

Vickers Focus Environmental Choices and Site Location in the Parklands of Southwestern Manitoba

L'occupation du territoire chez les « Vickers Focus » dans les forêts-parcs du sud-ouest du Manitoba

Colonización de los bosques parques del sudoeste de Manitoba por los Vickers Focus

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Résumé de l'article

Les « Vickers Focus » sont arrivés dans les forêts-parcs vers 1400 ap. J.-C. et se sont installés sur les plateaux des Tiger Hills. Leurs céramiques indiquent qu'ils étaient originaires du centre-sud du Minnesota et du nord de l'Iowa et qu'ils conservaient des liens avec le centre du Missouri, au sud. La reconstitution de leur mode de vie montre que, dans la région des Tiger Hills, leur choix de sites était lié à leur mode de subsistance (chasse-cueillette et horticulture). Peu avant 1500, ils se sont installés plus à l'ouest, dans la région des Lauder Sandhills, au sud-ouest de Oak Lake. Si rien ne permet d'affirmer qu'ils ont continué à pratiquer l'horticulture dans ce nouveau territoire, il semble par contre qu'ils y aient intensifié leurs activités de chasse-cueillette. Même si leurs stratégies de subsistance semblent avoir été différentes dans les deux régions, ces dernières présentent plusieurs similitudes des points de vue écologique et environnemental : les deux régions sont caractérisées par des sols chauds, comprennent une multitude de points d'eau et se distinguent par la complexité écologique et la richesse des ressources. Par ailleurs, il semble que les « Vickers Focus » aient délibérément évité de vivre à proximité des grandes voies de déplacement.

VICKERS FOCUS ENVIRONMENTAL CHOICES AND SITE LOCATION IN THE PARKLANDS OF SOUTHWESTERN MANITOBA

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ABSTRACT The Vickers Focus people entered the parklands of Southwestern Manitoba sometime around AD 1400, settling in the Tiger Hills uplands. Their ceramics indicate that their original homelands were in south-central Minnesota and northern Iowa and that they maintained connections with the Middle Missouri area to the south. The reconstructed lifeways of the Vickers Focus people, while they were living in this area, indicate that a foraging/horticultural subsistence background influenced their selection of sites. Sometime before AD 1500 they shifted westward into the Lauder Sandhills area south-east of Oak Lake. In their new homeland there is no evidence that they continued to practice horticulture but rather they intensified their foraging activities. While their subsistence strategies appear to have been modified when they relocated themselves, a number of environmental and ecological commonalities link these areas. Both areas are characterized by warm soils, with an abundance of pothole water sources. Ecological complexity and resource richness characterize the local environments. In addition, there appears to have been an active desire to avoid locating their sites along major travel routes in the region. The ecological and environmental parameters of the areas they selected are explored in this paper.

RÉSUMÉ *L'occupation du territoire chez les « Vickers Focus » dans les forêts-parcs du sud-ouest du Manitoba.* Les « Vickers Focus » sont arrivés dans les forêts-parcs vers 1400 ap. J.-C. et se sont installés sur les plateaux des Tiger Hills. Leurs céramiques indiquent qu'ils étaient originaires du centre-sud du Minnesota et du nord de l'Iowa et qu'ils conservaient des liens avec le centre du Missouri, au sud. La reconstitution de leur mode de vie montre que, dans la région des Tiger Hills, leur choix de sites était lié à leur mode de subsistance (chasse-cueillette et horticulture). Peu avant 1500, ils se sont installés plus à l'ouest, dans la région des Lauder Sandhills, au sud-ouest de Oak Lake. Si rien ne permet d'affirmer qu'ils ont continué à pratiquer l'horticulture dans ce nouveau territoire, il semble par contre qu'ils y aient intensifié leurs activités de chasse-cueillette. Même si leurs stratégies de subsistance semblent avoir été différentes dans les deux régions, ces dernières présentent plusieurs similitudes des points de vue écologique et environnemental : les deux régions sont caractérisées par des sols chauds, comprennent une multitude de points d'eau et se distinguent par la complexité écologique et la richesse des ressources. Par ailleurs, il semble que les « Vickers Focus » aient délibérément évité de vivre à proximité des grandes voies de déplacement.

