

Final Report

376/D-70  
Vol. 1 of 2

## CULTURAL LANDSCAPE REPORT

# HOPEWELL FURNACE NATIONAL HISTORIC SITE



Prepared for  
**National Park Service,**  
Northeast Region,  
Philadelphia Support Office,  
Philadelphia, Pennsylvania

Prepared by  
**KFS Cultural Resources Group**  
Kise Franks & Straw, Philadelphia, Pennsylvania

In association with  
**Menke & Menke**  
Landscape Architects, Swarthmore, Pennsylvania

**Color Scans**

7/22/2004

December 1997

PLEASE RETURN TO:

TECHNICAL INFORMATION CENTER  
DENVER SERVICE CENTER  
NATIONAL PARK SERVICE

ON MICROFILM



DSC-MS-(77C)



# United States Department of the Interior

NATIONAL PARK SERVICE  
Hopewell Furnace National Historic Site  
2 Mark Bird Lane  
Elverson, Pennsylvania 19520

IN REPLY REFER TO:

February 26, 1998

L30

Denver Service Center  
National Park Service  
P.O. Box 25287  
12795 West Alameda Parkway  
Denver, CO 80225-287

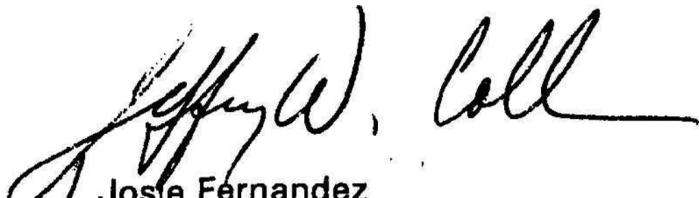
Dear Sir/Madam:

Hopewell Furnace National Historic Site would like to submit copies of the following to your library: *Final Report, Cultural Landscape Report, Hopewell Furnace National Historic Site; - Final Report, Adjacent Lands Study, Hopewell Furnace National Historic Site and Final Report, Cultural Landscape Report, Appendix G: Historic Base Maps, Hopewell Furnace National Historic Site.*

If you have any questions, please contact Dave Searles, VIP Historian or Becky Ross, Park Ranger (Cultural Resources), Hopewell Furnace National Historic Site, 2 Mark Bird Lane, Elverson, PA 19520 or call 610-582-8773.

Thank you.

Sincerely,

  
Josie Fernandez  
Superintendent

*Final Report*

## CULTURAL LANDSCAPE REPORT

### HOPEWELL FURNACE NATIONAL HISTORIC SITE



*Prepared for*  
**National Park Service,**  
Northeast Region,  
Philadelphia Support Office,  
Philadelphia, Pennsylvania

*Prepared by*  
**KFS Cultural Resources Group**  
Kise Franks & Straw, Philadelphia, Pennsylvania

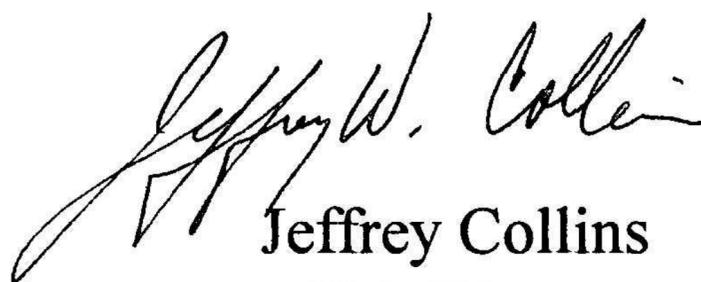
*In association with*  
**Menke & Menke**  
Landscape Architects, Swarthmore, Pennsylvania

*December 1997*

The staff at Hopewell Furnace National Historic Site have reviewed and approved this Cultural Landscape Report.



