires, and shells and bones provide the surrounding soils with significant amounts of nitrogen, phosphorous, and potash. Over time these inhabited areas develop soils much richer in plant nutrients than surrounding soils, and it is in just such locations that the early settlers and surveyors found huge populations of nettle. Indeed a map of the area prepared by the Hudson's Bay Company shows potato patches exclusively along riparian areas.

Since the Salish lived closely with nettles over long periods of time they eventually learned to use various parts of the plant for medicines and dyes.⁹ They learned to its roll and twist stem fibers into the string body for fish and duck nets and fishing lines. After introduction of the potato, the presence of nettles indicated fertile soils which were prime candidates for potato cultivation.

Skagit tribal members have related their people cared for nettles by keeping the prairie patches free of weeds and by burning the plant refuse in the fall after harvesting.¹⁰ It is likely the Nisquallies, descended from the same peoples, did likewise, and it is clear these practices favored the nettles over other plant species.

Witnesses said the Salish burned the forest edge about every third spring to encourage berries.¹¹ They also said edge fires reduced the likelihood of prairie fires escaping to the forests, where they would have been devastating.¹² Native testimony stated one of the purposes as

⁹ *ibid.* Also see Haeberlin and Gunther.

¹⁰ *ibid.*

¹¹ *Duwamish v. United States of America*, 79 CtCl 1530, May 27, 1935.

¹² *ibid.*

opening up the forest edge so hunters could see game over greater distances.¹³ Burning did open up the floor for new understory growth on which deer browsed, but this was probably a side effect.

(While the Indians modified vegetation patterns on the prairies, they clearly did not stop their activities at the prairie edge. Cedar trees had a number of uses for the Salish. They used the bark for weaving baskets and rainwear, and they shaped canoes from the main bole. Douglas-fir was used in construction, and hemlock and alder had specific uses. However, when considering the abundance of the forests and the massive size of the trees encountered by the early settlers, Indian uses obviously had minor impacts on the forests. It took the Makahs of the Olympic peninsula two weeks to fell a canoe-sized cedar, and surely the Salish would have taken as long.¹⁴ This length of time and the limited number of canoes and permanent buildings occupied by the Salish people show clearly that they only minimally altered the composition of forest.)

Surveyors conducting the first comprehensive land survey in 1870 noted extensive evidence of burning in forested areas.¹⁵ Few would doubt that occasionally a prairie fire would move into the forest. Unfavorable winds could carry embers beyond a previously burned area or it could drive fire around areas prepared by earlier forest edge fires. Surely if prairie fires could escape into the forest, fires deliberately set in the forest edge would have escaped also. Such forest fires would have been much more frequent than would have been

¹³ *ibid.*

¹⁴ White, *ibid.*

¹⁵ White, *ibid.*

caused naturally from lightning strikes. Lightning strikes are relatively infrequent west of the Cascade Range.

These fires are very likely the reason for the dominance of Douglas-fir in the lowland forests. Its seed germinate profusely in open, sunlit areas, and its seedlings flourish in these conditions. Without occasional fire, shade-tolerant hemlock and cedar would have gained dominance. On the other hand, frequent, deliberately set prairie fires would have killed the young seedlings and thus retarded the advance of the conifer forests into the prairies.

Thus we see that the “park-like appearance” described by early settlers was not, as they had supposed, the product of wild nature. The Salish created it over hundreds of years by deliberate manipulation and accidental fires. These forms of manipulation, especially the deliberate use of fire, apparently came to a complete halt in a very brief time. Many Nisquallies took employment with the Hudson’s Bay Company and its subsidiary, either as agriculture workers or trapping and hunting.¹⁶ Employment on the company farm would have removed workers from maintaining the prairie for traditional aboriginal agriculture. Further, it is likely the company discouraged the Nisquallies from burning, at least in the area of farms and where livestock were grazed. As settlers began to establish homes on the prairies, burning by the Nisquallies would have been a contentious issue. Certainly after the “Indian Wars” of the mid-1850s, the Nisquallies did not practice burning in any areas inhabited by the new settlers.

¹⁶ Huggins, Edward. Journal of Occurrences at Muck Station.

What would the area have looked like without the environmental manipulation of the native Americans? One can only speculate, but a good guess is that the entire area would be forested.