RESUMEN *Colonización de los bosques parques del sudoeste de Manitoba por los Vickers Focus.* El grupo de los Vickers Focus llegó a la región de los bosques-parques del sudoeste de Manitoba por el año 1400 d.C., instalándose en la región montañosa de Tiger Hills. El tipo de cerámica indica que el grupo provenía del centro-sur de Minnesota y del norte de Iowa y que mantuvieron contacto con la zona de Missouri al sur. La reconstitución del modo de vida de los Vickers Focus, cuando habitaban en el área, indica que su modo de subsistencia basado en la recolección, la caza y horticultura determinó la selección de los sitios para su establecimiento. Allí por el año 1500 d.C. se desplazaron hacia el oeste en la zona de Lauder Sandhills al sudeste de Oak Lake. En dicha zona no se conservan registros de que hayan continuado la horticultura sino mas bien una recolección y caza intensivas. Mientras que el tipo estrategia de subsistencia parece haber cambiado al establecerse en una nueva zona, un cierto número de semejanzas ambientales y ecológicas convergen en estas áreas. Ambas se caracterizan por suelos cálidos y abundantes socavaciones como recursos hídricos. La complejidad ecológica y la riqueza de recursos caracterizan además el ambiente local. Así mismo el grupo parece mostrar un deseo permanente de evitar establecerse cerca de las principales rutas de migración de la región. Los parámetros ecológicos y ambientales de los sitios que este grupo seleccionó para su establecimiento se discuten en el presente manuscrito.

INTRODUCTION

The term Vickers Focus appeared in the literature in 1991, in *The Mid-continental Journal of Archaeology*, following two years of testing and excavations at the Lovstrom Site. In this article, the Vickers Focus was named (Nicholson, 1991: 167) and the case was first made for the possibility of horticultural practice by an identifiable group in southwestern Manitoba (Nicholson, 1991: 165-166 and 168-169). In an article in *North American Archaeologist* (Nicholson, 1994) it was proposed that the Vickers Focus sites in, and adjacent to, the Tiger Hills were part of a more complex social order consistent with origins in the Eastern Woodlands of Minnesota/Iowa and the Middle Missouri area (Fig. 1). Further, it was proposed that these sites were the result of a coalescence of several distinct cultural entities to form polyethnic coresidence groups or possibly a fused ethnicity (Nicholson, 1994: 117-121). It has also been argued that the central Lowton Site, estimated to cover about 36 ha, may have been an ephemeral chiefdom, exercising influence over smaller subsidiary sites such as the Lovstrom and Randall sites (Nicholson, 1994: 121-122).

Recent work by Mr. Brain Scribe with Aboriginal Elders in southern Manitoba has contributed to supporting the case for the Vickers Focus people having practiced horticulture in the region. Mr. Dave Daniels from the Long Plain First Nation recounted that his father had told him that in times past, there was a group called the *Ichininewuk* that were an agrarian people living in the Tiger Hills. He indicated that they selected sites on south facing slopes where the soil would be warm and they would be protected from the north wind. He also noted that these people were "picked on" by other groups. The Vickers Focus sites and their locations fit well with this description.

Subsequent fieldwork (Fig. 2) in southwestern Manitoba, in the Lauder Sandhills, has identified a second cluster of Vickers Focus sites, some showing affinities with Mortlach wares found throughout southern Saskatchewan. The radiocarbon dates (^{14}C) from these sites are in the range of 100 years later than the Tiger Hills sites (Table I). While the ceramics indicate a Vickers Focus affiliation, other aspects of these sites indicate changes in subsistence strategy and in overall settlement strategies at these locations (Nicholson and Hamilton, 1997, 2001).

While there are changes in the Vickers Focus sites across time and space, there are commonalities to be found in the ecological and environmental parameters of the locales that were selected by these people. The balance of this paper will explore these variables.

SITE DESCRIPTIONS—EASTERN CLUSTER

Vickers Focus archaeological sites occur in two widely scattered clusters in southwestern Manitoba. The eastern cluster is associated with glacial till plains along the Pembina Trench and the glacial uplands of the Tiger Hills (see some of the figures). The western cluster is associated with aeolian landforms (parabolic dunes, sandsheets, and interdunal wetlands) derived from sandy glacio-fluvial and glacio-lacustrine deposits within the Glacial Lake Hind Basin (GLHB). Each of these

areas is characterized by high levels of biodiversity and contain numerous and diverse microhabitats that contribute to this wide range of diverse plants and animals. This diversity makes these areas attractive as living sites for foragers and small-scale horticulturists.

