PLANT REMAINS FROM ARCHAEOLOGICAL DEPOSITS IN PUKASKWA NATIONAL PARK, NORTH CENTRAL ONTARIO

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ABSTRACT

This paper addresses the potential for examining plant remains from archaeological sites along the north shore of Lake Superior. Analysis of archaeobotanical samples from two Blackduck sites, North Byron III (1050 B.P.) and Oiseau Creek (500 B.P.) is discussed. Results suggest that a variety of wood types and fleshy fruits were being utilized by the occupants of the sites. Methodological issues relating to context (near surface versus buried horizons), preservation, and sampling are also considered in light of associated boreal forest environments

RÉSUMÉ

Cet article se penche sur la possibilité d'analyser des restes botaniques en provenance de sites archéologique situés sur la côte nord du lac Supérieur. En particulier, nous discutons de l'analyse d'échantillons archéo-botaniques de deux sites de la tradition Blackduck, à savoir le site North Byron III (daté à 1050 B.P.) et Oiseau Creek (500 B.P.). Les résultats de ces analyses indiquent que les occupants de ces sites utilisaient une variété d'espèces de bois et de fruits. Enfin, nous examinons des questions méthodologiques ayant trait au content, à la préservation et à l'échantillonnage en milieu de forêt boréale.

INTRODUCTION

Palaeoethnobotanical research in Ontario has generally focused on food-producing economies in the south, with only a handful of studies being carried out outside of this area. The collection of flotation samples, and the analysis of botanical remains from archaeological sites in northern and central Ontario continues to be rare or absent, although we continue to know little about plant use in these regions (*cf.* Crawford and Smith 1996; Reid 1988). The paucity of plant-related data has prevented researchers from understanding plant-related subsistence practices and changes in plant use through time.

The purpose of this study has been to examine the potential for collecting and analyzing plant remains from archaeological sites in boreal forest environments of north-central Ontario. This paper outlines the results of the palaeoethnobotanical analyses of two Late Woodland Blackduck sites, North Byron III (1050 BP) and Oiseau Creek (*ca.* 500 BP), located on the northeastern shore of Lake Superior. Research objectives included: i) the systematic examination of charred botanical material from archaeological and non-archaeological deposits at North Byron III and Oiseau Creek; and ii) documenting and evaluating the plant remains recovered from these sites in an initial attempt to understand the subsistence-ecology of Late Woodland Blackduck

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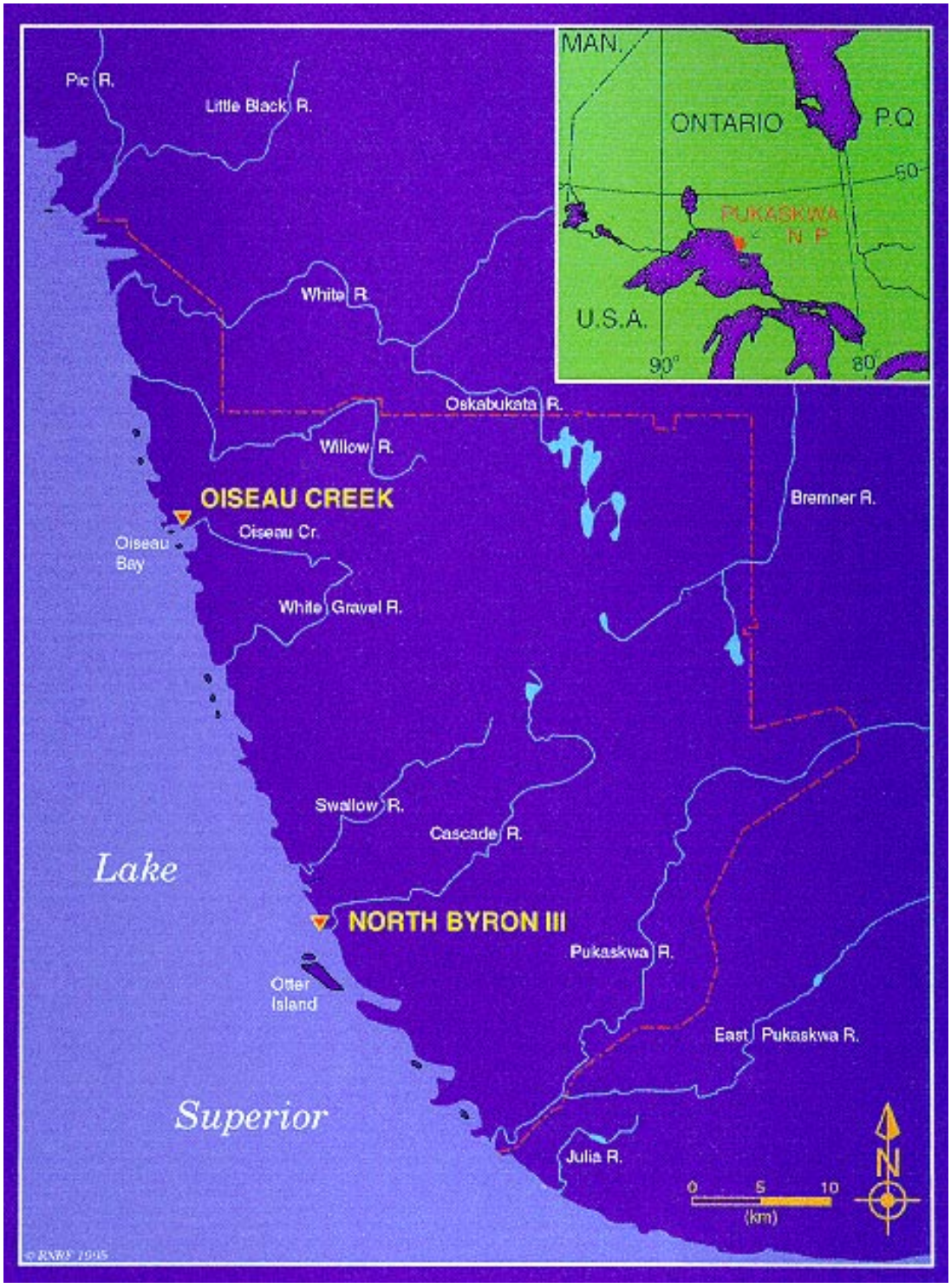

Figure 1 Location of the North Byron III and Oiseau Creek sites (after Farvacque n.d.).

peoples along the north shore of Lake Superior. This research is discussed in light of problems associated with boreal forest environments such as near-surface contexts and preservation issues.