Josie Fernandez  
Superintendent  
October 27, 1997



Jeffrey Collins  
Chief Ranger  
October 27, 1997

# TABLE OF CONTENTS

List of Figures  
List of Tables

<b>1.0 INTRODUCTION</b> .....	1
STUDY BOUNDARIES.....	1
PURPOSE OF REPORT.....	4
HISTORIC OVERVIEW AND CONTEXT.....	4
SIGNIFICANCE.....	5
METHODOLOGY AND SCOPE OF PROJECT.....	5
SUMMARY OF FINDINGS.....	7
<b>2.0 INVENTORY OF EXISTING CONDITIONS</b> .....	8
SITE DESCRIPTION.....	8
Inventory and Documentation of Existing Conditions.....	8
Current Resources.....	8
Primary Features.....	9
Access.....	10
Site Use.....	10
NATURAL FEATURES.....	14
Slopes.....	14
Soils.....	15
Streams and Drainage.....	15
Vegetation.....	17
Wetlands.....	21
<b>3.0 LANDSCAPE HISTORY</b> .....	23
INTRODUCTION.....	23
SETTLEMENT AND DEVELOPMENT: 1770-1800.....	24
GROWTH AND PROSPERITY: 1800-1845.....	30
DECLINE: 1846-1883.....	42
SHUTDOWN AND SURVIVAL: 1883-1935.....	46
THE CIVILIAN CONSERVATION CORPS: 1935-1938.....	55
THE NATIONAL PARK SERVICE: 1938-Present.....	62
<b>4.0 ANALYSIS AND EVALUATION</b> .....	68
INTRODUCTION.....	68
CULTURAL LANDSCAPE CHARACTERISTICS.....	68
Response to the Natural Environment.....	68
1770-1800: Settlement and Development.....	68
1800-1845: Growth and Prosperity.....	69
1846-1883: Decline.....	70
1883-1935: Shutdown and Survival.....	70
1935-1938: CCC Period.....	70
1938-Present: The National Park Service.....	71
Summary.....	71
Land Use and Activities.....	73
1770-1800: Settlement and Development.....	73
1800-1845: Growth and Prosperity.....	74
1846-1883: Decline.....	76
1883-1935: Shutdown and Survival.....	76

1935-1938: CCC Period .....	78
1938-Present: The National Park Service .....	80
Summary .....	80
Patterns of Spatial Organization.....	83
1770-1800: Settlement and Development.....	83
1800-1845: Growth and Prosperity .....	83
1846-1883: Decline .....	85
1883-1935: Shutdown and Survival.....	85
1935-1938: CCC Period .....	86
1938-Present: The National Park Service .....	86
Summary .....	88
Circulation.....	89
1770-1800: Settlement and Development.....	89
1800-1845: Growth and Prosperity .....	91
1846-1883: Decline .....	91
1883-1935: Shutdown and Survival.....	91
1935-1938: CCC Period.....	93
1938-Present: The National Park Service .....	95
Summary .....	97
Boundary Demarcation .....	99
1770-1800: Settlement and Development.....	99
1800-1845: Growth and Prosperity:.....	101
1846-1883: Decline .....	102
1883-1935: Shutdown and Survival.....	103
1935-1938: CCC Period.....	104
1938-Present: The National Park Service .....	105
Summary .....	107
Vegetation .....	108
1770-1800: Settlement and Development.....	108
1800-1845: Growth and Prosperity .....	111
1846-1883: Decline .....	112
1883-1935: Shutdown and Survival.....	113
1935-1938: CCC Period.....	117
1938-Present: The National Park Service .....	118
Summary .....	124
Clusters, Buildings, and Structures, .....	125
1770-1800: Settlement and Development.....	126
1800-1845: Growth and Prosperity .....	127
1846-1883: Decline .....	127
1883-1935: Shutdown and Survival.....	128
1935-1938: CCC Period.....	130
1938-Present: The National Park Service .....	132
Summary .....	135
Archeological Sites .....	137
1770-1800: Settlement and Development.....	137
1800-1845: Growth and Prosperity .....	139
1846-1883: Decline .....	144
1883-1935: Shutdown and Survival.....	144
1935-1938: CCC Period.....	144
1938-present: The National Park Service.....	144
Summary .....	146
Small-scale Elements .....	146
1770-1800: Settlement and Development.....	146
1800-1845: Growth and Prosperity .....	147

