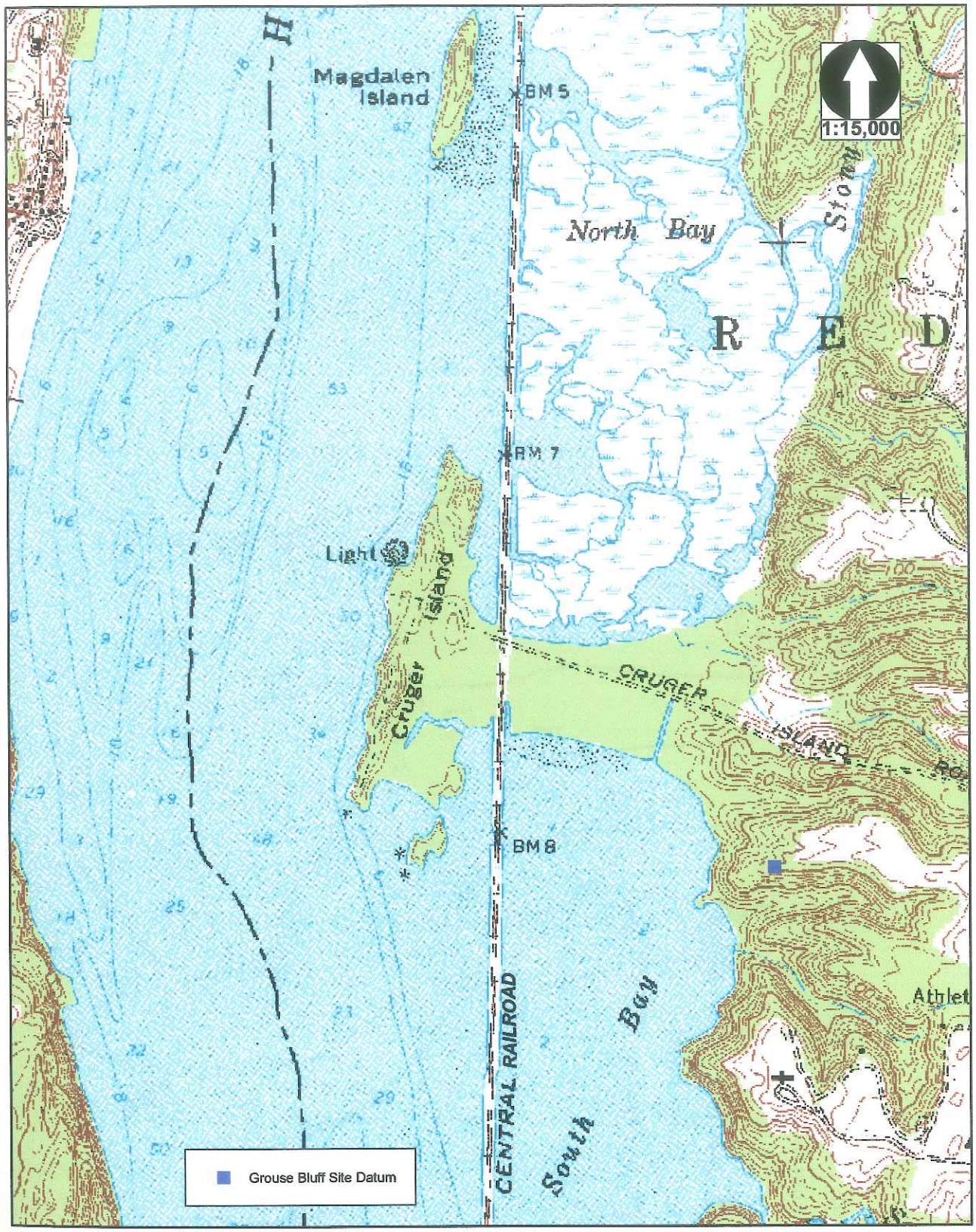

Tivoli Bays Project Location Map

Saugerties 7.5' Quadrangle - Dutchess County, New York

Archaeological Survey performed by Lindner [2002] for the New York Department of Transportation

0 187.5 375 750 1,125 1,500 Meters

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Paleoethnobotanical Assessment of Prehistoric Facilities at the Grouse Bluff Site, Tivoli Bays, Annandale-on-Hudson, Dutchess County, New York