STUDY REGION AND ENVIRONMENTAL SETTING

The Oiseau Creek and North Byron III sites are located in Pukaskwa National Park on the northeastern shore of Lake Superior (Figure 1). The area encompasses some of Ontario's highest elevations and roughest topography with bedrock exposures dominating the coast. The climate of the Pukaskwa region is continental, with the exception of a maritime effect which Lake Superior exerts up to five kilometres inland (Gimbarzevsky *et al*. 1978). With a mean annual temperature of one degree Celsius, lake-side temperatures are about two degrees Celsius warmer in the winter, and two degrees Celsius cooler in the summer than values in the interior of the region. Mean annual precipitation varies from 800 millimetres in the northern portion of the park to just over 875 millimetres at the mouth of the Pukaskwa River in the south (Chapman and Thomas 1968; MacIver and Whitewood 1989).

The vegetation of Pukaskwa National Park is diverse. This is attributed to the climate-moderating effects of Lake Superior (Barclay-Estrup 1987; Gimbarzevsky *et al.* 1978). The park is located within the Boreal Forest Region, but elements of the Great Lakes-St. Lawrence Forest Region are also present in the most southerly areas (Gimbarzevsky *et al.* 1978). Jack pine (Pinus banksiana), black spruce (Picea mariana), white birch (Betula papyrifera), and poplar (Populus sp.) are characteristic species of the Pukaskwa region. Other prominent conifers include tamarack (Larix sp.) and balsam fir (Abies balsamea). Disjunct arctic-alpine plant communities also occur along the harshest, most exposed portions of the Lake Superior shoreline (Gimbarzevsky *et al.* 1978; Rivard *et al.* 1989).

THE SITES

North Byron III is situated near the mouth of the Cascade River, in the sands of a beach at the back of a small Lake Superior embayment. On the cobble beach terraces adjacent to North Byron III are petroform sites North Byron II and North Byron IV. A wide variety of terrestrial and aquatic plants can be found within a short distance of the site (Farvacque n.d.). Most of these plants are distinctly boreal, although some southerly elements such as white pine (Pinus strobus) are present. Dominant trees include balsam fir (Abies balsamea), white birch (Betula papyrifera), showy mountain ash (Sorbus decora), and eastern white cedar (Thuja occidentalis). Other plants include speckled alder (Alnus rugosa), wild rose (Rosa blanda), and cherry (Prunus sp.).

