

Western Abenaki of the Upper Connecticut River Basin: Preliminary Notes on Native American Pre-Contact Culture in Northern New England

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Introduction

This paper provides a brief introduction to a regional archaeological study currently underway of Western Abenaki culture in the upper Connecticut River Basin with particular emphasis on the Cowasucks (Mathewson 2011a, 2011b). The heuristic framework presented here is being used to shed more light on Pre-Contact Woodland culture as a prerequisite for achieving a better understanding of the Abenaki way-of-life along the upper Connecticut River Valley during the Contact period. A holistic approach is focused on interdisciplinary linkages between archaeology and ethnohistory, ethnography, and oral history. In order to connect Pre-Contact Western Abenaki culture as understood through archaeological research with the events and traditional way-of-life during Post-Contact times primarily documented by Euroamerican colonial records, there needs to be a common interdisciplinary vision of how the disciplines of archaeology, anthropology and history can work together to complement one another.

Limited time and space has permitted here only a small step towards building a cultural overview about what is presently known about how Western Abenaki bands lived in northern New England during Woodland times over 2,000 years before the arrival of Europeans. A predictive model is briefly outlined on Native American settlement and subsistence patterns as well as technology within an environmental framework. Environmental factors and ethnographical analogies are reviewed as essential criteria for reappraising the role of horticulture on the fertile intervale meadows along the upper Connecticut River flood plain on both the Vermont and New Hampshire side of the valley during Woodland times.

The major objective of this paper is to discuss the relationships between crop cultivation (mostly corn) along the upper Connecticut River and population projections for Western Abenaki settlements along the valley during the Late Woodland period. There is a need

to reappraise Abenaki horticulture and its potential impact on population growth along this part of the Connecticut River in Late Pre-Contact times. A useful starting point is a discussion on the adaptation of corn hybrids for successful harvests within environment restrictions in northern New England. Using a settlement model within a climatic framework, a new approach is outlined towards building a better understanding of a Late Woodland settlement pattern which would support a higher population than envisioned in the past just prior to European contact.

It's now been thirty years since William A. Haviland and Marjory W. Power published their seminal book *The Original Vermonters: Native Inhabitants, Past and Present*. Their objective was three fold: First to answer the myths and distorted information about the Abenaki culture in Vermont; and second to explain the nature of the prevailing evidence about how Native Americans lived in Vermont from the Paleoindian period to Post-Contact times spanning over 400 generations; and third, to establish that Abenaki descendants remain today an integral part of the Vermont cultural fabric through the practicing of some lifeways of their ancestors. The published and unpublished data used to compile this synthesis and their updated 1994 edition provided a well-needed cultural overview as a basis for examining erroneous past assumptions while defining some of the archaeological research problems to be considered in the future. At the same time, the Vermont Archaeological Society published in the 25th Anniversary issue, a perspective on Vermont's Pre-Contact past by Peter A. Thomas (1994), which greatly added to what was then known about Native American archaeology in Vermont. Together, Haviland, Power, and Thomas have very successfully laid out the main parameters of Native American life during Pre-Contact times which established the basis of a well-structured foundation for further studies.

Although some early writers of special note such as historian Walter H. Crockett (1921); ethnohistorians,

Stephen Laurent (1955-56) of Abenaki descent, and Gordon M. Day (1965b); and archaeologist William A. Ritchie (1973) believed that the Native Americans inhabiting the state prior to the arrival of European settlers had a long cultural legacy going back thousands of years, it took Haviland and Power to fully articulate it. These co-authors presented a most convincing archaeological argument that present day Abenaki in Vermont are the descendants of the Late Woodland period with direct cultural roots probably going back to Late Archaic times.

Over the years, the field work of many archaeologists including Peter A. Thomas (1990, 1994); James B. Petersen (1978, 2002, 2004); David M. Lacy (1994, 1997); Elizabeth S. Chilton (1999, 2002); Michael J. Heckenberger (1988, 1992); David Skinas (1993); Giovanna Peebles (1989, 2002, 2004); Stephen Loring (1972, 1973); Howard R. Sargent (1960, 1985); and Daniel F. Cassidy (1991, 1999) among others have all made major contributions in the basic understanding of what is known about Native American cultures in Vermont back to Paleoindian occupation. The intent of this paper is to complement the ideas of these and many other scholars in building a better understanding of Western Abenaki culture in Woodland times.

The weight of the archaeological evidence during Terminal Archaic times in both Vermont and New Hampshire demonstrates significant stability of aboriginal culture primarily achieved through in-situ development rather than from introduced innovations by new peoples migrating into northern New England. For the first time in the archaeological record there is significant data sometime around 3,000 B.P. concerning subsistence patterns and technology which supports direct evolutionary cultural links and continuity with native peoples who can be identified as Western Abenaki during Contact and Woodland times. This paper focuses on this part of the Late Pre-Contact period as presently understood in the upper Connecticut River Basin.

Background

The Native Americans of northern New England have been grouped together in the Eastern Algonquian linguistic family which is divided into two main cultural branches: Eastern and Western Abenaki (Haviland and Power 1994). Although there is disagreement concerning Indian movements leading to some confusion about the cultural identity of some Native American populations, most workers agree that the Eastern Abenaki tribes include Wawenocks, Norridewocks, Kennebecs,

Androscoggins, Sacos, and Penobscots; for the most part, these native peoples have been identified with individual riverine watersheds (Calloway 1990). Further to the northeast of the Penobscots were the Etchemins, who were closely related to the Passamaquoddy and lived along the Passamaquoddy Bay in Maine (Bourque 2001). These native peoples were cousins to the Abenaki and were commonly grouped together by the English as the "Eastern Indians" with the Maliseet and Micmac tribes along the St. John River in Maine and in the far northern reaches of the Canadian Maritime provinces (Haviland 2011). The word "tribe" is used not to suggest anything about social organization but simply to describe any aggregate of Native American bands having descent ties from a common ancestor, with common cultural traditions, customs, and allegiance to the same leaders as representing a "people" or "nation."

The original homeland of the Abenaki, known by Native Americans as the "Dawnland," stretched from the upper reaches of the St. Francis River in southern Quebec and the Kennebec River in Maine to northern Massachusetts; eastwards to the Atlantic and Gulf of Maine and westwards to the eastern shores of Lake Champlain. Traditionally Eastern Abenaki warriors had to resist intrusion into their hunting grounds from the northeast by people the French called Souriguois (also known as Micmac), while Western Abenaki had to fight off occasional Mohawk war parties from across the Lake Champlain corridor from the Hudson Valley (Haviland 2011).

At the time of European contact, Western Abenaki inhabited a homeland territory known to them as Kdakinna translated as "our land" (Moody 1982). These Abenaki people occupied New Hampshire and Vermont living in the White and Green Mountains, along tributaries within the eastern drainage system of Lake Champlain, the upper Connecticut River Basin, along the upper and middle Merrimack River and in the lake region in the foothills of the White Mountains. In Vermont, there were bands at the village known as "Mazipskoik" ("at the flint") near the mouth of the Missisquoi River and nearby at Sand Bar/Grand Isle with other bands living along the eastern shore of Lake Champlain and the Lamoille and Winooski River valleys and Otter Creek. Western Abenaki territory extended northwards along the east shore of Lake Champlain into southern Quebec province where the Richelieu River became the boundary with the Mohawk to the west (Haviland and Power 1994). The Sokoki (Sokwakik) inhabited the upper Connecticut Basin probably from a short distance south of Mt. Ascutney and Lake Sunapee

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to Northfield, Massachusetts just south of the Vermont border; while the Cowasuck lived to the north along the Connecticut River in the Lower and Upper Cowasuck intervals; other bands lived northward into the head waters of the St. Francis River in Canada as well as between Lake Memphremagog in the west and Lake Umbagog in the east straddling the New Hampshire and Maine border. Additional native peoples affiliated with Western Abenaki in New Hampshire were the Penacook living along the middle and upper Merrimack River Valley, the Winnepesaukee centered along the river and around the lake named after its original inhabitants and the Pigwackets and Ossipee bands living along the eastern and southern flanks of the White Mountains (Figure 1).

The Connecticut River, known to the Abenaki people as Kwanitekw or “long river” flows south for some 380 miles from the Connecticut Lakes in northern New Hampshire to Long Island Sound (Hays 1929; Brown 2009). This paper concentrates on the Western Abenaki in the upper Connecticut River Basin with only the briefest mention of the culturally related neighboring communities they maintained close contact with in the Champlain Valley in Vermont, the Merrimack Valley in New Hampshire, and the St. Francis Valley in southern Quebec. Any regional synthesis has to focus on the big picture without spending time on the detail necessary to discuss major archaeological problems and theoretical issues. In order to stay focused on the larger issues concerning Western Abenaki culture in Pre-Contact times, an effort is being made to avoid concerns that do not measurably add to the available evidence for identifying cultural stability and change through time. If Vermont was the core of the Western Abenaki homeland as Colin Calloway suggests (1990:xvi), the upper Connecticut River Valley was a main artery and life-blood of Abenaki culture west of the White Mountains and a center of Western Abenaki resistance against incursions into their homeland as an important rallying point in their fight for independence through Contact times.

A major problem when trying to track archaeological cultures known from Contact times back into the Pre-Contact period is caused by the type of data available from field investigations. Excavations allow for the recovery of only a very small part of the material culture and hardly anything of its perishable day-to-day commodities which can tell us so much about the nature of native cultures prior to recorded history. The use of ethnographical analogy has always been used to flesh out

the comparisons between archaeological assemblages when direct data is non-existent (Ascher 1962). Inferences drawn from such comparisons are useful but never fully adequate when comparing the similarities and differences of varying cultural systems (Ascher 1961). For the purposes of the Abenaki study now underway, systematic cultural subsystems have been chosen from what Dean Snow used in his 1980 archaeological synthesis of New England; Snow (1980:17-18) pointed out when comparing and contrasting two different assemblages it is best to consider archaeological cultures as complete systems by describing them holistically on the basis of available physical remains. He promoted this approach by putting forward four subsystems with each one defined by several different components totally 14 specific categories. The classificatory scheme outlined below has been modified after Snow’s work using the following cultural categories:

1. Settlement Patterns – site type, location and size; population; house structures; storage pits; trash pits.
2. Subsistence Patterns – seasonal variability; annual mobility; food resources; storage techniques; fire cracked rock.
3. Technology – tool kits; flaked projectile points; trade commodities; lithic raw materials; ground, pecked, polished stone tools; waste flakes; ceramics; steatite bowls.

All these cultural criteria are influenced by one another and are not mutually exclusive within the total inventory assemblage. As many criteria as possible were selected which could be directly observed in the archaeological record. Other criteria can be used by weighing archaeological evidence through ethnographical analogy. The purpose of the study is to pose questions and evaluate problems about how the archaeological record can be used to scientifically evaluate what can be concluded about Western Abenaki culture across time. An ethnographic picture concerning social structure involving living units, settlement population and gender differentiation can only be used sparingly; spiritual belief concerning sacred sites, burial types, ceremonialism and grave goods presents another important cultural subsystem but one that will always be difficult to deal with archaeologically because of the strong opposition present-day Abenaki elders have towards the use of burial and sacred sites in any research project (Willard 2011; Moody and Moody 2011).

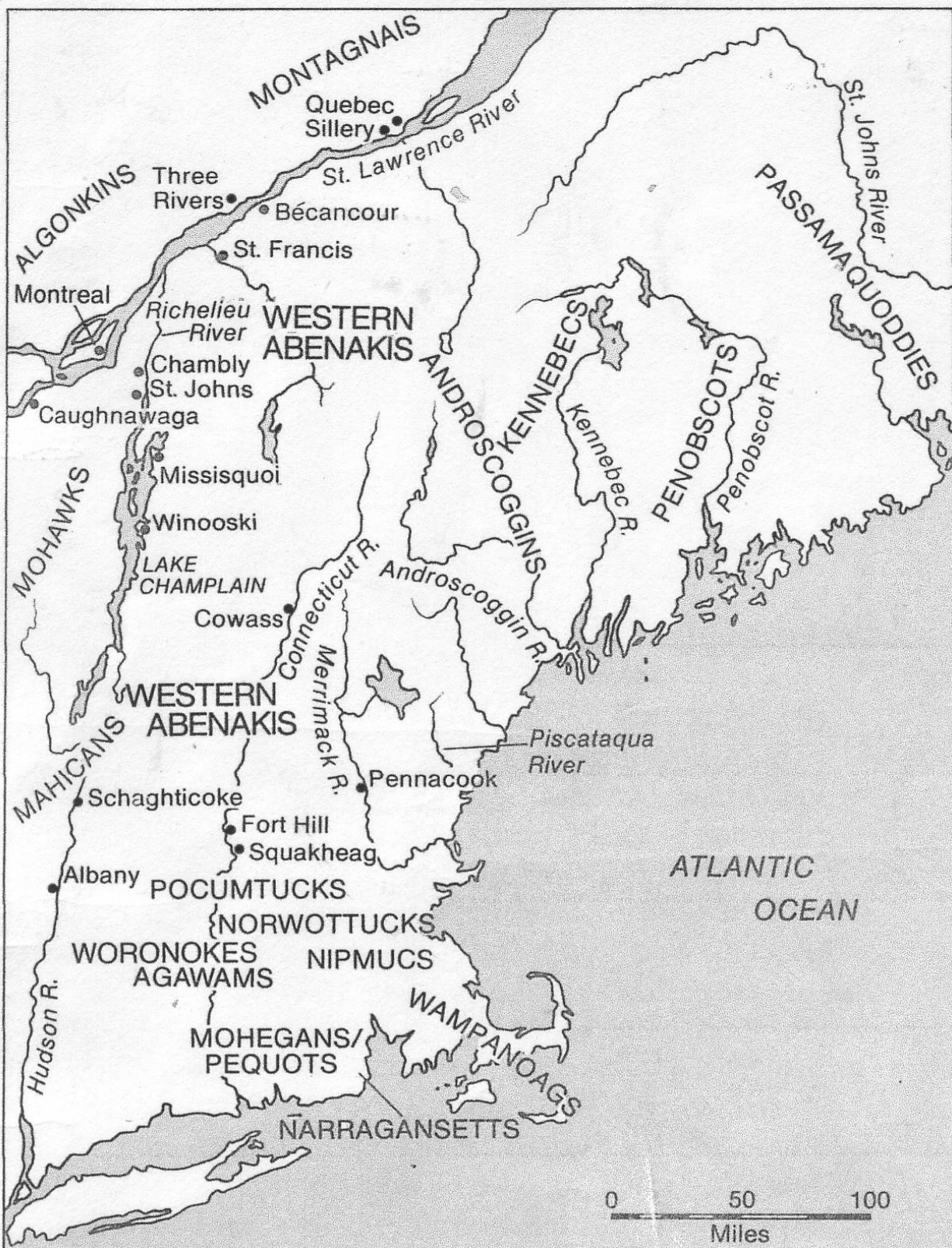


Figure 1. Western Abenaki and their neighbors. Map adapted from *The Identity of the St. Francis Indians* (Day 1981) (from Calloway 1990:41).

Periodization

The chronological development of Native American culture is characterized by time periods in common use among most archaeologists in New England: "Paleoindian," "Archaic," and "Woodland" (Table 1). The only major exception is in Maine where the term "Ceramic" is preferred to "Woodland" to characterize the late Pre-Contact period (Bourque 2001). I have chosen to use the term "Protohistoric" instead of "Ethnographic Present" used by Haviland and Power (1994:13) to designate the transition from the Pre-Contact to Contact periods covering the time from Champlain's visit in 1609 to the lake that now bears his name to the outbreak of Grey Locks War in 1722. This conflict had a great impact on Native Americans across northern New England and is an appropriate time marker between Pre-Contact times and a full "Historical" period from 1723 when more written records become available about events and responses by Native American communities to accelerated Euroamerican penetration of the Abenaki homeland in the interior. Like all conventional chronologies, this static temporal scheme masks the unevenness and inconsistencies of the state of our knowledge about the past and an exaggerated simplified view of the dynamic continuous flow of culture change occurring at different rates and places through time with no real hardfast boundaries between periods.

Interior Homeland Penetration

Much of what we know in New England about Native American culture and the success of native crop cultivation during the Early Contact period comes from ethnohistorical information gleaned from early European accounts of their exploration. In the absence of descriptions of native peoples living beyond the coast line, their way-of-life remained largely unrecorded until European contact was made. Consequently the horticultural activities of many interior bands throughout the Contact period have remained very little understood.

Although European exploration of the New England coast and along the St. Lawrence had been increasing since the late 15th century, English penetration and settlement of the interior did not occur until increased immigration to Massachusetts began in the early 1630s following the survival of the first settlement in Plymouth in 1620 (Salisbury 1982). Fur traders were quick to push inland along the river valleys as a response to the lucrative beaver trade as Native Americans tried to

prevent settlers from penetrating their homeland. Only after rampant disease resulted in widespread death and destruction of the Wampanoag and Narragansett during the Pequot War was it possible for Europeans to penetrate the interior from their settlements along the coast (Figure 2).

In 1633, John Oldham opened up an overland route from Boston to Connecticut along a well used Pre-Contact native trail. Two years later he was followed by William Pynchon along the trail to Rhode Island where Providence was founded in 1636, followed by Hartford in 1637 on the lower Connecticut River. Trading activities first initiated on the Connecticut River by Edward Winslow in 1632 now expanded up river with a trading post established at Springfield (Agawam) in 1636 by Pynchon. As a result of sustained Indian resistance to European penetration of the interior by Pocumtuck, Nipmuck, and Sokoki, Northfield remained the furthest European outpost on the Connecticut River for well over 100 years (Thomas 1973a, 1990).