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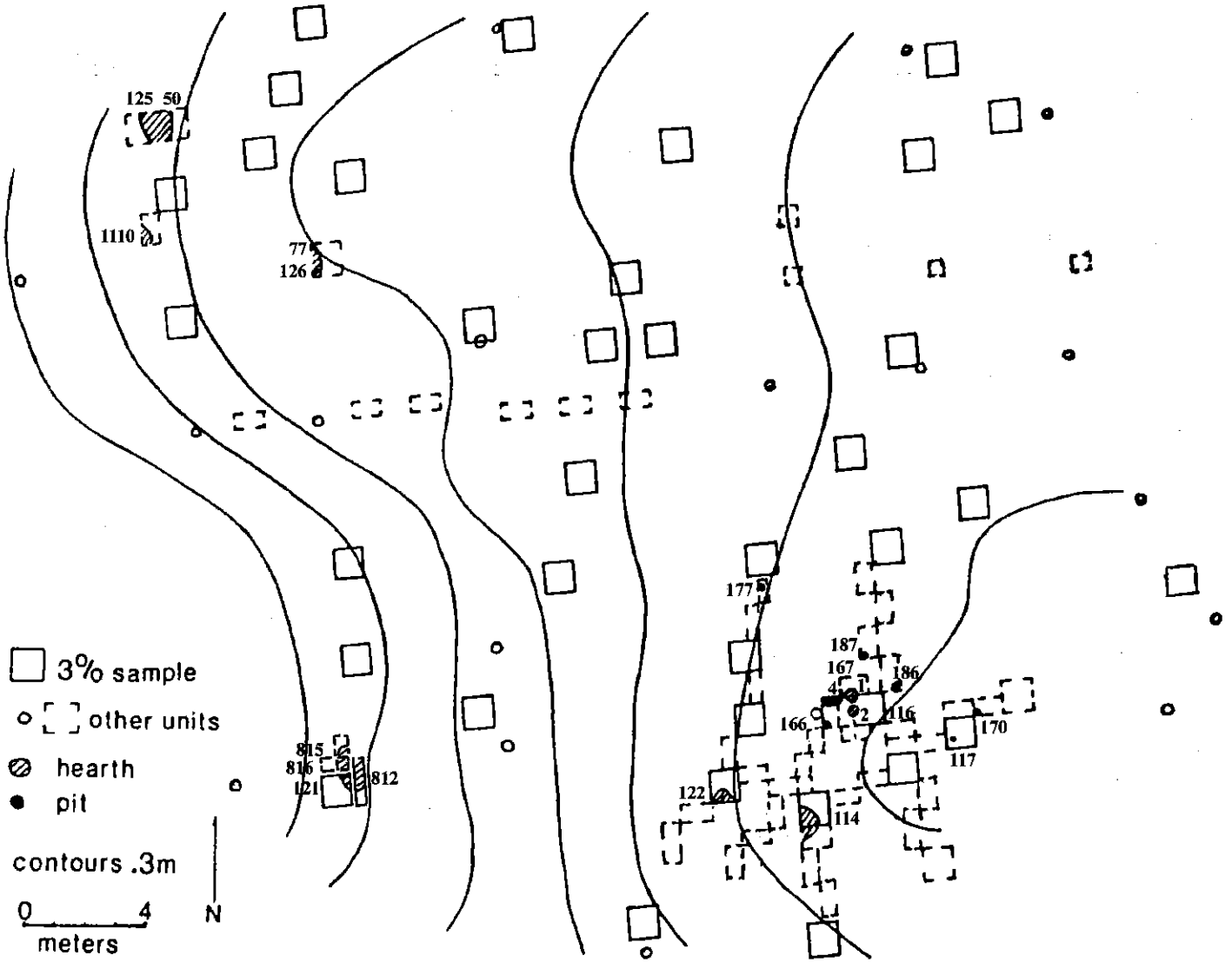

Figure 2. Location of Facilities at the Grouse Bluff site. 1-digit numbers refer to features, others to test units.

Introduction

With artifacts that span from 7,000 to 900 years ago, the Grouse Bluff site at Tivoli South Bay (Figure 1) has yielded one of the most continuous records of prehistoric occupation in the Hudson Valley (Lindner 1992). It is the largest scientifically known, and most productive as measured by artifacts per area excavated, of the numerous sites that date to 3150 to 2700 years ago in eastern New York and adjacent states. The current study aims to assess the presence of plant remains at the site, from which we can obtain ecological information that is difficult to extract from artifacts.

Microscopic analysis of soil samples from 15 prehistoric "features" or facilities – such as hearths, pits, and rock platforms – at Grouse Bluff finds 14 of them to contain a variety of charred plants and several kinds of animal remains. This representation of environmental use demonstrates the site's great potential to reveal cultural-ecological relationships over long spans of time along the middle section of the Hudson River. Such information will assist in the design of on-going research at the site. Public exhibits are planned for construction at the site in 2003 to convey this new data on plant and animal usage by prehistoric people. The Greenway Trail skirts the edge of Grouse Bluff. The site is handicapped-accessible via a gravel road from the Bard College campus.

Carbonized seeds of *Gaylussacia* sp. (Huckleberry) occur in 3 facilities, while another contains possibly carbonized seeds of *Viburnum dentatum* (Arrow-wood). Carbonized seeds that are not positively identifiable but are similar to *Potamogeton* sp. (Pond Weed), *Vitis* sp. (Grape), *Artemisia* sp. (Mugwort) occur once each. Carbonized *Carya* sp. (Hickory) nutshell occurs definitely in 9 facilities and possibly in 2 more. *Quercus* sp. (Oak) acorn shell occurs in 3 facilities; *Juglans cinerea* (Butternut) nutshell occurs in 3, and *Corylus* sp. (Hazel) nutshell occurs in 1. Most facilities have less than a dozen seeds or nut fragments of a given genus, but Hickory nutshell is present as more than 50 pieces in two facilities.