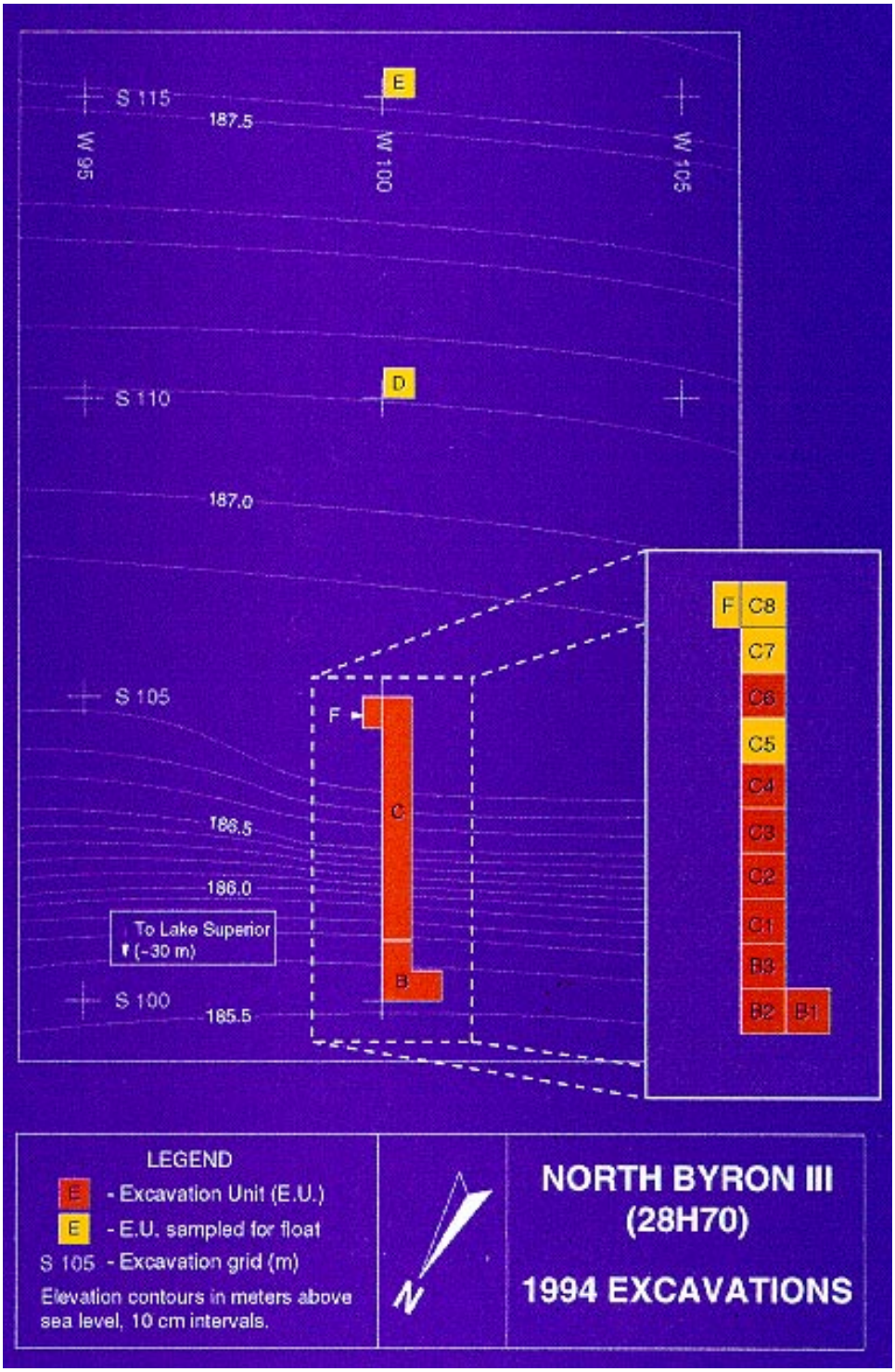

Figure 2 North Byron III site map showing location of flotation samples (after Farvacque n.d.).

The Oiseau Creek site lies on the north bank of an abandoned channel of Oiseau Creek in the northeastern corner of Oiseau Bay. The forest on the sand plain around the site is predominantly composed of Boreal Forest elements, including mature stands of jack pine (Pinus banksiana). Other plants found on the site are kinnickinnick (Arctostaphylus uva-ursi), cherry (Prunus sp.), cranberry and blueberry (Vaccinium spp.), rose (Rosa blanda), birch (Betula papyrifera), and poplar (Populus sp.). When conducting excavations in 1993 and 1994, Farvacque noted that a wide variety of ecological habitats were also easily accessed on foot from this site (Farvacque n.d.).

METHODS

Eight flotation samples (15.03 litres), ranging in volume from .08 to 5.5 litres, were selected for analysis from North Byron III. Three samples (2.6 litres total) ranging from .3 to 2.0 litres were examined from Oiseau Creek. Flotation samples were processed using a modified version of the SMAP flotation machine (Crawford 1982) and carbonized plant debris was captured in .4 millimetre mesh. The flotation of samples resulted in a light fraction (the portion of the sample which floats) and a heavy fraction (the relatively dense material caught in a mesh). The palaeoethnobotanical analysis reported here is based on the light fractions, while the heavy fractions were scanned for charred botanical remains.

In contrast to most sites along the northeastern shore of Lake Superior, North Byron III is deeply buried (Farvacque n.d.). The ‘capped’ nature of the site provided a unique opportunity to examine archaeological plant material from a context not regularly encountered in the region. Samples were collected from units C5, C7, C8, D, E, and F at North Byron III (Figure 2). The profile illustrated in Figure 3 shows the location of each sample in relation to its stratigraphic context at North Byron III. Four samples (C809, D111, E107, F109), totaling 8.7 litres, were analyzed from the Late Woodland Blackduck occupation. This consisted of a charcoal-rich layer of organic detritus, red ochre, fire-cracked rock, undiagnostic lithic tools and debitage, a copper knife, and Blackduck ceramics (Farvacque n.d.). In addition, samples from non-archaeological deposits were selected for analysis from North Byron III to determine the ‘natural’ abundance of charred plant remains at the site. Samples D104 and E105 (5.5 litres) were collected from a culturally sterile organic lens which looks similar to the charcoal layer associated with the Blackduck occupation at the site, but contains no artifacts. Flotation sample C712 (.75 litres) was also collected from a non-cultural sand deposit associated with re-deposited cultural material. In addition, one sample (C510) of .08 litres was examined from a sand layer of beach sediments.

Wood charcoal from two sample locations at North Byron III have produced dates (see Figure 3). From Sample C809 at 83 cm below surface unknown conifer-type wood charcoal associated with lithic debitage and ceramics was radiocarbon dated to 1040±70 years B.P.