Further east the English exploration of the Merrimack Valley did not begin until the 1640s when Simon Willard began pushing up the river to expand his beaver trade with the Pigwackets and Penacooks. In 1642 Darby Field was led by Abenaki guides north along the Saco River to the White Mountains where he looked north-westward into the territory of New France and saw a "sea to the westward" as the broad reaches of the St. Lawrence River. Gabriel Druilletes, a French Jesuit missionary staying on the Kennebec River while visiting native villages and camps was the first European to have circumnavigated Lake Winnepesaukee in 1650. In 1652, John Sherman and Jonathan Ince were the first Englishmen to reach Lake Winnepesaukee and the source of the Merrimack River, penetrating for the first time the northern territories of the Penacook and Pigwacket homeland (Stewart-Smith 1999).

Following Champlain's "discovery" of Lake Champlain in 1609, apart from brief visits of French missionaries to native villages in 1615 along its eastern shore, there was no known European penetration again into Vermont until over fifty years later. It wasn't until 1666 that the French established the first European presence on Lake Champlain, at Isle La Motte, with the construction of Fort Ste. Anne with a small mission (Eccles 1969). This initial out-post did not last for very long, however, and was soon abandoned. A second French effort was made in 1682 by establishing a mission somewhere along the east shore of Lake Champlain (Day 1965b). Little is known about this early mission; its location has never been determined but may

Table 1. Vermont Archaeological Framework: Chronological Outline.

Period	Characteristics	Approximate Dates
Paleoindian	Big game hunting in small bands of surviving mega-fauna during last glacial retreat from New England; Clovis fluted projectile points; habitation in caves and temporary small upland campsites out of river valleys. Long distance trade with exotic lithic resources.	c.13,000-9,000 B.P.
Archaic	Hunting, fishing, and gathering of wild plant food, nuts, and berries with dugout canoes within a riverine orientation. Great variety of projectile points identified with hunters using atlatls and speaking Proto-Algonquian dialects; migration into New England; exploitation of exotic lithic resources.	Early; 9,000-7,500 B.P.
		Middle; 7,500-6,000 B.P.
		Late; 6,000-2,800 B.P.
Woodland	Cultural continuity from Late Archaic including expansion of long distance trade routes from Paleoindian times, increased diversity in food gathering with introduction of birch bark canoes, horticulture, bow and arrow, ceremonial internments and pottery with in-situ development of rich and varied wood-working, basketry, and textile technology identified with Western Abenaki of Northern New England; increased settlement with cultivation of corn, beans, and squash in the Champlain Basin and Upper Connecticut River Basin. Extended nuclear family units coalescing into bands and semi-permanent villages focused on intervale environments and seasonal upland base camps.	Early; 2,800-1,850 B.P.
		Middle; 1,850-1,000 B.P.
		Late; A.D. 950-1608
Proto Historical	Initial contact between Western Abenaki and European explorers, fur traders, and colonists; spread of epidemic diseases; indigenous people become increasingly dependent upon European trade goods, firearms, and alcohol through the fur trade. King Phillip's War, Iroquois War; Canadian-French alliance with St. Francis Abenaki. Abenaki's fight to maintain control over their homeland in the face of encroaching Anglo-American settlement up the Connecticut and Merrimack River Valleys and north along the Champlain Corridor.	Early; A.D. 1609-1675
		Late; A.D. 1676-1722
Historical	Grey Lock's War, Abenaki Wars, French and Indian War, American War of Independence, establishment of Vermont Republic; Vermont becomes 14th State, War of 1812, Civil War, WW I and II, 20th Century Economic and Social Development.	Early ; A.D. 1723-1791
		Late; A.D. 1792-1950

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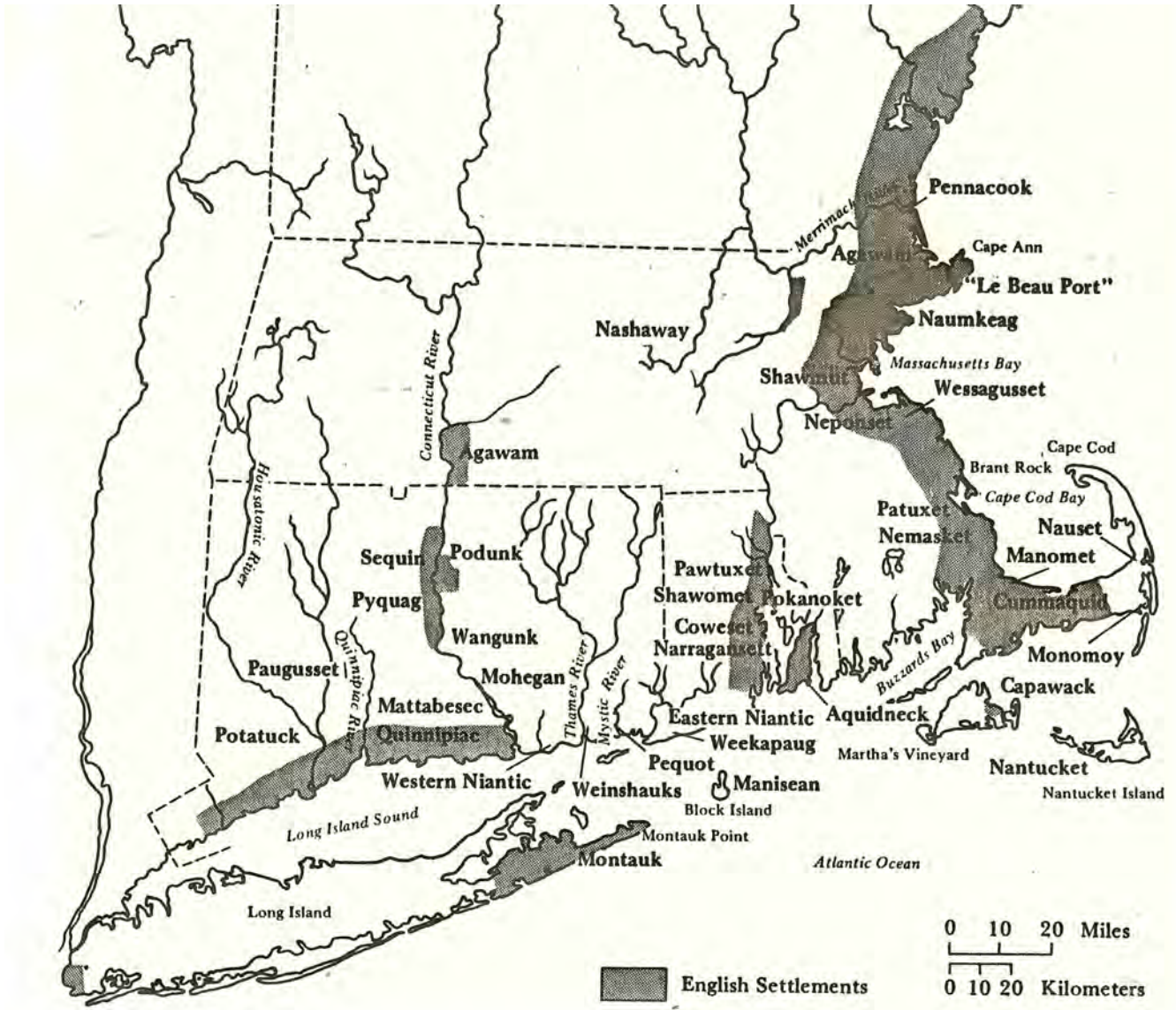


Figure 2. New England English settlements and known Indian bands in 1643 (Salisbury 1982:112).

have been near a native village site close to the mouth of Otter Creek. Eight years later, an English and Dutch contingent from Albany established a small fortified trading post in 1690 on the east shore of Lake Champlain at what would later become known as Chimney Point, near where the French would build their log fort in 1731 prior to building Fort St. Frederic at Crown Point (Coolidge 1979). In the upper Connecticut River Valley, French maps of 1713 and 1715 show an abandoned native village at Lower Cowas marked as a French Jesuit mission near present day Newbury, Vt. (Calloway 1990:108). This clearly suggests a presence of strong French influence at this time in the upper

reaches of the Connecticut River. The presence of Jesuit rings handed out to native converts after catechism classes recovered in the Fort Hill excavations clearly indicates that French concepts of religious beliefs had been well established in the Sokoki community along the upper Connecticut Valley by 1663 (Thomas 1973b, 1990).

Calloway (1990) has pointed out that direct documentary evidence of the Western Abenaki in Vermont is rare in the early Contact period. Written records are comparatively rich concerning colonial events and activities involving the Iroquois in New York, the Eastern Abenaki and Etchemin in Maine, and

the Algonquian peoples in southern New England. But only brief glimpses are seen in the French and English records of the Missisquoi, Sokoki, and Cowasucks and provide few clear descriptive accounts of life in native villages in Vermont throughout colonial times. This problem was magnified because of the Western Abenaki survival strategy of adopting evasive tactics by withdrawing into safe-refuges hidden from view (Calloway 1984, 1986). Although their villages were protected successfully by covering their tracks during troubled times, their absence perpetuated the myth that the land lay uninhabited rather than a central part of their ancestral legacy (Haviland and Power 1994). This did not bode well in modern times when Abenaki people were regarded as intruders in their own land as their lack of a homeland legacy was initially used against them by the state of Vermont to deny individual bands tribal recognition (Moody 1982).¹

Maize

Much remains to be learned about Abenaki corn horticulture along the fertile intervale flood plain on both sides of the upper Connecticut River and its major tributaries. Although the exact origin of modern maize (corn-*Zea mays*) is still being passionately debated among botanical authorities and anthropologists, most agree where it all began – with Richard S. MacNeish, the archaeologist, who first identified the progenitor of modern corn almost 50 years ago (Fagan 2005). Transforming wild corn (*Tesosinte*) into a primitive domesticate took at least a thousand years. Until the arrival of Columbus, no single event was more significant in the development of Native American cultures than the domestication of corn. The Pilgrims at Plymouth Rock would have starved during their first winter had it not been for Squanto, a Pawtuxet Indian, who showed the white settlers how to grow it (Salisbury 1982).

¹ Native American bands in Vermont are now being recognized by the state legislature. On April 22, 2011, the Governor and the General Assembly approved official state recognition for the Elnu Abenaki Tribe (Windham County) and the Nulhegan Band of the Coosuk Abenaki Nation (Orleans, Essex, and Caledonia Counties). Two other applications are now pending from the St. Francis-Sokoki Band of Missisquoi (Franklin and Grand Isle Counties) and Koasek Abenaki of the Koas (greater Newbury area). Another application from a native group claiming to be Abenaki from Orange and Windsor Counties is currently under review by the Vermont Commission on Native American Affairs (VCNAA).

At last count geneticists group the world's corn into some 300 different sub-species (Hurt 1987). Various results from centuries of breeding corn for traits such as size, flavor, pest resistance and quick maturity from a Pre-Contact Mexican grass is well documented (Smith 1989). Corn now grows in thousands of varieties on six continents in all types of climatic zones. From a diminutive ear of wild corn, not much larger than an inch long, Indians in Tehuacan valley of central Mexico began domestication of corn as early as 7000 B.C. Over thousands of years Native Americans bred hybrid varieties of corn many of which are the most popular today including pop, dent, flint, flour, and sweet (Hurt 1987).

Although Native American agriculture primarily focused on corn, beans, and squash, they also planted a whole range of crops such as sunflower, pumpkin, tobacco, and Jerusalem artichoke depending upon local environmental conditions. But corn always remained the main crop among almost all tribal groups. Through trial and error and experimental efforts over several millennia, a number of different hybrids became successful; each variety was bred to meet the particular environmental requirements of the local growing season determined by frost-free days between the first planting in the spring and the harvest in the late summer or the early fall. It is unknown how productive corn cultivation was with individual tribes before European contact. A number of different figures could be used as guestimates to suggest how many bushels of shucked corn was cultivated per individual every year; however any such numbers would be suspect without reliable documentation. But what is very clear from early European reports, is the degree to which the Europeans relied on native crops for their very survival. It didn't matter where it was - either with the Anasazi and the Spanish in the Southwest, the Algonquians with the English in the mid-Atlantic, or the Hurons with the French in the Northeast, native farmers showed European settlers what had to be done to survive the New World in conditions they were not prepared to deal with.

Corn was the most important agricultural crop with Native American farmers of the northern plains; they planted several different hybrids – flint, flour, and dent. Specific tribes planted them depending upon local environmental conditions determining harvest success. Flint corn is the hardest type and grows best in the lower temperatures. Northern tribes liked it because it matures earliest with some varieties maturing in only about 70 days (Ford 1985). If environmental conditions were

right, they preferred to plant a variety of five or six different types of eight-rowed flour corn; this subspecies is easier to grind into flour and tastes better than flint corn if eaten green. In more southern climates, native farmers particularly preferred flour and dent corn. It was important that no families planted more than two or three different varieties to prevent as much as possible cross-pollination. It was a tradition for different members of the family to plant their own variety of corn in a separate garden plot spaced as many as 100 yards away from another (Hurt 1987).

Abenaki Horticulture

Several types of information are needed in order to understand what the range and extent of cultigen cultivation there was in Western Abenaki country during Late Woodland times. This involves a multi-disciplinary approach dealing with the archaeological evidence (Heckenberger et al. 1992; Hart and Rieth 2002) together with tribal traditions, oral histories, and ethnographical analogies in combination with uneven historical documentation from early European accounts about what crops were being grown by various bands at the time of initial contact. Ethnohistorical evidence needs to be drawn from oral histories and traditional stories for inferences about crop cultivation, particularly corn. Further inquiry will involve a close analysis of past and present day micro climatic environmental information together with available data derived from modern experimental archaeological projects focused on cultivation during different lengths of growing seasons with traditional hybrid varieties; a good beginning for this type of research work was conducted by Fred Wiseman and his college students from Johnson State College at the Ethan Allen Homestead Park from 1989 to 1996 as part of the Abenaki Experimental Ethnobotany Project (Wiseman 2005). Finally, ethnographical data can be reviewed available from other specific tribal groups who have a recorded history of successful cultivation elsewhere.

Corn has always been harvested most successfully where the annual frost-free growing season ranged from 120 to 215 days. Hybrid corn varieties, however, were developed by Mississippian Period farmers needing only 70 to 90 days to mature from planting to harvesting (Ford 1985). Experience over many years taught Native Americans when to plant their seeds to provide an acceptable safety margin against abnormally short growing seasons; they fully became aware that if they miscalculated by planting too early – a late spring frost

could easily kill the newly planted seeds requiring them to replant the crop. An early autumn frost could just as easily kill the crop before it could be harvested. A margin of error of about 25 days was usually accepted to be on the safe side for the projected growing season (Galinat 1988).

During the Mississippian Period, Mid-Western and Great Lake tribes living in areas having a growing season more than 190 frost-free days normally planted two corn crops with staggered plantings (Ford 1985). By having two plantings, this farming procedure helped to ensure a successful harvest of at least one crop with a good likelihood of having two harvests to provide more winter reserves. Eight-row northern flint corn was favored as the second planting because it required a much shorter growing season. Native American agriculture during the Mississippian Period closely resembled crop cultivation in the Woodland Period in the Northeast. Archaeological evidence suggests that native farmers during the Mississippian Period like those in the Northeast, preferred crop cultivation on the flood plains of rivers and streams rather than upland fields where their flint hoe wooden shafts had a hard time breaking up the heavy, stony clay soil. The rich sandy loam of the flooded river bottom lands in New England were naturally much easier to till and were far more productive than upland farms out of the river valleys (Bennett 1955).

Most corn hybrids can be grown in a growing season of less than 120 days (Hurt 1987). Although it grows better and quicker in warmer climates with a high average summer temperature, corn can be successfully harvested in cooler summers with growing seasons having as few as 90 frost-free days. Today in New Haven in Addison County near the western flank of the Green Mountains, a second planting of a 75- to 80-day corn crop sowed in early July has been successfully harvested by early October if all the environmental conditions were just right (Bessette 2011). Corn is successfully grown in the Canadian Yukon territory close to the Arctic Circle; at 12,000 feet in the Andes, and in the steamy jungles of the Amazon Basin. Providing that a hybrid corn has been bred for particular environmental conditions, it can survive in most any soil and with a short growing season if it is properly tended to; without humans to care for it, corn cannot survive in any environment regardless of the length of the growing season. Although modern day molecular DNA genetics have greatly expanded corn varieties today, the long patient trial and error experiments by Native Americans with cultigens have been successful for centuries in

hardscrabble garden plots under different environmental conditions; this process laid the foundation for corn as a staple in the Western Abenaki diet by late Woodland times. "Indians created the plant as we know it today," said Walton C. Galinat, professor of Botany at the University of Massachusetts. "The truth is that Native Americans made most of the major genetic changes in corn ages ago...what we are doing is fine tuning." (Rhodes 1993).

Population Projection

The weight of the available archaeological evidence seems to suggest that the introduction of corn cultivation and a food producing subsistence economy gradually created a population increase in the Northeast during Woodland times. (Chilton 1999, 2002; Sidell 2003; Cassedy and Webb 1999). The archaeological confirmation for this relationship in Vermont and New Hampshire is presently based on very little clear evidence largely because of the small number of sites producing any direct evidence of corn cultivation (Heckenberger et al. 1992; Crock 2011; Bunker 2011). Any review of Western Abenaki population in connection with crop cultivation during the Late Woodland period has to begin with a revision of the pre-epidemic population around A.D. 1600 with estimates calculated by Dean Snow over thirty years ago.