The Vickers Focus sites in the Tiger Hills area form the eastern cluster. The Lowton and Lovstrom sites are located within the uplands of the Tiger Hills geoform and the Randall Site is located on the till plain to the south, at some distance to the south of the Pembina River (Fig. 2). All of these sites are situated on warm, silty clay loam soils, at some distance from major waterways and depend upon potholes as water sources (Nicholson, 1993). The warm soils at these sites and the presence of horticultural implements supports the horticultural hypothesis that has been advanced, indicating small-scale horticulture was a part of the Vickers subsistence economy in this eastern cluster.

LOWTON SITE

The Lowton Site has been chosen as the Vickers Focus type-site. It is located on a gently rolling, cultivated field approximately 6 km east of the Souris-Pembina trench, within the Tiger Hills uplands (Fig. 3). High moraines and intermittent wetlands bound the site to the north and ponds and wetlands bound it on the south. These shallow ponds are the only local water source. It should be noted that historic drainage has completely drained several nearby ponds. A survey of recently broken land, and interviews with local collectors, indicate that the site area is close to 35 ha in extent (86 acres).

Prior to cultivation, the vegetation would have included native grasses (*Agropyron* sp., *Bouteloua* sp., and *Stipa* sp.) (Fig. 4), mixed with small groves of aspen (*Populus tremuloides*) and oak (*Quercus macrocarpa*). Willows (*Salix* sp.) would have grown in areas with high soil moisture (Ellis and Shafer, 1971: 60-61; Weir, 1983: 11). The thin layer of black clay loam, developed on the glacial till, is often only 10-12 cm deep. Below this, the black Ah horizon fades to a grey-drab to brownish grey-drab B horizon, 5-10 cm thick. This grades into a white-grey chalky carbonate horizon over glacial till (Ellis and Shafer, 1971: 62). While the vegetation was most likely a parkland mix of aspen and meadow, it was not likely a prairie sod. This cover would have been more suitable to pre-industrial farming practices.

The contemporary Lowton Site environment includes a range of plants and animals common to agriculturally modified parklands and a number of significant differences can be seen between the modern and precontact availability of mammalian subsistence resources within the region. Bison were the major large ungulate species, prior to European intervention, and this fact is reflected in the faunal remains recovered in the archaeological sites throughout the region. Other ungulate species, including Mule deer, moose and elk are still found in the Tiger Hills and were also found in the Lowton Site materials. Beaver, now scarce, would have been locally abundant. It can be confidently stated that the local ecology would have offered a diversity of plants and animals from nearby microhabitats (Nicholson, 1987, 1988a).