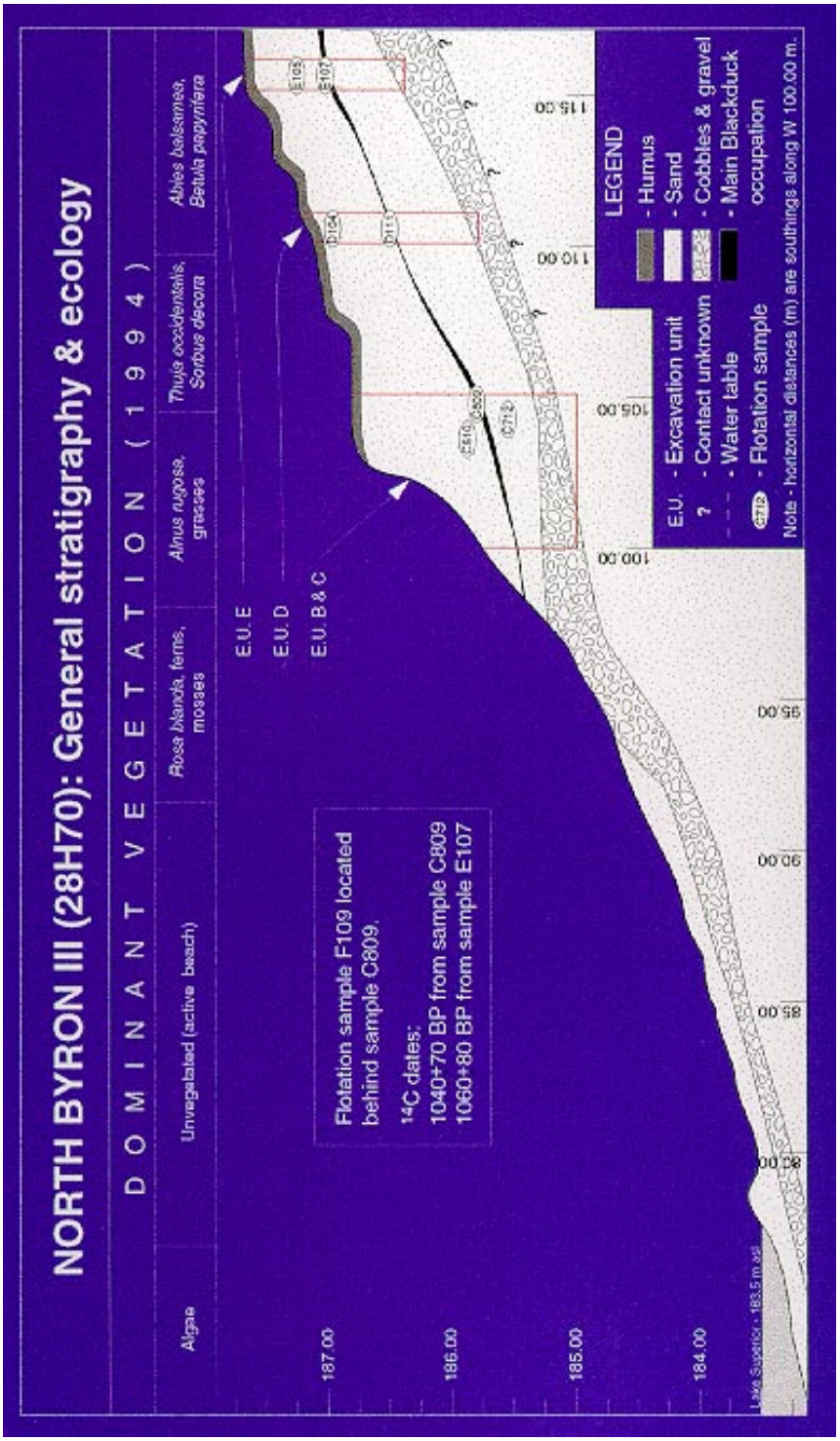

Figure 3 Relationship of flotation samples to stratigraphic contexts at North Byron III (after Farvacque n.d.).

(WAT-2860). From Sample E107 at 62 cm below surface, unknown conifer-type wood charcoal associated with lithic debitage was radiocarbon dated to 1060±80 years BP (WAT-2877). Based on these dates and ceramic attributes, Farvacque (n.d.) suggests North Byron III represents an early Blackduck Tradition occupation.

In contrast to North Byron III, Oiseau Creek exhibits a strongly compressed stratigraphy more typical of sites in northern Ontario (Farvacque 1994). The problem with shallow archaeological deposits such as at Oiseau Creek, however, is that there is a greater likelihood for botanical material recovered to be relatively modern in origin (*cf.* Miksicek 1987; Minnis 1981). The near surface contexts of many of the samples collected at Oiseau Creek made contamination from the modern litter mat possible. Care was therefore taken to select samples for analysis which showed little in-situ contamination subsequent to deposition (Farvacque n.d.). Two samples (2.3 litres total) were examined from the center and edge of a hearth feature at Oiseau Creek (Figure 4). These samples were associated with charcoal-rich sandy gravel, an abundance of fire-cracked rocks, numerous lithics and faunal remains, and a few sherds of ceramics (Farvacque 1994). Based on ceramic attributes Farvacque (n.d.) assigns the hearth feature to Late Woodland Blackduck (*ca*. 500 BP). One flotation sample (.3 litres) was also analysed from a non-archaeological deposit, in an excavation unit approximately 25 metres to the east of the hearth feature, to assess the natural background occurrence of plant remains in proximity to cultural features at the site.

DISCUSSION

A variety of taxa were identified at North Byron III and Oiseau Creek, and are represented by charred wood, seeds and fruit, conifer needles, and cone scales (Table 1). Sixteen taxa were identified at North Byron III. Carbonized seeds from the fleshy fruits category are well represented and include blueberry/cranberry (Vaccinium sp.), bramble (Rubus spp.), and elderberry (Sambucus pubescens). In addition, one charred Vaccinium sp. fruit containing seeds was recovered. Carbonized seeds of bush honeysuckle (Diervilla lonicera) and wild rose (Rosa blanda), and taxa from the Grass (Poaceae) and Legume (Leguminoseae) families are also present, but in lesser quantities. Wood charcoal is represented by a number of taxa including deciduous trees such as speckled alder and conifers like pine. In addition, balsam fir needles and eastern white cedar leaves are represented at the site. Plant remains from the Oiseau Creek samples include carbonized seeds of the Sedge (Cyperaceae) family and bush honeysuckle (Diervilla lonicera). Other plant debris include balsam fir needles and cone scales.