European accounts by early explorers in Maine and the Canadian Maritimes have provided Eastern Abenaki and Etchemins population figures and descriptions of villages which have been used to project aspects of their culture backwards in time to the Late Woodland period prior to European contact (Snow 1980). This "direct historical approach" is not nearly as useful in Vermont among the Western Abenaki because of the general lack of European penetration until much later in the Contact period. The scarcity of such ethnohistorical information has always made the use of East Abenaki demographic data important as an analogy in the study of Pre-Contact Western Abenaki culture; Eastern Abenaki Post-Contact population figures also provides a comparative base-line to view the direct ramifications of what it tells us about the impact on the native population from the onslaught of wide spread European diseases across northern New England (Calloway 1990).

More is known about the native population and demographic distribution during the early Contact period in Maine than any other part of northern New England. This is due to the written descriptions of Eastern Abenaki and Etchemins along the coasts, up the rivers

and into the interior by European explorers since 1524 when Giovanni Verrazano first sailed along the Maine coastline. Among the ethnohistorical sources which have provided Eastern Abenaki population figures is the written account that is derived from interviewing in England natives who had been kidnaped during the Weymouth expedition in 1605 along the Maine coast (Snow 1980). The detailed account by James Rosier, published by Purchas in 1625, provides the names of a number of villages and the rivers they were located on; in some cases there is enough geographical detail to relocate some of the individually named village sites (Snow 1980:36-37).

Purchas lists 21 villages with 23 village leaders referred to as "sagamos" as well as the number of men and the number of houses per village. Snow has taken the count of adult men making up the total population at about 30% to arrive at a best case projection of the total population in 1605. Using Purchas's figure of the number of houses, a population per household comes out at about eight people. This figure was seen about right according to what is known about the extended Abenaki family and the size and shape of their houses. Snow relies on Purchas's data supplemented by figures provided by Champlain (Grant 1907:44-77) and John Smith's accounts (Arber and Bradley 1910:192-193) to project the population for Eastern Abenaki and neighboring peoples just prior to one of the earliest widespread European disease epidemics that killed thousands of native peoples between 1564-1570 (Calloway 1990).

The Abenaki statistics for western and central Maine have been extended to serve as an analogy when considering Western Abenaki demographic questions where there is a noticeable lack of such data for Vermont and New Hampshire. Projecting tribal population in the absence of any direct historical documentation is very much of a numbers game when it is based on little credible evidence. Common techniques used by historians have been based on projecting sizes of Indian bands, wigwams and/or villages depending upon the availability of information contained in early European accounts when explorers encountered native groups during the mid-16th and -17th centuries. A further technique for estimating populations comes from the early work of archaeologists and ethnohistorians based upon the use of warrior counts cited in the written records; various authorities have used different warrior ratios to determine the total population of any given native group. Snow (1980:39) used a warrior ratio of 1:3 without any real explanation of why he did so. Haviland

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and Power (1994:159) used a ratio of 1:5 apparently following Day (1981:118); on the other hand, Day was the first to point out that warrior ratios as high as 1:7 have been used in the past depending upon what seemed appropriate with each individual case. In general, Day always preferred a 1:5 ratio as he believed it fitted better with northeastern native peoples.

Eastern Abenaki statistics for western and central Maine with a projected population of 11,900 was used by Snow (1980:33) as an analogy when considering Western Abenaki demographic questions; Snow estimated the population in the Champlain valley at about 4,200 and another 3,800 on the upper Connecticut River for a total Vermont population of some 8,000 around A.D. 1600. He further suggested that some 2,000 in Pre-Contact times inhabited the upper and middle Merrimack drainage in New Hampshire. Snow himself realized that his total Western Abenaki Pre-Contact population estimated at only 10,000 was on the low side and some years later adjusted this figure to 12,000 (Snow and Lamphear 1988). Snow used a much higher mortality figure for Western Abenaki than he used to estimate the loss of population further east due to the direct contact of smallpox, plague, measles, and yellow fever; these epidemics began the first well documented wave of chronic diseases among the Eastern Abenaki in 1616. Using this same model of continuing epidemics, Snow suggested that the more distant Western Abenaki died off at a faster rate, reducing their total population by 1750 to no more than 250 (Snow 1980:34). This very low figure did not fit well with other historical evidence particularly in the face of the survival strategy Western Abenaki used of withdrawing to safe locations whenever their communities came under stress (Calloway 1990: 39). Although the mortality rate was extremely high in all native communities, Calloway has inferred that the withdrawal strategy may have lessened some of the impact on Western Abenaki settlements of such staggering losses. By using a mortality figure that was much higher than what Snow used for the Eastern Abenaki and their neighbors, an overly exaggerated and inaccurate impression was created of the devastation Western Abenaki suffered in Vermont. Snow also neglected to take into considerations the continuous stream of refugees from southern New England being integrated into Western Abenaki communities at increasing rates by 1675 as a result of King Philip's War.

Using social and cultural analogies from other parts of northern New England and the Canadian Maritime provinces, Haviland and Power (1994:159) have proposed that the population of an average Pre-Contact

Western Abenaki village would range from 500 to at least 1,000. Using these numbers they have suggested that there would have been a total of about 4,000 Abenaki in the Champlain Valley and at least another 2,000 in the upper Connecticut Valley including the extended hunting and fishing territories between Lake Memphremagog and Lake Umbagog within the headwaters of the St. Francis River. A large part of this reasoning was based upon their reading of the available archaeological evidence and projected population densities of the Penobscot suggesting to them that there would be no more than 1,300 at village sites (Haviland and Power 1994:297). Following Trigger (1991) they reasoned that it would not be higher than 1,500 as some form of political coercion is needed at this population level, a characteristic completely foreign to Abenaki culture. Their projected total Vermont population in Pre-Contact times at 6,000 was less than Snow's estimate of 8,000. Both these estimates are clearly too low in view of the number of probable villages suggested by archaeological evidence assuming they were occupied contemporaneously. This is the key factor in any population projection as it has been confirmed from ethnohistorical sources that Abenaki peoples customarily relocated their village sites about every ten years when the soil became depleted and firewood hard to find (Haviland and Power 1994:127; Day 1981:4).

Predictive Model

The predictive model presented here for habitation in the upper Connecticut water shed is a work in progress (Table 2). The background research involving a relatively small sample of known sites in the upper Connecticut River Basin from Massachusetts to the Canadian border has only just begun with any specificity. More time is required to get a first hand impression of the physical landscape under study before the available data base can be properly assessed. Any predictions based on background research is only as good as the data that are available. Without ground truthing with careful surveying, such hypothetical predictions can only be regarded as preliminary until they can be tested through field work. This model is being used simply as a heuristic device to generate a more systematic investigation in the future along both the Vermont and New Hampshire side of the valley. Preliminary background research is an important first step in projecting an overall archaeological set of multiple working hypotheses structured to answer specific cultural questions. A focus on Native American

Table 2. Predictive Habitation Model in the Upper Connecticut River Basin.
(page 1 of 2)

Period	Settlement Sites	Subsistence Activities	Social Unit
Paleoindian c13,000-9,000 BP	Small, mobile camps on upland ridges and high river terraces overlooking the river valley and its main tributaries.	Hunting, fishing, and gathering, exploitation of local food resources, and non-local lithics.	Small migratory nuclear family hunting bands of 10-20 people of all ages.
Archaic 9,000-2,800 B.P.	Small, temporary base camps, gradual shift from upland sites to lower river terraces and flood plains.	Hunting, fishing, and gathering; exploitation of exotic lithic resources; wild food plant domestication.	Small, mobile extended family hunting bands composed of multi-generational population between 10-30 people.
Early Woodland 2,800-1,850 B.P.	Semi-permanent base camps on well-drained, fertile alluvial soils on a low river terraces and flood plains 200 feet above annual spring flood line; burial site ceremonialism	Hunting, fishing, and gathering with long-distance trade; use of ceramics with birch bark canoes; horticulture with wild food plants.	Semi-sedentary bands composed of lineages joining together seasonally to exploit local resources with groups between 50-100 people.
Middle Woodland 1,850-1,000 B.P.	Annual semi-permanent small villages on level, well-drained fertile alluvial soils situated on low river terraces and flood plains 200 feet above annual spring flood line; burial grounds near occupation sites.	Hunting, fishing, and gathering with expansion of horticulture of local food plant resources; ceramic and extension of long-distance trade bartering.	Seasonal sedentary village community of common lineages of up to 500-750 people.
Late Woodland A.D. 950-1608.	Annual seasonal villages on higher ground away from river banks; burial grounds close to river.	Continued hunting, fishing, and gathering with increasing reliance on cultivation of major exotic cultigens, corn, beans, squash, and tobacco. Horticulture is main subsistence activity from April to September with hybrid cultigens and two plantings of corn in a 120-130 day growing season.	Sedentary villages of related lineages with "Sagamore" leaders spending at least six months a year as a community of 750-1,250 people.

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Table 2. Predictive Habitation Model in the Upper Connecticut River Basin.
(page 2 of 2)

Period	Settlement Sites	Subsistence Activities	Social Unit
Protohistorical A.D. 1609-1675	Mobile, sedentary villages located in a defensive position with palisade fortification some distance from the river; smaller base camps in same refuge locations around interior ponds, lakes, and navigable tributaries concealed from enemy war parties.	Horticultural system disrupted by social upheaval and migrations in response to Iroquois attacks across Hudson Valley into Northern New England. European trade goods in the accelerating fur trade introducing wide-spread cultural and social disruption with epidemic diseases, warfare, famine, and great loss of life.	In response to civil upheaval, village communities break up into small-to-medium mobile bands of 50-100 people with common lineages reverting to former settlement model in self-sufficient, concealed locations in safe refuges.

settlement and subsistence patterns as well as technology will increase precision in survey efforts on the ground while providing a comparative framework for evaluating the archaeological and historical significance of this central core of the Western Abenaki homeland. Little archaeological attention has yet been drawn to Vermont Native American settlement sites dating to the 17th to mid-19th century; such examination during Contact times would further substantiate challenges to the myths of Abenaki occupation in the state. Prolonged modern-day resistance of some Abenaki elders towards scientific excavation has made such examination difficult on known historical habitation sites other than ancestral burial sites which quite naturally should never be disturbed unless absolutely necessary to rescue skeletal remains.

The lack of archaeological information from settlement sites bridging the transition from Late Woodland times to the early Contact period represents a very obvious gap in our knowledge of how the Abenaki way-of-life changed during this important period of cultural struggle and transformation in the face of increasing colonial expansion. Historical records indicate that the Sokoki occupation of Fort Hill only represents settlement at this defensive position from 1663-1664 and therefore did not include an earlier habitation during Pre-Contact times (Thomas 1990). It would be invaluable to be able to compare and contrast material culture and its accompanying tool kits between A.D. 1400, not long after the use of ceramics and exotic cultigen cultivation had begun in Vermont with sites dating

to some three hundred years later when Abenaki Cowasuck and Sokoki bands had fought for almost one hundred years against the inexorable colonial expansion up the Connecticut River and into the heart of their homeland.

Eco-Zones

An important part of a settlement model will consist of different eco-zones. Native procurement of food resources and raw materials were focused on specialized strategies designed to maximize the food supply within a particular eco-zone. Resource procurement required only small sites having a low density of artifacts which usually contained only material remains associated with particular procuring activities (Frink et al. 1994). These sites are located on a landscape and in the eco-zone that can best optimize seasonal resource exploitation. The utilization of resources involves many different behavioral decisions involving locating and acquiring resources and processing them before transporting them back to the main village. These decisions reflect particular direct relationships between Native American behavior patterns maintaining a regular food supply and necessary raw materials within the biological world they live in.

The natural habitats in the upper Connecticut River watershed present a complicated mosaic of plant communities, animal life, and physical landscapes which are the direct descendants of the periglacial environment prevailing at the end of glaciation and the draining of Lake Hitchcock (Delacourt and Delacourt 2004). The

wide variability of different eco-zones have been reviewed elsewhere and need not be repeated here in any detail (Brown 2009; Thompson and Sorenson 2005). Future archaeological work in the upper Connecticut River Basin will most likely be linked to an understanding of settlement patterns within micro-environments within the following ecological zones:

1. Northern Upland Hardwood and Coniferous Forests with the most visible and important habitat components with the greatest biodiversity in the watershed's landscapes having a high potential for sites of all periods.
2. Wetlands with a high potential for sites in a complex riverine system of rivers, creeks and streams; a lacustrine system of lakes and deep ponds; and a Palustrine system of shallow ponds, marshes, swamps and bogs. Some of the largest wetlands in the upper Connecticut Basin occur in the watershed of the Clyde and Nulhegan drainage basins and along the Connecticut Lakes north of Pittsburg, N.H.
3. Falls and Rapids with sites located on the major tributaries and along the interconnected waterway of streams and brooks through the upper Connecticut Valley. Although flow management for flood control has created a very different river today than it was when first navigated by Abenaki in birchbark canoes, the undeveloped land around rapids and waterfalls can still provide important archaeological information about past settlement along both river banks of the Connecticut River and its tributaries.
4. Intervale Flood Plains with major settlement sites situated along stretches of the upper Connecticut River where its gradient is low and meanders occur along with oxbows and mid-river islands. The construction of dams and hydroelectric facilities resulting in reservoirs have flooded out large tracts of riparian forests and alluvial meadows which most probably contained substantial settlement remains.
5. River Terraces located on both sides of the upper Connecticut River and the lower courses of major tributaries well above annual flood lines always presented good localities for settlement sites particularly during Woodland times.

Subsistence Choices

An increase in subsistence choices occurs as a result of

cultural changes induced by the seasonal availability of different food sources. Human choices become important when decisions have to be made between multiple food choices available at the same time. The major cultivation questions are: How did Western Abenaki individual bands gradually shift over time from their traditional subsistence activities based on hunting and fishing and more towards the management and domestication of wild plant foods as they became a higher priority for meeting the immediate needs of native bands along the upper Connecticut River Valley? What was the process involving the transition from the domestication of indigenous wild plants to the cultivation of exotic cultigens introduced from contact with southern New England as the idea and/or plantable seeds moved their way up the Connecticut River? Although we don't know how these transitions actually happened, it most probably had a lot to do with an increase in population as a result of increased crop cultivation and food storage with less strain on securing local wild plant and animal resources within easy access to village settlements. More archaeological research needs to be done to explore how the cultivation of corn and beans at Skitchewaug by 750-850 B.P. (years before present) spread to other parts of the upper Connecticut River Valley and elsewhere in northern New England (Heckenberger et al. 1992; Petersen and Cowie 2002).

As Snow (1980:158) has reminded us, there most probably were rapid cultural readjustments with environmental disasters in Pre-Contact times that must have had devastating results. We only have to recall what small Vermont communities in river valleys had to live through with the most recent flooding and destruction from the torrential rains of tropical storm Irene. The well-documented 1816 catastrophic impact on the growing season during "the year without a summer" and other climatic catastrophes will always be a reminder of what most likely happened at crucial times in the past and always must be considered in any horticultural model (Ludlum 1985).

Climate Factors

The gradual adaption of exotic cultigens initiating Western Abenaki horticulture was dependent upon the ability of individual native bands to breed a corn hybrid which could be successfully farmed within the prevailing environment conditions in northern New England. Vermont's Champlain Valley and the upper Connecticut River Valley promised everything that southern New England offered for the development of Native

Western Abenaki of the Upper Connecticut River Basin

American agriculture north of Deerfield, Massachusetts; both regions had a milder climate and richer fertile soils than any other region in northern New England. The moderating climatic effect of Lake Champlain along its eastern shore and the mountains protecting the Connecticut River Valley provided the longest growing season anywhere in northern New England. The sedimentation from glacial deposits complemented by seasonal flooding of the major rivers draining into Lake Champlain and the annual flooding of the Connecticut River intervale meadows provided an unrivaled agricultural potential for Western Abenaki farming in Woodland times.

Growing Season

The length and warmth of the growing season is the critical factor when considering the geographical range of Native American horticulture (Carrier 1923). The longest growing season in Vermont is in the extreme southeast part of the state at Vernon, on the Connecticut River, where it is as high as 166 days; the shortest average frost-free days on record is 83 at Somerset at 2,000 feet in the southern Green Mountains (Meeks 1986). The Champlain Valley has one of the longest growing seasons in northern New England with Burlington having more than 150 days and Rutland on the edge of the Green Mountains with an average of 141 frost-free days (Figure 3). When judging the agricultural potential in Pre-Contact times, topography plays almost as much of a role as the growing season. Except for the high elevations along the spine of the Green Mountains and the highlands in the North East Kingdom where the heaviest snow falls are, the shortest average growing seasons are in the lower valleys and lowlands which can have fewer than 100 frost-free days along the flanks of the Green Mountains under 1,000 feet. It is important to note that the whole stretch of the upper Connecticut River from the Newbury/Haverhill area of Lower Cowas all the way south along the intervale flood plain deposits to the Massachusetts border enjoy a growing season of at least 130 days of frost-free days. An enclave of a 130-day growing season around Lake Memphremagog allowed for native cultivation some distance out of the river valley (Bennett 1955). The median annual date ranges of the first and last frosts along the upper Connecticut River Valley indicates that most years would have had a growing season south from Lunenburg, Vt., and Lancaster, N.H. for most areas from May 1 to September 15 for some 120-130 days (Figures 4 and 5).

