The Woodland Period Occupation of Grand Island

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ABSTRACT The coastal waters surrounding Grand Island, Michigan represent one of the most productive fisheries along the southern shore of Lake Superior. Archaeological investigations of coastal settings like Grand Island have figured prominently in studies of Woodland period (ca. 0–A.D. 1600) subsistence, settlement, and social integration in the Upper Great Lakes. The topic of Woodland subsistence and settlement is not without controversy regarding the timing of technological changes associated with the increased exploitation of the fall fishery. This article provides a summary of Woodland period archaeology on Grand Island with the goal of interpreting the data from within the framework of the Inland Shore Fishery debate. A multiscalar approach is used to look for differences between Initial and Terminal Woodland fishing strategies and address changes in the way Grand Island was socially and economically integrated into the broader context of Woodland period settlement and subsistence systems. The evidence suggests that while Grand Island was occupied and used in a consistent manner throughout the Woodland period, the social and economic significance of the island may have changed with a shift in settlement toward greater access to deepwater settings for the exploitation of fall-spawning fish.

Woodland period (ca. 0–A.D. 1600) populations throughout the Upper Great Lakes developed a broad, versatile, seasonally-based subsistence economy involving multiple strategies for hunting, fishing, collecting, and horticulture, with an increased emphasis on exploiting aquatic resources (Brashler et al. 2000; Brose 1970a, 1970b; Cleland 1966, 1982, 1989, 1992b; Fitting 1975; McPherron 1967; Martin 1985, 1989, 1999; Martin et al., 1993). Within this diverse system of settlement and subsistence, Great Lakes coastal settings with highly productive fisheries are thought to have become key locations on the landscape, where households and extended family groups seasonally congregated to exploit the spring and fall fisheries.

This article provides a summary of archaeological investigations at Woodland period coastal sites on Grand Island, Michigan (Figure 1), with the goal of placing Grand Island into the context of the debate between Charles Cleland (1982, 1989) and Susan Martin (1985, 1989) regarding the timing, nature, and development of the fall fishery in the Upper Great Lakes. The debate serves as an interesting entry point for a discussion of Grand Island archaeology because it provides the regional framework for understanding changes in the seasonal nature of coastal site use (i.e., spring- and/or fall-spawning fisheries), their social and economic significance within a broader settlement system, population changes, and the timing of technological developments (e.g., the gill net) during the Woodland period in the Upper Great Lakes.

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Cleland (1982, 1989) argues that the Terminal Woodland period (ca. A.D. 600–1600) marks the introduction of the gill net, which helped intensify the harvesting of fall-spawning fish species, and provided Woodland peoples with a large, storable food source immediately prior to the onset of winter. This, in turn, supported a growth in population size from the Initial Woodland (0–A.D. 600) to the Terminal Woodland and inspired new forms of work organization in order to better meet the labor demands of the fall fishery.

Martin (1985, 1989) criticizes Cleland's model by arguing for greater continuity in subsistence strategies and coastal site use throughout the Woodland period in the Upper Great Lakes. According to Martin's model (1989), there is a significant degree of overlap between the location and physiographic settings for Initial and Terminal Woodland coastal sites in the Upper Great Lakes region. Both occur in close proximity to spring and fall-spawning fish habitats, which raises doubts about the rapid introduction of the gill net and the development of the intensive fall fishery during the Terminal Woodland (Martin 1989:602–603).

Neither model fully explains the Woodland settlement and subsistence patterns currently observed in the archaeological record for Grand Island. In fact, the models seem to approach the issue of Woodland subsistence and settlement from two different scales of analysis. Cleland (1982) appears much more concerned with understanding macroscalar processes of evolutionary change by providing a mechanism for population growth and social development during the Terminal Woodland (i.e., the gill net and fall fishery).

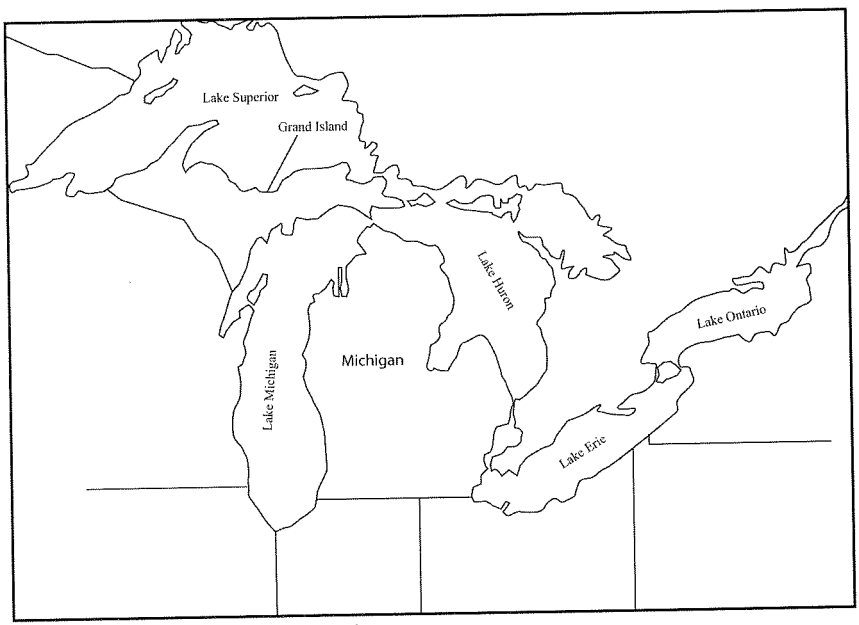

Figure 1. Location of Grand Island.

Martin (1985, 1989), on the other hand, is looking more at the specifics of local settlement and environmental data in order to argue for greater continuity in population size and the maintenance of a flexible and diversified subsistence economy throughout the Woodland period.

We argue that at the local scale of analysis, the evidence suggests that Grand Island was continuously occupied by small social groups on a seasonal basis throughout the Woodland period for the purpose of harvesting seasonally spawning fish and conducting a variety of other activities tied to locally available resources (e.g., hunting, gathering, and quartzite procurement). At the regional scale, however, changes in settlement and subsistence patterns indicate that the social and economic significance of Grand Island may have changed in response to the gradual formation of sociopolitical boundaries during the Terminal Woodland period that perhaps foreshadow the individual band territories of the historic era (Cleland 1992b; McHale Milner 1991; Martin 1999:226). We therefore advocate the need for a multiscalar approach to Grand Island archaeology that takes into account alternating scales of analysis in order to better explore and interpret how routinely utilized locations like Grand Island were socially and economically integrated into the regional framework of Woodland settlement and subsistence in the Upper Great Lakes.

A Woodland Period Primer: The Inland Shore Fishery Debate

The Woodland period in the Upper Great Lakes is marked by a number of technological innovations, including the introduction of ceramics, the adoption of the bow and arrow, the increased importance of cultigens in the diet, and the development of new techniques for harvesting spring- and fall-spawning fish (Brashler et al. 2000; Brose and Hambacher 1999; Cleland 1982, 1992b; Fitting 1975; Martin 1989, 1999; Mason 1981). The recovery of artifacts associated with these technological innovations has served as the primary means for identifying Woodland period sites on Grand Island and throughout the Upper Peninsula of Michigan.

Unlike much of the Eastern Woodland Region, the Woodland period of the Upper Peninsula and northern Wisconsin has been subdivided into two broad cultural-historical periods, the Initial Woodland and the Terminal Woodland (Brashler et al. 2000; Brose and Hambacher 1999; Fitting 1975; Mason 1981). The Initial Woodland is characterized by the widespread introduction of ceramics associated with the emergence of the Lake Forest (Fitting 1975:98–99), or Northern and Middle Tier (Mason 1981:284–292) Middle Woodland cultural developments (i.e., Laurel, North Bay, Saugeen, Point Peninsula, and Nokomis ceramic traditions; Brose and Hambacher 1999:173–174). Settlement and subsistence patterns for the Initial Woodland suggest seasonal hunting, collecting, and fishing, with an emphasis on harvesting spring-spawning fish, such as sturgeon and sucker (Brose 1970a, 1970b; Brose and Hambacher 1999; Cleland 1966, 1982). Sites such as Summer Island (Brose 1970a), Winter (Martin 1980; Richner 1973), and

Naomikong Point (Janzen 1968) have been interpreted as warm-season fishing sites where sturgeon and suckers were harvested from the shallow coastal waters of the Upper Great Lakes through the use of spears, hook-and-line, and seines (Cleland 1982; Dunham 2002).

The Terminal Woodland in the northern Great Lakes and Upper Peninsula is characterized by a series of regional adaptations to local environmental conditions; the continuation of a flexible and diverse subsistence economy; a shift in settlement patterns toward the formation of large, seasonal aggregation sites; and the maintenance of permeable social boundaries through interaction and trade with neighboring and distant groups (Brashler et al. 2000; Holman and Brashler 1999; McHale Milner 1991; Martin 1999). Archaeological data suggests relationships and interaction with groups to the west (Blackduck), southwest (Oneota), and the southeast (Iroquoian); along with the development of local cultural expressions, such as Mackinac, Juntunen, and Sand Point ceramic wares (Brose 1970a; Dorothy 1980; Dunham and Hambacher 2002; McPherron 1967; Mason 1966, 1981; Salzer 1986).