Many of these plant remains indicate food sources although some suggest other usages as well. Wood charcoal, presumably indicative of fireplace fuel, occurs in two facilities. In the sole platform hearth the fuel is *Quercus* sp. (Oak) and the wood of a conifer. In one of several basin hearths the fuel is possibly *Ulmus* sp. (Elm) and either *Carya* sp. (Hickory) or a member of the family *Fagaceae* (Beech), probably *Castanea* sp. (American Chestnut).

Two unidentified fragments of fish scales and one fish bone support a hypothesis of use in fish preparation in regard to the single known platform hearth on the site. The hypothesis is based on its form as a long, narrow bed of burnt rocks, with ash and charcoal, and its location on the edge of the main occupation area (Figure 2). Unidentifiable burnt and/or unburned bone fragments occurred in this facility and 4 others. In one case the unidentifiable bone is probably mammal. One facility, containing bone, seeds, acorn and nutshells, also had a piece of probable mollusk shell.

Although 3 hearths on the site have radiocarbon assays (see Appendix A) that place them after the currently known inception of maize horticulture in the region, approximately 1100 years ago, no cultigens occur in the 15 samples. Three more facilities are in similar stratigraphic position, and in close proximity to the three that have been dated as early in the last millennium. A possible explanation for the absence of cultigens is the low volumes of the samples, which were deliberately kept small so as to make them manageable in the amount of time available for analysis. Cassedy and Webb (1999) note that remains of maize at the earliest horticultural site in the region, on the Roeliff Jansen Kill in Columbia County, occur at a frequency of 1 item per 100 liters of soil analyzed. The total volume of the soil samples from Grouse Bluff flotated for this study amounts to 53.25 liters.

In 1990 excavations at Grouse Bluff focused on a 3 percent stratified random sample of the 1200-square-meter main occupation area of the site. Here the sheet midden contains the highest concentration of artifacts per volume, over 400 per square meter, based on frequencies in shovel tests. The 36 meter-square units encountered 7 facilities. Additional test units, as one-meter-squares or half-square-meter trenches, have revealed 8 more facilities.

After a brief description of methodology, this paper lists the contents of the facilities. Synopsis of the biological vestiges will proceed in this sequence: seeds, nuts, wood, other plant material, and faunal remains. The inventory of microremains by paleoethnobotanist Tonya Largy, who analyzed 14 of the facilities, appears as Appendix B. The 15th facility description below summarizes identifications made by paleoecologist Dorothy Peteet as part of a senior project at Bard College by Amy Foster (1999), with corrections by Tonya Largy based on her knowledge of seeds apt to be mistaken as charred. Then follow the discussion and conclusions sections. Acknowledgements appear between the body of the paper and its References Cited section. Appendix A lists the radiocarbon determinations of the age of four features at Grouse Bluff.

Methodology

Early in the research on the Grouse Bluff site, excavators took most soil samples from a bucket under the quarter-inch mesh hardware cloth screen, but later samples were not put through the sieve in order to better protect fragile remains. We placed the measured dry soil sample into a rudimentary but dependable flotation device: a bucket with a very fine screen in the cut-off bottom, which was then submersed and rotated in a tub of clean water, the light fraction skimmed off the top with a very fine mesh strainer. The mesh openings in the screen and strainer measure 0.36 mm in diameter. Charred poppy seeds, used as a control on recovery rates, demonstrated moderate to high rates of retrieval, 60 to 90 percent. Ethnobotanist Tonya Largy examined 14 light and heavy fractions (those materials that floated or sank to the bottom respectively) sent to her, along with items isolated by project assistant Mary Burns and two Bard students under her supervision. They inspected the residues from a volume of soil flotated from these facilities that amounted to approximately 53.25 liters. Another Bard student and volunteers isolated items from residues of approximately 10 liters of soil, by inspection of approximately 50 percent of the fractions, and sent them to paleoecologist Dorothy Peteet for identification. For archive purposes we set aside 0.5 liter of each soil sample.

Discussion of Carbonized Organic Materials in the Grouse Bluff Facilities

1. Radiocarbon assay of charcoal from 22 cm below surface in a shallow basin hearth, in Units **50 and 125** at the northwest corner of the site in 1989, the first season of excavation, gives an age of 985 +/- 70 C-14 yrs Before Present (BP, by convention A.D.1950; laboratory number GX-18813) for this facility. Flotation of 3.25 liters of soil from a large upper pit yields:

2 *Gaylussacia* sp. (Huckleberry) seeds
1 unidentified seed
1 possible nut shell
1 stem or root
1 item resembling a carpel (seed chamber)
wood of *Ulmus* sp. (American Elm) and *Fagaceae* (Beech family), probably *Castanea* sp. (American Chestnut) or *Carya* sp. (Hickory)