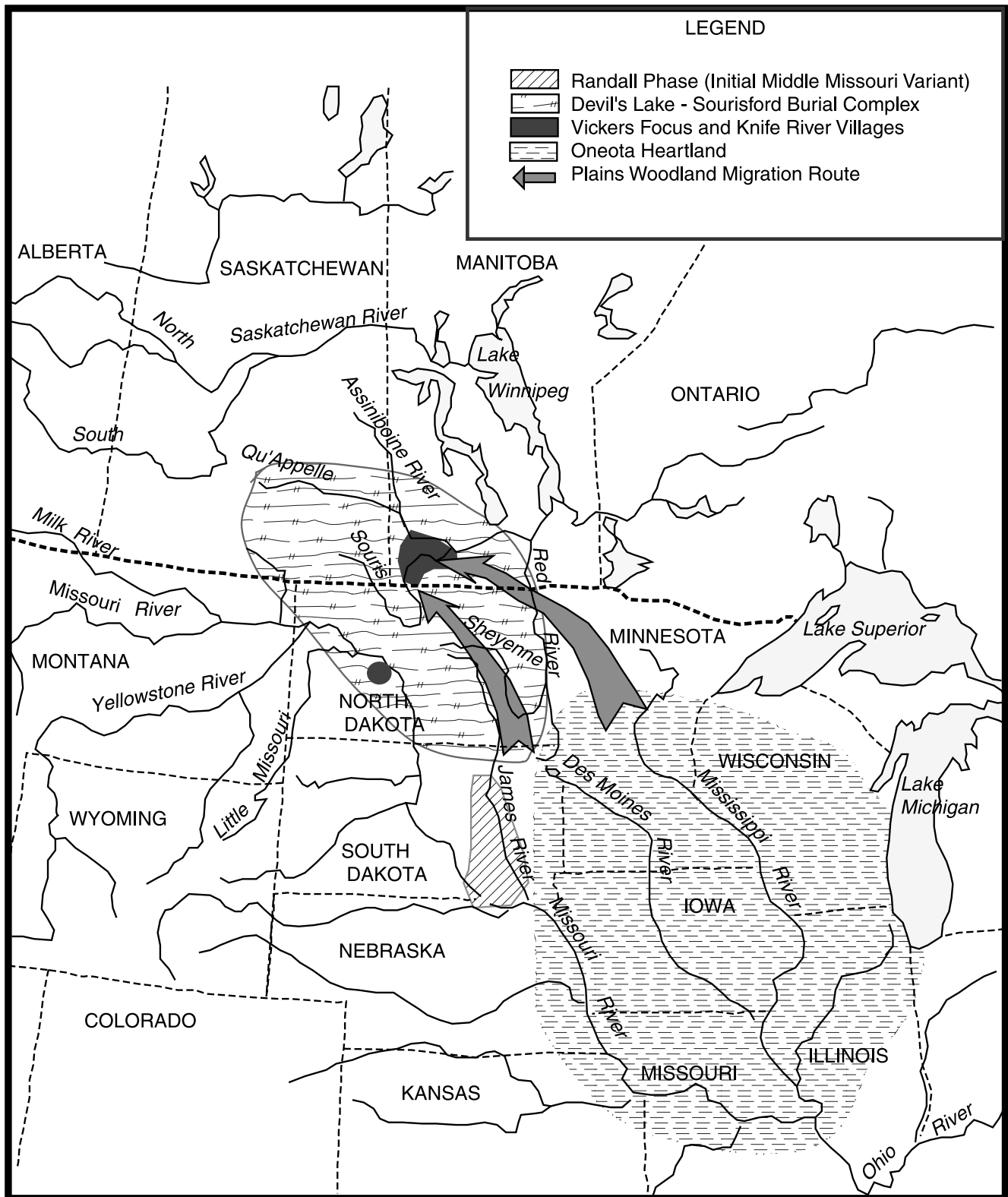


FIGURE 1. Northeastern plains showing Vickers Focus coalescence in southwestern Manitoba.

Les Grandes Plaines du Nord montrant l'habitat des « Vickers Focus », au sud-ouest du Manitoba.



TABLE I
Vickers Focus site dates from southwestern Manitoba

| Location | Site | Lab Number | Material | Uncorrected Date |
|-----------------|----------|-------------|---------------|------------------|
| Eastern Cluster | Lovstrom | S-3032 | bone | 405 ± 110 BP |
| | | S-3033 | bone | 465 ± 100 BP |
| | Lowton | S-4559 | bone | 510 ± 110 BP |
| | | TO-9215 | bone collagen | 350 ± 80 BP |
| | | TO-9216 | bone collagen | 440 ± 80 BP |
| | | TO-9217 | bone collagen | 390 ± 50 BP |
| Western Cluster | Jackson | Beta 82795 | bone collagen | 330 ± 60 BP |
| | | Beta 83864 | bone collagen | 300 ± 70 BP |
| | | Beta 83865 | bone collagen | 290 ± 50 BP |
| | Vera | Beta 106109 | bone collagen | 340 ± 60 BP |
| | | Beta 111141 | bone collagen | 250 ± 50 BP |



FIGURE 3. Fieldwork at the Lowton Site in the Tiger Hills.

L'équipe au travail au site Lowton, dans les Tiger Hills.

LOVSTROM SITE

The Lovstrom Site is located on hummocky ground moraine north of the Souris River channel. The site is forested with burr oak at the present time, with an understory of saskatoon, chokecherry and hazelnut (Fig. 5). The surrounding area is a parkland mosaic of aspen/oak groves, medium grass prairie with willow thickets in low areas that likely held water most years. The Souris River flows through a deeply incised channel approximately 1 km south of the site. Jock's Creek, which flows through a deep, sharply incised ravine west of the site, is a possible water source but the sharp slope would not offer easy access. There is also a waterlogged peat bed above the escarpment edge, west of the site. If horticulture were practiced at this site, the sandy south facing slopes in the Souris Channel below the site would be more suitable than the shallow rocky soils adjacent to the site.

RANDALL SITE

The Randall Site is located 2 km south of the Pembina River in a cultivated field. The soil is a medium silty-clay loam. Most of this area is cultivated or covered with aspen/oak forest. It would have been a parkland mosaic prior to European settlement. Potholes would have provided water in precontact times. The Pembina River channel is approximately 1 km distant, enhancing the range of ecological complexity available to Randall Site occupants.