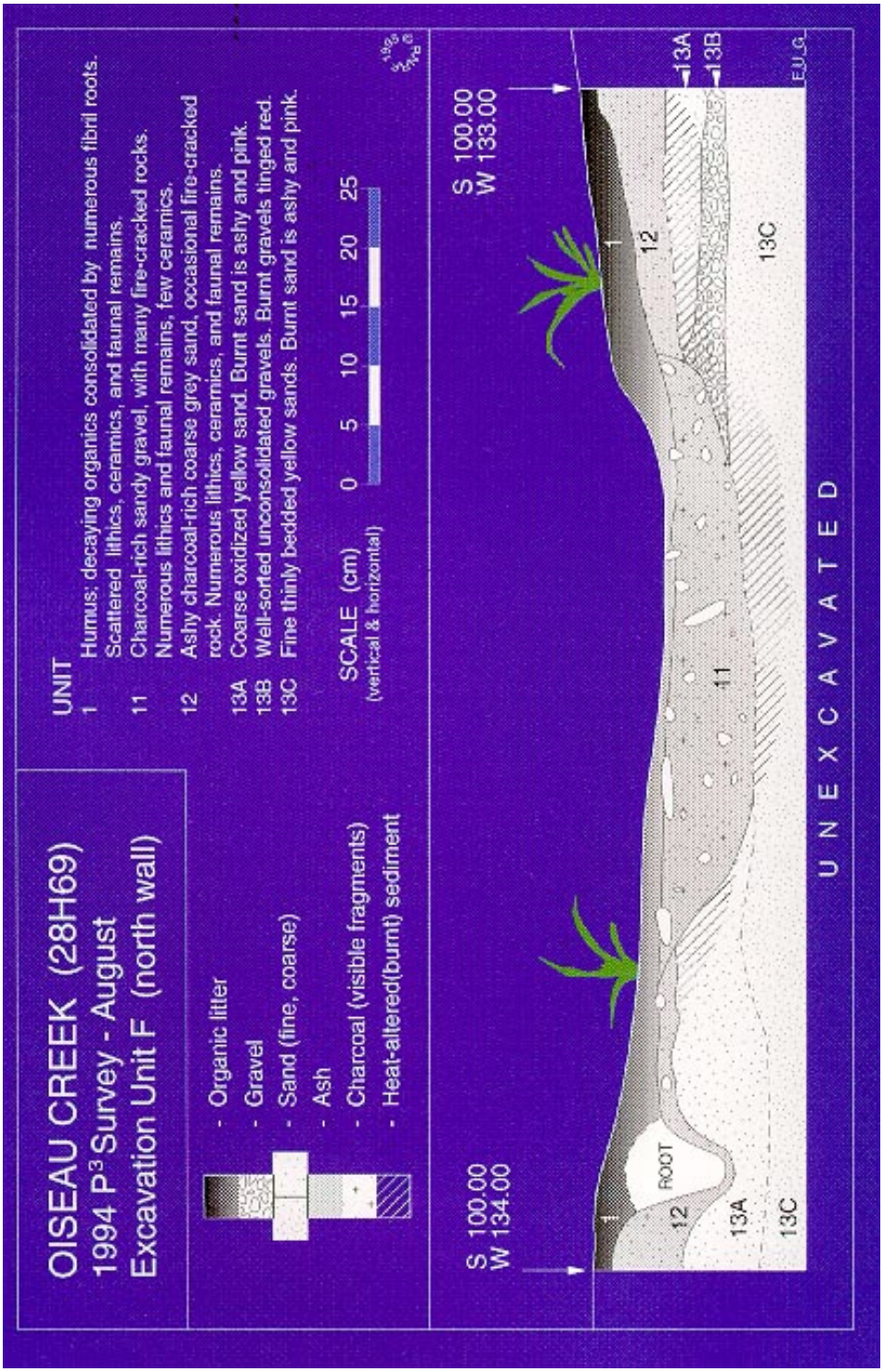

Figure 4 Hearth feature (unit 11) in excavation unit F at Oiseau Creek. Note the scale (after Farvacque n.d.).

Table 1 Carbonized plant remains from the North Byron III and Oiseau Creek sites.

Taxon	Common Name	North Byron	Oiseau Creek
Abies balsamea	Balsam fir	wood charcoal, needle	needle
Acer sp.	Maple	wood charcoal	
Alnus sp.	Alder	wood charcoal	
Betula sp.	Birch	wood charcoal	
Cyperaceae	Sedge		seed
Diervilla lonicera	Bush honeysuckle	seed	seed
Larix sp.	Larch	wood charcoal	
Legume	Leguminoseae	seed	
Pinus sp.	Pine	wood charcoal	
Poaceae	Grass	grain	
Populus sp.	Poplar	wood charcoal	
Rosa blanda	Wild Rose	seed	
Rubus sp.	Bramble	seed	
Sambucus pubescens	Elderberry	seed	
Sorbus decora	Showy mountain ash	wood charcoal	
Thuja occidentalis	Eastern white cedar	wood charcoal, leaves	
Vaccinium spp.	Blueberry/cranberry	seed, fruit	

COMPARISON OF ARCHAEOLOGICAL AND NON-ARCHAEOLOGICAL CONTEXTS

The archaeological and non-archaeological plant assemblages at North Byron III and Oiseau Creek are different in composition and density, with archaeological deposits containing a more diverse range of taxa than non-archaeological contexts. This finding is especially significant at Oiseau Creek where the shallow archaeological provenience increases the chances of contamination by charred modern plant material. All of the identified taxa from Oiseau Creek were encountered in samples from the hearth and its edge, with only negligible amounts of wood charcoal recovered from non-archaeological deposits.

The plant assemblage from North Byron III displays trends similar to that from Oiseau Creek. Out of the sixteen taxa encountered at North Byron III, fifteen are present in samples associated with the early Blackduck occupation (Table 1). In contrast, five taxa are present in the

samples from the non-cultural organic contexts, and only one taxon is present in the context with re-deposited cultural remains. The only carbonized seed type found in a non-archaeological deposit was elderberry, which was recovered from a sample associated with a non-cultural organic context. Charred balsam fir needles were encountered in all of the context types examined, and it is possible that some of the needles found in association with the early Blackduck occupation at North Byron III are part of the 'natural' plant debris in the soil.