As indicated in the introduction to this article, there is a certain degree of controversy surrounding the nature of subsistence and settlement during the Terminal Woodland. Cleland (1982) has proposed an evolutionary model of social change, population growth, and resource specialization that views the invention of the gill net as the technological keystone of a Terminal Woodland adaptive strategy focused on exploiting the fall fishery. He argues that with the development of gill net technology, Woodland peoples in the northern Great Lakes were able to better exploit the more productive and nutritionally superior fall fishery in order to procure a food surplus prior to the onset of the cold season. Unlike the spring spawning season, the cooler weather of the late fall and early winter facilitated the preservation of smoked and sun-dried fish for the late winter months (Cleland 1982:775, 1989:606). This, in turn, fostered population growth, encouraged new forms of cooperative work arrangements, and strengthened the formation of identities among Terminal Woodland groups as they became more geographically and socially localized around specific fisheries (Cleland 1982:780). Large coastal village sites, such as the Juntunen site (McPherron 1967), Scott Point (Martin 1982), and Whitefish Island (Conway 1980), are thought to have become key aggregation sites during the Terminal Woodland where smaller social groups would seasonally gather in order to pool their labor and exploit the intensive fall fishery (Cleland 1982:772, 775).

Cleland (1982, 1989) provides a mechanism for explaining social and economic change on a macroregional scale that links the northern Great Lakes to other regions of the Upper Midwest where similar cultural evolutionary processes have been observed in the Woodland archaeological record. According to his model, fish became the mechanism for change in the northern Great Lakes, just as wild rice and maize-based agriculture provided the mechanisms for change among Woodland groups to the west and south, respectively (Brashler et al. 2000; Cleland 1983).

In contrast to Cleland (1982), Martin (1985, 1989) has argued that the Terminal Woodland subsistence pattern represents a continuation of the same diverse and flexible settlement/subsistence strategy developed during the Initial Woodland and that the gill net may actually predate the Terminal Woodland. Unlike Cleland, Martin (1985, 1989) is less concerned with addressing the "Big Picture" of Woodland period adaptation at the macroregional scale. Her model for Woodland subsistence and settlement focuses more on the specifics of the intraregional data as a means to explain the characteristics of Initial and Terminal Woodland period site locations.

Martin conducted a statistical analysis of environmental factors associated with Woodland coastal site locations and found little evidence to support Cleland's model for the timing and development of the fall fishery and the sudden appearance of the gill net. The results of her study indicate that there are no statistically significant differences in the physiographic conditions of Initial and Terminal Woodland site locations. Aside from the fact that many coastal sites are multicomponent, Initial and Terminal Woodland sites tend to occur in generalized resource areas located in close proximity to spring, summer, and fall spawning fish habitats (Martin 1989:597–602). As a result, Martin (1989) sees the continual reuse of the same coastal settings throughout the Woodland period as contributing to the formation of large sites with dense concentrations of artifacts and faunal remains. Her perspective on site formation processes brings into question the relationship that Cleland (1982) envisions between site size, population size, and the emergence of large coastal aggregation sites during the Terminal Woodland. Furthermore, she contends that the faunal assemblages and widespread occurrence of net sinkers at both Initial and Terminal Woodland sites suggests that the gill net was not exclusively a Terminal Woodland technological development (Martin 1989:596).

Both Cleland (1982, 1989) and Martin (1985, 1989) have recently been criticized for their failure "to present a systematic review of the empirical evidence of fish remains from any of the archaeological sites in the region" (Smith 2004:66). In her analysis of fish remains recovered from 24 sites in the northern Lake Michigan and Lake Huron basins, Smith (2004) found evidence that supports aspects of both models. The results of her study show that both Initial and Terminal Woodland fish assemblages are characterized by a high diversity of species and that the overall picture of fish selection supports Martin's (1985) observations regarding continuity in the use of specific coastal locations for the exploitation of spring and fall spawning fish throughout the Woodland period (Smith 2004:76–77).

At the species level of analysis, however, Smith (2004) also observes clear trends in the relative frequencies of individual fish species that may indicate an increase in the use of nets in general, and suggests a Terminal Woodland age for the development of the gill net. Faunal assemblages from transitional Initial to Terminal Woodland sites suggest that yellow walleye decline in importance relative to suckers. Yellow walleye was an important species throughout the Woodland period and is believed to have been caught using single-species

collection techniques, such as hook-and-line (Smith 2004:81). Smith (2004:81) hypothesizes that the declining numbers of yellow walleye over the course of the Woodland period may indicate a technological trend toward the more intensive use of seine nets for capturing anadromous species of sucker, which travel up streams and rivers in the spring to spawn.

The heavier use of net-based fishing continued through the Terminal Woodland with the more intensified exploitation of fall-spawning fish species and the development of the gill net. Smith (2004:81–83) presents data showing that fish assemblages from Terminal Woodland components/sites (especially those post-dating A.D. 1100) contain significantly higher numbers of lake whitefish and lake trout than their Initial Woodland counterparts. Cleland (1966:157–210) made a similar observation in his analysis of fish remains from the Juntunen site where he found that fish accounted for over 85 percent of the faunal assemblage (McPherron 1967:190) compared to other classes of animals and supplied 66 percent of the usable meat (Cleland 1982:771). Smith's (2004:82–83) analysis of fish assemblages from multiple Initial and Terminal Woodland sites expands the geographic distribution of this observed pattern of fish species procurement, and bolsters Cleland's (1982, 1989) argument for the timing of the gill net by providing a more robust and refined analysis of the regional data.

Smith's study underscores the analytical value of using the Inland Shore Fishery debate as a methodological framework from which to quantitatively and qualitatively examine local datasets and place them within a broader context of Woodland settlement and subsistence. Her study began by asking a straightforward question concerning how the fish assemblages from Initial and Terminal Woodland period sites might look if they were to support the models presented by Cleland (1982) or Martin (1985, 1989), or both. Following Smith's example, this article poses a similar set of questions to the archaeological record of Grand Island. What is the archaeological evidence for fishing on Grand Island? What other types of subsistence-related activities are represented in the artifact assemblages? Are there noticeable changes in the nature of settlement and subsistence from the Initial to the Terminal Woodland, or is there more evidence for continuity in island use throughout the Woodland period? Is there evidence for settlement nucleation and resource specialization on the island? Finally, what are the limitations posed by the Grand Island data and what directions should future research on the island take in order to further our understanding of the Woodland period?

Woodland Period Archaeology on Grand Island

Knowledge of the Woodland period occupation and use of Grand Island has grown significantly over the last decade as a result of numerous archaeological surveys and test excavations (Drake and Franzen 2004; Dunham 2000; Dunham and Branstner 1995; Dunham et al. 1997; Franzen 2000; Robinson 1991), as well as large-scale block excavations at sites with Woodland components (Skibo 2001, 2002). This work resulted in identifying 14 Woodland period

coastal sites on Grand Island and the mainland, along the Grand Island/Munising Bay Channel (Figure 2).

Classification of Grand Island sites has been based largely upon the comparison of recovered ceramic and lithic assemblages with established typological sequences from stratified and/or more intensely excavated sites located in the Straits of Mackinac (e.g., McPherron 1967), the Green Bay/Bay De Noc region (e.g., Brose 1970a; Mason 1966, 1967, 1991), and along the southern and northern shores of Lake Superior (e.g., Dorothy 1980; Janzen 1968; Wright 1967). Based on these comparisons two sites have been assigned to the Initial Woodland period, four to the Terminal Woodland period, and three contain evidence for both Initial and Terminal Woodland occupations. The five remaining sites have been assigned to a general "Woodland" category based upon the recovery of artifacts, such as small nondecorated ceramic fragments and net sinkers, which defy further refinement of their chronological associations (Table 1).

All of the Grand Island Woodland sites are located along the island's shorelines in close proximity to shallow and deepwater fish habitats, with the highest density of sites located along the sandy beaches of Murray Bay (see Figures 2 and 3). Several of these 14 sites have been archaeologically investigated beyond the level of Phase I shovel testing. Of this group, however, only seven sites have produced a significant amount of information pertaining to the Woodland occupation and use of Grand Island. This group of seven sites includes 03-04 (Powell Point), 03-754, 03-803 (Gete Odena), 03-821, 03-825 (Popper site), 03-832, and 03-929. The following discussion provides a brief site-by-site description of the results of archaeological investigations conducted at each of these sites.

Site 03-04 (Powell Point)

The Powell Point site (03-04) was discovered in 1968 during an archaeological survey conducted by the University of Michigan (Bigony 1968). The site is located on the mainland across the channel from the southernmost end of Grand Island (Figure 2). Since its discovery, a large portion of the site has been disturbed by the construction of a paved road and parking lot for the Grand Island ferry service. Initial testing of the site recovered numerous pieces of chert and quartzite debitage along with a stemmed chert projectile point, a few sherds of cordmarked pottery, and a copper fishhook (Bigony 1968; Karen O'Brien, personal communication 2002). While the spatial extent of the site was not fully recorded in 1968, it was assigned to the Terminal Woodland time period due to the presence of cordmarked ceramics (Martin 1977:223).