SITE DESCRIPTIONS—WESTERN CLUSTER

The western cluster of sites is dominated by those in the *Makotchi-Ded Dontipi* locale, on the southwestern edge of the Lauder Sandhills (Fig. 6) within the GLHB. The combination of local high topographic relief, and the presence of the Oak lake



FIGURE 4. View across the parkland ecotone in the Tiger Hills.

Vue de l'écotone de la forêt-parc, dans les Tiger Hills.



FIGURE 5. Oak dominated forest at the Lovstrom Site in the Tiger Hills.

Forêt dominée par le chêne au site Lovstrom, dans les Tiger Hills.

aquifer, has created a diverse ecotone with high resource potential for hunter-gatherer subsistence (Hamilton and Nicholson, 1999). Warm sandy soils, combined with the high water table and abundant surface water in small lakes and ponds would have been suitable for small-field horticulture. However, the pattern of site distribution and the artifact assemblages in the sites differs significantly from Vickers Focus sites in the eastern cluster (Nicholson, 1991, 1994).

JACKSON SITE

The Jackson Site is located within the *Makotchi-Ded Dontipi* locale in the Lauder Sandhills. This area is a mixture of sand plains and dune fields, located within the GLHB. There are numerous potholes near the site that may have held water in precontact times. It is approximately 4 km to the Souris River.

The local ecology is a mosaic of xeric prairie, aspen-oak forest and small local wetlands (Hamilton and Nicholson, 1999). The Jackson Site is located at the southern edge of a sand plain, bounded by dune formations to the west, south and east. The site is located in an aspen-oak forest patch with an understory of saskatoon, chokecherry, hazelnut, and scattered willow in lower areas (Fig. 7). It is a wintering site, based upon the presence of several foetal bison specimens (Playford, 2001).

VERA SITE

The Vera Site is also within the GLHB and the setting is similar to the nearby Jackson Site. There is a large depression to the east of the site, which would have held water most years. The present water table is approximately 2 m below surface. The site is covered by aspen/oak forest similar to that