1846-1883: Decline .....	149
1883-1935: Shutdown and Survival .....	149
1935-1938: CCC Period .....	152
1938-Present: The National Park Service .....	153
Summary .....	158
<b>EVALUATION OF SIGNIFICANCE AND INTEGRITY .....</b>	<b>158</b>
Statement of Significance.....	158
Evaluation of Site Integrity .....	160
Contributing and Non-Contributing Resources.....	162
Recommendations for Further Research .....	163
<b>5.0 TREATMENT ALTERNATIVES .....</b>	<b>164</b>
PRESERVATION .....	164
REHABILITATION .....	165
RESTORATION .....	166
RECONSTRUCTION.....	167
RECOMMENDED TREATMENT STRATEGY .....	168
<b>6.0 TREATMENT RECOMMENDATIONS .....</b>	<b>169</b>
INTRODUCTION.....	169
LANDSCAPE MANAGEMENT ZONES.....	170
GENERAL TREATMENT GUIDELINES .....	174
Patterns of Spatial Organization.....	175
Circulation.....	177
Boundaries.....	179
Vegetation .....	181
Clusters, Buildings, and Structures .....	183
Archeological Sites .....	184
Small-Scale Elements.....	184
HANDICAPPED ACCESSIBILITY .....	184
SPECIFIC TREATMENT RECOMMENDATIONS.....	185
Core Village Management Zone .....	185
Agricultural Management Zone .....	198
Woodland Management Zone .....	204
Park Support Management Zone.....	209
INTERPRETATION .....	214
Overview .....	214
Overall Interpretive Recommendations .....	218
Interpretive Recommendations by Proposed Management Zone .....	218
<b>7.0 BIBLIOGRAPHY .....</b>	<b>226</b>
<b>APPENDICES</b>	
APPENDIX A.	BUILDING NUMBERS
APPENDIX B.	CONTRIBUTING/NON-CONTRIBUTING RESOURCES
APPENDIX C.	SITE CHRONOLOGY
APPENDIX D.	BEFORE & AFTER SITE PHOTOGRAPHS
APPENDIX E.	FOREST AGE DOCUMENTATION
APPENDIX F.	FARMING DATA
APPENDIX G.	KEY TO HISTORIC BASE MAPS



## FIGURES

1.1.	Location Map.	2
1.2.	United States Geological Quadrangle showing "Hopewell Village National Historic Site," 1956, rev. 1974.	3
2.1.	Thomas Lloyd Complex, 1995.	9
2.2.	View of Hopewell Village from across the meadow.	11
2.3.	PA Route 345 at French Creek.	11
2.4.	Raccoon Trail, 1995.	12
2.5.	Woodlot House Ruins, 1995.	13
2.6.	Field Number 8.	14
2.7.	View to the Village from the Visitor Center, 1995.	15
2.8.	Upland forested areas near Shed Road, 1995.	16
2.9.	French Creek at PA Route 345, 1995.	16
2.10.	Spring house along the Lenape Trail, 1995.	17
2.11.	An open field near Hopewell Road with a forest stand in the background, 1995.	18
2.12.	Lowland forest near the confluence of Baptism and French Creeks, 1995.	19
2.13.	Map of Agricultural Fields.	20
2.14.	Apple orchard in the vicinity of the visitor parking area, 1995.	21
2.15.	An example of wetlands near French and Baptism Creeks, 1995.	22
3.1.	View of Office & Store, Barn, and Ironmaster's House, ca. 1915.	26
3.2.	View of Tenant House No. I, circa 1954.	28
3.3.	View of "Log House at Hopewell National Historic Site," 1900-1907.	29
3.4.	Hopewell Furnace Lands.	31
3.5.	Hopewell Furnace 1800 Base Map.	32
3.6.	Hopewell Furnace 1800 Base Map, core area.	33

3.7.	View of Boarding House, ca. 1954.	37
3.8.	Tracing of garden plan near Ironmaster's House.	39
3.9.	View of Ironmaster's House, probably twentieth century.	40
3.10.	Hopewell Furnace 1845 Base Map.	43
3.11.	Hopewell Furnace 1845 Base Map, core area.	44
3.12.	Map of Union Township, Berks County, Pennsylvania, 1876.	46
3.13.	View of furnace grouping, ca. 1887.	47
3.14.	View of Office and Store, Barn, and Ironmaster's House, ca. 1890.	47
3.15.	Hopewell Furnace 1883 Base Map.	48
3.16.	Hopewell Furenace 1883 Base Map, core area.	49
3.17.	View of Carpenter's Shop/Wheelwright Shop and Blacksmith Shop, ca. 1895.	51
3.18.	View of Furnace, Bridge House, and remains of Casting House, ca. 1896.	51
3.19.	Birdsboro-Warwick Road, ca. 1914.	52
3.20.	View of Furnace and Bridge House, 1900-1907.	53
3.21.	Map of twentieth century land acquisitions by Hopewell owners.	54
3.22.	Hopewell Furnace 1938 Base Map.	56
3.23.	Hopewell Furnace 1938 Base Map, core area.	57
3.24.	Birdsboro-Warwick Road, ca. 1914.	58
3.25.	Appleman's "Map of Hopewell Village & Ruins," 1935.	60
3.26.	Hopewell Furnace 1995 Base Map.	63
3.27.	Hopewell Furnace 1995 Base Map, core area.	64
3.28.	View of Furnace ruins, ca. 1949.	66
4.1.	View across the sloping topography towards the furnace complex, 1995.	69
4.2a.	French Creek east of the village core, ca. 1936.	72
4.2b.	French Creek east of the village core, 1995.	72
4.3.	Map of land use during the period 1769-1883.	75