Flotation of 6.25 liters of soil from a small pit, at the bottom of the larger basin, beneath a rock slab cover, yields:

2 *Gaylussacia* sp. (Huckleberry) seeds
1 parenchyma tissue (such as nut meat, tuber)
2 *Carya* sp. (Hickory) nut shells
13 unidentified nut shells

2. Two meters south of Units 50 and 125 is a deep basin hearth in Unit **1110** that has its top at 24 centimeters below surface and contains a potsherd. Flotation of 1.5 liters of soil yields:

2 seed fragments of *Cyperaceae* (Sedge family)
1 fragment of an unidentified seed or nutlet
1 *Carya* sp. (Hickory) nutshell
1 unidentified nutshell
1 unidentified plant part

3. In the south-central section of the site, in Units **116 and 131**, is a small basin hearth known as Feature **1**. Radiocarbon assay of charcoal from 25-27 centimeters below surface, has given its age as 885 +/- 95 C-14 yrs BP (GX-18814). Flotation of 3.75 liters of soil yields:

½ seed coat, possibly *Gaylussacia* sp. (Huckleberry)
9 possible *Carya* sp. (Hickory) nutshells
1 possibly nutshell
2 non-calcined (unburned) bone

4. Ten centimeters north of Feature 1 is Feature **2**, another small basin hearth with its top at 20 centimeters below surface, in Units **116 and 131**. Radiocarbon assay of charcoal from 31-34 centimeters below surface, has given its age as 905 +/- 85 C-14 yrs BP (GX-18823). Flotation of 8.25 liters of soil yields seeds, nuts, and other materials:

13 *Gaylussacia* sp. (Huckleberry) seeds
2 possible *Gaylussacia* sp. seeds
1 seed similar to *Potamogeton* sp. (Pond Weed)
½ unidentified charred seed
3 unidentified seed coat fragments
5 *Quercus* sp. (Oak) acorn shells
1 possible *Quercus* sp. shell
1 possible *Carya* sp. (Hickory) nutshell
17 unidentified nutshells
5 possible nutshells
9 pieces of unidentified charred material, possibly parenchyma tissue
1 unidentified charred stem or root
1 unidentified charred bud
ca. 38 non-calcined bone fragments
ca. 8 calcined bone fragment
1 possible Mollusk shell, possibly burnt

5. Partially underlying Feature 2 is Feature **4**, a large dark pit with its top at 33 centimeters below surface in Unit **167**. Flotation of 3.25 liters of soil yields nutshells:

2 *Quercus* sp. (Oak) acorn shells
2 *Corylus* sp. (Hazel) nutshells
11 *Carya* sp. (Hickory) nutshells
6 possible *Carya* nutshells
2 unidentified nutshells
1 unidentified charred material, possibly nutshell

6. Seventy centimeters south of Feature 4 is a small dark pit with its top at ca. 20 centimeters below surface, in Unit **166** . Flotation of 2.5 liters of soil yields:

1 unidentified seed coat fragment
1 possible *Quercus* sp. (Oak) nut shell
11 possible *Carya* sp. (Hickory) nutshells
4 calcined bone fragments

7. One meter east of Feature 4 is the edge of a dark pit with its top at ca. 20 cm below surface, in the corner of Unit **186**. Flotation of 1.875 liters of soil yields:

1 possible seed
17 *Carya* sp. (Hickory) nutshells
2 *Juglans cinerea* (Butternut) shells
3 items similar to *Quercus* sp. (Oak) acorn shell
1 item similar to *Corylus* sp. (Hazel) nutshell

8. One meter north of Feature 4 is the edge of a dark pit with its top at ca. 20 cm below surface, in the corner of Unit **187**. Flotation of 1.5 liters of soil yields:

1 seed similar to those of *Labiatae* (Mint family)
1 *Quercus* sp. (Oak) acorn shell
11 *Carya* sp. (Hickory) nutshells
2 *Juglans cinerea* (Butternut) shells
1 shell similar to *Juglans cinerea* (Butternut)
4 unidentified nutshells
1 calcined bone

9. Four meters northwest of Feature 4 is a narrow but deep pit with its top at ca. 20 cm below surface and dark staining in Unit **177**. Flotation of 2.125 liters of soil yields:

1 incomplete seed, possibly *Gaylussacia* sp. (Huckleberry)
1 seed similar to *Artemisia* sp. (similar to *A. vulgaris* or Mugwort)
54 *Carya* sp. (Hickory) nutshells
7 possible bark fragments

10. Four meters south-southwest of Feature 4 is a large, deep basin hearth at 35 centimeters below surface, reddened with faint staining in Unit **114**. Flotation of 1 liter of soil yields:

61 *Carya* sp. (Hickory) nutshells

11. Five meters southwest of Feature 4 is a large, deep pit in Unit **122** that contains a dense mass of fire-cracked rock and dark gray sooty ash, but very little signs of burning in place, suggestive of an earth oven into which hot materials were moved from an adjacent hearth. Radiocarbon assay of charcoal, from 44 to 52 centimeters below surface, gives its age as 2070 +/- 80 C-14 years BP (GX-16803). Flotation of 10 liters of soil yields to identificaton by Dorothy Peteet:

1 seed, possibly carbonized, of *Viburnum dentatum* (Arrow-wood)

12. Fourteen meters west of Feature 4, in the southwest corner of the site near its edge, beyond which the ground slopes downward toward Tivoli South Bay, is a bed of fire-cracked rock and ash, charcoal, and burnt earth at ca. 30 centimeters below surface, in Units **121, 812, 815, and 816**. Because of its similarity to rock platform hearths assumed to have been used to roast fish along the Delaware River, a similar function was hypothesized for this facility at Grouse Bluff. Flotation of 13 liters of soil yields:

1 *Gaylussacia* sp. (Huckleberry) seed
2 *Carya* sp. (Hickory) nutshells
6 unidentified nutshells
9 possible nutshells
1 possible plant stem
15 pieces of *Quercus* sp. (Oak) wood
1 piece of conifer wood
2 pieces of "diffuse-porous" wood (such as *Tilia* sp. [Basswood])
2 fragments of Fish scales
1 Fish bone, possibly a rib
2 pieces of calcined bone

13. In the northwest corner of the site, a concentration of fire-cracked rock occurs in Units **77 and 126**, at approximately 35 centimeters below surface, a relatively great depth in comparison to other features on the site. Flotation of 2.5 liters of soil yields:

3 *Juglans cinerea* (Butternut) shells
1 unidentified nutshell

14. In the south-central section of the site occurs a faint stain and cluster of fire-cracked rock in Unit **170**, at 33 centimeters below surface, a relatively great depth in comparison to other features in the immediate cluster of facilities. Flotation of 2 liters of soil yields:

½ seed similar to *Vitis* sp. (Grape)
8 *Carya* sp. (Hickory) nutshells
2 items similar to *Quercus* sp. (Oak) acorn shells

15. Also in the south-central section of the site occurs a faint stain in Unit **117**, at 30 centimeters below surface, a relatively great depth in comparison to other features in the immediate cluster of facilities. Flotation of 0.5 liters of soil yields no microremains.

Discussion

Carbonized plant remains have a remarkably consistent presence in the prehistoric facilities at the Grouse Bluff site despite the small size of the soil samples that have been examined. While the nearly ubiquitous nutshells indicate probable use of the nut meats as food, the discard of the shells into hearths also suggests processing for dye-stuffs or burning in smudge pots (Largy et al. 1999). Seeds might have played a variety of roles in Native cuisine at Grouse Bluff. For example, seeds of *Artemisia* sp. might have been used as a condiment, while those of *Cyperaceae* sp. possibly were processed into flour or used as a drink (Fernald and Kinsey 1958). Monckton's (1992) paleoethnobotany of the Huron provides evidence for a wide range of prehistoric plant usages by neighboring Iroquoian groups.

The plant remains also inform us on the foraging range of the people who lived at Grouse Bluff and the seasonality of their visits to the site. The presence of *Potamogeton* sp. (Pond Weed) suggests wading in the adjacent shallow waters for procurement of its starchy root stock (Fernald and Kinsey 1958). The huckleberries and nuts found at the Grouse Bluff site indicate its occupation in the late summer through middle of the autumn respectively. The absence of charred *Rubus* sp. (Blackberry, Raspberry) seeds suggest that the facilities known thus far were not in use in early summer (Tonya Largy, personal communication 2002).

Analysis of the stratigraphic position of the facilities should take place. Additional information on relative depths may enable construction of a finer chronological sequence and could provide clearer temporal sorting of the deposits to enable meaningful comparison of feature contents. Tonya Largy (personal communication 2002) noted the abundance of uncharred plant remains and insect body parts in some of the samples, likely to have been introduced by through burrows, prompting her to wonder whether any of the carbonized materials were also intrusive. During excavation, however, we carefully noted and often mapped signs of disturbance such as rodent holes. For example, Unit 121 had many burrows in the section of the facility that yielded charred wood, but the samples containing the other remains, such as the fish scales and bone, were in relatively undisturbed sections of the facility.

Conclusions

Carya sp. (Hickory) nutshell is the most frequently found of the charred plant remains at the Grouse Bluff site, occurring in 9 of 15 facilities. Hickory wood may have served as fuel in one facility as well. Other nutshells include that of *Quercus* sp. (Oak), *Juglans cinerea* (Butternut), and *Corylus* sp. (Hazelnut). Two and possibly all three of the basin hearths with radiocarbon assays at the start of the last millennium contained *Gaylussacia* sp. (Huckleberry) seed, as did the rock platform hearth, which dates at least a millennium earlier. *Carya* sp. (Hickory) nutshell was present in these facilities as well, and 5 others. Carbonized seeds similar to *Potamogeton* sp. (Pond Wood), *Vitis* sp. (Grape), and *Artemisia* sp. (Mugwort) occur once each in the 15 facilities. *Quercus* sp. (Oak) wood appears to have been fuel in one facility, the platform hearth, which also contains fish scales and a fish bone. The hearth may have been utilized for fish roasting. Another 4 facilities contained calcined and/or unburnt bone, once possibly accompanied by burnt Mollusk shell.