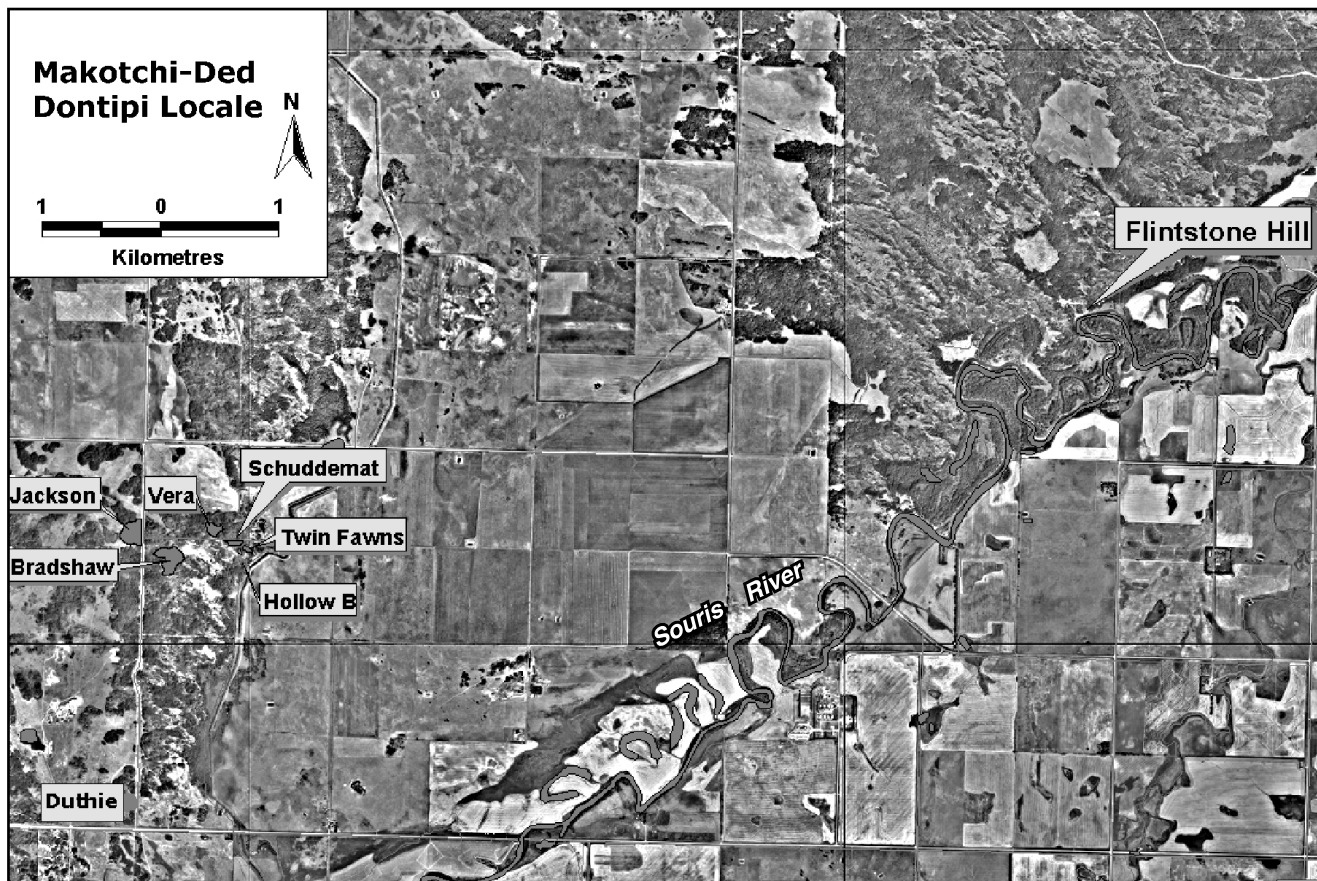


FIGURE 6. The *Makotchi-Ded Dontipi* locale in the Lauder Sandhills within the GLHB.

L'établissement Makotchi-Ded Dontipi dans les Lauder Sandhills, dans le bassin du Lac glaciaire Hind.

of the Jackson Site. It is believed to be a summer site since there are no foetal bison specimens.

TWIN FAWNS/SHUDDEMAT/HOLLOW B SITE COMPLEX

These three sites have been subsumed into a single interpretive unit. The Schuddemat locality is situated along the southern margin of the large depression east of the Vera Site. This site is partly grassed and thinly forested with aspen and oak on the higher portions and balsam poplar and willows in the lower sections. The Twin Fawns Site is separated from Schuddemat and Hollow B by low sand ridges. This site is underlain by a sandy clay layer, which appears to serve as a barrier to groundwater. There was previously a large shallow body of water to the east of the site. This was drained in historic times. It is thought to be a winter site based upon the presence of several ice-gliders, gaming pieces that were used on an ice surface (Nicholson *et al.*, 2003).

JOHNAS SITE

The Johnas Site (Nicholson, 1988b) is located on a sandy ridge adjacent to a large permanent pond. There is a large marshy area south of the site and it is located approximately 4 km north of the Assiniboine River (Fig. 2). Present ground cover is a mosaic of immature stands of aspen, interspersed with xeric prairie. The entire area is underlain by shale

bedrock, which maintains a high water table. The combination of sandy, well drained, easily worked soil, and high water table, forms an ideal situation for prehistoric horticulture. A stone hoe and a possible scapula hoe were recovered from the surface of the site. The waterhole would have permitted pot irrigation to facilitate sprouting and early growth of cultigens and, once warm weather crops such as corn, beans, squash, or sunflowers became established, the proximity of the water table would have sustained their growth.

TAYLOR SITE

The Taylor Site is located in the sandhills 2 km north of Oak Lake. This site is known only from surface materials, collected along a road cut through the site. The ceramics indicate a Vickers Focus occupation. The site is situated on a low, rolling sand plain. The surrounding area is a mosaic of aspen groves and xeric prairie. Nearby depressions may have held water in some years.

VICKERS FOCUS SITE SELECTION

The known distribution of Vickers Focus sites extends across southwestern Manitoba from Pelican Lake in the east to Oak Lake in the west and from the Randall Site in the south to the Johnas Site in the north (Fig. 2). All of the known sites are



FIGURE 7. Aspen dominated forest section at the Vera Site in the Lauder Sandhills.