4.4.	Map of land use during the period 1883-1935.	77
4.5.	Map of land use during the period 1935-1938.	79
4.6.	Map of land use during the period 1938-1995.	81
4.7.	Patterns of open and wooded spaces.	84
4.8.	Aerial view of Hopewell Furnace National Historic Site, 1937.	87
4.9.	Map of historic roadways through Hopewell Furnace core area.	90
4.10a.	Warwick-Birdsboro Road, ca. 1914.	92
4.10b.	Warwick-Birdsboro Road, 1995.	92
4.11.	Roads, trails, charcoal hearths.	94
4.12.	Village Core area roads, 1935-1970.	96
4.13.	Core Area Roads, 1815-1954.	98
4.14.	East Head Race between PA Route 345 and the Church House, 1995.	101
4.15.	Sketch of fencing at Hopewell Furnace National Historic Site.	103
4.16a.	Invasive vegetation at East Head Race boundary, 1954.	106
4.16b.	Invasive vegetation at East Head Race boundary, 1995.	106
4.17.	Low vegetation under powerlines at Hopewell's northeast boundary, 1995.	107
4.18.	An example of tree stumps sprouting new timber, 1995.	110
4.19.	Typical agricultural field in the vicinity of Hopewell, N.d..	115
4.20.	Map of Historic field divisions, ca 1880-1920.	116
4.21.	Core area vegetation, 1995.	119
4.22a.	View of garden terrace north of Ironmaster's House, ca. 1936.	120
4.22b.	View of garden terrace north of Ironmaster's House, 1955.	120
4.23.	Cedar Pasture, 1990.	121
4.24.	Map of Transitional Woodlands, twentieth century.	123
4.25.	Bethesda Church Cluster, 1995.	126
4.26.	Recollections of Lafayette Houck, 1936.	128
4.27a.	Early twentieth century view of the Ironmaster's House.	129

4.27b	Ironmaster's House, 1995.	129
4.28.	Two extant CCC-era buildings, 1995.	130
4.29.	Map of Baptism Creek Picnic Area, ca. 1940.	131
4.30.	CCC-era picnic shelter located in the Environmental Study Area, 1994.	132
4.31.	Reconstructed Furnace Complex, 1995.	133
4.32a.	Charcoal House, 1920.	134
4.32b.	Charcoal House, 1995.	134
4.33a.	Tenant House No. 3, 1936.	136
4.33b.	Tenant House No. 3, 1995.	136
4.34.	Visitor Center, 1995.	138
4.35.	Quarters No. 99, 1995.	138
4.36.	Map of Archeological Sites and Stone Walls.	140
4.37.	Greenhouse ruins, 1995.	141
4.38.	School House ruins, 1995.	141
4.39.	Ruin of Harrison Lloyd Barn, 1995.	142
4.40.	Harrison Lloyd Farm Lane, 1995.	143
4.41.	Woodlot House ruin, 1995.	143
4.42.	Insurance Company sketch of Hopewell Village, 1879.	145
4.43.	Thomas Lloyd House, Barn, and Spring House, 1995.	147
4.44.	Bethesda Church Cemetery, 1995.	148
4.45.	Sketch of Boarding House water pump.	150
4.46.	Sketch of a grape arbor located behind Tenant House No. 2.	151
4.47.	Sketch of small-scale elements.	151
4.48.	Garden terrace stone steps, ca. 1936.	152
4.49.	Rustic Bridge at Baptism Creek, ca. 1940.	154
4.50.	Drinking fountain and fireplace, ca. 1940.	155
4.51.	Sketch of outbuildings from the vicinity of the tenant houses.	156