The European Settlers

Enter the Europeans. Though several explorers had ventured along the Washington coast and even to southern Puget Sound, westerners made no serious, documented effort to settle the area until the Hudson’s Bay Company arrived. Company representatives built a small shed at the mouth of Sequelitchew Creek in 1832 and returned to build Fort Nisqually in 1833 where the town of DuPont now stands.

The early objective was to widen the company’s grip on the western fur trade, but its forward-looking entrepreneurs soon realized a growing market was building among the Russians in Alaska.¹⁷ They thought to provide that market with agricultural commodities and began to establish farms along coastal areas of what became Oregon Territory including the area around Fort Nisqually.

Over the next few years as the new part of its operation matured, the company realized cultivation would not work on a commercial scale in the Fort Nisqually area. On the other hand, the fescue of the prairies was ideal for grazing livestock.

In 1839 the company founded a subsidiary, Puget’s Sound Agricultural Company, whose mission would be to supply company trappers and the burgeoning Russian market in Alaska

¹⁷ Troxel, Kathryn Marie. “Fort Nisqually and the Puget’s Sound Agricultural Company.”

with meat.¹⁸ Hudson's Bay assigned to the new subsidiary all lands lying between the Puyallup and Nisqually Rivers and from the Cascade foothills to Puget Sound. The new company later estimated the total area to be 252 square miles.¹⁹ The new operation was to cultivate only sufficient produce to sustain itself and to raise livestock with an initial herd of 1000 cattle from California.²⁰ Shortly the company added sheep, and they soon became the primary meat source. The cattle were of a breed known as "Spanish longhorn" and were much wilder than the genteel Hudson's Bay farmer had experienced.²¹

The new company located its headquarters at Fort Nisqually, and herders lived at out-stations built strategically about the plain.²² The principal station was Muck Station on the south bank of Muck Creek, where there was also a farm. A European head shepherd supervised each of these stations and had responsibility for two to four bands of sheep, numbering about 500 each. Two shepherds watched each band and moved it every two or three days. Each night they moved the sheep into a sheep park, or corral, to be released for grazing the next morning.

This progressive attitude probably meant sheep caused relatively light damage to the natural fescue cover during these early years even though sheep were much more numerous than the cattle. The Nisqually establishment managed a herd of 5,872 sheep in 1845 and four

years later it peaked at 12,419. In 1856, the last year for which records are available the flock was down to 5,269.²³

Less information is available about the company's cattle operation. The initial herd of 1,000 had increased to 2,280 by 1845 and peaked at 6,077 in 1852.²⁴ About that time, anticipating U. S. dominion over the area, squatters began taking up residence on the company's property. Livestock "missing, killed, or driven off by squatters" reduced the herd to 5,770 the next year and 3,558 in 1856. The company asserted the squatters stole or killed 6,058 head of cattle during that three-year period.²⁵

The transition to U. S. dominance in the area marked the next acceleration of environmental change. There were few if any ways for company employees to get legal title to the land they lived on or to acquire livestock to support themselves and their families once they completed their company contract. A dispute over placement of the boundary between the United States and the British colony of Canada further complicated land issues for the employees. The United States and Great Britain agreed to the present boundary in the Oregon Treaty of 1846. However, the treaty did not resolve the issue of lands and facilities owned by British companies such as Puget's Sound Agricultural Company.

Congress did not wait for settlement of the issue of compensation. It further complicated the issue in 1850 by passing the Donation Land Claim Act as a vehicle for donating land to settlers in return for the settlers "improving" the

¹⁸ *ibid.*

¹⁹ Galbraith, John S. *The Hudson's Bay Company as an Imperial Factor, 1821-1869.*

²⁰ Troxel. *ibid.*

²¹ Galbraith. *ibid.*

²² *ibid.*

²³ *ibid.*

²⁴ *ibid.*

²⁵ *ibid.*

land. Under the act a white, male settler over the age of 18 could receive 320 acres after he proved he had settled before December 1, 1850, occupied and cultivated the land for four years. If he were married his wife could also claim 320 acres. The second class of settler who benefited was the white male citizen 21 years old or more who settled in the Territory between December 1, 1850, and December 1853. This class of settler could claim 160 acres and, if he married within a year of arriving in the Territory, his wife could also get 160 acres. U. S. Citizenship was not an absolute requirement for either class of claimant; the claimant had only to declare intent to become a citizen.²⁶