Only a small (ca. 375 m^2) triangular-shaped portion of the site remains today (Figure 4). Recent testing confirmed a Terminal Woodland occupation for the site and also identified an Initial Woodland component (Drake and Franzen 2004). Nineteen Laurel drag-stamped sherds, and 109 associated plain body sherds, were recovered from a single 1 x 1 m test unit (Test Unit 3) located at the northern edge of the site (see Figure 4). Eight of the drag-stamped sherds

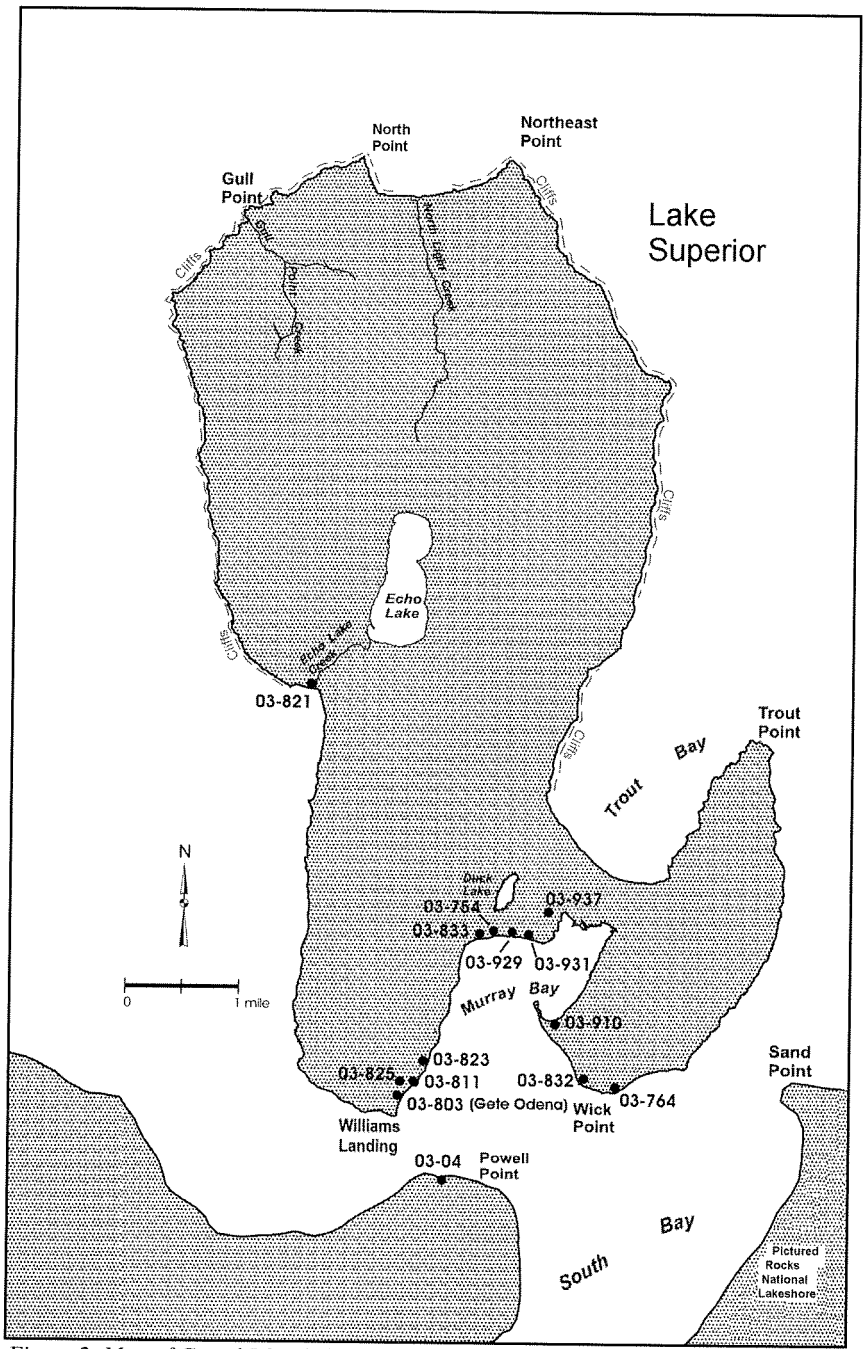

Figure 2. Map of Grand Island showing Woodland Period site locations.

Table 1. Woodland Period Sites and Associated Artifacts from Grand Island.

	Site Number 03-													
	910	*754*	*004*	*931*	*803*	*764*	*929*	*937*	*823*	*833*	*832*	*821*	*811*	*825*
Middle Woodland														
Laurel Linear/ Drag Stamped	x	x	x											
North Bay II Cordmarked				x										
Lang Corner Notched Point					x									
Corner/Side Notched Point					x									
General Woodland														
Net Sinker			x		x				x	x	x			
Dentate Stamped			x											
Plain, Smoothed Grit-Tempered	x	x	x	x	x	x	x	x	x		x	x		
Bone Harpoon					x									
Copper Fishhook			x											
Late Woodland Diagnostics														
Cordmarked/ Impressed Grit-Tempered			x	x	x						x	x	x	
Triangular Point			x		x								x	
Sand Point CWO					x							x		
Madison Folded Lip					x									
Mississippian-like Sherd Fragment					x									
Miniature Pot				x	x									
Fabric Impressed														x
Radiocarbon Dates (BP)			1710 ± 70, 1740 ± 40											1230 ± 350
Woodland Period	Middle		Middle and Late			General					Late			

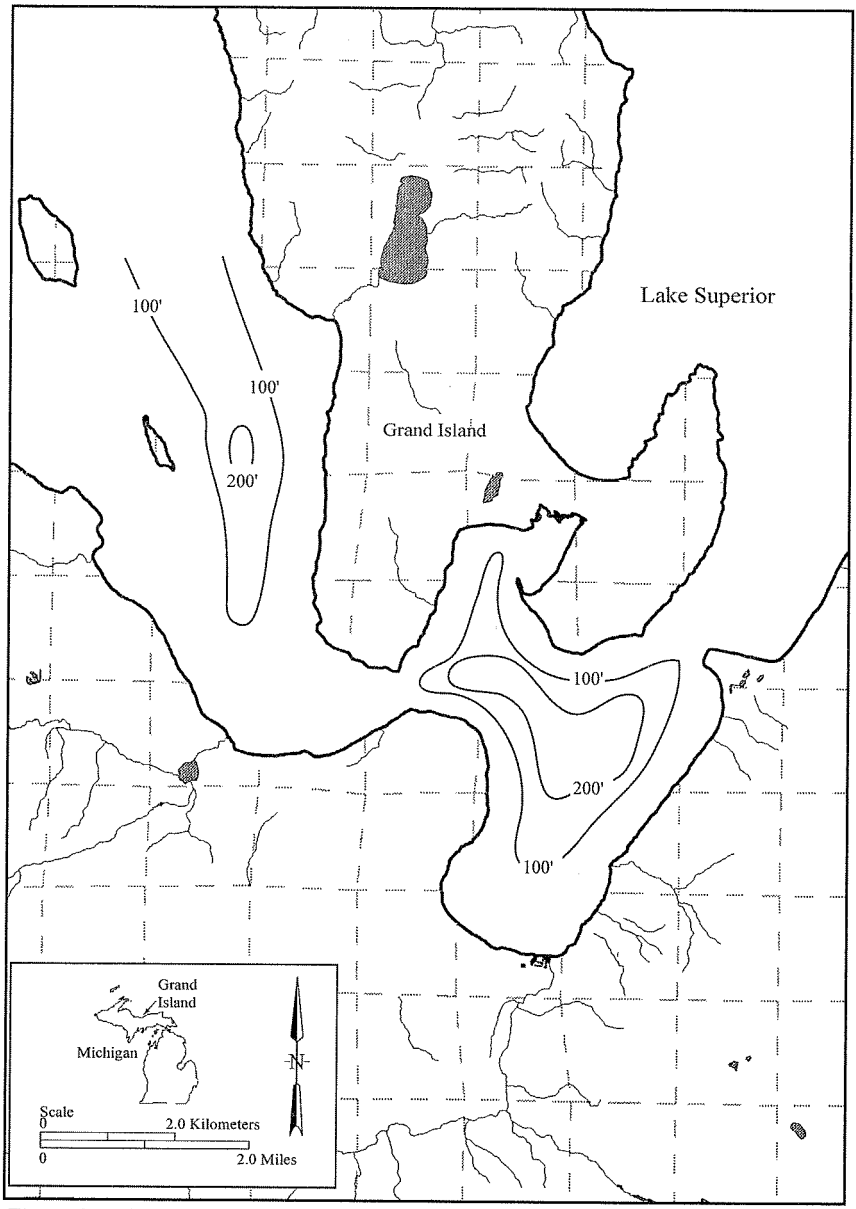

Figure 3. Relative depth of water surrounding Grand Island.

were found to form three groups of conjoining sherds, suggesting that most, if not all, originated from the same discarded vessel. This vessel is similar to the type Laurel Linear Stamp (Janzen 1968:51–53), or Upper Peninsula Dragged Stamp, Dentate and Plain tool varieties (Brose 1970a:65–70). Plasticene impressions of the decorated surface reveal a combination of dentate and plain tool applications, with at least 10 neatly applied horizontal rows of right-slanted, oblique dentate tool impressions and one row of large, plain tool, left-slanted, oblique impressions (Figure 5). Many of the decorated sherds had a thin veneer of charred organic residue on their interior surfaces. Residue from one sherd produced an AMS date of 1740 ± 40 B.P., with a two-sigma calibrated age of A.D. 225 to A.D. 405 (Beta-182099; Drake and Franzen 2004).