Table 2 Carbonized plant remains from North Byron III.

	PLANT REMAINS	CONTEXT		
		C	NCO	NCS
	Balsam Fir	X		
	Maple	X		
	Speckled Alder	X		
	Birch	X		
CHARCOAL	Larch	X	X	
	Pine	X		
	Poplar		X	
	Showy Mountain Ash	X		
	Eastern White Cedar		X	
	Unknown Conifer	X		
	Grass	X		
	Legume	X		
	Rose Blueburry / Cranberry	X		
SEEDS	Blueberry	X		
	Bramble	X		
	Elderberry	X	X	
	Bush Honeysuckle	X		
	Unknown B	X		
NEEDLES	Balsam Fir	X	X	X
	Cedar	X		

C=Cultural, NCO=Non-Cultural Organic, NCS=Non-Cultural Sand

The extremely fragmented nature of wood charcoal from Oiseau Creek did not permit identifications. However, there is an impressive variety of wood charcoal types represented at North Byron III (Figure 5). Wood charcoal associated with the Blackduck occupation at North Byron III is dominated by alder and pine, with smaller amounts of ash, balsam fir, birch, larch

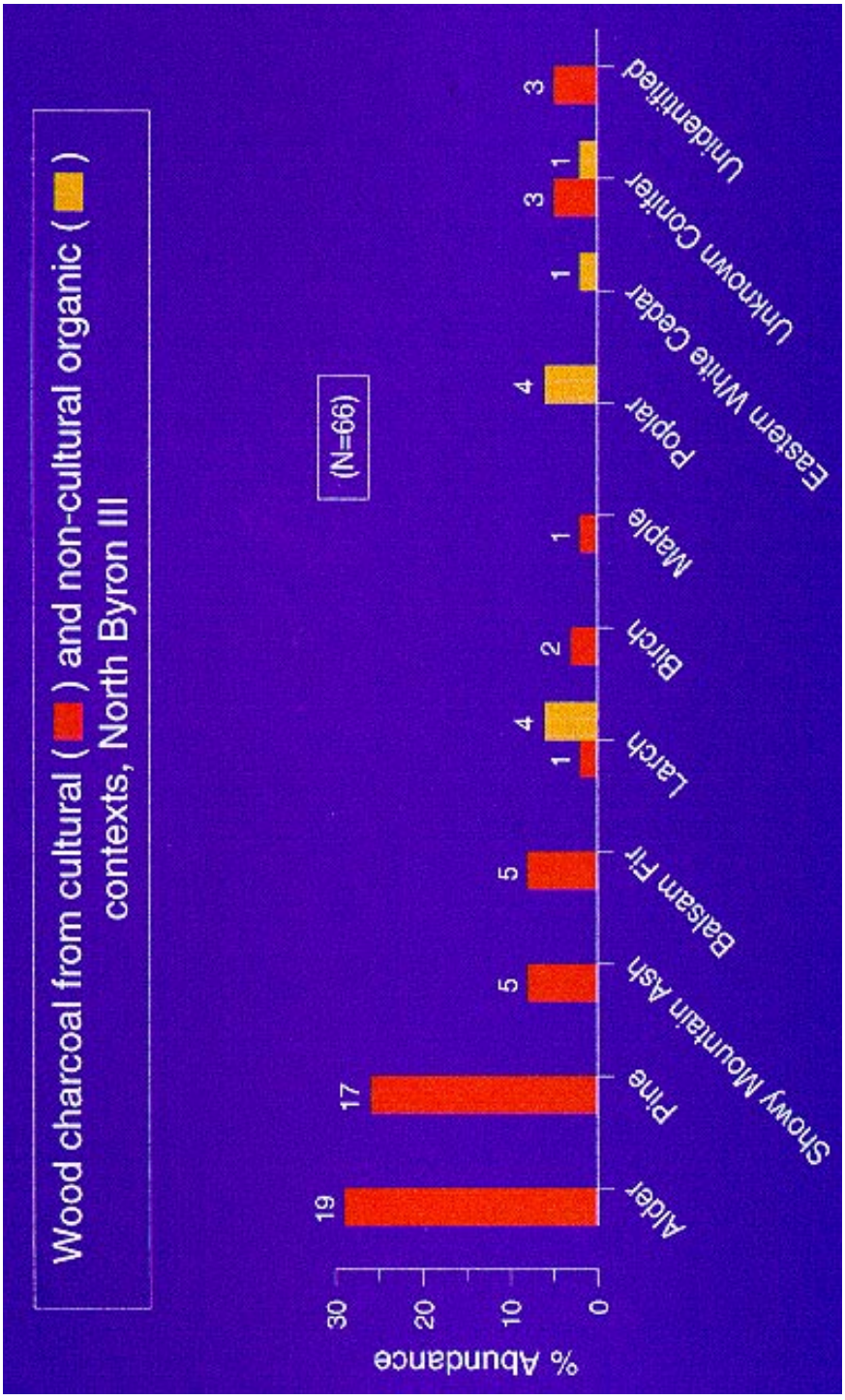

Figure 5 Comparison of wood charcoal taxa from archaeological and non-archaeological deposits at North Byron III using percentage abundance.

and maple. In contrast, wood charcoal examined from non-archaeological contexts included very minimal amounts of larch, poplar, and eastern white cedar. Interestingly, poplar and eastern white cedar were not encountered in samples from the Blackduck occupation of the site, and larch is the only taxon that is found in both types of deposits. It is not surprising to find eastern white cedar in non-archaeological deposits at North Byron III as it is one of the dominant trees at the site today. The source of poplar and larch, however, is less clear as these trees are not found on the site.