Congress extended the act to December 1, 1855, and allowed purchase of the land at \$1.25 an acre after living on the land for two years. It later reduced the residency requirement to one year. Settlers could only take advantage of this provision on surveyed land, and the first surveys were not done until 1854. The Surveyor General had trouble finding surveyors who would work over the rugged terrain and through the heavy vegetation.²⁷

The liberal wording of the act anticipated the needs of company employees and former employees who were already living in the area. It also increased the difficulties of the company in enforcing its property rights, both concerning its lands and its livestock. The sudden, dramatic reductions in its livestock inventories noted above clearly illustrated these difficulties.²⁸

²⁶ Donation Land Claims of Washington Territory. Seattle Genealogical Society

²⁷ *ibid.*

²⁸ Galbraith. *ibid.*

The implications for the prairie ecosystem are also clear. As noted above, establishment of white homesteads caused an abrupt cessation to the annual burning practiced by the Nisquallies. Records of the time reflect many settlers had little regard for size restrictions or niceties of the law. Many of them fenced off as much land as their neighbors would permit.²⁹ The key word here is “fenced.” The appearance of fences meant that livestock grazing could no longer be managed to assure continued dominance of fescue as during the Puget’s Sound Agricultural Company era. Now fescue in the fenced areas would get little chance to flower and disperse new seed; instead it was gnawed to the ground. In fact, grazing was likely managed only in the sense that settlers tried to keep their stock on their property. A positive impact, however, was that the grazing may have helped retard colonization of the prairies by conifers.

Not only was the land over-grazed, but it was surely near this time that the new residents began to import pasture grasses. Pasture grass seed likely contained seeds of a number of other weedy species. Non-native trees persist on former prairie that could only have been brought in by the settlers. The best examples are remnant orchards and a number of individual fruit trees scattered around Fort Lewis. White discovered a journal in which the journalist recorded nearly half his shipment of seed wheat was weed seeds.³⁰

²⁹ Meeker, Ezra. Pioneer Reminiscences of Puget Sound and the Tragedy of Leschi.

³⁰ White. *ibid.*

Some settlers who had wetlands on their property also drained bogs and marshes to increase the area of arable soil.³¹

In short, passage of the Donation Land Claims Act set the stage for 75 years of unbridled development. Such development increased pressure on a prairie ecosystem established over perhaps thousands of years by the Native Americans. As the years went by, owners of many of these large land parcels divided them into smaller and smaller lots until 1916, when land was condemned for establishment of Fort Lewis.

Former employees of Puget's Sound Agricultural Company knew, of course, that it was vain to try cultivating the dry prairies. Settlers initially concentrated along streams and in wetlands to take advantage of water and wetter soils. Agriculture censuses conducted in 1860, 1870 and 1880 demonstrate the new settlers concentrated on livestock, principally sheep. Most cultivation seems to have been limited to subsistence farming, though some farmers attempted commercial crops. The censuses identified wheat, oats, peas and beans, and Irish potatoes as commercial crops. No record exists locally of any more agricultural censuses.

Henry Murray, an early settler on Muck Creek even tried his hand at growing tobacco, according to the 1870 agriculture census. The 1880 census did not record any tobacco crops. It is relatively well documented that hops made a successful crop from the 1880s

³¹Bonney, W. P. Pierce County — Washington. See also Edward Huggins writing in Pioneer Reminiscences of Puget Sound and the Tragedy of Leschi by Ezra Meeker.

until the 1920s when a blight invaded the area. Murray's property had a hops shed on it when the Pierce County Assessor's office mapped the area as part of a 1908 county-wide timber cruise/survey.

Adventurous as he was in his agricultural efforts, Murray appears to have had his greatest success at acquiring property. Records at the Pierce County Assessor's Office indicate he had accumulated some 10,000 acres of present-day Fort Lewis by 1890. Some of the property stayed in family hands until Fort Lewis acquired its last large parcel just months before the attack on Pearl Harbor.