A conventional radiocarbon date of 1710 ± 70 B.P. (two-sigma calibration date of A.D. 140 ± A.D. 465, or A.D. 480 ± A.D. 520; Beta-182098) was also obtained from a sample of wood charcoal recovered from a possible living surface in Test Units 1 and 2, on the southern end of the site (see Figure 4; Drake and Franzen 2004). Both dates support an Initial Woodland occupation

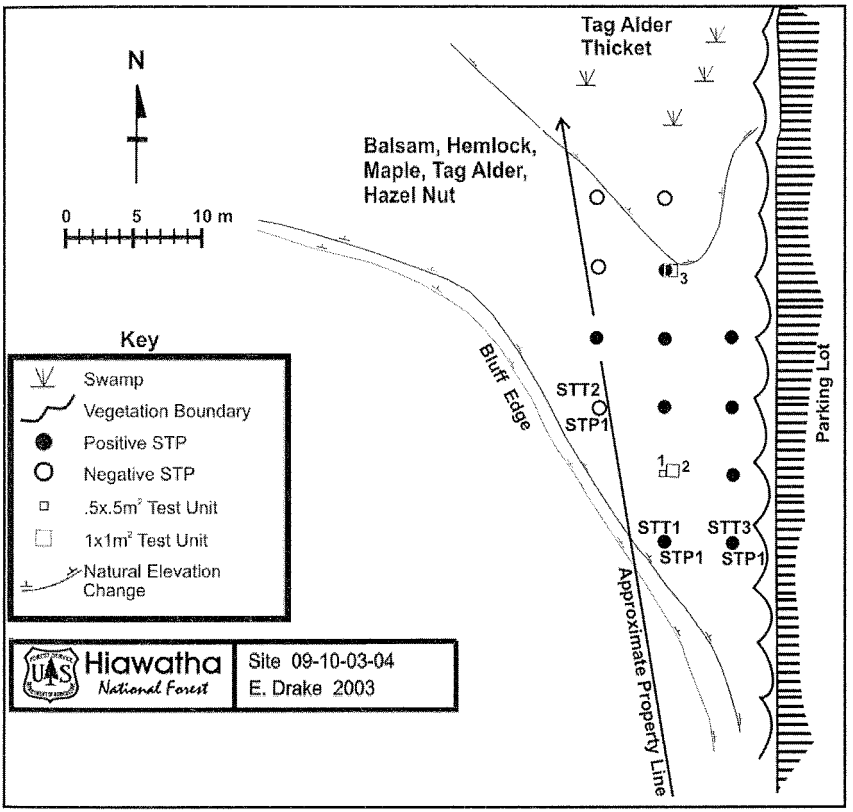

Figure 4. Map of site 03-04 (Powell Point).

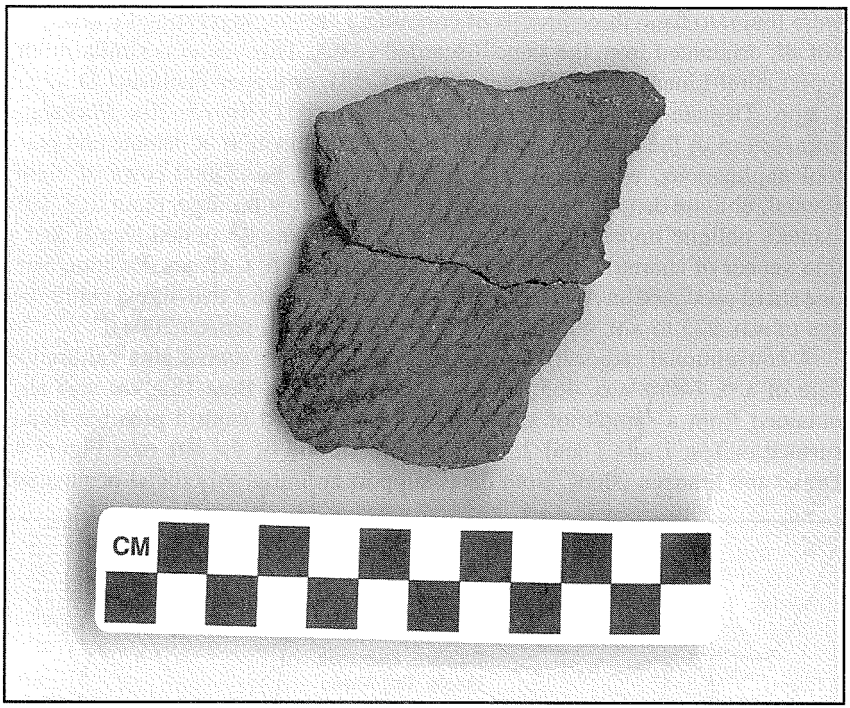

Figure 5. Two conjoining Laurel drag-stamp decorated sherds recovered from Test Unit 3, site 03-04.

and fit within the spatial-temporal dimensions of the Laurel ceramic tradition in the Upper Great Lakes (Brose 1970a; Brose and Hambacher 1999; Janzen 1968; Mason 1991; Reid and Rajnovich 1991).

A 3-cm thick layer of black, organic-rich, loamy sand lying on top of culturally sterile B-horizon soils (Figure 6) comprises the living surface. Seven pottery sherds, similar in their paste and temper characteristics to the plain body sherds from Test Unit 3, were found resting horizontally on top of the living surface. Six of them refit, suggesting that they represent the remains of a "pot break" found in situ (Drake and Franzen 2004).

The living surface itself is covered by a thick (25–30 cm) zone of very dark brown, organic-rich loamy sand containing numerous pieces of chert and quartz debitage and artifacts diagnostic of the Terminal Woodland period. Cordmarked pottery and Juntunen-style triangular projectile points made of chert and quartz (McPherron 1967:148–153) were recovered from the first 20 cm of this zone. Consequently, the artifacts appear to be vertically distributed with the earlier Initial Woodland living surface overlain by a succeeding Terminal Woodland occupation (Drake and Franzen 2004).

The tool assemblage from the Powell Point site is quite diverse and indicative of a number of subsistence related activities, including fishing. The

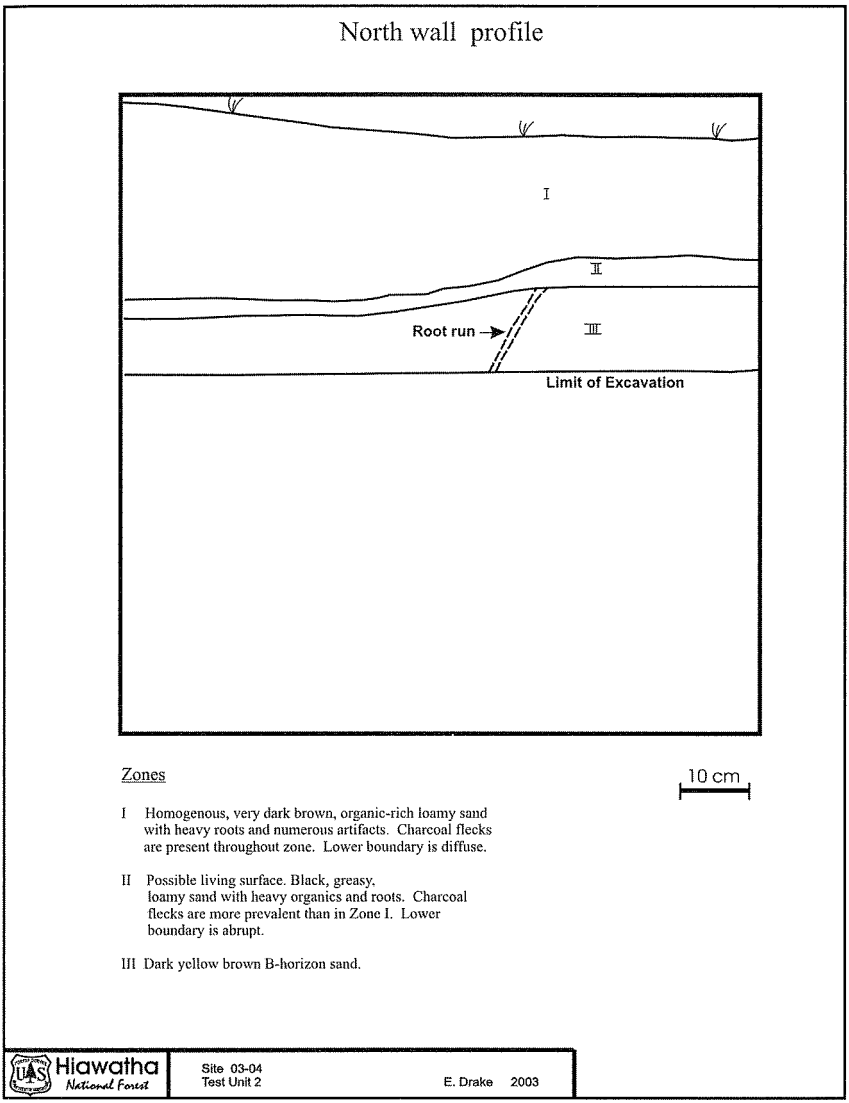

Figure 6. Drawing of north wall profile for Test Unit 2, site 03-04, showing stratigraphic location of living surface (Zone II).

assemblage includes several chert scrapers, bipolar lithics (i.e., wedges/cores) made from chert nodules, two projectile points, a quartz core, and ceramics. Fishing-related artifacts include a copper fishhook and two end-notched sandstone net sinkers, one of which was found in association with the Laurel drag-stamp decorated pottery in Test Unit 3 (Drake and Franzen 2004). Chert was the primary raw material used to manufacture stone tools at the Powell

Point site. Quartz and quartzite flakes are also present in the lithic assemblage, but in much smaller amounts. A relatively small amount of fire-cracked rock was also recovered from the site. The location of the Powell Point site and the composition of its artifact assemblage suggest that this site functioned as a small fishing and hunting camp that was seasonally occupied throughout the Woodland period.