Soils

The upper Connecticut River Basin has well over 100 soil types, on some of the finest agricultural lands in the country situated along the alluvial intervale of the flood plain (Meeks 1986). The most fertile loamy soils of the intervale are formed from the organic materials left behind from the periodic flooding of the flood plain occurring each year in the spring when the river overruns its banks. These alluvial soils also have rich lacustrine sediments left behind by the retreating Lake Hitchcock during the glacial retreat during the Late Pleistocene. This mix of soil components have created some of the richest soils in the state along both banks of the Connecticut where ever intervale deposits have been stabilized on the flood plain. Upland soils are a different matter all together. Rocky upland soils are formed on glacial till, while sandy soils were generally formed on river terraces from gravelly glacial outwash and moraines (Meeks 1986). The upper Connecticut River Valley as far north as the Wells River has mesic soil temperatures which makes them warmer than the surrounding up-land regions where the soils are in the frigid soil-temperature zone (Brown 2009:20). These upper valley warm rich alluvial soils are much more similar to comparative farming soils in southern New England than the glacial till rocky soils of neighboring upland areas.

All of the intervale soils have always had extremely good agricultural potential (Meeks 1986). They drain well and have good moisture holding texture; for the most part they are on level ground with few slopes and are free of large stones and glacial erratics. These soils have an unusually high nutrient organic content. Plotting these various soil types by individual units creates a distribution map very difficult to read with a meaningful sized scale; therefore it is more practical to lump them together into a larger aggregate of the richest soil classes 1 and 2 determined by U.S. Department of Agriculture (Figure 6). Most of the soils in the upland regions of the river basin are classified as sandy loams which contain a moderate amount of stones and lacked sufficient amounts of potassium, nitrogen, and phosphorus. All factors considered, the lowlands in the river valleys were far more suitable for horticulture than the uplands.

Precipitation

Vermont is the driest of all New England states (Meeks 1986). As it is the most inland state, Vermont's air

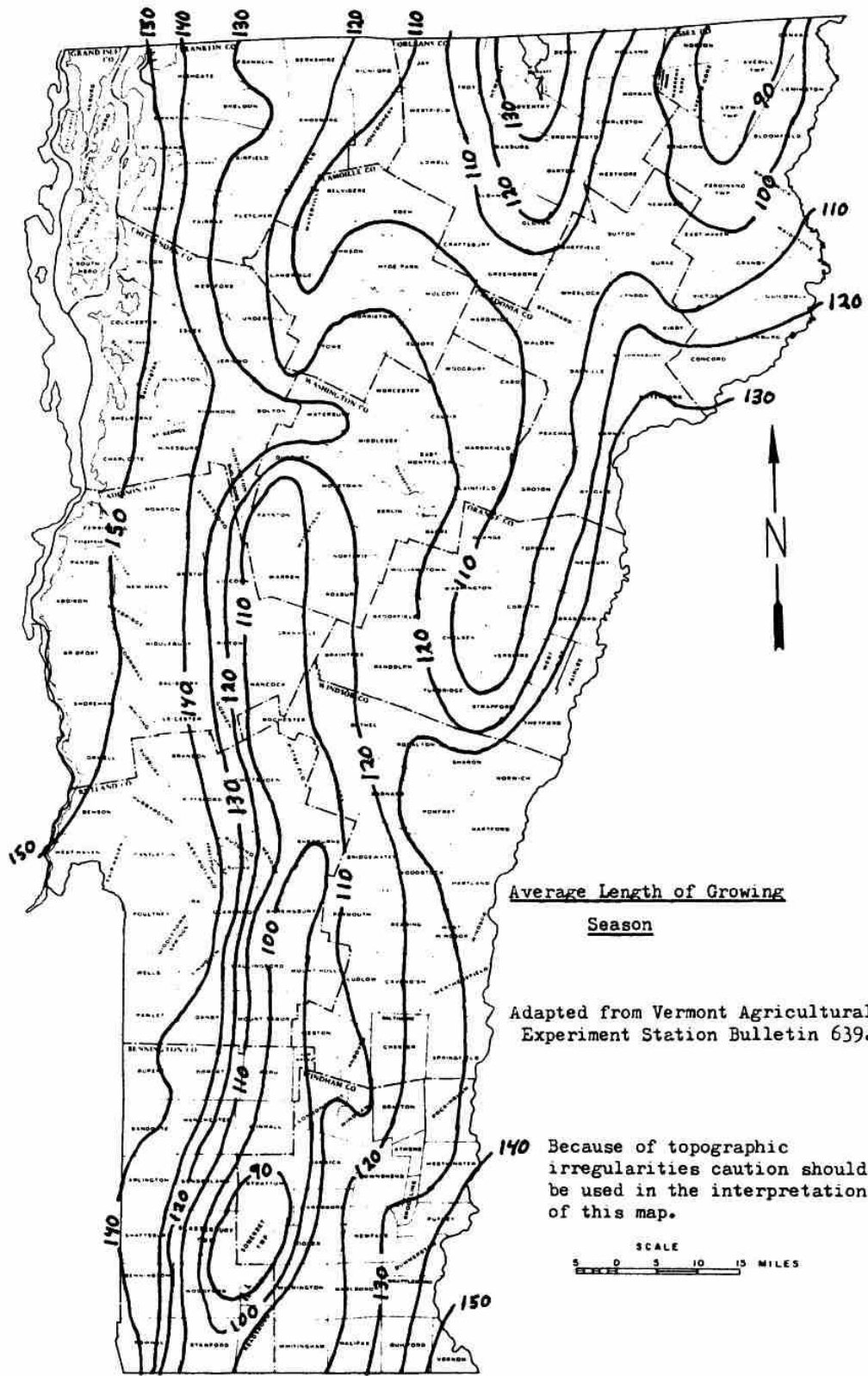


Figure 3. Average Length of Growing Season in Vermont (from Meeks 1986:161).

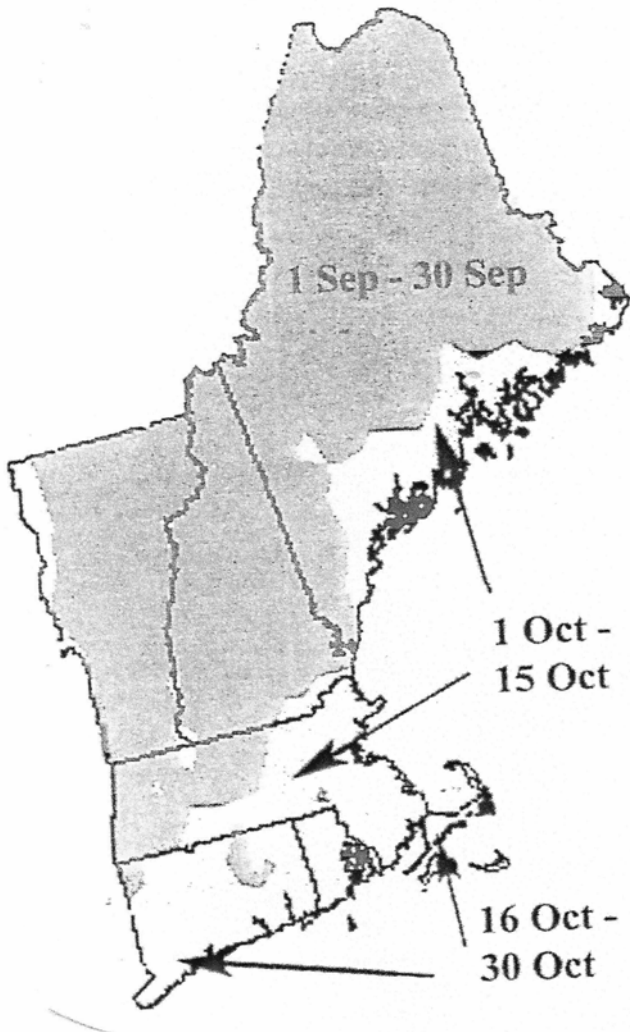


Figure 4 (left). Range of dates for the median first frost across New England (Zielimski and Klein 2003:95).

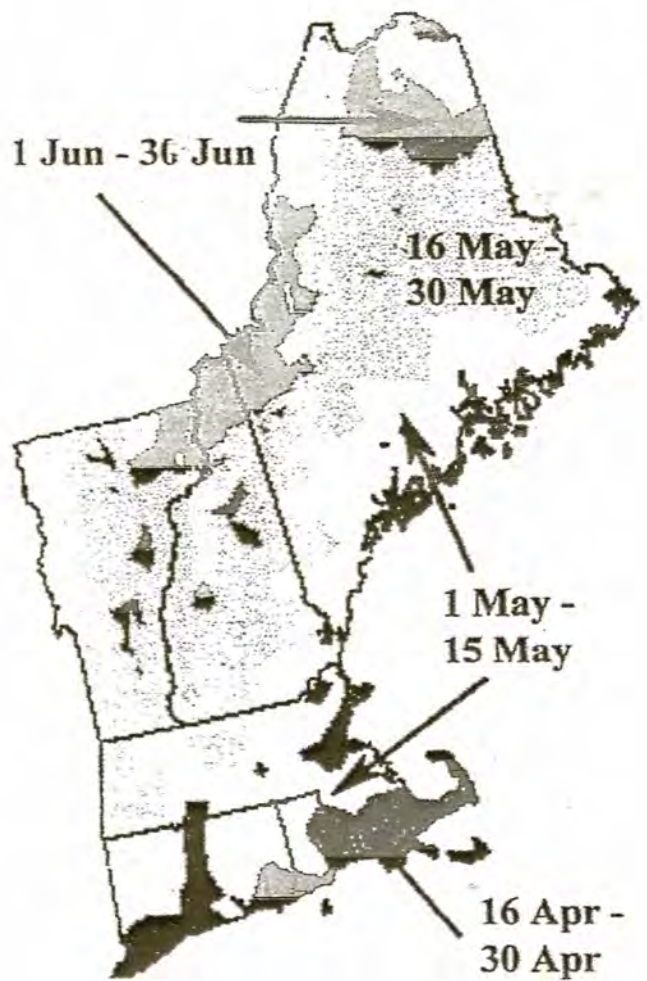


Figure 5 (right). Range of dates for the median last frost across New England (Zielimski and Klein 2003:110).

loses much of its moisture coming in from the Atlantic coast from the east before it reaches the Connecticut Valley and from the Great Lakes from the west before arriving over the Champlain valley (Meeks 1986). Consequently, Burlington receives only about an average of 32 inches of rain a year with the northern Champlain valley usually receiving not more than 36 inches (Figure 7). A good part of the upper Connecticut River Valley also only receives less than 36 inches a year. This dry part of the river valley coincides precisely with the intervale area of past fertile cultivation of the Abenaki Cowasucks in the area stretching from the mouth of the Wells and Ammonoosuc Rivers to over 50 miles to the south. This would have been the most serious concern for cultivation in the Cowas region in the upper valley.

Harsh Environment

The environment of northern New England set definite limits for developing successful horticulture within specific ecological restrictions. Corn was transformed from a south-west warm weather crop requiring high temperatures with a growing season of at least 150 days to a hybrid species that could mature within a growing season of no more than 100 to 120 frost-free days while remaining resistant to cold, windy weather with wide daily temperature swings and uncertain precipitation. There is no indication how long it took to develop hearty corn crops as well as beans and squash through trial and error. Although much remains to learn about this process, there is little doubt that the upper Connecticut Valley intervale flood plains facilitated successful horticulture which was a major bench-mark in native plant breeding during Pre-Contact times.

Information about early farming methods comes from evidence of cultigens, inferred use of specific tool kits, and C-14 dates. To understand the accomplishments of Western Abenaki farming activities a whole range of cultural questions come to mind:

- How did cropping patterns and farming technology change through time among different Abenaki bands in northern New England as opposed to the Iroquois in New York, the Huron in Ontario, and the Nipmucs in Massachusetts?
- What and when were the first cultigens harvested in northern New England?
- What did the farming process involve with planting, cultivating, harvesting, and storage of different cultigens?
- How did the new economic innovation of

horticulture affect daily lives?

- How did Abenaki farmers learn to grow hybrid corn species within microenvironments allowing for consistent successful harvests?

These are easy questions to ask, but most difficult to answer without a reliable archaeological data-base and well formed ethnographic analogies. The accomplishments of horticulture among the Western Abenaki have gone relatively unrecognized as compared to the Iroquois (Fenton 1978) and Huron (Trigger 1969). This is largely due to a lack of written accounts of Abenaki corn growing efforts in the interior where Europeans had not yet penetrated until rather late in the Contact period. Europeans had first hand observations of the Iroquois harvesting their corn along the St. Lawrence Valley and the Huron along Lake Ontario as early as the mid 1530s. The only recorded observation of Abenaki growing corn was not available until sometime around the 1635-45 period in the middle Merrimack Valley after Champlain's brief comment in 1609 about the "fertile fields of maize" the Abenaki were growing on the east shore of Lake Champlain (Grant 1967).

Ancient Oral Traditions

When oral traditions are viewed in a cultural context they become unique living records in the documentation of Western Abenaki culture in the form of traditional beliefs and value systems. Nowhere is this more apparent than with the Abenaki lunar calendar. The Western Abenaki lunar calendar strongly reflects the importance of crop cultivation in their seasonal subsistence cycle (Brink 2011). This is clearly demonstrated by the five traditional months of the year designated from May to September as the corn growing season (Figure 8). This doesn't necessarily mean this was the case with every settlement; quite naturally those villages and other habitation sites situated in warmer and more fertile river valleys having a growing season of between 100-130 frost-free days would rely more heavily on crop cultivation than the colder, more northern upland areas situated out of the river valleys. Under conditions less favorable to cultivation, traditional hunting, fishing, and gathering activities continued with little if any changes in the subsistence economy. The existence of the lunar calendar seems to have been neglected by some researchers when considering the marginality of the central role corn played in Western Abenaki culture. The fact that almost half of the year was focused on crop cultivation is something that cannot be dismissed. Similarly, it is curious why the Abenaki oral traditions

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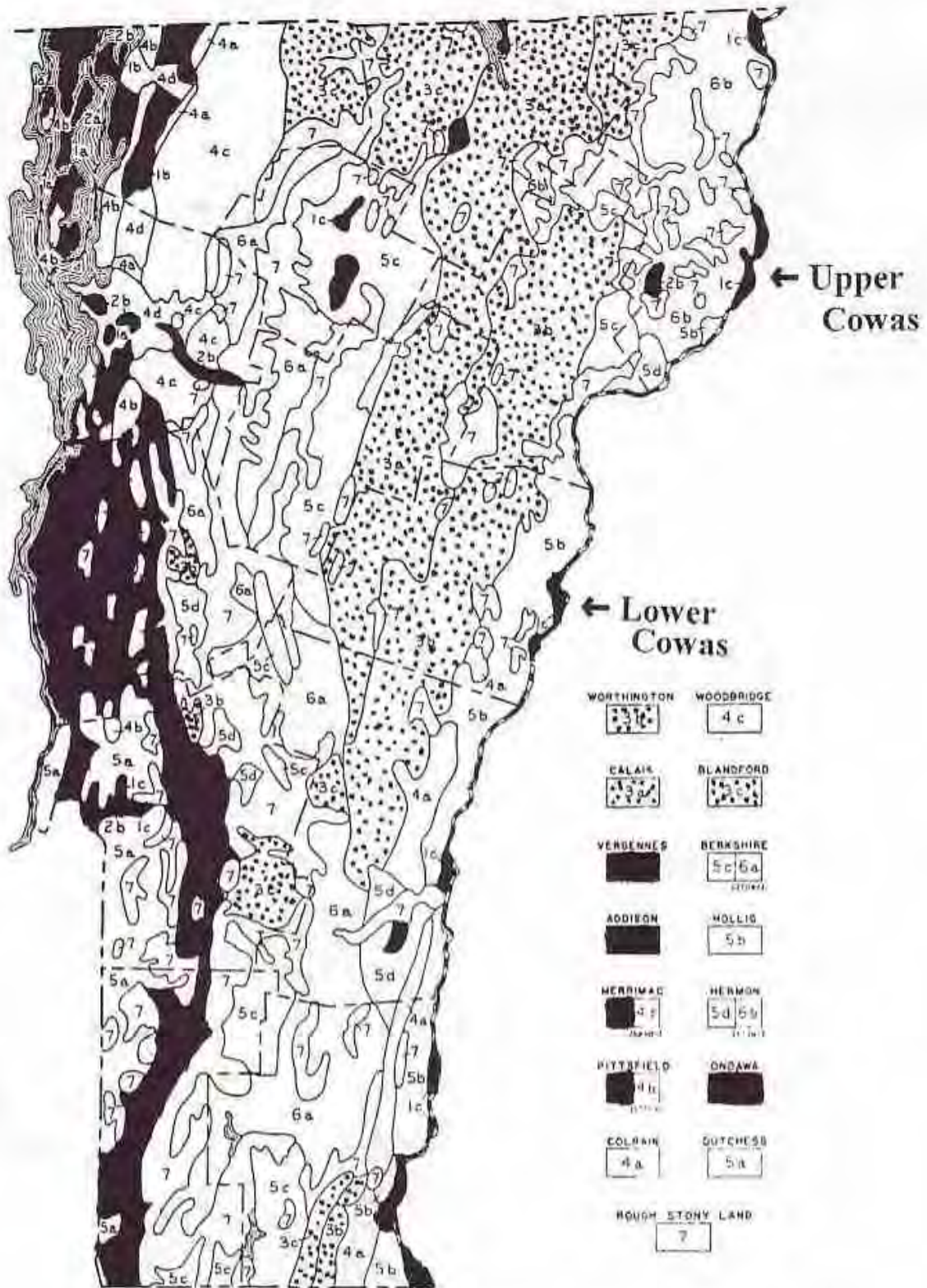


Figure 6. Class I and II rich soils shown in black along the upper Connecticut River on intervale alluvial deposits (from Meeks 1986:280).

concerning their corn legend did not draw nearly as much attention to its cultural importance as very similar legends did with the Iroquois and Huron (Thompson 1966). Fred Wiseman (2005:244) makes a very good point when he asks how can a native tribe have an explanatory tale as an important part of oral history concerning the adaptation of corn when some researchers believed it did not play a major role in their annual subsistence? The Abenaki traditional "Green Corn Festival" relates mythical stories about how corn was first planted in a major cultural celebration. The traditional "Green Corn" dance recounts the important role women have in the whole cultivation process by depicting a grandmother tribal elder as the only one who can decide when the green corn should be picked, and what seeds are to be kept for the following spring's planting (Wiseman 2011; Brink 2011). Western Abenaki cultural traditions lends significant weight to the argument that the marginality of crop cultivation where environmental conditions permitted it, was far less than previously suggested from the lack of available archaeological evidence.