Partie de la forêt dominée par le peuplier au site Vera, dans les Lauder Sandhills.

located at some distance from major streams and lakes and all appear to have relied upon small potholes as a water source. All of these sites are located in out-of-the-way situations where they would not easily be encountered by chance. Similarly, all of these sites are located in resource rich areas within the larger Aspen Parkland ecotone. In addition, all of these sites are located on or adjacent to well watered soils, which are easily worked and suited to the growing of precontact cultigens such as corn, sunflowers or squash. While no actual remains of these crops have been identified, stone and bone hoes have been recovered from the Lowton and Lovstrom sites in the Tiger Hills (eastern cluster) and at the Johnas Site (western cluster).

The major integrating geophysical feature of the Vickers Focus territorial area is the Souris/Pembina drainage, which forms an arc from west to east. This is augmented by an extension northward in the western section to include Oak Lake and the Johnas Site north of the Assiniboine River (Fig. 2). While these major waterways pass through the Vickers Focus territory, no known Vickers sites are closely adjacent to them. The Lowton Site is located 6 km from Pelican Lake and the Lovstrom Site is located on a high bluff on the north side of the Souris River channel, 1 km from the river itself, which is incised into the shale bedrock at this point. The Randall Site is located between Killarney Lake and the Pembina River at a distance of 2 km from the river and 2.5 km from the Lake. The *Makotchi-Ded Dontipi* locale, which includes the Jackson, Vera and Twin Fawns sites, is over 3 km from the Souris River (Fig. 8) and the Johnas Site is 4 km north of the Assiniboine River. Finally, the Taylor Site is located 2 km north of Oak Lake.

All of these sites contain or are closely associated with large potholes/ponds. Many of these potholes are permanent surface-water sources today and many others—given higher water tables prior to European settlement—would have been permanent water sources at the time of the Vickers occupations (Hamilton and Nicholson, 1999). The Vickers people

seem to have deliberately selected sites at some distance from major waterways and lakes.

This contrasts with earlier settlement patterns typical of the Archaic, Middle Woodland and Late Woodland groups, such as Blackduck/Duckbay. Typically, Blackduck/Duckbay sites in the region can be shown to be small, short term or multiple reoccupation sites common to hunter/gatherer band level subsistence strategies. The major exception is the large Stott Site northwest of Brandon, which extends from the edge of the Assiniboine Floodplain to the top of the high bluff. The presence of an old meander below the site likely indicates that, during the Blackduck occupation, the Assiniboine River ran very close to the habitation area. The huge size of this site can be accounted for by continued seasonal, intermittent reoccupation over several centuries related to a highly specific seasonal activity, bison pounding. The Stott Site fits well with seasonal round models which have been proposed for Blackduck hunter-gatherers (Ray, 1972; Syms, 1977; Nicholson, 1988a). For these cultures, rivers and lakes furnished travel routes, which facilitated seasonal migrations (Fig. 2).

This is in marked contrast to the large extended occupations that characterize the Vickers Focus sites. The Vickers Focus sites, in almost all cases are relatively large. The largest of these is the Lowton Site, the type-site for the Vickers Focus (Nicholson, 1991). This site covers at least 35 ha. Other sites such as Jackson, Twin Fawns, Vera, Johnas, and Taylor range from 5 to 15 ha in area. The small Lovstrom and Randall Vickers Focus sites appear to have been logistical dependencies of the massive Lowton Site. These two small logistical sites appear to have been warm season occupations. Most of the earlier Blackduck/Duckbay hunter-gatherer sites are less than 1 ha. The exception is the large Blackduck Stott site, where seasonal bison pounding was conducted intermittently over several centuries.

Both Blackduck/Duckbay and Vickers Focus sites occur in the same general areas. However, their choice of site location



FIGURE 8. Souris River in the Lauder Sandhills.

La rivière Souris, dans les Lauder Sandhills.

differs significantly. Typically, the Blackduck/Duckbay sites are positioned to facilitate water travel and the likelihood of encounters with other mobile groups. The Vickers Focus sites are located well away from water travel routes and frequently in difficult to reach locations. This suggests that water transport was not important, chance encounters were to be avoided, and group mobility was not important to their subsistence strategy. The differences in the size and placement of Vickers Focus sites, compared to that of preceding groups, indicate differences in social organization and subsistence strategies.

The evidence indicates that Blackduck/Duckbay groups were small, highly mobile bands, which moved frequently to exploit resources according to their abundance and optimal quality as the seasons progressed. They were highly dependent on bison in this region and sometimes aggregated to engage in bison pounding. Their sites are intimately associated with riverine environments and lake margins.