Site 03-754

Site 03-754 is located at the head of Murray Bay (Figure 2) and comprises four discrete artifact concentrations, or loci, dispersed over an area of approximately 2800 m^2 (Figure 7; Dunham et al. 1997:121–143). Three of the four loci were defined by clusters of positive shovel tests placed on a 5 m grid (Loci 2, 3, and 4), while the other (Locus 1) was identified by a small surface scatter (Dunham et al. 1997:138). A small number of Laurel drag-stamped ceramics (n = 2) recovered from a 1 x1 m test unit in Locus 1 suggests site 03-754 was occupied during the Initial Woodland (Dunham et al. 1997:129). Three nondecorated sherd fragments were also recovered from the same test unit. The lack of diagnostic artifacts recovered from the other three loci leaves open the possibility for earlier and/or later occupations.

Loci 1, 2, and 3 constitute relatively small, but dense, artifact scatters (measuring 8 m^2, 21 m^2, and 9 m^2, respectively), interpreted as spatially distinct occupation areas. Locus 4, on the other hand, is the largest of the four artifact clusters (1200 m^2) and appears to contain a minimum of three partially overlapping occupation/activity areas. The artifact assemblages associated with all four loci are similar in composition, and include numerous pieces of fire-cracked rock and a wide range of lithic debris associated with the reduction of quartz, chert, and quartzite cobbles, as well as an assortment of expedient scraping and cutting tools and bipolar lithics (Dunham et al. 1997:138–141). Likewise, the presence of rock hearths in Locus 3 (TU 8) and Locus 4 (TU 2) indicates that each occupation may have been organized around a central hearth feature. Finally, the size and composition of the first three loci and the individual occupation/activity areas of Locus 4, further suggests that site 03-754 was used by relatively small social groups on a presumably seasonal basis (Dunham et al. 1997:143).

Site 03-803 (Gete Odena)

The Gete Odena site (03-803) is the largest and most intensively occupied location on Grand Island, with an occupational history extending from the Late Archaic to the present (Dunham and Branstner 1995; Robinson 1991; Skibo et al., this volume). The site is located near Williams Landing on the southern end of the island, across the channel from Powell Point (see Figure 2). Since its discovery in 1990, Gete Odena has been the subject of two Phase II site evaluations (Dunham and Branstner 1995; Robinson 1991) and two large-scale excavations (Skibo 2001, 2002).

The site consists of an extensive artifact scatter covering an area of approximately 11,000 m^2 (Dunham and Branstner 1995: Figure 29). While most of the feature data and artifacts recovered from Gete Odena derive from the nineteenth-century occupation of the site, the prehistoric component is clearly dominated by a Terminal Woodland presence (Dunham and Branstner 1995; Skibo 2001, 2002; Skibo et al., in press). Although two Middle Woodland-style projectile points were initially recovered from the site (Robinson 1991:112), cordmarked pottery and triangular projectile points dominate the assemblage of chronologically sensitive artifacts for the Woodland period (Dunham and Branstner 1995:127–162; Skibo 2001, 2002).

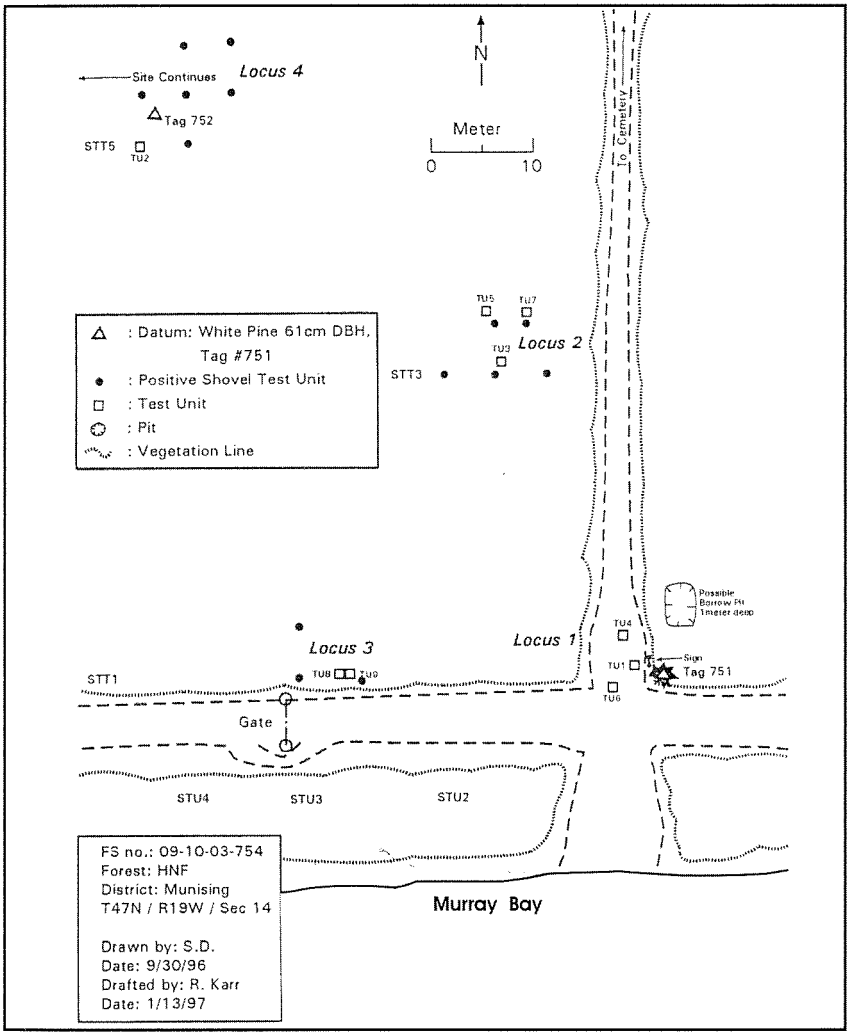

Figure 7. Map of site 03-754 (redrawn from Dunham et al. 1997:Figure 14).

Cordmarked ceramics recovered during the 1994 test excavations closely resemble Sand Point ware (Dorothy 1980:67–69), which dates between ca. A.D. 1000–1200 (Dunham and Branstner 1995:141). A rim sherd from a Madison Folded Lip vessel and a thumb-shaped handle from an unidentified Upper Mississippian vessel were also recovered during the initial testing of the site (Robinson 1991:130–131).

The Terminal Woodland component appears fairly concentrated within an approximately 2,500 m^2 area located near the shoreline in a location which, until recently, served as a parking lot for the island's current inhabitants (Figure 8; Dunham and Branstner 1995:158–161). As a result, the last 1,500 years of occupation have, unfortunately, been compressed into an approximately 25 cm thick organic-rich layer, with little to no internal stratigraphic integrity (Skibo 2001, 2002; Skibo et al., this volume). In spite of this problem, a wide variety of subsistence related activities is represented in the overall prehistoric tool assemblage recovered from Gete Odena. The assemblage includes grit-tempered ceramics, scrapers, utilized flakes, projectile points, net sinkers, and bipolar lithics (Dunham and Branstner 1995; Robinson 1991; Skibo 2001, 2002; Skibo et al., this volume). Large amounts of fire-cracked rock and lithic debitage were also recovered from the site. Fishing-related artifacts include three grooved-pebble net sinkers, one carved-bone harpoon fragment, and a small sample of both spring- and fall-spawning fish species (i.e., sturgeon, sucker, bass, walleye, herring, whitefish, and lake trout) (Dunham and Branstner 1995; Robinson 1991; Skibo et al., this volume).

The only verifiable prehistoric feature identified at Gete Odena is a small circular pit feature exposed at the base of the material culture-bearing stratum during the 1994 test excavations of the site (Dunham and Branstner 1995:134). The feature, which was bell-shaped in cross section, measured 20 cm in diameter and extended into the culturally sterile subsoil to a depth of 36 cm below the ground surface. The feature was removed as a flotation sample and found to contain lithic debitage, the carbonized remains of acorns and cherry seeds (*Prunus* sp.), and a small collection of conjoining pottery sherds belonging to a miniature vessel consistent with Terminal Woodland ceramic assemblages (Dunham and Branstner 1995:159).