Gender roles

There was no difference between gender roles among northern and southern New England Native American cultures when it came to farming the land (Russell 1980). In both cultural areas, women played the dominant role in the planting, cultivating, and harvesting of crops except in the case of tobacco which remained largely a male responsibility. The important role Western Abenaki women had in the success of horticulture needs to be further explored. Evaluating successful cultivation among different native tribes has never been easy. Crop cultivation changed the gender division involving domestic responsibilities and made women much more important than men in providing food. A native woman could raise more or less on her own anywhere between 25 to 69 bushels of corn by working an acre or two, which was enough to provide over half of the annual caloric requirements for a family of five (Cronon 1983: 44). Ethnographical studies provide good evidence in Post-Contact times that Abenaki women, like other native women, were the food gatherers while the men concentrated on hunting and fishing. There is little doubt that this was the case during Pre-Contact times; the women as chiefly involved with food gathering had a much better understanding of the natural characteristics of edible and medicinal plants (Wiseman 2005). Because women spent more time in the village on a daily basis

with domestic chores, they had the best chance to learn how to cultivate plants close to home. In this capacity, Abenaki women were no doubt responsible for learning how to cultivate local plants and to breed the new cultigens to suit local crop growing conditions. Women planted the seeds, weeded, and tilled the soil and may have developed the first farming tools with stone, bone, wood, and antler for planting and cultivating (Smith 1989).

Ethnographic evidence and oral history accounts indicate that Abenaki women must have been very experienced plant breeders; they were able through trial and error to develop skills to make the right selection of seeds after each harvest to gradually improve their corn crops within prevailing environmental restraints (Brink 2011). By selecting seeds from plants that had the least branches and fewest ears, they produced corn plants with strong stalks and long ears. They also learned to plant their corn with beans and squash in hills and to mound the soil around each cornstalk. This discouraged the growth of sucker branches that would weaken the plant and prevent it from reaching its full maturity (Russell 1980). By growing all three cultigens together, cornstalks supported the climbing beans, which replenished the soil with nitrogen, while the squash helped to retain soil moisture and shade out the weeds (Hunt 1987). The best seeds were always taken from the strongest plants for the next year's planting in the prevailing northern climate. Although evidence clearly indicates that Abenaki farmers were expert plant breeders, it is impossible to know exactly how they acquired that skill in the absence of recorded documentation.

Abenaki horticulture produced greater differences in responsibilities between the sexes than prevailed among hunters and left women with the major focus of maintaining band stability and continuity. As the result of their central role in food cultivation coupled with their day-to-day activities around the village, women strengthened the autonomy of individual bands and promoted a more sedentary existence. Horticulture similar to gathering and fishing could be conducted easily by women near the village; tilling the soil was not physically dangerous and could be performed efficiently during child bearing and the upbringing of their children without neglecting their other duties in the village.

Settlement Sites

The present archaeological data-base from the upper Connecticut River Basin suggests the following criteria would be useful for distinguishing between different

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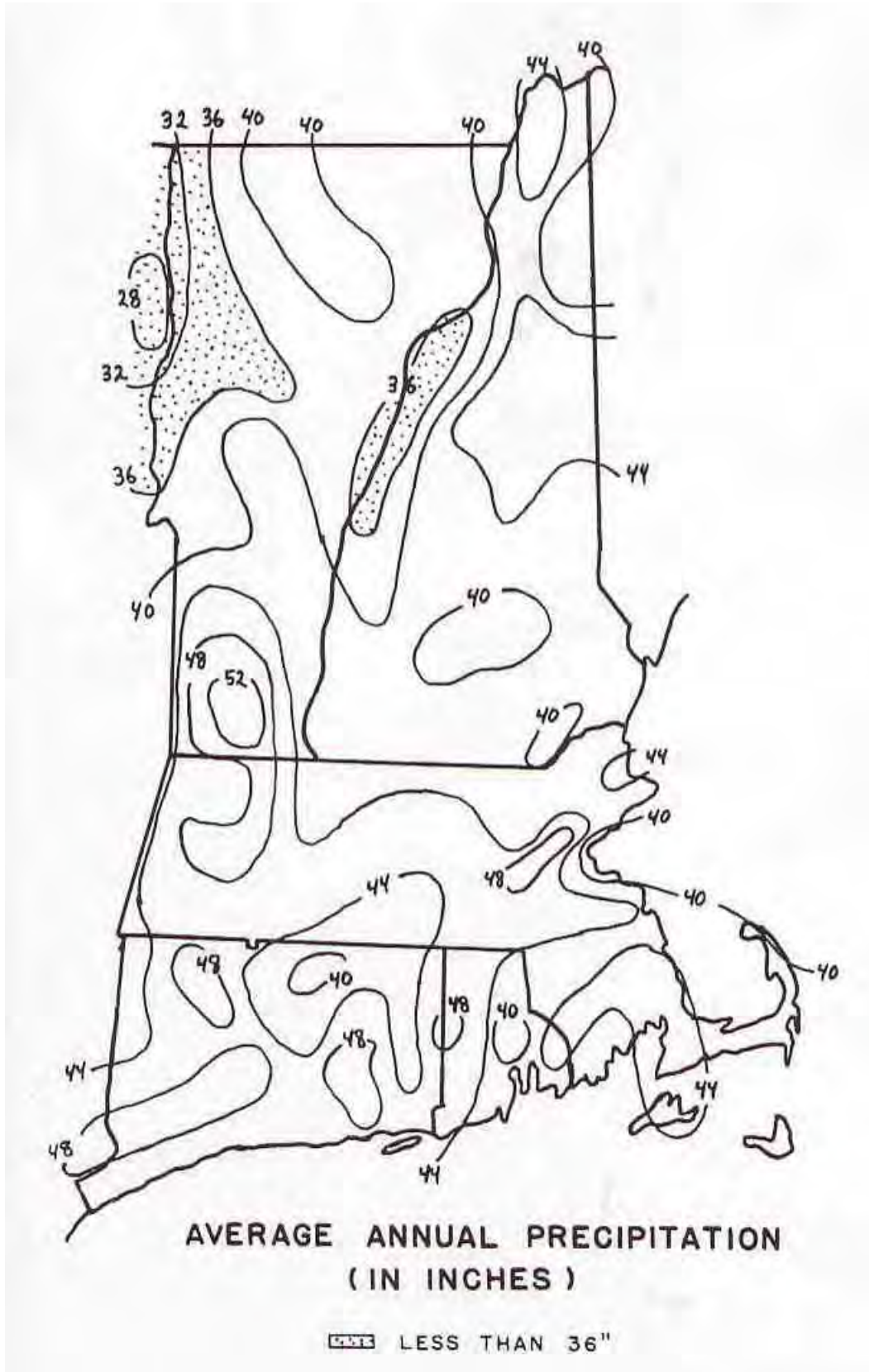


Figure 7. Average Annual Precipitation in Vermont (Meeks 1986:165).

types of habitation sites in the Woodland period:

Villages are semi-permanent major settlements occupied at any one time for at least six months of the year and comprising multiple extended family bands related through marriage and descent of between 500 and 1,250 people of all ages. These sites may have concentrated surface finds irregularly scattered over a 100-yard diameter or more. The main part of the site represents a homogeneous occupation having as much as 4 feet of stratigraphy containing horizontal living floors with features such as post holes, storage and/or refuse pits, cooking hearths, fire-cracked rocks, faunal, flora, and fish remains, ceramics, and a tool kit assemblage of flaked and ground stone implements with a wide distribution and density of debitage. Burials may be present nearby.

Base-Camps are seasonal habitation sites occupied for no more than a couple of months at any time and comprising several inter-related family bands representing a mobile population of between 100 and 250 people; these sites are focused on a specialized activity and/or food procurement. They can be roughly defined as an area of discontinuous surface finds scattered over an area of about 35 to 75 yards in diameter. Shallow stratigraphy of no more than about 2 to 4 inches containing remnants of living floors with cooking hearths, fire-cracked rocks, ash and charcoal deposits, a good amount of debitage and a stone tool kit defining traces of activity areas.

Bivouac Encampments are small, sheltered camp sites occupied for no more than about a month at any one time and comprising extended family bands of about 25 to 50 people; the primary site activities are focused on food procurement based on the seasonal subsistence cycle. They can be roughly defined as a surface scatter of finds no more than about 35 yards in diameter. A thin scatter of flaked debitage, stone tools, and very shallow if any discernible stratigraphy with few if any sub-surface features.

Unless individual surface finds are diagnostic artifacts, they are of limited value in establishing a contextual focus with archaeological meaning for specific model building. Such finds are usually best interpreted as random artifacts stemming from a single cultural episode.

Upper Connecticut River Basin

Ethnoarchaeological research has only just begun on a demographic study of the upper Connecticut River Basin during Woodland times (Mathewson 2010). Data for this study is being compiled from both the Vermont and New

Hampshire state site files, Cultural Resource Management (CRM) reports, published site reports, surface and museum collections, and discussions with archaeologists, ethnographers and local informants knowledgeable about the area and Abenaki culture in northern New England. There is a need to gather reliable archaeological data for establishing a better understanding of subsistence patterns in the annual seasonal cycle and settlement patterns along the upper reaches of the Connecticut River (Mathewson 2011a). Identifying site types and their distribution reflecting Abenaki economic systems through time similar to what has been proposed elsewhere (Beardsley et al. 1955) has not yet been fully developed. Work needs to be focused on developing a study based on what has been achieved on the lower Connecticut River Valley (McBride and Dewar 1981) and the middle part of the river (Holmes et al. 1991).

Archaeological work along the upper Connecticut Valley began in modern times in 1947 with Elmer Harp and his anthropology students at Dartmouth College and continuing intermittently into the early 1960s with field schools, surveys, and small excavations on both sides of the Connecticut River around Hanover, N.H. An initial archaeological survey of the upper valley was conducted by Howard Sargent in the early 1950s. This work built upon the earlier survey efforts of Warren Moorhead as part of his New England expeditions from 1912 to 1920. But it wasn't until sometime later that Bert Salwen prepared a site inventory of the upper Connecticut Valley (Salwen 1970). This effort was quickly followed by Howard Sargent in 1971 who provided more than a glimpse of Pre-Contact habitation from his excavations at the Sumner Falls site (1960) and the Hunter site (1974). What is known about the Pre-Contact habitation of the upper Connecticut Valley largely comes from Peter Thomas's 1979 Ph.D. dissertation on the Sokoki at Fort Hill (1990), the site inventory of the area compiled by Daniel Cassedy (1991), and the demographic survey Andrea Ohl (1994) put together largely based on Cassedy's inventory data.

The discovery and examination of sites has randomly occurred from surface collections recovered from plowed fields along the river valley. Many of these isolated finds are in private collections and in most cases do not have reliable provenience data. A number of local collectors and avocational archaeologists over the years have documented their finds in their large surface collections which have made an invaluable contribution for a general understanding of the temporal and spatial site relationships (Loring 1972, 1973). Very knowl-

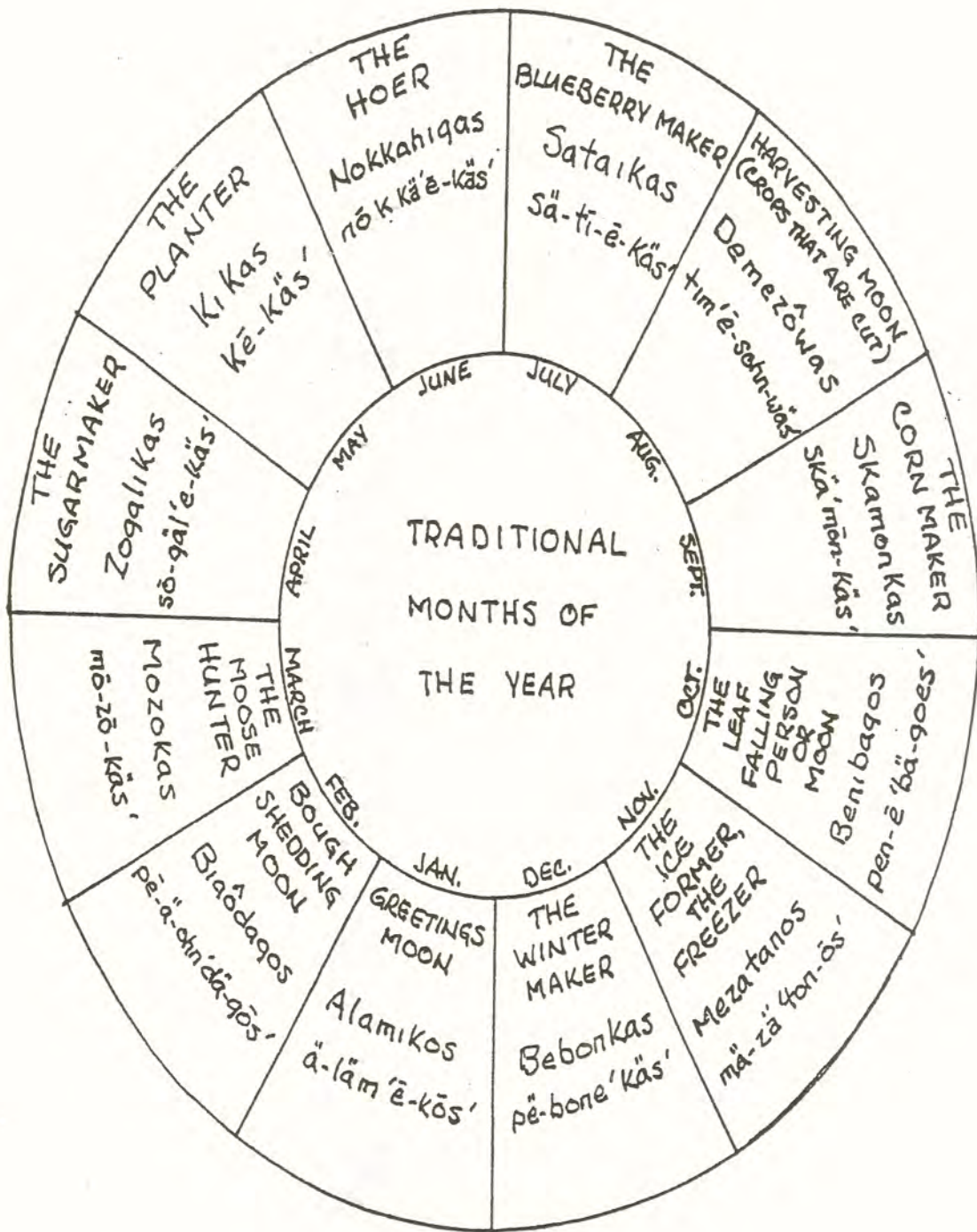


Figure 8. Western Abenaki Traditional Lunar Calendar (courtesy Jeanne A. Brink, 1991).

edgeable residents throughout the river basin have made major archaeological contributions with collections having known attributions include Arthur Whipple, Walter Needham, John Gale, Johnny Manarite, Gordon and Maurice Crandall, Gerald Coane, Tom Daniels, Tom Blais, Keith Spaulding, Bob True, and Clyde Berry.

The erosion of sites, particularly along steep river banks have resulted in a continual loss of archaeological information. Artifacts eroding out of a slumping river bank due to the river undercutting of the intervalle flood plain deposits has led to the loss of crucial provenience data which would have gone a long way in defining contextual associations. This is particularly the case on multi-component superimposed habitation horizons long buried by over several feet of redeposited river silt and sand sediments from the periodic flooding over the river banks. Very few systematic surveys have been conducted in the upper valley other than those carried out by CRM studies designed to mitigate negative impact of commercial development on threatened archaeological sites. These field projects are very selective according to where and how test excavations are permitted to proceed. Such work in the past has focused along the river valley with construction projects on bridges, hydroelectric power facilities, sewer lines, and highways such as the I-91 project begun in the early 1970s (Vogelmann 1973).

Information on 140 sites in the upper Connecticut River Basin have been briefly reviewed. Seventy-seven of these sites, or 55% of the total number in this sample, were either isolated finds with little or no contextual data or small undated assemblages (Figure 9). Without any diagnostic artifacts (usually projectile points or ceramics), these sites have limited archaeological value in any comparative study. Within the drainage basin, three Paleoindian sites have been identified in New Hampshire; the Whipple site on the Ashuelot River (Curran, 1984); the Tenant Swamp Site in Keene excavated in 2010 and 2011 by Robert Goodby; and the Colebrook Site on the upper Connecticut River flood plain examined by a SCRAP field school in 2005 (Boisvert 2011). There is also a string of Paleoindian sites along the Israel River Valley, an important part of the native trail from the Connecticut River eastwards towards the Androscoggin Valley (Haviland 2011).