The nuts and seeds indicate late summer to mid-autumn use of the facilities at Grouse Bluff. It is likely that occupations of the site were temporary and recurrent, as typical for mobile foragers who fish, gather wild plants, and hunt game and fowl. Study of larger amounts of soil from the facilities may need to take place in order to determine whether cultigens such as corn are present.

The Grouse Bluff site demonstrates the rich yield of plant remains, preserved by carbonization, which prehistoric camps in the mid-Hudson Valley may contain. Long known well as hunters, and thought to have been fishermen too, the Native people clearly also depended on nuts, acorns, and a variety of seeds for their sustenance. The proportion of each of these resources in the diet may be a key to understanding change in long-term adaptations, the principal focus in prehistoric archaeology of this region (Funk 1993). Research on sites in diverse environments, representing parts of a long time span, promises significant advancements in knowledge about the variety in Native subsistence and the complexity in ancient peoples' dynamic relationship with the natural world.

Acknowledgements

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My greatest debt is to Mary Burns, M.S. who assisted in the collection of samples, their processing and analysis, and supervised some of the Bard students involved in the project. Principal among the students deserving gratitude for the processing and analysis are Audrey Reifler and William Ruiz, the latter working under a Bard environmental fellowship. I thank Amy Foster for the extensive research in her senior thesis at Bard College. I am also grateful for other students involved in the laboratory, Ashley Kamen, Andrew Sipperly, Molly Northrup, Linda Ivan, Inge Shaeffer, Heidi Willms, and Christina Wilson. Persons deserving thanks for their work on the features include Lisa Folb, Samantha Miller, Bethia Waterman, Christopher Pryslopski, James Mockoviac, Tanessa Hartwig, Elizabeth Norton, Inge Schaeffer, Kate Wellspring, Timothy Goldberg, Jeanne Goldberg, Michael Weintraub, Erica Marciniec, Jill Patterson, Laura Ann Costello, Mariann Mantsouris, and especially the late Charlie Eickhorn.

I'm very endebted to ethnobotanist Tonya Largy for her work under pressure to analyze most of the samples and provide comment on the results. I also thank Dorothy Peteet for her assistance as a volunteer in the identification of plant remains.

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Appendix A

Radiocarbon Age Determinations of Charcoal from Grouse Bluff

Unit	Feature	Cmbs	Age (C-13 corrected)	Lab Sample #
122	---	44-52	2070 +/- 80 C-14 yrs BP	GX-16803
50	---	22	985 +/- 70 C-14 yrs BP	GX-18813
116	1	25-27	885 +/- 95 C-14 yrs BP	GX-18814
131	2	31-34	905 +/- 85 C-14 yrs BP	GX-18823

Appendix B

Inventory by Tonya Largy, Consultant in Archaeobotany and Zooarchaeology, Peabody Museum, Harvard University

Flotation Samples from Features at the Grouse Bluff site, Bard College, Hamlet of Annandale-on-Hudson, Town of Red Hook, Dutchess County, New York, Excavated 1989 to 2001 by Christopher Lindner and Students, with Mary Burns, Project Assistant

Unit #	Fea #	Cat. #	Identification
In the NW corner of the site, a shallow basin hearth			
50		747-L.1	1 Stem/Root =0.02g
		747-H.1	1 Nutshell?=0.02g
50		747-L-E.1	2 *Gaylussacia* sp. (Huckleberry)
		747-L-E.2	1 Char. Carpal? <0.01g Wood=American Elm, Fagaceae (probably Amer. Chestnut) Hickory; rest is dicot wood
50		747-H-E.1	1 Unidentified charred seed
Under the basin hearth, a small pit with a rock slab cover			
50/125		10380-L	NOTHING
		10380-H	NOTHING
50/125		10380-L-E.1	2 *Gaylussacia* sp.
		10380-L-E.2	1 parenchyma tissue
50/125		10380-H-E.1	2 Hickory nut=0.05g; 13 Nutshell=0.1g
In the NW section of the site, a deeply buried cluster of FCR w/ faint staining			
77	NE ¼	10704-L	NOTHING
	NE ¼	10704-H	NOTHING
77	NE ¼	10704-L-E	NOTHING
	NE ¼	10704-H-E.1	3 Butternut shell=0.05g
126	SE ¼	10500-L	NOTHING
	SE ¼	10500-H.1	1 Nutshell=0.06g
126	SE ¼	10500-L-E	NOTHING
	SE ¼	10500-H-E	NOTHING

In the S-Central section of the site, a large red-stained shallow basin

114	10408-L	NOTHING
114	10408-H.1	45 Hickory nutshell=0.29g
	10408-H-E.1	16 Hickory nutshell=0.07g