Site 03-821

Site 03-821 is located adjacent to the mouth of Echo Creek and covers an area of approximately 2,000 m^2 along a high sandy bluff overlooking the productive fishery of the west Grand Island Channel (see Figure 2). A substantial Terminal Woodland component has been confirmed as a result of two separate Phase II site evaluations (Dunham 2000; Robinson 1991). Combined, the two investigations produced a relatively large prehistoric assemblage consisting of 162 pottery sherds, 19 stone tools, and a substantial amount of lithic debitage and fire-cracked rock (Dunham 2000; Robinson 1991). Two Terminal Woodland triangular projectile points were recovered, and at least one of the pottery

sherds could be assigned to the type Sand Point Cord-wrapped Object (see Dorothy 1980:56; Robinson 1991:130). A Late Archaic component is also suspected for 03-821 based upon the large percentage of quartzite debitage (63 percent) recovered from the site and its location on a former Lake Nipissing shoreline terrace (Franzen 1998:77). Similar amounts of quartzite debitage have been recovered from other Late Archaic coastal sites on Grand Island, such as Trout Point I (Benchley et al. 1988) and the Popper site (Dunham and Anderton 1999).

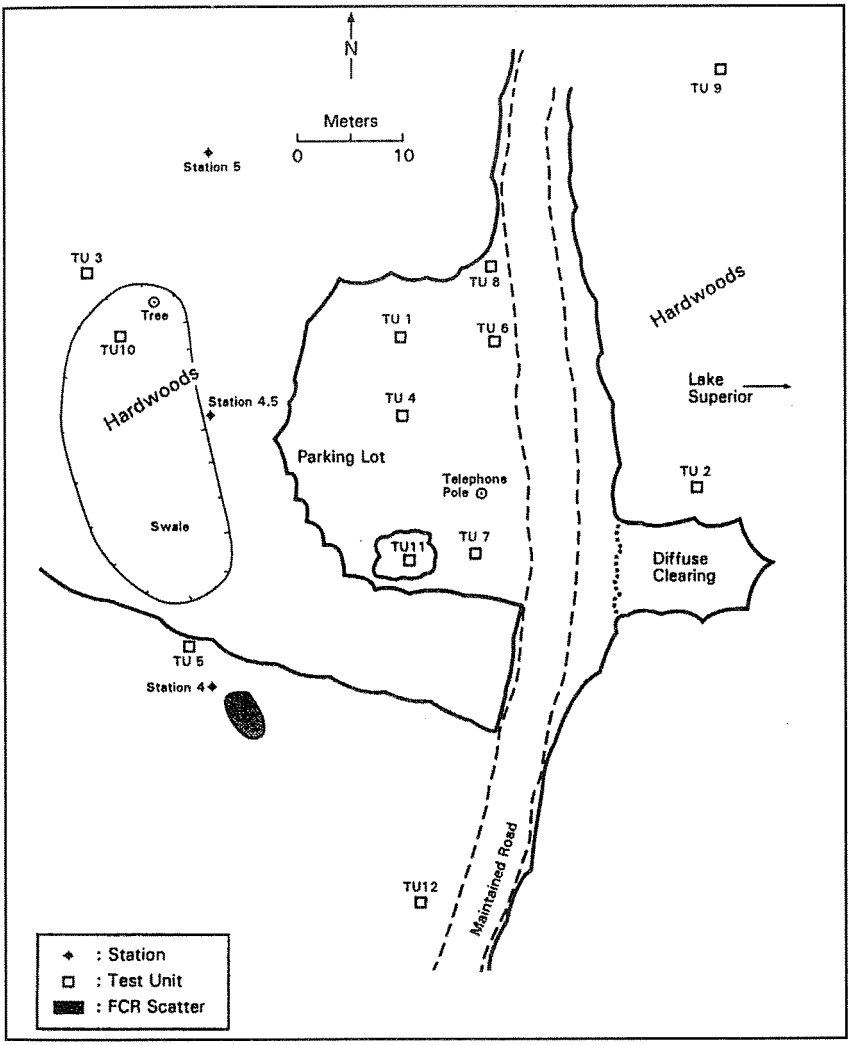

Figure 8. Map of 1994 test excavation at site 03-803 (redrawn from Dunham and Branstner 1995:Figure 35).

Two possible Terminal Woodland hearth/pit features were also discovered during the initial test excavations (Robinson 1991:93–94). The floated contents of one feature produced a small, but diverse faunal assemblage that included the remains of sturgeon, longnose sucker, whitefish, painted turtle, beaver, and a number of unidentifiable mammals and bony fish (Robinson 1991:139). The overall faunal assemblage supports the potential for a spring to autumn occupation, during which a variety of subsistence related activities, including maple sugaring, berrypicking, trapping, fishing, and hunting could have occurred (see Ball 1993).

Site 03-825 (Popper Site)

The Popper site consists of a very extensive subsurface lithic scatter (ca. 40,000 m^2) located on top of a relict coastal spit formed during the Nipissing I, or Nipissing Maximum, lake stage circa 4700 B.P. (Anderton 1993, this volume; Dunham and Anderton 1999). The results of test excavations conducted in 1991 and 1994 indicate that the site was most intensively occupied during the Late Archaic period (Dunham and Anderton 1999; Dunham and Branstner 1995). The Late Archaic age of the site is supported by the recovery of two radiocarbon dates derived from feature contexts (4260 ± 50 B.P. and 4100 ± 60 B.P.), its geophysical location on a relict coastal spit, and the lithic assemblage, which is dominated by quartzite debitage (86 percent) (Dunham and Anderton 1999).

A Terminal Woodland component has also been identified at the Popper site due to the recovery of six prehistoric ceramic sherds and a radiocarbon date of 1235 ± 350 B.P. (Anderton 1993:40; Dunham and Branstner 1995:172). Four of the six ceramic sherds form the rim of a single vessel. The vessel is grit-tempered, with a narrow scalloped lip and smoothed-over fabric-impressed exterior (Dunham and Branstner 1995:172). While stylistically characteristic of Terminal Woodland ceramics in the Upper Peninsula, the sherds could not be assigned to a specific ware or type. The remaining two ceramic sherd fragments were too small to classify.

The Terminal Woodland radiocarbon date was obtained from a sample of wood charcoal collected from the fill of a pit feature exposed during the 1991 test excavations (Anderton 1993:38 – 39). The feature is basin-shaped in crosssection and measures 60 cm in diameter and 44 cm deep. The feature is interpreted as a possible storage pit. No ceramics or lithics were recovered from the feature, but charred organic remains were noticed throughout the fill and a small amount of fire-cracked rock was collected from the base of the pit (Anderton 1993:38–39).

Site 03-832

The prehistoric component of site 03-832 represents a relatively small (500 m^2) Woodland period fishing camp situated along a two-tiered, wave-cut bench that overlooks the deeper waters of the Grand Island/Munising Bay Channel

(Figures 2, 3, and 9). The site is also the location of a mid-nineteenth-century cabin that was initially occupied by Rufus Williams, the son of the first permanent Euro-American settler of Grand Island, Abraham Williams (Drake and Franzen 2004).

A Terminal Woodland age is suggested for 03-832 based upon the recovery of two cordmarked pottery sherds from a single test unit on the upper terrace (Drake and Franzen 2004). The uneven distribution of artifact types across the site suggests the presence of either discrete activity areas or a series of overlapping seasonally based occupations over a short period of time. Test Unit 3, for example, yielded a significant amount of fire-cracked rock (n = 147) and a single quartz flake; while 20 pieces of lithic debitage, two cordmarked sherds, and only three pieces of fire-cracked rock were recovered from Test Unit 5, located 5 m away (see Figure 9; Drake and Franzen 2004). The prehistoric artifact assemblage recovered from Test Unit 1 and the root ball of a nearby fallen tree, however, proved to be the most diverse, suggesting that a wide variety of activities took place along the lower terrace of the site. In addition to a relatively high amount of lithic debitage (n = 166) and fire-cracked rock (n = 179), eleven net sinkers, two plain grit-tempered pottery sherds, and several utilized flakes, end scrapers, flake cores, and bipolar lithics (i.e., cores/wedges) were also recovered (Drake and Franzen 2004). Like many

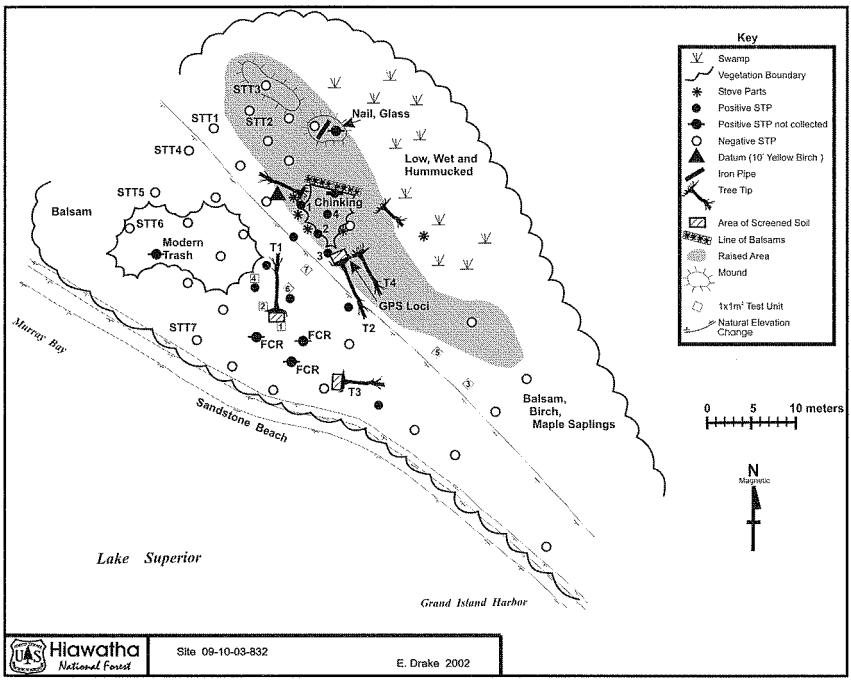

Figure 9. Map of site 03-832.

of the other Woodland period sites on Grand Island, chert and quartz make up the majority of the lithic assemblage compared with the number of quartzite flakes (Drake and Franzen 2004).