It is possible that some of the differences between samples collected from cultural and non-cultural contexts at North Byron III and Oiseau Creek are due to sampling biases, as a greater volume of sediments were analysed from the cultural contexts at both sites. For instance, the sample volume for non-archaeological contexts at Oiseau Creek is .3 litres whereas the volume of samples from the hearth feature is 2.3 litres. At North Byron III, the total sample volume from archaeological contexts is 8.7 litres in contrast to 6.3 litres from non-archaeological contexts. Nevertheless, when the differences in sample size (cf. Miller 1988:80-81) are considered for North Byron III, wood charcoal and seeds densities are still significantly higher for the cultural contexts (Figure 6). At the North Byron III site these differences are especially pronounced with regards to seed density. Relatively high densities of seeds are present in those samples associated with the early Blackduck occupation. In contrast, very low densities of seeds were recovered from non-cultural organic contexts, and seeds are completely absent from the non-cultural sand context.

It is evident from the above discussion that the samples examined from the archaeological versus non-archaeological deposits at North Byron III (and to a lesser extent at Oiseau Creek) are different in composition and density. Samples from archaeological contexts contain more wood charcoal (g) and seeds (count) per litre of sediments examined, and contain a much broader range of taxa (see Figure 6). It is suggested that this distribution of charred botanical material is likely the result of human activity rather than the contamination of charred modern material into cultural deposits.

SUBSISTENCE-ECOLOGY

It is difficult to evaluate the economic importance of the bush honeysuckle and sedge seeds recovered from the hearth at Oiseau Creek. The analysis of additional samples from various contexts at the site will assist in addressing this question. It is possible that fleshy fruits, and other taxa such as bush honeysuckle, rose, legumes, and grasses were food items to the prehistoric inhabitants at North Byron III. Unfortunately, there are no archaeobotanical studies from the Pukaskwa region, or the north shore of Lake Superior, with which to compare the North Byron III and Oiseau Creek plant assemblages.

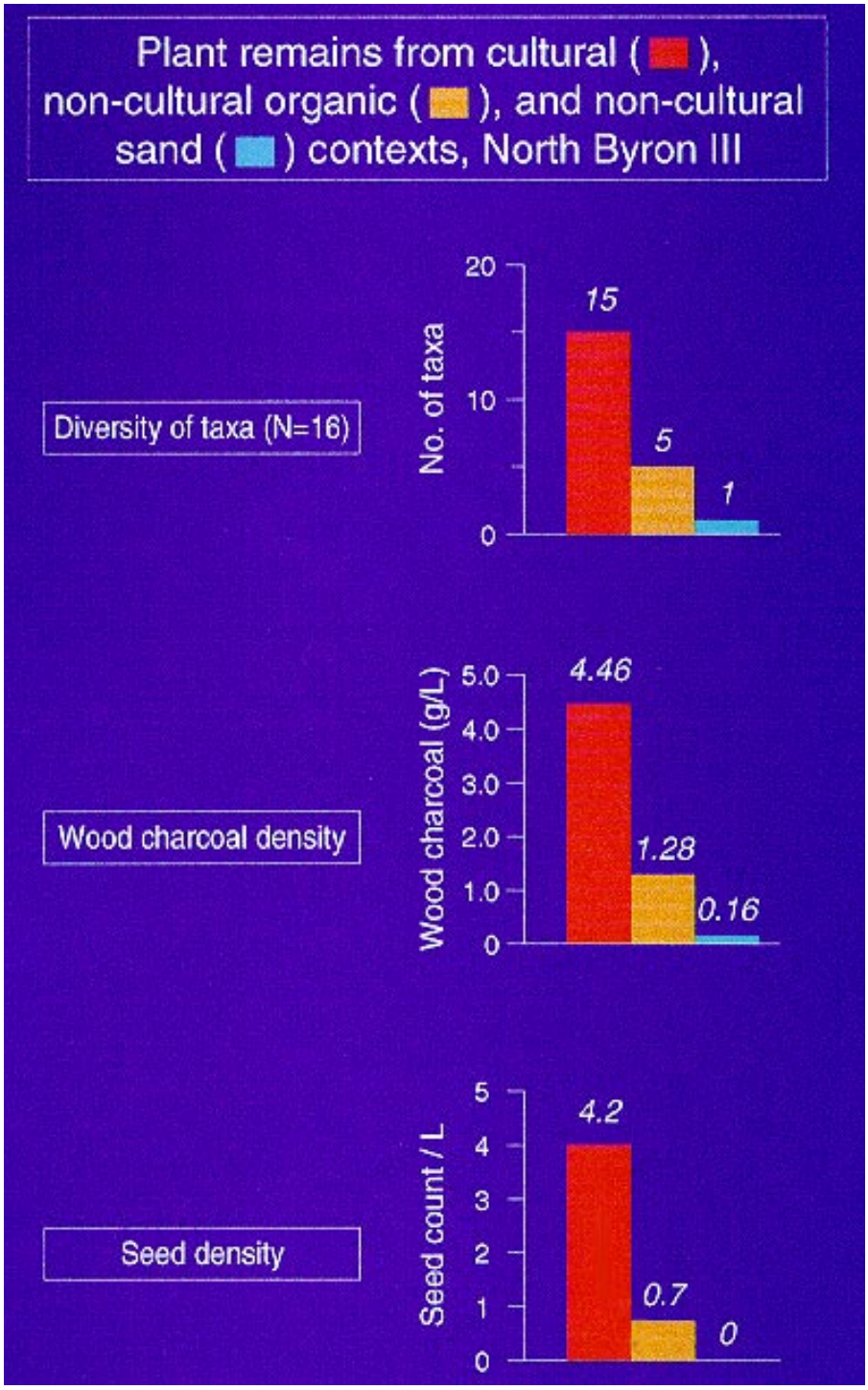

Figure 6 Comparison of diversity and density of charred botanical material (wood charcoal and seeds) recovered from archaeological and non-archaeological deposits.