Another large, and apparently successful, agricultural effort in the area was the increase in dairy operations. Several prosperous dairy farms operated near Roy around the turn of the century.³² Fort Lewis continued to lease grazing rights in the area until the late 1970s. The remains of a corral still exist near the installation boundary north of Muck Creek. One can also find remnant grain-crop graminoids in this area.

As one might expect, the number of settlers grew rapidly, encouraged both by passage of the Donation Land Claim Act and by vigorous promotional campaign conducted by the railroads and local businessmen hoping for growth. From a period when no white households existed before 1833, hundreds of white residents lived on present-day Fort Lewis by 1916. That was when property was condemned to establish Fort Lewis. Indeed, the condemnation proceeding named 176

³² Kunschak, Walter. A History of Roy, Washington.

respondents whose last name began with A or B. These lands do not include areas that were not acquired until the 1940s.

This explosive growth had another implication as well, though no documentation apparently exists. Each of these hundreds of homesteads must have had at least one well. The impact is difficult to gauge, though it likely was negligible. Clearly the amount of individual water use was much smaller than today. Baths were less frequent, and body waste was not flushed away with water. Showers were unknown. On the other hand, subsistence gardens had to be irrigated in some way. It is likely that almost each homestead included such a garden, regardless of its location. How much of the water used by the hundreds of households recycled relatively quickly into the aquifer is unknown.

The Military Era

As early as 1902 Pierce County businessmen encouraged establishment of a military reservation in the county. In 1916 with U. S. involvement in WW I looming, 86% of eligible voters elected to condemn 70,000 acres to achieve that aim.³³ Today's Fort Lewis is the product of that decision. It was a decision that as surely as aboriginal land use resulted in continuation of much of the original prairie.

The original installation was considerably smaller than today. The Army acquired just over 1100 acres distributed along Muck Creek in the 13th Division prairie just before the U. S. entered World War II. The 18,066 acres south of the Nisqually River

known as the Rainier Training Area were added after the U. S. entered the war.³⁴

Even so, there were dozens of homesteads on the prairies inside the original installation boundaries. The Army probably removed the buildings and fences and filled the wells. It is possible that some were retained for their training value. After all, WW I was notorious for its barbed wire entanglements, and much of it was fought in rural France. In any event, the livestock were surely removed, and cultivation ceased.

Fort Lewis until last year had never housed a major mechanized or armored unit; it had always been an infantry or a training post. There undoubtedly have been small armored units stationed on the post from time to time, and WW II-era infantry units had various sorts of tracked vehicles. A major Army reorganization in 1963 resulted in an armored brigade locating at Fort Lewis.³⁵ One of the brigade's two tank battalions was stationed at Fort Irwin, CA. The remaining battalion had both light and medium tanks, and it was deactivated in 1965.

Therefore, scattered soil disturbances such as foxholes, tank revetments, and trenches probably constituted most of the damage to the prairie. There are several old airstrips scattered about, most of which have been in disuse except for sporadic activation. The unit present in the 1960s caused some prairie soil disturbances; excavations remain along road edges that were likely tank defilades dug during that period. Tanks of that unit are probably responsible for

³³ Huddleston, Joe D. Fort Lewis: a History.

³⁴ *ibid.*

³⁵ Tacoma News Tribune, Oct. 1, 1963.

extensive soil disturbances noticeable largely on 13th Division prairie. Other light construction is highly probable, but no longer visible.

No doubt many large-scale maneuvers and motorized troop movements took place, and these would have caused varying degrees of local soil disturbance. (Invasive graminoids, however, had likely already done most of the damage.) It is these dramatic, attention-getting activities that usually come to mind when assessing damage to the prairies. However, it is likely other practices followed by the military have caused the most harm. Suppression of fire probably caused more damage than anything else. Related to that, was a very active forestry program that encouraged growing conifers, and that saw widespread clear cutting into the early 1960s. The post even operated a sawmill until 1963.³⁶

In the years just after WW I, Fort Lewis had no large units assigned. Indeed, garrison strength was at or below 1,000 until 1927. During this period, Douglas-fir even invaded the current parade ground across the street from Headquarters I Corps. Forest management did not exist. For the next several decades it is likely the military removed trees only when necessary for new construction or when they impeded military operations. Forest management did not begin on Fort Lewis until after WW II,³⁷ and no professionally trained forester was assigned until the mid-1960s.