In the S-Central section of the site, a small dark stain

117	2721-L	NOTHING REMOVED FROM THIS SAMPLE
	2721-H	"
	2721-L-E	"
	2721-H-E	"

In the SW corner of the site, a large but shallow basin hearth

121	10701-L.1	4 *Quercus* sp. (Oak wood)=0.06g
	10701-H	NOTHING
	10701-L-E	NOTHING
	10701-H-E	NOTHING

121	10702-L.1	1 *Quercus* sp. (Oak wood)
	10702-H	NOTHING
	10702-L-E	NOTHING
	10702-H-E.1	1 cf. Nutshell=<0.01g

121	10705-L.1	5 *Quercus* sp. (Oak wood)
	10705-L.2	1 Conifer
	10705-L.3	2 Nutshell?=0.02

121	10705-H	NOTHING
	10705-L-E	NOTHING
	10705-H-E	NOTHING

812	10652-L	NOTHING
812	10652-H.1	4 Nutshell=0.03g
812	10652-L-E	NOTHING
812	10652-H-E	NOTHING

812	10706-L.1	2 Nutshell=0.02g
	10706-L.2	5 Oak wood
812	10706-H.1	2 cf. nutshell=0.01g
812	10706-L-E	NOTHING
	10706-H-E	NOTHING

812	10707-L	(film canister A)	NOTHING
812	10707-L	(film canister B)	NOTHING

812	10707-H.1	2 Fish scales, frags.= <0.01g
812	10707-L-E	NOTHING
812	10707-H-E	NOTHING

815	10653-L	NOTING
815	10653-H.1	2 Hickory nutshell=0.01g
	10653-H.2	1 Stem?-0.02g (dirt encrusted)
815	10653-L-E.1	1 *Gaylussacia* sp.
	10652-L-E.2	1 Diffuse-porous wood=0.01g
815	10653-H-E	NOTHING

815	10671-L	NOTHING
815	10671-H.1	1 Fish (rib?) bone=<0.01g
815	10671-L-E	NOTHING
815	10671-H-E	NOTHING

816	10335-L.1	1 Diffuse-porous wood=0.03g
816	10335-H.1	2 Calcined bone (tiny 1-2mm) <0.01g.
	10335-H.2	2 Hair-like strands-unident. material, uncharred
816	10335-L-E	NOTHING
816	10335-H-E.1	4 Nutshell?=<0.01g

In the S-Central section of the site, 2 shallow basin hearths and a large deep stained pit

131	1	2709-L	NOTHING
131	1	2709-H.1	1 Nutshell?=<0.01g

131	1	2710-LX	NOTHING REMOVED FROM THIS SAMPLE
131	1	2710-HX	NOTHING REMOVED FROM THIS SAMPLE

131	1	2710/2711-L.1	½ seed coat, may be *Gaylussacia* sp.
		2710/2711-L.2	1 cf. Nutshell=<0.01g
131	1	2710/2711-H.1	9 cf. Hickory nutshell=0.05g
		2710/1711-H.2	2 Non-calcined bone=0.01g

131	2	2715-L.1	1 cf. *Gaylussacia* sp.
		2715-L-2	1 Nutshell?=<0.01g
		2715-L.3	9 Char.Unid. parenchyma? tissue =0.06g
		2715-L.4	2 Non-Calc. Bone (tiny frags.)=<0.01g
		2715-L.5	7 Hematite frags.=0.05g

131	2	2715-H.1	6 Nutshell-0.04g
		2715-H.2	1 Non-Calc. bone (cf. Mammal)=0.03g

131	2	2715-LX.1	1 Char. Stem/Root=<0.01g
		2715-LX.2	3 Char. Unident.=0.02g
131	2	2715-HX.1	2 Nutshell? (tiny)=<0.01
		2715-HX.2	1 Calc. Bone (tiny)=<0.01
131	2	2716/2717/2718-L.1	8 *Gaylussacia* sp.
		2716/2717/2718-L.2	½ Seed coat
		2716/2717/2718-L.3	2 Nutshell?=0.01g
		2716/2717/2718-L.4	3 Charred Unident. (resemble nutshell)=0.06g
		2716/2717/2718-L.5	3 Non-calcined Bone=0.02g
131	2	2716/2717/2718-H.1	7 Nutshell=0.04g
		2716/2717/2718-H.2	30 Bone (several calcined)=0.57g
		2716/2717/2718-H.3	23 Hematite (with striations)=0.13g
		2716/2717/2718-H.4	1 Ceramic sherd=0.5g
131	2	2716/2718-LX.1	2 *Gaylussacia* sp.
		2716/2718-LX.2	2 Seed coat frags. (probably *Gaylussacia* sp.)
		2716/2718-LX.3	cf. *Potamogeton* sp.
		2716/2718-LX.4	2 Charred Unident.=<0.01g
		2716/2718-LX.5	1 Insect Gall?=<0.01g
131	2	2716/2718-HX.1	1 *Gaylussacia* sp.
		2716/2718-HX.2	1 Unid. Plant Part=<0.01g
		2716/2718-HX.3	7 Bone (2 Calcined)=0.09g
131	2	2724-L.1	1 Nutshell (tiny)=<0.01g
131	2	2724-H.1	1 Nutshell (Probably hickory)=0.01g
		2724-H.2	1 Bone=0.02g
131	2	2724-LX.1	1 *Gaylussacia* sp.
		2724-LX.2	1 Acorn? shell=<0.01g
131	2	2724-HX.1	1 Nutshell=<0.01g
131	2	2725-L.1	3 Acorn shell=0.01g
		2725-L.2	1 Char. Bud=<0.01g
131	2	2725-H.1	1 Nutshell (not acorn)=0.02g
		2725-H.2	1 Mollusc? Shell frag. (burned?)=0.01g
		2725-H.3	1 Calc. Bone=0.03g
		2725-H.4	5 Char. Unident. (resemble fecal pellets)=0.02g
131	2	2725-LX.1	1 *Gaylussacia* sp.
		2725-LX.2	2 Nutshell=0.01g
		2725-LX.3	½ Charred Seed
		2725-LX.4	45 Poppy Seed (controls)