Test Unit 1 and the nearby tree tip produced the largest collection of net sinkers found on Grand Island (Figure 10). Net sinkers are frequently recovered from Woodland coastal sites in the Upper Great Lakes and indicate the use of gill nets or seines to harvest fish in large quantities (Brose 1970a; Cleland 1982; Janzen 1968; Martin 1985; Moore 1972). The recovery of 11 net sinkers from such a small area at 03-832 suggests that an old net or seine was either cached for future use and subsequently forgotten, or discarded in a refuse area. Although the context was disturbed by the tree fall, the wide variety of artifact types associated with this provenience lends greater support to the later interpretation.

Site 03-929

Site 03-929 consists of a linear scatter of materials paralleling the shoreline of Murray Bay (see Figure 2). Like site 03-832, the artifacts are unevenly distributed over an area of approximately 900 m^2, suggesting the possibility of partially overlapping activity/occupational areas (Dunham et al. 1997:156–157). The artifact assemblage is largely composed of lithic debitage and fire-cracked rock, although two grit-tempered body sherds from a single ceramic vessel

Figure 10. Three of the 11 sandstone net sinkers recovered from site 03-832.

were also recovered. Both sherds have a compact, silty paste tempered with moderate amounts of felsic grit, and exhibit well-smoothed interiors and exteriors with no decoration (Dunham et al. 1997:153).

The lithic assemblage consists mainly of chert debitage, although flakes of quartzite and quartz were also recovered. No formal tools were found despite the recovery of flakes associated with later stage lithic reduction and biface rejuvenation (Dunham et al. 1997:157). The presence of these materials suggests that at least some degree of resource extraction was taking place at the site, albeit on a much more ephemeral basis when compared to sites like Powell Point, 03-754, and 03-832, which have a greater diversity of tool types present in their assemblages.

Discussion

Woodland period research on Grand Island has been largely carried out under the rubric of Cultural Resource Management and not with the intentions of testing the two models posited for the development of the Inland Shore Fishery. Nonetheless, patterning in the settlement and artifact data from Grand Island provides insights into certain aspects of the debate; namely, the relationship between site formation processes and the nature of island occupation and use throughout the Woodland period.

The most notable observation concerning the Grand Island settlement data is that there are no large, intensively occupied, "Juntunen-like" coastal villages on the island. In fact, the two largest Terminal Woodland components on Grand Island, Gete Odena and 03-821, are not any larger in size than the Initial Woodland site, 03-754. All three sites have areas measuring between 2,000 m^2 and 2,800 m^2 (Dunham 2000; Dunham and Branstner 1995; Dunham et al. 1997; Robinson 1991), suggesting that, in this instance, there is not a noticeable increase in the size of sites over the Woodland period as predicted by Cleland's (1982) model.

Second, the overall size of individual sites is clearly not an appropriate measure for relative group size given the internal structure of Woodland sites on Grand Island. Most of the Woodland sites are characterized by an uneven spatial distribution of materials, with clusters of dense artifact concentrations, possibly representing loci of seasonal occupations, activity areas, or both (cf. Martin 1989, 1999). Sites 03-754, 03-832, and 03-929 are the best examples of this intrasite spatial pattern, which suggests the seasonal reuse of site specific locations by small social groups during the Initial and Terminal Woodland periods. Unfortunately, this pattern of use is harder to address at sites like Gete Odena where a long history of occupation (ca. 3,000 years) has resulted in the loss of archaeological context for the Woodland components (Skibo et al., this volume).

This pattern of occupation and use is also suggested by the ceramic data from Grand Island. Ceramic assemblages from Grand Island sites are typically small (fewer than 10 sherds) and highly fragmentary, consisting mostly of nondiagnostic grit-tempered body sherds with badly eroded surfaces. When

sizable amounts of culturally and chronologically diagnostic sherds are encountered, it is usually in the context of recovering a small number of discarded vessels from a single provenience. At the Powell Point site, for example, 129 sherds belonging to a single Laurel drag-stamped vessel were recovered from one test unit (Drake and Franzen 2004). Likewise, at the Gete Odena site only 16 rims were identified out of 2,255 recovered sherds, indicating that a small number ($n < 16$) of individual vessels are represented by the total assemblage (Dunham and Branstner 1995; Robinson 1991; Skibo 2001, 2002).

Calculations for the minimum number of vessels represented in the overall Grand Island ceramic assemblage have not been conducted; however, an impressionistic estimate would place the number somewhere around 40 distinct vessels, based upon the number of rims and body sherds recovered from each site. Even so, the assemblage is made up of a diverse array of ceramic types (Table 1), suggesting the visitation by people culturally affiliated with the Woodland groups to the east, west, and south throughout the period. The array of ceramic types includes examples of Laurel drag and/or linear-stamped (e.g., Brose 1970a:68–70; Janzen 1968:51–53), North Bay II Cordmarked (e.g., Mason 1966:90–91), dentate stamping (e.g., Janzen 1968:54–55; Mason 1966:83), and a wide variety of Late Woodland ware types decorated with different cord-wrapped paddle and stick designs (see Dorothy 1980; McPherron 1967). Whereas one might expect a greater number of rims and individual vessels to be recovered from sites occupied by larger groups for longer periods of time, the ceramic data from Grand Island presents a picture of short-term seasonal use by small social groups.

A similar relationship between intrasite spatial patterns, ceramic data, and the nature of island occupation and use has been observed on Isle Royale in the western part of Lake Superior (Clark 1995:166–170; Fitting 1975:141, 190). As Clark (1995:167) describes:

> The amount of domestic refuse recovered at many occupation sites suggests repeated use by small groups. Typically, one to four pots were broken and discarded in the immediate vicinity of hearths, around which chipped stone tools were manufactured and repaired. The picture is one of a family or a few families engaged in brief episodes of mining supported by fishing, collection of berries, the hunting or trapping of beaver, and caribou hunting.

Woodland period sites on Isle Royale demonstrate a comparable degree of intrasite spatial patterning and assemblage composition to the Grand Island sites described above. Subsistence related activities on Grand Island, however, were not organized around the exploitation of copper deposits, but rather a number of other naturally occurring resources, including fish, game, plants, and lithic raw materials for stone tool production.

Cobbles of quartzite and quartz, along with smaller amounts of chert nodules, can be collected from several cobble beaches on the island. While the

chert is glacially transported, the quartz and quartzite originate from the basal conglomerate of the Munising formation, which forms part of the bedrock geology for Grand Island (Anderton, this volume; Benchley et al. 1988:69). All three raw material types were used by the prehistoric inhabitants of Grand Island to manufacture stone tools.

Apart from the differences in projectile point styles, Initial and Terminal Woodland lithic assemblages from Grand Island are indistinguishable from one another. Lithic assemblages from each period contain a variety of expedient cutting and scraping tools, bifaces, bipolar lithics (i.e., cores/wedges), cores, split and tested cobbles, fire-cracked rock, and large amounts of quartz, chert, and quartzite debitage (Drake and Franzen 2004; Dunham 2000; Dunham and Branstner 1995; Dunham et al. 1997; Franzen 1998, 2000; Skibo 2001, 2002). This generalized Woodland pattern of stone tool production suggests that many of the same subsistence related activities were being performed on Grand Island coastal sites throughout the Woodland period.

Unfortunately, as a result of poor preservation conditions, investigations of Woodland subsistence practices on Grand Island have been stymied by a scarcity of faunal and floral data. Faunal remains have been recovered from only two sites with well-established Terminal Woodland components; Gete Odena and site 03-821. Both sites are multicomponent and associated with historic Native American and Euro-American occupations, making it difficult at times to determine the chronological age of much of the recovered faunal materials (Dunham 2000; Dunham and Branstner 1995; Robinson 1991; Skibo et al., this volume). While only small amounts of fish remains were identified in each assemblage, it is not inconsequential that a variety of both spring and fall spawning species were present in nearly equal amounts (Dunham and Branstner 1995; Robinson 1991; Skibo et al. this volume).