At present, archaeological evidence for dietary plant use along the north shore of Lake Superior is lacking. The ethnohistoric literature provides some evidence for plant food use among boreal forest foragers. For instance, it is known that vetchling, rose buds, and fleshy fruits such as blueberry were used as plant foods by Ojibway and other northern Algonkian speakers (Black 1980; Bushnell 1919; Densmore 1974; Yarnell 1964). Evidence for prehistoric plant use comes from archaeological sites outside of the Pukaskwa region. Analyses of botanical remains from the Late Woodland Providence Bay and Shawana Bay sites on Manitoulin Island document a wide variety of plant material including vetchling, fleshy fruits, nuts, and cultigens such as maize (Crawford and Smith 1996). At the Providence Bay site, however, the most commonly recovered botanical remains were from the fleshy fruits category (Crawford and Smith 1996) which is similar to the findings at North Byron III. At the Juntunen site, a Late Woodland site located in the straits of Mackinack, Yarnell (1964) identified a variety of botanical remains including bramble, elderberry, grasses, and maize.

It is evident that more studies involving the systematic collection and analysis of botanical remains from north central Ontario, and particularly boreal forest environments, are needed to assess the economic importance of plant resources in the diet of northern Late Woodland prehistoric peoples. Future research involving the analysis of plant remains from archaeological sites in the region will provide valuable insights into plant-related subsistence activities. Building a data base of archaeological plant material will assist in understanding regional subsistence patterns, changes in plant use through time, and will allow researchers to make meaningful comparisons between contemporaneous Late Woodland hunter-gatherers in the North and food-producing groups further south.

It appears that a variety of habitats were being exploited by the Late Woodland early Blackduck occupants at North Byron III. At the time of occupation, the vegetation in the vicinity of North Byron III was likely similar to what it is today (Farvacque n.d.). During the 1993 and 1994 field seasons Farvacque (n.d.) noted that blueberries were found on nearby rock outcrops. Bramble, although found at the forest edge, was more common inland at the forest/cobble terrace interface behind the site. Rose, speckled alder, and showy mountain ash were common at the beach/forest interface while balsam fir, birch, and eastern white cedar were observed growing on the site. The diversity of wood charcoal types recovered from Late Woodland contexts at North Byron III possibly represent the opportunistic collection of dry wood in the form of deadfall or driftwood. It appears that the plant assemblage at North Byron III is the result of its inhabitants taking advantage of various habitats in the vicinity of the site.

The dominant wood charcoal types - pine and alder - might reflect a preference for these woods for fuel or building materials by prehistoric inhabitants at North Byron III. It is interesting to note that pine, which is present in low quantities at the site today, is the second most abundant wood charcoal type next to alder. This might indicate that the prehistoric inhabitants at the site were purposefully selecting this wood. At present, evidence for fuel selection by Late Woodland

inhabitants of the north shore of Lake Superior is scanty. However, some evidence for fuel selection comes from the Terminal Woodland Lone Tree Cove site on Isle Royale, northwestern Lake Superior, where wood charcoal from a hearth feature/dog burial was dominated by pine and birch, and smaller quantities of balsam fir (Clark 1990). The systematic collection of flotation samples from hearth, hearth perimeters, and structural features such as posts will assist in shedding light on fuel selection and construction material preferences in the region.

CONCLUSIONS

Although there is some variability between sample sizes from archaeological and non-archaeological deposits at North Byron III, it is suggested that the greater diversity and density of charred plant remains in the archaeological deposits at the site is the result of human activity. Furthermore, the results of this study indicate that the Late Woodland Blackduck occupants at North Byron III were possibly using fleshy fruits, rose, bush honeysuckle, grasses, and legumes as food items. In addition, the occupants at North Byron III were selecting a variety of woods, possibly for fuel, building, or other technological purposes, and were exploiting a variety of habitats in the vicinity of the site.

At present, plant-related data from the Oiseau Creek site (Late Woodland Blackduck) is limited to a few samples. The analysis of more samples will assist in addressing questions regarding the subsistence-ecology of its inhabitants. Of significance, however, is that the flotation samples examined from the hearth feature (a near-surface archaeological deposit) at the Oiseau Creek site yielded a variety of botanical material. When compared to non-archaeological deposits, the plant assemblage from the hearth feature exhibited distinct differences in composition and density, although this may partly reflect differences in sample size between these contexts. Future research will continue to examine this patterning at the Oiseau Creek site.

Although the results of this research are preliminary, the examination of charred plant remains from near-surface sites in the boreal forest of northern Ontario shows promise. This study illustrates the importance of collecting flotation samples from non-archaeological deposits in addition to features and other cultural deposits in boreal environments. Researchers can more accurately assess the composition and densities of charred botanical assemblages from non-cultural and cultural contexts for comparison. This is particularly relevant in boreal forest environments where the contamination of modern plant material in shallow archaeological deposits is a concern. It is suggested that the collection of flotation samples in north central Ontario include the routine collection of samples from near-surface contexts and nearby off-site localities, in addition to the cultural deposits of interest. This will assist researchers in assessing and characterizing the natural abundance of charred seeds in the soil and factoring out this material from archaeological plant assemblages.

The results of this research represent one of the few detailed studies of macrobotanical remains from archaeological sites from the northeastern shore of Lake Superior. Research in this area is clearly in its infancy, and it is evident that much is to be learned about the economic importance of gathered plants in the region. Research undertaken in this project represents an initial step in building a data base that will assist in understanding regional plant use patterns, and help track changes in plant utilization through time.

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