³⁶ Huddleston. *ibid.*

³⁷ Carbaugh, Paul M. And Lester D. Hansen. Forest Management Plan, Fort Lewis, Washington.

The establishment of a professional forestry management program saw an effort to increase Douglas-fir populations.³⁸ Early on, the program encouraged even-aged Douglas-fir monocultures. The training value of the prairies probably prevented them from being planted to Douglas-fir, though no documentation to this effect is available. More enlightened management followed closely, however, and the current forestry program is on the leading edge of progressive forest management. Even after the forestry program began Ponderosa pine was considered of no commercial value.³⁹ Forestry officials at Fort Lewis ignored the Ponderosa pine population until 1994. That year the post adopted a Land Management Plan that included provisions for restoring a Ponderosa pine savanna, and that work is now underway.

The end of the Cold War, as we all know, led to a reduction of forces and restationing of some overseas forces to U. S. installations. Planning for the redistribution of forces included publication of a final environmental impact statement (FEIS) in 1994 that approved stationing of one armored brigade at Fort Lewis. In October of that year Fort Lewis began to receive elements of the 3rd Armored Brigade, 2nd Infantry Division, the first major armored unit to be stationed there since 1965. The brigade consists of its headquarters unit, two armored battalions, a mechanized infantry battalion, an engineer battalion, a field artillery battalion, and a forward support battalion, all of which are stationed at Fort Lewis. Training activities on Fort Lewis proper were minimal during the

³⁸ *ibid.*

³⁹ *ibid.*

first year while the Third Armored Brigade organized itself. This year has been different.

This summer saw the first major training maneuver, Exercise Cascade Thrust. Protections built into the Final Environmental Impact Statement prepared for assignment of the unit minimized damage to the prairies. South Weir Prairie proved the exception. There a tank unit ignored operating restrictions. Its equipment operated long and vigorously enough to extensively damage a prairie that was under restoration. Although this violation was likely an oversight, it was an ominous sign that assignment of the armored mission could lead to disastrous consequences for the prairies.

The M1A1 Abrams tanks in the Third Brigade weigh 67.5 tons each and are capable of speeds of 42 mph. Bradley Fighting Vehicles and Combat Engineer Vehicles (CEV) are present in large numbers, and these, too, are fast, heavy, tracked vehicles. The CEVs are built on the chassis of the tanks that preceded the M1A1 as the Army's main battle tank. Additionally, the field artillery battalion has track-mounted howitzers. There is clearly potential for massive damage to native prairie vegetation and some associated animal species, both vertebrate and invertebrate.

It remains to be seen whether mitigation measures prescribed by the FEIS will ultimately preserve the prairies. Pressures to amend the FEIS are building at Fort Lewis. On the other hand, it is clear the prairies have fared reasonably well under the care of the Army. Consider the surrounding prairies, which have been colonized by conifers, sliced by railroads and utility

rights-of-way, chopped up for housing lots, and otherwise developed

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The Fort Lewis mapping was modified to better incorporate areas of scattered tree canopy (‘‘savanna’’), most of which had been missing from the previous 1999 coverage. Cover types on some of the Fort Lewis prairies (Johnson, Weir, 13. th. Division) were updated based on recent intensive surveys of vegetation condition conducted in 1999 and 2001 by the Land Condition Trend Analysis in DPTM - Range Control. Effects of human disturbances on prairies and the regional endemic *Aster curtus* in western Washington. Northwest Science 67:163-169. Crawford, R.C., C. Chappell, B. Stephens, C. Soper, and D. Rolph. Dept. of Fish and Wildlife and the Capitol Land Trust. Macklin, J.D., and D.C. Thompson. 1992. Oregon white oak woodlands of Fort Lewis, Pierce County, Washington. Fort Lewis is a United States military facility located 9.1 miles (14.6 km) south-southwest of Tacoma, Washington, under the jurisdiction of the United States Army Joint Base Garrison, Joint Base Lewis-McChord. It was merged with the United States Air Force's McChord Air Force Base on February 1, 2010 into a Joint Base as a result of 2005 Base Realignment and Closure Commission recommendations.