The known Early and Middle Archaic sites representing only less than 1% of the total sample presents a very sketchy picture at best and a totally inadequate archaeological record of what must have been a far more substantial settlement of the river basin than this small aggregate of sites suggests. It is only with

the thirteen Late Archaic sites and the thirty-four Woodland sites that some type of an incipient distribution settlement pattern is only just emerging for late Pre-Contact times. A larger sample is needed for a much better archaeological understanding of what the negative evidence is providing about temporal and spatial relationships between sites. The occurrence of Early and Middle Archaic sites with the presence of a widespread use of quartz tool kits upstream from the West and Ashuelot Rivers suggests that the hunting, fishing, and gathering subsistence was not restricted at this time to this part of the Connecticut Valley (Ohl 1994:55). Until more Middle Archaic sites are identified with reliable provenience data, one can only speculate to what extent upland settlement was preferred over valley habitation.

Isolated surface material has been found in the White Mountains in several areas including the Nash Bog pond in Stratford near the headwaters of the Nash stream in a mountain pass at about 1,700 feet (Cassedy 1991:39). Although no one can say what these scattered few finds can tell us at this stage, it would be hard to dismiss what David Lacy (1994, 1997) has reminded us that living in such mountainous altitudes is not at all beyond what Pre-Contact native bands were capable of in northern New England. Five Pre-Contact sites and two find spots identified in 1997 in 47 locations along a 72-mile gas line in the far northwest corner of New Hampshire has produced clear evidence of habitation in a scarcely populated area that has received very little archaeological attention in the past. These sites represent small, brief occupations dating from Paleoindian times to the Contact period and clearly reflect a variety of natural settings and resource availability through time (Bunker 1997).

The distribution of Late Archaic sites and their transition to the Woodland period mapped by Ohl (1994) clearly suggests that sometime around 3,000 years ago, the Native American population in the upper Connecticut Valley had just begun to move in greater numbers onto the alluvial flood plain deposits. The thirteen Late Archaic sites generally reflects this same distribution pattern. Ohl, however, correctly cautions that the lack of earlier sites in the flood plain zone may be due to the remains of previous habitation being buried by later deposits or simply lost due to river erosion. If this movement on to the Connecticut River flood plain can be confirmed as a definite shift in population, it would indicate the likelihood that richer natural resources and a more reliable subsistence cycle continually drew small family bands down into the river

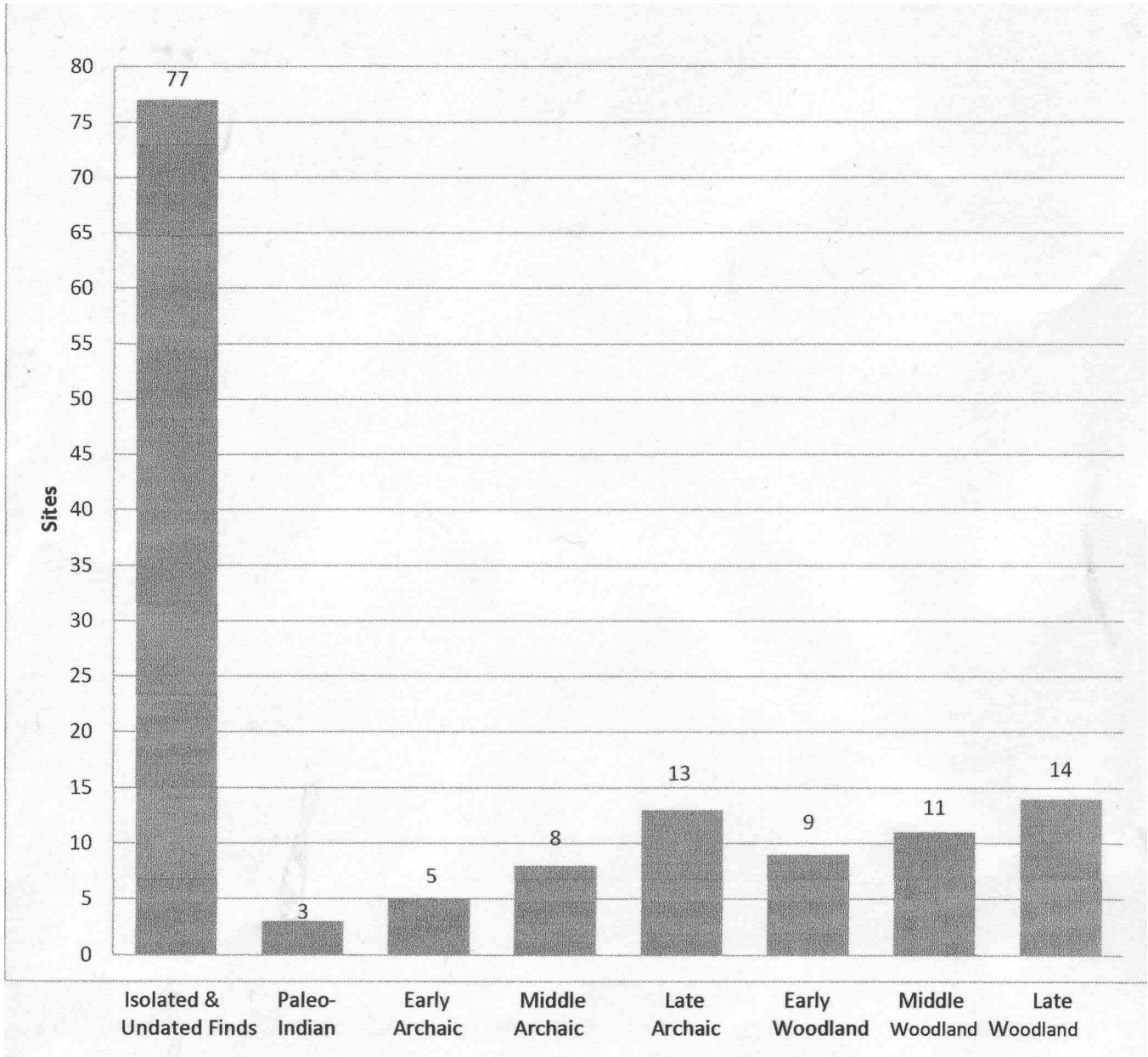


Figure 9. Primary Site database in the upper Connecticut River Basin. N-140.

valleys from the surrounding uplands. Six multi-component sites with Archaic and Woodland horizons need to be more fully understood as representing an important cultural transition with environmental implications. The petroglyphs along the Connecticut River at Brattleboro and Bellows Falls are best explained as Abenaki shamanistic rock art expressing spiritual beliefs involving chiefly power and fertility of water and game animals (Haviland and Power 1994:188-194).

Baseline Data

Based on known surface collections and the C-14 dates available from excavated sites (Boulangier 2007), it has been confirmed that there was widespread and continuous Native American occupation in the upper Connecticut River basin from the Late Archaic to Late Woodland times with a transition into Contact times. Much of this evidence comes from Middle and Late

Woodland sites representing small base-camps and bivouac encampments probably occupied by small family bands. Larger semi-permanent base-camps are also present in well chosen locations that most probably were occupied for longer periods. The general locations of twelve Late Woodland and Early Contact sites have been designated as villages based upon ethno-archaeological criteria of varying specificity in the hypothetical model previously outlined above. The inconsistent village site nomenclature in the distribution map reflects varying uncertainties about the designated settlements and their location which future ethno-archaeological research hopefully will be able to verify (Figure 10). Notwithstanding the documented fluidity of Abenaki villages and their population presented during the Contact period (Calloway 1990), it is assumed that these sites were occupied simultaneously; for the purposes of this study a figure of 500 has been taken as a conservative number of occupants at each village site at any one time over a six month period. Thomas (1990) used the same number when estimating the minimum population from his excavations at Fort Hill. Although others have pointed out that this figure may be too low (Haviland and Power (1994:159), it is better to be on the conservative side when estimating populations from an incomplete and scattered archaeological data base. An in-depth study needs to be made to further define what these following sites tell us about native occupation and to what extent they represent contemporary habitation during Late Pre-Contact times:

1. Squakheag (Sokwakik) was recognized as a major Sokoki village by English settlers as they began penetrating into the Green Mountains (Crockett 1921). By the 1650s Sokoki bands in Squakheag lived side-by-side with English settlers around Northfield, Mass. (Temple and Sheldon 1875; Thomas 1973a, 1990). In 1670 the Sokoki community at Squakheag became scattered as it broke up under the strain of the social upheaval and unrest developing as a precursor to King Philip's War in 1675 (Calloway 1990:76).

2. Vernon Oxbow Site (VT-WD-10) is a site known since the 1930s from a large collection of surface finds made by Walter Needham and John Gale. It's reported that these artifacts came from an area of about 20 to 30 acres (Cassedy 1991:6). In the 1970s Jim Petersen examined some of the Needham collection and identified ceramic sherds, numerous projectile points, celts, gorgets, nutting stones, and bifaces. He also identified Contact trade material in the form of glass trade beads,

copper beads, and a copper "thunderbird" similar to the one excavated in New Hampshire from Amoskeag Falls, a major Penacook village site, in the Merrimack River Valley (Starbuck 2006). More recently, in the early 1990s two burials became exposed in the same general area as a result of erosion and farming activities (Skinas in Cassedy 1991:6).

For a long time there has been a belief by some that when the nuclear power reactor facility was built on the west bank of the Connecticut in the early 1970s it was constructed over a native village site. We know from early Contact times Vernon was part of the Sokoki occupation of the Squakheag-Hinsdale stretch of the Connecticut River (Temple and Sheldon 1875). During colonial times Vernon represented one of the best salmon and shad fishing areas along the entire length of the Connecticut River (Haviland and Power 1994:9). A major village settlement most certainly was located in the Vernon area. In 1675 the area around Vernon became the rallying point and encampment for probably as many as 3,000 warriors from all over New England who had come there in support of Metacom and his resistance against the English (Crockett 1921:41-45). This was the largest native gathering on record in this part of New England during early Contact times (Calloway 1990:78).

3. Fort Hill Site (NH41A-5). The native village known as Fort Hill was inhabited by the Sokoki (also called Squakheag from the Indian village near Northfield) during a six- to eight-month period in 1663-64 (Thomas 1990). It is situated on a high bluff 100 feet above the Ashuelot River near Hinsdale, upstream from its mouth on the east bank of the Connecticut River (Cassedy 1991:4). The site was first located by Walter Needham from surface ceramics and signs of earthworks. Upon his discovery, Needham contacted Peter Thomas at the University of Massachusetts who then turned four years of extensive excavation of the site into his Ph.D dissertation. This seminal work has since become an archaeological bench mark for Western Abenaki studies in northern New England (Thomas 1990). The archaeology at Fort Hill closely confirmed historical documents and ethnohistorical information about the role of the Sokoki alliance with the French against Mohawk raids sweeping eastward from across the Hudson River during the mid 1600s (Day 1981; Calloway 1990). The horizontal removal of large sections of the plowed surface revealed extensive bank and ditch fortifications on three sides and a palisade trench on the other; floatation recovered significant subsistence data consisting of organic remains of food, remnants of fish

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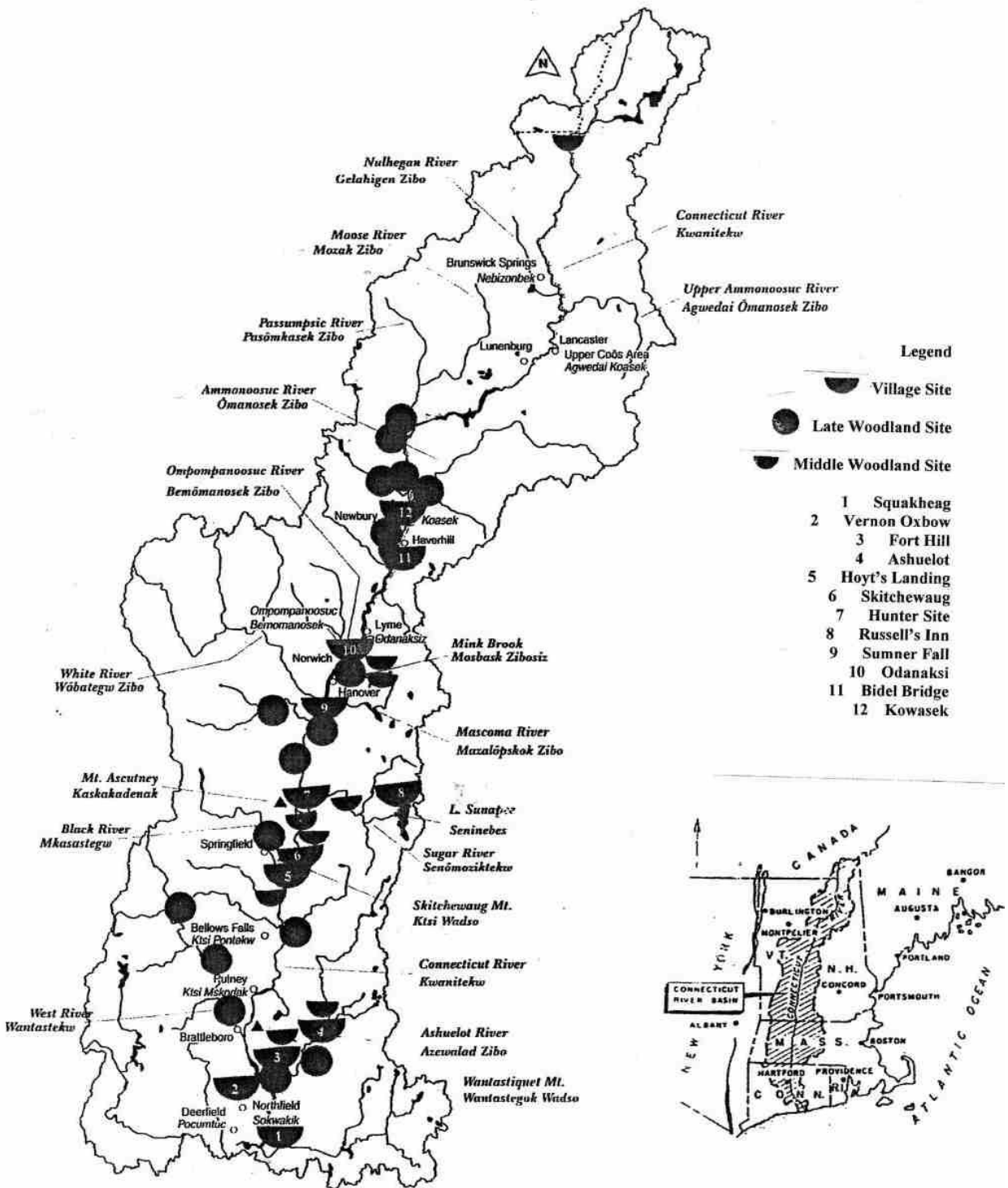


Figure 10. Abenaki Settlements in the upper Connecticut River Basin c. A.D.100 - A.D. 1675 (base map with Abenaki place names used with permission from Brown 2009:134).

bones, mussel shells, burnt seeds, and dog bones. Although no evidence of corn or other cultigens were recovered in the excavation, historical references describes the invading Mohawks destroying the village's large supply of corn being stored for the winter which clearly indicates that crop cultivation was a major part of the subsistence economy. The archaeological work at this site has opened up a number of aspects of the Abenaki culture of the Connecticut Valley during Contact times that needs to be further explored.

Not much is known about the origin of the Sokoki. Different writers have proposed different ideas about where they came from (Haviland and Power 1994; Crockett 1921). Gordon Day determined from 17th-century documents that the Cowasucks probably broke away from the Sokoki who had at one time inhabited the upper Connecticut River, which was referred to by the French as the "River of the Sokoki" (Calloway 1990:11). Day (1965a) believed that the name Sokoki is derived from the Abenaki word "Sohkwawkiak" meaning "the people who separated." This has prompted others to speculate about why and how this separation occurred (Calloway 1990:12; Bruhac 2006).

4. Ashuelot River. A good number of Pre-Contact sites have been found along the Ashuelot River and its brooks and streams due largely to the activity over many years of Arthur Whipple, an avocational archaeologist from West Swanzey. Widespread occupation remains occur throughout this area particularly around Swanzey and Winchester. Whipple has identified surface material from all Pre-Contact periods including a Paleoindian site and several small Early and Middle Archaic sites as well as sites dating to the Late Archaic and Woodland periods (Cassedy 1991:2-4). This southwestern corner of New Hampshire has a long history of native occupation which has drawn considerable attention over the years from Howard Sargent and Robert Goodby and their Anthropology students at Franklin Pierce College. Several Middle and Late Woodland sites along both banks of the Ashuelot River appear to be associated with an alignment of boulders pointing downstream in a V-shaped configuration that many believe to be a native dam for catching fish (Goodby 2002). Twenty years ago a field team from the University of Massachusetts unsuccessfully tried to date it. More recently, Goodby with his college students found scattered surface material near the dam and excavated three hearths of fire-cracked stones with charcoal providing C-14 dates between 3300-3800 B.P. in close association with Normanskill and Susquehanna points. Ceramics of the Late Woodland

period suggests a date ranging between A.D. 1300-1700, bridging the transition from late Pre-Contact times with the early decades of the Protohistoric period (Goodby 2002).