In contrast, the Vickers Focus people lived in larger village groups and stayed within a locale for extended periods of time. In the Tiger Hills, logistical camps were utilized to harvest resources from a wider area and across a number of distinct ecotones/microhabitats. Similar practices were likely followed in the GLHB. These differences in the size and placement of sites, and evidence for extended occupations, strongly suggest a different kind of engagement with the environment and, in the eastern cluster at least, a lifeway supported in part by horticulture. In both areas, the Vickers Focus people adopted the practice of selecting habitation sites suitable for the establishment of extended occupations or for the establishment of home-base camps for extended seasonal occupation. The locations of all of the known sites fall within areas characterized by ecological complexity and a rich resource base. These practices reflect a very different socio-economic system where the mechanisms for redistribution of surpluses are more complex. Similarly, there appears to have been a more complex socio-political system where organization strategies are in

place to dispatch logistical resource extraction groups into locations where there is a confident expectation that surpluses can be accumulated. In this way, larger aggregations of people could be sustained through accumulation of surpluses and by dispersing these logistical groups more widely, so that the immediate areas of the home-base camps would not be as completely denuded of useful resources.

DISCUSSION

The locations chosen by Vickers Focus people for their sites were, without exception, areas characterized by ecological complexity and a rich resource base. Such areas have frequently been referred to as ecotones (Nicholson, 1987: 44-55) and, while Manitoba is one of the Prairie Provinces, these grasslands contain numerous areas of ecological complexity with a rich resource base, such as river valleys, wetlands, glacial uplands and dune fields. Such biophysical units comprise ecosystems that may contain resources of the surrounding prairies in addition to resources that are uniquely their own within the larger biome. Some, such as wetlands, form an essential part of the larger system, others such as dune fields and river valleys contribute additional biological complexity to the larger system. All of these units provide resources that are uniquely configured according to the interaction of their constituent parts. In many cases, plants and animals that are useful for hunter-gatherers, foragers and horticulturists are present only in these distinctive biophysical units. The Tiger Hills and GLHB exemplify this kind of ecological complexity.

The Vickers Focus people abandoned the Tiger Hills *ca.* AD 1450. They reappear in the archaeological record *ca.* AD 1650 in the *Makotchi-Ded Dontipi* locale in the GLHB. Both areas are ecologically complex and characterized by a wide range of resources useful to hunter-gatherers and foragers. The warm soils in both areas would have been suitable for horticulture yet there is no evidence for horticultural practice in

the *Makotchi-Ded Dontipi* locale, where the warm sandy soils, underlain by a high water table with nearby surface water, would have been well suited to small-scale horticulture. These sites are about 100 years younger than those of the eastern cluster (Table I).

The reason for the abandonment of horticulture, that accompanied the move to the western region, has been a source of interest. Our ongoing work suggests that a short-term climatic event may have influenced this outcome. The absence of horticulture in these sites may be attributable to a dramatic cold spike during the Little Ice Age ca. AD 1450 (Mann *et al.*, 1998) that likely ended the viability of horticulture in an already marginal climatic regime. This issue is being addressed in more detail in a subsequent paper that is in preparation.

CONCLUSIONS

While earlier, and smaller, Blackduck/Duckbay groups used these ecologically complex, resource rich areas in their seasonal rounds, their settlement strategy was highly mobile and site location was largely determined by proximity to water travel routes and, in some cases, by the suitability of the terrain for seasonal bison entrapment. Several authors (Ray, 1972; Syms, 1977; Nicholson, 1987) have modeled these seasonal mass kill practices.

The Vickers Focus sites indicate extended occupation by larger aggregations of people. These people selected their sites to position themselves to readily take advantage of a wide range of resources harvested from adjacent prairie, wetlands and lightly forested areas. There is also evidence that warm, easily worked soils were important for small-scale horticultural practice. The placement of the Vickers Focus sites suggests that water travel routes were unimportant to them and that, in fact, they likely chose sites that would minimize chance contact with travellers. Possibly this was to protect small surpluses, which they may have accumulated through horticultural practice. Their site placement appears to have been the result of a considered practice of choosing locations that placed them in a logistically favourable position to most advantageously exploit a wide range of resources from the widest possible number of microhabitats, where these resources were in close proximity and concentrated in relatively small areas.

The Vickers Focus subsistence strategy does not appear to have included seasonal mass kills of bison, but rather a practice of stalking individual animals or small groups of bison. A small kill event at the Jackson Site may indicate that they later learned the techniques for bison pounding as they moved westward.

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