131	2	2725-HX.1	1 Poppy Seed (control)
		2725-HX.2	2 Acorn shell=<0.01g
		2725-HX.3	2 Char. Unident.(fecal pellets?)-0.01g
		2725-HX.4	1 Calc. Bone (tiny)=<0.01g
131	4	2723-L	NOTHING
131	4	2723-H.1	6 Hickory? Nutshell=0.05g
		2723-H.2	1 Very old grape seed (Uncharred)
167	4	2765-L	NOTHING
167	4	2765-H.1	11 Hickory nutshell=0.1g
		2765-H.2	2 Acorn shell=0.01g
		2765-H.3	2 Hazelnut shell=0.02g
167	4	2765-L-E.1	1 Unid. Char. (possibly nutshell)=0.01g
167	4	2765-H-E.1	2 Nutshell=0.02g

In the S-Central section of the site, a deep, small dark-stained pit

166	SW	10650-L.1	1 Acorn? Shell=<0.01g
		10650-L.2	1 Charred Seed coat frag.
166	SW	10650-H.1	11 Nutshell (hickory?)=0.04g
		10650-H.2	4 Calc. Bone=0.02
166	SW	10650-L-E	NOTHING
166	SW	10650-H-E	NOTHING

In the S-Central section of the site, another deep, small-dark stained pit: 2 liters flotated

170	10332-L.1	1 Acorn-like nutshell=<0.01g
	10332-H.1	2 Hickory nutshell=0.06g
170	10332-H.2	6 Hickory Nutshell=0.04g
	10332-H.3	½ cf. *Vitis* sp. (grape (charred)
170	10332-L-E	NOTHING
170	10332-H-E.1	1 Acorn? Nutshell (attachment scar)=<0.01g

In the S-Central section of the site, a narrow but deep, very dark pit

177	10523-L.1	1 Incomplete Seed (*Gaylussacia*?)
177	10523-H.1	54 Hickory nutshell=0.43g
	10523-H.2	7 Bark? (sample removed)=0.26g
	10523-H.3	1 cf. *Artemisia* sp. (Wormwood)

177	10523-L-E	NOTHING
177	10523-H-E	NOTHING

In the S-Central section of the site, a 3rd deep, small dark-stained pit: 1.875 liters

186	10620-L.1	½ Seed? Endosperm? Unidentified
186	10620-H.1	17 Hickory Nutshell=0.20g
	10620-H.2	1 Unid. Nutshell (resembles hazelnut)=<0.01g
	10620-H.3	2 Butternut shell=0.05g
186	10620-L-E	Nothing
186	10620-H-E.1	3 Acorn-like shell=<0.01g

In the S-Central section of the site, a 4th deep, small dark-stained pit: 1.5 liters flotated

187	10564-L	NOTHING
187	10564-H.1	2 Butternut shell=0.06g
	10564-H.2	9 Hickory nutshell=0.05g
	10564-H.3	1 Calc. Bone=<0.01g
187	10564-L-E.1	1 cf. *Labiatae* (resembles mint family) Charred
187	10564-H-E.1	1 cf. Butternut shell=0.01g
	10564-H-E.2	2 Hickory nutshell=0.01g
	10564-H-E.3	1 Acorn nutshell=<0.01g
	10564-H-E.4	4 Nutshell=<0.01g

In the NW section of the site, a small hearth

1110	10713-L	NOTHING
1110	10713-H.1	1 Hickory nutshell=0.04g
	10713-H.2	1 Nutshell=0.02g
	10713-H.3	1 *Cyperaceae* (Sedge family) Broken accidentally
	10713-H.4	1 *Cyperaceae* (Sedge family) Incomplete seed
	10713-H.5	1 Parts of incomplete Unident. seed/nutlet
1110	10713-L-E	NOTHING
1110	10713-H-E.1	1 Char. Unident. Plant part

*NB– this sample had a large fragment of coal in the heavy fraction