Stewart-Smith (1994:75) has observed that this area of the Connecticut drainage basin was an important meeting place of three closely related peoples: Nipmuc, Pocumtuck, and Sokoki. He further points out that archaeologically this is an important region with Fort Hill, the major Contact period site in the upper Connecticut River Valley at Hinsdale, and the historically known native village, Squakheag, only a few miles down the Connecticut River. It is very likely that a major Sokoki village or fishing base camp dating from the Middle and Late Woodland times was situated upstream from Fort Hill in the upper reaches of the Ashuelot River. Evidence of continuous settlement in this region during Pre-Contact times has clearly presented a completely different picture of Native American occupation along this part of the Connecticut Valley from a time when it was estimated that there were no more than 100 natives living in the early Contact period on the New Hampshire side of the Connecticut River from Hinsdale to Haverhill (Cook 1976:18).

5. Hoyt's Landing Site (VT-WN-61) is among several other sites near the confluence of the Black River and the Connecticut, which have yielded varying amounts of archaeological evidence indicating Woodland occupation (Frink 1991). This particular site revealed five overlying prehistoric alluvial strata dating to the Woodland Period overlaid by 19th- and 20th-century flood plain deposits (Frink in Cassedy 1991:17). Surface collections by Maurice Crandall and Tom Blais around the mouth of the Black River and upstream on the south bank towards Springfield indicated a widespread scatter of material. Scattered finds have been found in small test pits undertaken over the years on other sites upstream towards the Skitchewaug site. Considerable debitage, a hearth feature, and considerable amount of ceramics have been recovered. A flexed burial and 14 bifacial cache blades were recovered eroding out of the Connecticut River bank in the 1940s. When this material was examined by Stephen Loring he compared it to other material dating to the late Middle Woodland period in the Hudson Valley (Cassedy 1991:19). This high concentration of surface material and stratified deposits certainly suggests the existence of a village settlement near the mouth of the Black River. Petersen believed that this whole stretch of the west bank of the Connecticut should be considered one continuous site (Cassedy

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1991:19). Alternately, it could represent the shifting of village site locations up and down the river through time (Haviland 2011).

6. Skitchewaugh Site (VT-WIN-41) is located a short distance north of the mouth of the Black River on the Vermont side of the Connecticut River flood plain; it is one of the most important Pre-Contact sites in the Northeast (Cassedy 1991:19-20). Archaeological horizons dating from the Terminal Archaic to Late Woodland times are associated with well-preserved horizontal and vertical stratified multi-component features representing at least 6,000 years of continuous habitation along the Connecticut River (Heckenberger and Petersen 1988). Corn, beans, and squash, referred to by Abenaki people as the “three sisters,” were among the botanical remains found associated about at the same time with a Late Woodland C-14 date of about A.D. 1100 ± 50 (Petersen and Cowie 2002:270). This is the earliest known date of exotic cultigens cultivated anywhere in northern New England (Heckenberger et al. 1992; Chilton 1992, 2002). The presence of corn in all seven storage pit features at Skitchewaugh has been interpreted by Heckenberger et al. (1992) as indicating that corn was an important diet staple rather than simply a diet supplement.

The Skitchewaugh site was first identified in the 1950s from surface finds made by Maurice and Gordon Crandall and other collectors in the Springfield, Vt., area. Later in the 1980s, Tom Blais recovered a large artifact collection eroding out of archaeological features being destroyed by the slumping river bank. Soon after Vermont archaeologists began monitoring the site, the New England Power Company began funding several years of evaluation and excavation in 1987 under the general direction of James Petersen from the Archaeological Research Center at the University of Maine (Heckenberger and Petersen 1988).

A phase III excavation tested a small part of the site which was estimated at covering at least 100 by 700 yards. Random shovel test pits examined neighboring fields where surface collections were made in an effort to tie horizontal artifact scatter patterns into four excavated units of about 6 square yards. The stratigraphy near the eroding river bank was recorded at over 6 feet deep, containing several discrete living floors associated with a number of archaeological features such as cooking hearths, and storage pits with a large amount of organic remains and human burials. Seventeen different C-14 dates were recorded which bracketed the Terminal Archaic and Late Woodland cultural layers in the

Skitchewaugh excavation (Boulanger 2007). Quite clearly the Skitchewaugh site represents a major village settlement on the west bank of the Connecticut River some 500 years before Contact times and into the Protohistoric period (Haviland and Power 1994:136). Archaeological evidence indicates that the lower reaches of the Black River was also heavily populated during Late Woodland times when crop cultivation along the Connecticut River Valley was gradually accelerating.

Besides the Skitchewaugh site, additional evidence of corn cultivation in Vermont occurs in the Champlain Valley with C-14 dates of A.D. 1440 ± 125 and A.D. 1700 ± 115 at the Donohoe site (Bumstead 1980). Further evidence of corn comes from northwestern Vermont at the Headquarters site in the Missisquoi River delta in Swanton with a C-14 date of A.D. 1110 ± 40 with other dates from stratified Late Woodland contexts. (Hart and Rieth 2002). Another C-14 date of AD 1250 ± 60 for corn cultivation comes from the Bohannon site located close by in Alburg (Crock 2011; Petersen and Cowie 2002:270-271). A recent University of Vermont Consulting Archaeology Program (UVM CAP) mitigation project on the National Guard Road site (VT-CH-994) has produced additional evidence of corn with two C-14 dates indicating horticulture near the Winooski Valley in Late Woodland times around A.D. 1310 (Robinson 2011; Crock 2011). Beans may have been grown in Vermont later than corn while squash or gourds appear to be much older in northern New England where it occurs at the Sharrow site in Maine with a C-14 date of 3745 ± B.C. (Petersen and Cowie 2002:270-271).

In New Hampshire, the recovery of Pre-Contact cultigens is particularly rare. Apart from the Fort Hill site near Hinsdale from a Protohistorical context, the only evidence of corn from Pre-Contact evidence on the New Hampshire side of the Connecticut River comes from the Ingalls site (27-GR-112) near North Haverhill in Lower Cowas. This site excavated in 1994 by the New Hampshire Department of Historic Resources was reported on in 1996 in an MA thesis by Ronald Tetu in the Anthropology Department at Harvard University (Hume 1996; Boisvert 2011). Deep, well-stratified multiple components attributed to the Late Woodland period were dated by three C-14 dates from about A.D. 1050 to A.D. 1240 (Petersen et al. 2004). Dates from six corn kernels associated with St. Lawrence Iroquoian ceramics has suggested a realignment of when corn first arrived in this part of the Connecticut Valley (Boisvert 2011). Presently, the only other confirmed corn evidence from New Hampshire comes from the Campbell site at

Litchfield in the Merrimack Valley. However, this exists in the form of a single kernel from a possible Post-Contact context which may indicate trading activities rather than cultivation (Starbuck 2006; Bunker 2011).

7. Hunter Site (NH28-3) as the most substantial Woodland habitation site on the New Hampshire side of the Connecticut is located in Claremont on the north side of the mouth of the Sugar River. It was first surveyed by Sargent in 1952 and later excavated by him and William Young in 1967 in a salvage effort funded by the N.H. Dept. of Transportation in order to rescue artifacts being disturbed by the construction of a new bridge across the Connecticut. In 1970, Sargent returned to excavate an additional small area next to the bridge (Cassedy 1991:12-13).

The Hunter excavations extended over a large area covering three different terraces on the side of the river valley. It contained deep stratified cultural deposits of about 11 feet thick consisting of seven distinct habitation levels (Sargent 1974). The lowest terrace contained two separate components dated by two C-14 dates to A.D. 1300 ± 120 and A.D. 1430 ± 95 linking habitation with continuous occupation through the Early, Middle, and Late Woodland periods containing multiply occupation levels in each component (Cassedy 1991:13). The excavation uncovered over 2,000 square yards, which revealed numerous artifacts and features including some structural evidence, burials, and charred plant remains (Sargent 1975:19). Early interpretation suggested the presence of at least three “longhouses” and ceramics attributed to the Abenaki during the Late Woodland period (Starbuck 2006). Although Howard Sargent never got the chance to publish a full site report, he was successful in 1976 at getting it listed on the National Register of Historic Places based upon the site’s archaeological significance (Starbuck 2006:225-226). The Hunter site represents one of the most complete records available of Woodland occupation along the upper Connecticut River Valley. It has necessary criteria for designating it as a major village settlement just prior to the Contact period.

8. Russell’s Inn Site (NH29-1). Sargent first reported the Russell’s Inn site in 1949 and began systematic work at the site in the village of George’s Mills, N.H., and from 1979 continuing with several field schools and workshops through the 1980s (Cassedy 1991:13). It is located at the northern end of Lake Sunapee and is a prolific site producing artifacts from all Pre-Contact

periods except the Early Archaic. A possible Paleoindian site was identified as well as a Middle Archaic site with the characteristic Stark and Merrimack projectile points (Sargent 1985). Archaeological evidence of Middle Woodland occupation is widespread in the area including ceramics and stone tools found close to the lake as well as clusters of fire-cracked rocks in hearths with scattered remnants of burnt bone and debitage. The Late Woodland period is represented by a house structure Sargent identified by uncovering three hearths in a row associated with Levanna points, and incised and collared pottery he believes dates to about A.D. 1300. These hearth features could represent a “longhouse” such has been suggested by a living floor at the Skitchewaung site (Skinas 1993). The region offers the right type of habitat for the location of a good-size village. The widespread surface collections in the area lends some support to signs of occupation suggesting a village site reported somewhere around Newport (Price 1967:11). Stewart-Smith (1994, 1999) has pointed out the importance of the Sunapee Lake area in the cultural exchange and movement between the Sokoki in the Connecticut Valley and the Penacook in the Merrimack Valley a short distance to the east. The weight of the present evidence suggests the presence of a village settlement in the Late Woodland period not far from Lake Sunapee.

9. Sumner Falls Site (VT-WN-2). This site near Hartland, Vt., was examined by Howard Sargent in the 1950s and was later excavated by him in the 1960s (Cassedy 1991:21). It was situated on the second terrace of the Connecticut River and contained two different occupation horizons separated by sterile flood deposits (Haviland and Power 1994:72-73). Thirtyfive 5-foot squares were excavated in two separate areas of the site. The lower occupation contained material suggesting a Late Archaic transitional date with Orient Fishtail projectile points, steatite bowl fragments and a large assemblage of flake debitage clustered in localized groups suggesting work shop activity areas. A number of hearths were identified which yielded a C-14 date of about A.D. 800. The upper occupation horizon had a Late Woodland assemblage including Levanna points, cord-marked and incised pottery and a steatite elbow pipe. A stone lined hearth was excavated associated with this assemblage (Sargent 1960, 1971). Other sites in this immediate area include the People’s site (VT-WN-1) near the confluence of the Ottauquechee and Connecticut Rivers; this site in this area has drawn a lot of attention from a number of archaeologists over the years but is

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still not understood very well. A small Late Woodland site at Deweys Mills (VT-WN-57) was excavated in 1985 at the site of the Hydro Energies project on the west bank of the Ottauquechee River seven miles upstream from the Connecticut River. About 25% of a 36-square-yard area was excavated, which produced a C-14 date of about A.D. 1460. from hearth charcoal. This site was determined significant enough to be nominated to the National Register of Historic Places. The cluster of Woodland sites and surface finds in this area of the West bank of the Connecticut River strongly suggests the good likelihood that there is a village size settlement in this region of the valley.

10. Odanaksi/Odanaksis (“at the Little Village”) has been identified at Lyme, N.H., and designates a cluster of five Pre-Contact sites that have been documented on river terraces on the east side of the valley a short distance from Post Pond, along a small brook leading into the Connecticut River (Cassedy 1991:26; Haviland and Power 1994). Elmer Harp’s Dartmouth College anthropology students investigated some of these sites in 1947. Howard Sargent followed with a survey in 1951 in this same site cluster which he referred to some as “village” sites. He reported a good-size surface collection including projectile points, drills, gouges and an axe. Katharine Blaisdell (1980:4) remarked that a good quantity of surface finds including “arrowheads, tools, and the skeleton of a 12-year-old boy” were found as well as fire-cracked rocks from a disturbed hearth near these same sites. In the early 1980s Professor Barbara McMillian of the Anthropology Dept. at Dartmouth College used one of these sites which she designated as the Bailey site (NH17-12) as a student field school. Her research over several years yielded over 3,000 lithic flakes, over 50 pottery sherds, and two C-14 dates of about A.D. 1170 and A.D. 1370. Cassedy examined and photographed this assemblage in 1989 and compiled a short summary of her findings including eight Levanna points, grit-tempered pottery, and a large complex pit feature (Cassedy 1991:27). A full report on the Bailey site by Andrea Ohl (1991) confirmed a Late Woodland date while providing more contextual data of this period. The concentration of archaeological remains around this cluster of sites basically represents a homogeneous data-base of the same date as the Bailey site; this association strongly suggests that a village settlement dating to this period was most probably situated somewhere in this general area not far from the east bank of the Connecticut River. Such a settlement at this location might very well refer to the “native village” that

Chester Price (1967) mentioned in his article on New Hampshire native trails as having existed somewhere just north of Lyme.

11. Bedel Bridge Site (NH 12-5) is located in Lower Cowas, N.H., on the east bank of the Connecticut River not far from Haverhill. Surface reconnaissance in adjoining corn fields in 1976 identified a large Pre-Contact site from a surface collection including steatite fragments, an adze, and pottery. The presence of fire-cracked rock and charcoal indicated that plowing had disturbed a shallow sub-surface hearth. It was reported as “apparently a village site” on an old meander dating to at least the Early Woodland period (Cassedy 1991:29).

12. “Kowasek” is a well known Western Abenaki village identified by historic and ethnohistoric sources as being located on the Oxbow near modern-day Newbury, Vt., and Haverhill, N.H. (Haviland and Power 1994; Calloway 1990) (Figure 11). Gordon Day translates the Abenaki place-name “Kowasek” (Coos, Cowas, Cohas, Koes) as “at the place of the White Pines.” He believed that it was the major settlement of the Cowasucks at least as old as 1663 when refugees from the Iroquois wars were beginning to make their way towards Canada from the south in search of a safe refuge (Day 1981). The Oxbow area of the upper Connecticut River Valley appears to have been traditionally divided into two different areas – Lower Cowas and Upper Cowas – separated by the “15 mile rapids,” a rough stretch of white water on the river that made continued canoe traffic difficult north of the Passumpsic River. Flood plains on both sides of the river were prime areas for settlement sites with nearby fertile alluvial soils on the intervale meadows, forests full of game, a abundant supply of fish each year during the spring runs, and a growing season in most cases of no less than 130 frost-free days. Early colonial captives who were led by Indian war parties through Lower Cowas on their way to captivity in Canada later reported the many cleared and cultivated fields they saw along the river, which is what first drew settlers to the upper Connecticut Valley after 1760 at the end of the French and Indian War (Powers 1841; Crockett 1921). In 1770, it was observed that there were fields of corn in Newbury so tall and luxuriant it was difficult to see a man standing up in the field more than one rod from the outermost row (Hemenway 1868-91, II:23).

The Cowasuck are known in northern Vermont for their hybrid corn seed grown on the intervale meadows

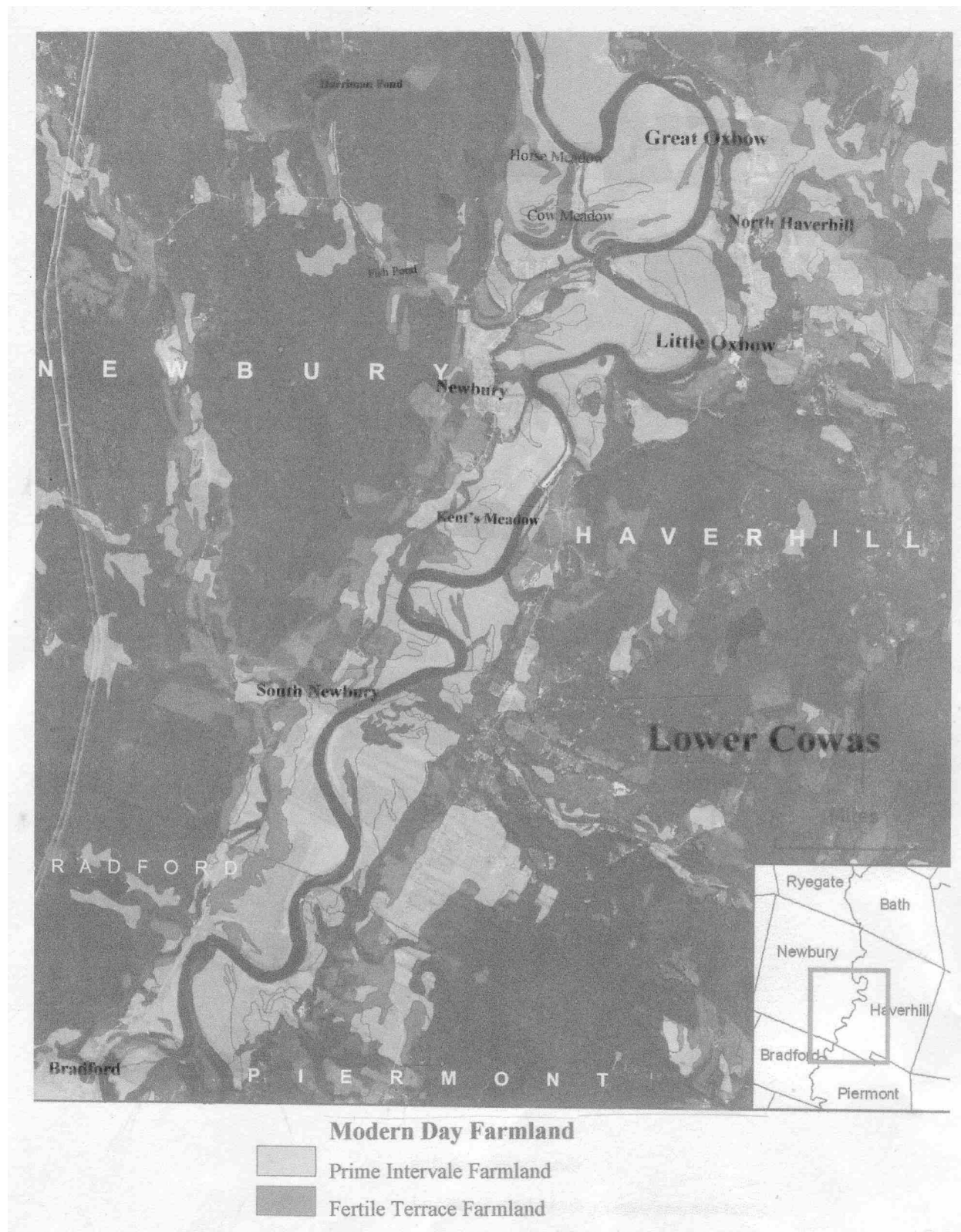


Figure 11. Some of the richest farmland in northern New England is located in the upper Connecticut River Valley in the area of Newbury, Vt., and Haverhill, N.H., in the heart of Cowasuck country near the suspected location of the Lower Cowas village of “Kowasek” (modified with permission from Brown 2009:21).