The problem of analyzing changes in fish procurement strategies between the Initial and Terminal Woodland on Grand Island has been further exacerbated by the lack of faunal remains from an Initial Woodland context. The best evidence for Initial Woodland fishing in the Grand Island locality has been in the form of a single end-notched sandstone net sinker recovered from a 1 x 1 m test unit yielding Laurel drag-stamped sherds at the Powell Point site (Table 1). A second net sinker was also recovered from a nearby shovel test, but its context remains unclear.

A total of 18 net sinkers have been found on Grand Island, including the two from Powell Point. Most of them, however, were found in direct association with established Terminal Woodland components (Table 1). This may indicate the increased use of netting technology during the Terminal Woodland, or it may be the result of sampling error resulting from the fact that more Terminal Woodland sites than Initial Woodland sites have been excavated on the island. The problem with interpreting the specific function of net sinkers is that they were used as weights for both seines and gill nets. The most "suggestive" evidence for the use of gill nets during the Terminal Woodland on Grand Island hails from site 03-832, where 11 net sinkers were recovered as part of a cached

or discarded net (Drake and Franzen 2004). The physiographic setting for 03-832, with its access to the deeper waters of the Grand Island Channel (Figure 3), implies the possible use of a gill net rather than a seine, but the evidence remains inconclusive without the recovery of statistically large enough samples of fish remains to lend further support to this interpretation.

The argument for a Terminal Woodland shift in focus to the fall fishery and the development of the gill net is hard to fully address given the incomplete nature of the Grand Island dataset. Yet, despite the problems posed by poor preservation conditions and sampling error, the archaeological evidence from Grand Island does seem to support the argument for greater continuity in the nature of island occupation and use during the Woodland period. Indeed, at the local scale of analysis the intrasite spatial data along with the composition of ceramic, lithic, and sparse faunal assemblages, indicates that Initial and Terminal Woodland sites on Grand Island were formed as a result of small social groups seasonally occupying the same locations on an annual basis in order to carry out a variety of subsistence related activities, including hunting, gathering, stone tool production, and fishing. But how does the picture of Grand Island occupation and use look from a regional perspective on Woodland settlement and subsistence?

Life on Grand Island did not take place within a social, historical, and geographic vacuum. Placing Grand Island into a regional context requires that we take a multiscalar approach that links local developments to regional trends and transformations in Woodland settlement, subsistence, and social-political interactions (McHale Milner 1991). Proponents of multiscalar approaches argue that human action and interactions take place on multiple scales, and that each scale influences the nature of the others in a dialectical fashion (Marquardt 1992; Nassaney 1991; Nassaney and Cobb 1991; Nassaney and Sassaman 1995). Patterns of subsistence and settlement that appear continuous and homogeneous at one scale of analysis may in fact appear quite discontinuous and heterogeneous at another (Marquardt and Crumley 1987; Nassaney and Cobb 1991; Nassaney and Sassaman 1995). By alternating the scales of analysis we can begin to examine how local patterns and developments were shaped and influenced by regional processes of social, economic, and geographic organization, and vice versa (e.g., McHale Milner 1991; Nassaney 1991).

In a recent archival survey of Woodland period site distributions in the eastern Upper Peninsula, Dunham (2002) observed a number of interesting regional trends in Initial and Terminal Woodland settlement and subsistence patterns that are not readily evident from the local vantage point of the Grand Island archaeological record. First, there is a noticeable decrease in the frequency of coastal sites relative to the number of interior sites from the Initial Woodland to the Terminal Woodland (Dunham 2002). Second, there is a shift in the geographic location of archaeological sites over time. According to Dunham (2002), the highest concentrations of Initial Woodland sites are located in the Bay De Noc region, the Straits of Mackinac, and Drummond

Island. During the Terminal Woodland, however, the relative density of sites drops on Bay De Noc and Drummond Island, while remaining constant in the Straits of Mackinac. In concert with this drop in regional site densities, the number of sites with Terminal Woodland components increased on Grand Island as well as along the Indian River, which originates from a cluster of inland lakes about 10 miles south of Grand Island and eventually empties into Lake Michigan at Manistique, Michigan (see Figure 1; Dunham 2002).

At least seven Terminal Woodland components have been identified on Grand Island as opposed to only five Initial Woodland sites (Table 1). Four of the five remaining sites, including 03-929, have been classified as "General Woodland" based upon the recovery of nondiagnostic, plain, grit-tempered ceramics with well-smoothed surfaces. A Terminal Woodland age is suspected for most, if not all, of these ceramics in light of their paste and temper characteristics. This means that the Terminal Woodland site/component count could be as high as 11, which is more than twice the number of confirmed Initial Woodland components.

Although the social, political, and ecological reasons underlying this shift in geographic focus are not fully understood, the regional data suggests that access to deep water locations and interior lakes and rivers may have become more important during the Terminal Woodland than during the Initial Woodland (Dunham 2002). Furthermore, the shift in site densities away from shallow water settings, like Drummond Island, toward areas with greater access to deep-water fish habitats, such as Grand Island, supports the argument for the increased importance of fall-spawning fish to the diet of Terminal Woodland peoples in the Upper Peninsula (Cleland 1982, 1989; Dunham 2002). Rather than looking for large aggregation sites on Grand Island, therefore, we should perhaps consider the possibility that Grand Island functioned as an "aggregation locality" where multiple families could seasonally visit in order to exploit the fall fishery and other local resources without necessarily having to share the same campfire.

While the Grand Island archaeological data indicates continuity in the nature of island use during the Woodland period, the regional picture suggests that the social, political, and economic significance of the island may have changed from the Initial to Terminal Woodland. If this is the case, then perhaps this change in significance coincided with the formation of social identities and political boundaries on a macroregional scale, as Woodland groups across the Upper Peninsula became socially and geographically affiliated with specific hunting grounds and productive fisheries (Cleland 1992b:25; McHale Milner 1991; Martin 1999:226). Investigating this question lies beyond the scope of this article, but similar processes of social and geographical "localization" during the Late Woodland have been archaeologically recognized in the geographical distribution of ceramic styles in the eastern Upper Peninsula and the northern Lower Peninsula (e.g., Hambacher 1992; McHale Milner 1991). In fact, such processes are even thought to foreshadow the formation of individual Ojibwe band identities and territories associated with well-known

inland shore fishing locations during the historic period (Cleland 1992a; Doherty 1990:1-6, 86–104; Martin 1999:226).

Conclusion

Archaeological investigations of the Woodland period occupation and use of Grand Island are ongoing. Much of the research has been focused on refining the details of time-space systematics, while simultaneously confronting the problems posed by poor preservation and a fragmentary database. This article summarizes the currently available ceramic, lithic, and intrasite spatial data from Initial and Terminal Woodland sites on Grand Island and weighs the evidence against the debate surrounding the timing of the gill net and the increased social and economic importance of the fall fishery. A multiscalar approach to the study of Grand Island archaeology has been advocated in this discussion, one which emphasizes the importance of using alternating scales of analysis in order to explore relationships between local and regional patterns of continuity and change in Woodland settlement and subsistence.

At the local scale of analysis the archaeological evidence from Grand Island supports the argument for greater continuity in subsistence strategies and the nature of coastal site use during the Woodland period. While the number of sites/components increases from the Initial Woodland to the Terminal Woodland, there is no evidence to suggest an increase in site size or the formation of large coastal aggregation sites during the Terminal Woodland. Initial and Terminal Woodland coastal sites were formed as the result of small social groups seasonally visiting the island in order to hunt, fish, gather wild plants, and procure lithic raw materials for stone tool production.

The recovery of net sinkers from several sites on the island attests to the use of netting technology throughout the Woodland period, but in no way secures a Terminal Woodland date for the development of the gill net. Unfortunately, the timing of the gill net on Grand Island is hard to fully assess given the lack of sizable faunal assemblages from both Initial and Terminal Woodland contexts. In the two cases where faunal assemblages were recovered, the remains of both spring and fall spawning fish species were identified in nearly equal amounts, suggesting the dual importance of the spring and fall fisheries to the subsistence economy of the Grand Island inhabitants.

This picture of continuity in Woodland subsistence and settlement on Grand Island is presented differently when viewed from a regional scale of analysis. Settlement data from across the central and eastern Upper Peninsula indicates a geographic shift in coastal site densities away from shallow water locations during the Initial Woodland toward deepwater locations like Grand Island during the Terminal Woodland. This in turn suggests the growing importance of the fall fishery to the Terminal Woodland subsistence economy and possibly the more intensive use of gill net technology.

While there remains evidence for continuity in the nature of island use throughout the Woodland period, the social and economic importance of Grand

Island may have changed as Woodland groups across the Upper Great Lakes became more socially and geographically associated with particular inland shore fisheries. As a fixed location on the landscape, therefore, Grand Island may have begun to function as a social "aggregation locality" where small, but related groups seasonally congregated during the fall in order to fish and exchange goods and services while simultaneously occupying several different campsites. Consequently, by taking a multiscalar approach to the analysis of Grand Island Woodland archaeology the idea of a coastal fishing village has been expanded beyond the boundaries of a single site to include multiple sites within a given region or locality.

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