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in Lower Cowas (Haviland 2011). When the first colonial settlers came up the Connecticut River to the Newbury area, they were given corn seeds from the Cowasucks living there. Since that time, the Green family has grown these corn seeds for many generations on the Cowas flood plain. Through many generations, they shared these corn seeds with others including Sarah and Charlie Calley who grew the Cowasuck hybrid corn seeds for 25 years (Kowasuck Traditional Band of the Koas, nd). In 2006, the Calleys donated the seeds back to the Kowasuck Abenaki Nation who have in turn shared them with local families who are continuing to grow the special hybrid seed today as a special traditional focus of interest (Doucet 2010). Benjamin Hall (1858:582-592) provided a mid-19th-century description of “Coos,” which clearly indicated the extensive habitation “Coosucks” had on the intervale meadows on both sides of the Connecticut from Lunenburg, Vt., in the north to Bradford, Vt., in the south. Not only does Hall quote local residents explaining all the signs of past habitation they have seen, including large quantities of surface finds and plowed up burial remains, but also the remnants of what was described as a burial ground and a “fort” still visible near the Oxbow. The archaeological identification of the “Kowasek” village site, remnants of a fort and remains of a French mission, which some local Newbury residents believe may date to as early as 1675, still remain undetected (Mathewson 2011b). The signs of past habitation in the Lower Cowas region of the “Great Oxbow” are clear indications that the antiquity of this area stretches back deep into the Western Abenaki past during Pre-Contact times and well beyond the mid-17th-century date tentatively suggested by Gordon Day in 1965. The early history of the Cowasucks and their major village at “Kowasek” is well beyond the written record and can only be understood now with a trowel rather than documents. But above all else, people of Abenaki ancestry believe the area around the Great Oxbow in Lower Cowas should always remain sacred ground as it contains ancestral Abenaki remains they maintain memories of in their oral histories (Doucet 2010; Moody 1985).

In 1985 a small beginning was made with a Vermont Division for Historic Preservation (VDHP) grant awarded to Tom Hemmings through the Fairbanks Museum in St. Johnsbury for conducting an archaeological survey and test excavations on the Newbury/Haverhill Oxbows. He made a start at sorting out the many different sites in the area and sieving through the sometimes contradictory descriptions of locally known

site information gathered through many generations (Hemmings 1985). Work on this project continued with the analysis of the artifacts, features, and site stratigraphy by Dan Cassedy, who completed his report in 1989 (Cassedy 1991:31). In 2007, the UVM CAP archaeological team conducted a full examination of a proposed water main extension project in Newbury (Mandel et al. 2011). Three previously unknown pre-historic sites were identified generally dated to the Middle to Late Woodland period and a possible Paleoindian site. This report contained a brief review of other Pre-Contact sites previously recorded on the intervale meadows and an outline of Euroamerican settlements in this area during the historical period. Much remains to be done to conceptualize the archaeological potential of the sites previously examined in the “Kowasek” settlement cluster, and the means for further research at Cowas on Western Abenaki cultural history. Details on individual Cowas sites previously identified by Hemmings, Cassedy, Boisvert, and the CRM contract archaeology reports are available in the VDHP and NHDHR state site records in Montpelier, Vt., and Concord, N.H., respectively. Archaeological research on Lower Cowas and Cowasucks continues and will be reported on in more detail elsewhere (Mathewson 2011b).

Demographic Pattern

The archaeological data used to compile the distribution map of Middle and Late Woodland population in the upper Connecticut River Basin is based upon the work of countless scholars, collectors, and avocational archaeologists in some cases going back beyond the 1930s. This attempt at looking at the upper Connecticut River Basin as an integral cultural area was contingent upon the integration of the archaeological data base developed over the last thirty years in both Vermont and New Hampshire. This site distribution should be considered a preliminary effort only. Not surprising in such an undertaking, more work needs to be done in tracking down source material particularly in artifact collections and archives I've not yet been able to access. Continued work on this Pre-Contact settlement pattern will no doubt sharpen the emerging picture, which should provide a better understanding of micro-environmental factors affecting human choices for the selection of site locations in the upper Connecticut River Basin. Before gaps in the archaeological knowledge of the upper Connecticut Valley can be filled, attention needs to be directed at learning more about the sites we already

know something about in the context of the physical landscape around them. Until our environmental and subsistence models are refined through problem-oriented research, searching for new sites is not the answer.

The coming together of family bands near the mouths of the tributaries and the major falls and rapids along the upper Connecticut Valley would naturally lead to a greater inclination towards sedentism with the forming of village settlements positioned to have the opportunity for hunting in the uplands while taking maximum advantages of the rich riverine food supply and wild plant cultivation within fertile wetlands along the flood plains. As Ohl (1994) pointed out, the evidence for increased sedentism in river valleys during this period has been noted in other parts of New England by other researchers (McBride and Dewar 1981; Heckenberger and Petersen 1988). Such a shift in the settlement pattern down on to the riverine flood plains during the Late Archaic times might well have initiated intensive wild plant management and cultivation during the Early and Middle Woodland times setting the scene for the cultivation of exotic cultigens some time before A.D. 1100. The distribution patterns clearly suggests the clustering of Early and Middle Woodland sites in areas around Vernon and the Ashuelot River, north of Bellows Falls, the Great Oxbow intervale area around Newbury-Haverhill, north to the mouth of the Wells and Ammonoosuc Rivers, and around Canaan and West Stewartstown near the Canadian border (Bolian and Gengras 1990). This site distribution pattern is also generally reflected in the Later Woodland period.

The whole question about increasing sedentism linked with crop cultivation and the formation of aggregated populations of family bands in village settlements is a topic that continues to raise considerable interest among New England archaeologists (Bunker 1994; Petersen and Cowie 2002; Sidell 2002). A major archaeological question that needs investigation concerns the "clustering" of Woodland settlement sites and to what extent they represent the coalescing of the Abenaki Cowasuck bands by Woodland times into villages in the upper reaches of the Connecticut River Basin centered around Lower and Upper Cowas, while Abenaki Sokoki bands settled into more southern villages in the areas of the West, Black, Ashuelot Rivers and along the great bend in the Connecticut River around Vernon. The homeland territory of the Cowasuck and Sokoki were likely to have begun to separate as a response to maintaining cultivated meadows along the river valleys as early as Middle Woodland times; the separation of these two peoples most likely happened

long before they were recognized in the written record by ethnohistorians and ethnographers during Contact times. Hopefully through further archaeological research it will be possible to shed more light on the settlement of the upper Connecticut River Basin by Cowasuck and Sokoki bands during Pre-Contact times.

It is clear that there are definite biases in the present database which reflects more accurately past archaeological work rather than settlement distribution patterns. Most of the known sites are the results of surface collecting by farmers and avocational archaeologists, academic sponsored projects, and commercial construction requiring CRM mitigation survey and excavation. Site locations have been much less frequently reported in heavy woodland upland areas out of the river valleys and along the more remote stretches of such major waterways such as the Nulhegan, Clyde, and Indian Stream tributaries. In particular, waterways and wetlands around Lake Memphremagog and Lake Umagog as well as many interior ponds remain largely unsurveyed as many parts of the Connecticut River Valley north of Wells, Vt., and Woodsville, N.H. Much remains to be done to clarify the archaeological picture along the upper Connecticut Valley by minimizing built-in interpretative biases caused by site preservation and random chances of discovery.

Conclusion

Notwithstanding the obvious gaps in the available data base concerning the Native American population along the upper Connecticut River, an overall picture of continuous habitation along the valley is slowly emerging from the Late Archaic through Woodland times to the Contact period. This has allowed a number of inferences to be drawn which are providing a more complete foundation for framing research questions based upon the following ideas, which differ in important ways to what was suggested on the basis of available data thirty years ago:

1. Haviland and Power (1994:145) believed that Woodland settlements were located in places that "purely by chance" were admirably suited for growing crops. Present evidence strongly suggests that there was nothing random about where Abenaki villages were located in order to take full advantage of crop cultivation within the upper Connecticut River Valley during Woodland times. By the end of the Late Archaic individual family bands had figured out the great advantages of increased subsistence activities involving

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the management and domestication of wild plants on the fertile flood plain of the intervale meadows along the river valley and near the mouth of its major tributaries. This increased effort in the tending and gathering of wild food plants integrated with the traditional hunting and fishing activities set the scene for the gradual adoption of exotic cultigens ushering in horticulture as the new component of the subsistence cycle. The positioning of major settlements near the rich alluvial soils within a protected valley habitat having an average growing season of 120 to 130 frost-free days was no accident; – it was a conscious decision stemming from accumulated knowledge about how and where wild food resources can best be harvested. The idea that “topographic compression” would have forced foragers into earlier and a more concentrated horticulture on the narrow upper Connecticut intervale than in the northwest corner of the Champlain Valley (Heckenberger et al. 1992) needs to be further examined.

2. Snow (1980:335) was of the opinion that horticulture was not consistently possible in northern New England in any areas having less than a 150-day growing season. His belief that the upper Connecticut River Basin was totally unsuitable for horticulture helped to establish his premise for linking Vermont Western Abenaki with the same basic subsistence patterns he defined for the non-horticultural Eastern Abenaki and their neighbors in Maine and the Canadian Maritimes. Environmental factors argues strongly against this view and support the contrary idea that the upper Connecticut Valley was well within a 130-day growing season and represented some of the best farming land in northern New England during late Pre-Contact times.

3. The clustering of archaeological sites dated to the Woodland period in the Great Oxbow area of the upper Connecticut River Valley provides the time depth necessary for a better cultural perspective of the Cowasuck settlement and the “pivotal” Abenaki activities in Lower Cowas during the 17th- and 18th-century described through ethnohistorical sources by Day (1981) and Calloway (1990). New information is required to clarify the archaeological picture in Lower Cowas during both Pre-Contact and Contact times; the weight of the present evidence strongly indicates that the important role this region had in the Protohistorical and Historical periods can be directly linked to its strategic location described by Calloway (1980:84) as the “cross roads” of native traffic across the upper Connecticut Basin; its importance is also due to the success of

Cowasuck management of wild food plants leading to corn cultivation probably dating back to Later Middle Woodland times.

4. Cowas as a region rivaled Missisquoi as a physical sanctuary and safe-refuge while it maintained a special focus of Western Abenaki resistance against the encroachment of white settlers up the Connecticut River. The on-going fight for independence by the Cowasucks throughout the 17th- and 18th-century continued long after other neighboring native bands to the east had succumbed to European political pressure and military supremacy. We know that Cowas in early Contact times provided a secluded area of retreat and safe refuge for a very heterogeneous “intertribal community” of refugee immigrants coming from raging warfare in the south but also arriving from Missisquoi and the Abenaki village at St. Francis (Calloway 1990). Other out-of-the-way places unknown to EuroAmericans were no doubt concealed around Lake Memphremagog, Lake Umagog and the lakes and ponds further to the north of upper Cowas. Many of these sites were no doubt inhabited back in Pre-Contact times and continued to shelter Cowasucks and refugees throughout the Contact period (Mathewson 2011b). This pluralistic phenomena demonstrated by the Cowas community was not something that just happened during the Post-Contact period, but rather it was a manifestation of deep cultural roots firmly embedded in Pre-Contact Western Abenaki society.

5. No matter what sources are used to project demographic figures from ethnohistorical research on the Western Abenaki, the present archaeological evidence indicates that the estimates for the pre-epidemic population in the upper Connecticut River Basin may be as much as twice as large as previously projected (Snow 1980; Haviland and Power 1994). It is clear that there were far more major settlements along the upper Connecticut River Valley and up its major tributaries dating back to Woodland times than those few settlements Europeans knew about as reported in the ethnohistorical documentation covering the early Contact period. There is little reason to believe that the present archaeological data base does not support the existence of major settlements along the upper Connecticut River Valley occupied by Sokoki in the south and Cowasucks in the north just prior to A.D. 1609 at the beginning of the Protohistorical Period. Using the very conservative estimate of 500 people of all ages per village, the total population in this part of Vermont and

New Hampshire would be somewhere in the range of 6,000 to 8,000 Abenaki. This more realistic demographic figure for the upper Connecticut River Basin will place the total Western Abenaki pre-epidemic population figure in Vermont somewhere in the neighborhood of between 12,000 to 16,000 including at least 6,000 Abenaki in the Champlain Valley (Mathewson 2011a). With an archaeological reappraisal of the settlement patterns and corn cultivation in the upper and middle Merrimack valleys, it would not be surprising that the total Abenaki Pre-Contact population taken together in both Vermont and New Hampshire might be adjusted to within a general range of 18,000 to 20,000. Using a more conservative post-epidemic mortality rate of 90% instead of Snow's figure of 98% (1980:34), more realistic figures for the overall surviving Western Abenaki population by the mid-18th century would be possibly somewhere in the range of 1,800 to 2,000 with a population range of some 600 to 1,000 Abenaki projected for the upper Connecticut River Basin.

In the past there has not been adequate archaeological evidence available for ethnographers and ethnohistorians to use in their efforts at estimating Western Abenaki populations in northern New England for a study of Post-Contact epidemics. Consequently, most Western Abenaki population estimates for both the Pre-Contact and Post-Contact periods have been very much on the low side. This initial analysis of Woodland sites within the upper Connecticut River Basin is seen as just one small effort at gaining a better archaeological perspective of the thriving indigenous population which existed across northern New England prior to the arrival of the Europeans. Continued archaeological work over the years is making it possible to paint a totally different cultural picture from that which has caused writers in the past to generally treat Vermont as an "uninhabited area" and "ethnographically a virtual terra incognita" (Day 1962:28).

Without a more accurate demographic picture of the Western Abenaki community during Late Woodland times, it is difficult to interpret, with any clarity, how and why particular native bands functioned the way they did in response to the consequences of European conquest of their homeland during the Contact period. An increase of Pre-Contact population estimates, primarily based on the present archaeological data base is laying a foundation for revising the post-epidemic lethal mortality figures used in the past in both Vermont and New Hampshire. This new look at the native population from the archaeological evidence left behind in the ground will have implications for the further study

of Western Abenaki history across northern New England.

New England archaeologists need to take into account the full carrying capacity of horticulture together with that of wild fruit, nuts, and plants among the Cowasuck and Sokoki of the Upper Connecticut River Valley. While acknowledging the marginal nature of cultivation among the Eastern Abenaki and related bands, the full potential for native horticulture among the Western Abenaki in Vermont has not been properly assessed within a very different environmental setting from what prevails in northern New Hampshire, most of Maine, and the Canadian Maritimes. The importance of crop cultivation in Western Abenaki culture is clearly indicated by the essential role it has in traditional oral history and its focus as the main subsistence activity during much of the native lunar calendar (Brink 2011). The cultural impact of crop cultivation on Abenaki society has yet to be fully explored; the consequences of successful harvests over time not only results in more sedentary village life and a rise in population, but also many other profound social and technological changes which need to be better understood.

Future research calls for sensitivity to the issue of contemporaneous village habitation and built-in biases in the archaeological data base. It's important to know the survey history and data accessibility for any blank areas on a map before definitive statements can be made about its cultural significance. There are many gaps in our archaeological knowledge about the site locations in the upper Connecticut River Basin; little is known archaeologically in the upper Cowas region of Lunenburg, Vt., and Lancaster, N.H., and further north that it is difficult to come to any meaningful conclusions about native habitation along this part of the Connecticut Valley up to the Canadian border.

Instead of just looking for more sites, there needs to be a renewed effort made at interpreting sites and collections already recorded. Questions need to be posed about crop cultivation and resource availability. Assemblages from single component sites need to be carefully studied where behavior activities are less difficult to recognize than from material remains of repeated habitation over several successive occupations. There is also a need to recognize and define relationships between different components and structural features within multiple component sites bridging the transition from Late Archaic to Woodland cultures. Ethnohistorical and ethnographical sources including traditional oral histories need to be carefully reviewed for historical and cultural inferences that might better explain archaeologi-

cal findings and how they reflect the evolution of Western Abenaki culture through time.

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