4.52.	National Park Service signage, 1995.	157
4.53.	Elements near the Blacksmith Shop and Furnace, 1995.	157
6.1.	Map of Existing Management Zones, 1994.	171
6.2.	Map of Proposed Management Zones.	172
6.3.	Overall Recommendations Map.	176
6.4.	Core Village Recommendations Map.	178
6.5.	Regional example of crossroads community, N.d.	188
6.6.	Regional example of a nineteenth century, N.d.	189
6.7.	Regional example of a dirt road and post-and-rail fences.	190
6.8.	Picket fencing at the Mohn Home, ca. 1900.	190
6.9.	Regional example of a creek with meadow, ca. 1900	193
6.10.	Nineteenth century farm cluster, N.d.	195
6.11.	Regional example of a spring house with small-scale features, ca. 1900.	197
6.12.	A blacksmith shop with small-scale elements, N.d.	198
6.13.	David Bitler Farm, Warwick, PA, 1900-1907.	199

## TABLES

6.1	Summary of Treatment Recommendations and Phasing Plan Core Village Management Zone	222
6.2	Summary of Treatment Recommendations and Phasing Plan Agricultural Management Zone	223
6.3	Summary of Treatment Recommendations and Phasing Plan Woodland Management Zone	224
6.4	Summary of Treatment Recommendations and Phasing Plan Park Support Management Zone	225

**1.0 INTRODUCTION**



## 1.0 INTRODUCTION

### STUDY BOUNDARIES

Hopewell Furnace National Historic Site is located in the Schuylkill River Valley approximately five miles south of Birdsboro in Union Township, Berks County and Warwick Township, Chester County, Pennsylvania (Figure 1.1). French Creek bisects Hopewell and Pennsylvania State Route 345 provides a north-south route through the site. The site contains approximately 635 acres of woodland and 140 acres of farmland, meadows, and pastureland.<sup>1</sup> The centerpiece of the site is the furnace complex and village core. Hopewell Furnace National Historic Site is located in a rural area near the edge of a growing number of bedroom communities associated with Philadelphia and its suburbs. French Creek State Park borders the site along most of its north, east, and west boundaries. State Game Lands #43 borders the site on the south. Privately held lands border the site along the southeast (Figure 1.2). The federal government purchased the approximately six thousand acres of land, currently comprising most of Hopewell Furnace National Historic Site and French Creek State Park, in 1935 for French Creek Recreation Demonstration Area.

This Cultural Landscape Report concentrates on the approximately 848 contiguous acres of land located within Hopewell Furnace National Historic Site's boundaries. These boundaries, set on July 24, 1946, are located within the southeast section of lands acquired for French Creek Recreation Demonstration Project and include the entire 213 acre parcel first designated as Hopewell Village National Historic Site on August 3, 1938. The current site contains only a fraction of the lands formerly associated with Hopewell Furnace. Approximately 260 acres of land contained within the current park boundaries were acquired by former furnace owners during the first quarter of the twentieth century. The majority of lands historically associated with Hopewell Furnace are located within French Creek State Park's boundaries.<sup>2</sup> In 1942 all lands formerly designated as French Creek Recreation Demonstration Project were placed under Hopewell Village National Historic site's charge. Four years later approximately five thousand acres of this land reverted back for use as a recreation demonstration area and in 1947 these lands were deeded to the Commonwealth of Pennsylvania for use as French Creek State Park.<sup>3</sup> The 848 acres set aside in 1946 remained as Hopewell Village National Historic Site. In 1985 the site's name changed to Hopewell Furnace National Historic Site.

---

<sup>1</sup> Diann L. Jacox and Joseph Lee Boyle, "Hopewell Furnace," National Register of Historic Places Nomination, 1985. On file with the Pennsylvania Historical and Museum Commission, Bureau of Historic Preservation, Harrisburg, Pennsylvania.

<sup>2</sup> William H. Dechant & Son, "Hopewell Furnace Lands and Contiguous or Adjacent Tracts, Property of A. Louise C. Brooke At Hopewell Penna.," August 1915, rev. to January 1931. Map on file at Hopewell Furnace National Historic Site.

<sup>3</sup> Joseph E. Walker, *Hopewell Village: The Dynamics of a Nineteenth Century Iron-Making Community* (Philadelphia: University of Pennsylvania Press, 1966), 70; Jacox and Boyle, "Hopewell Furnace."

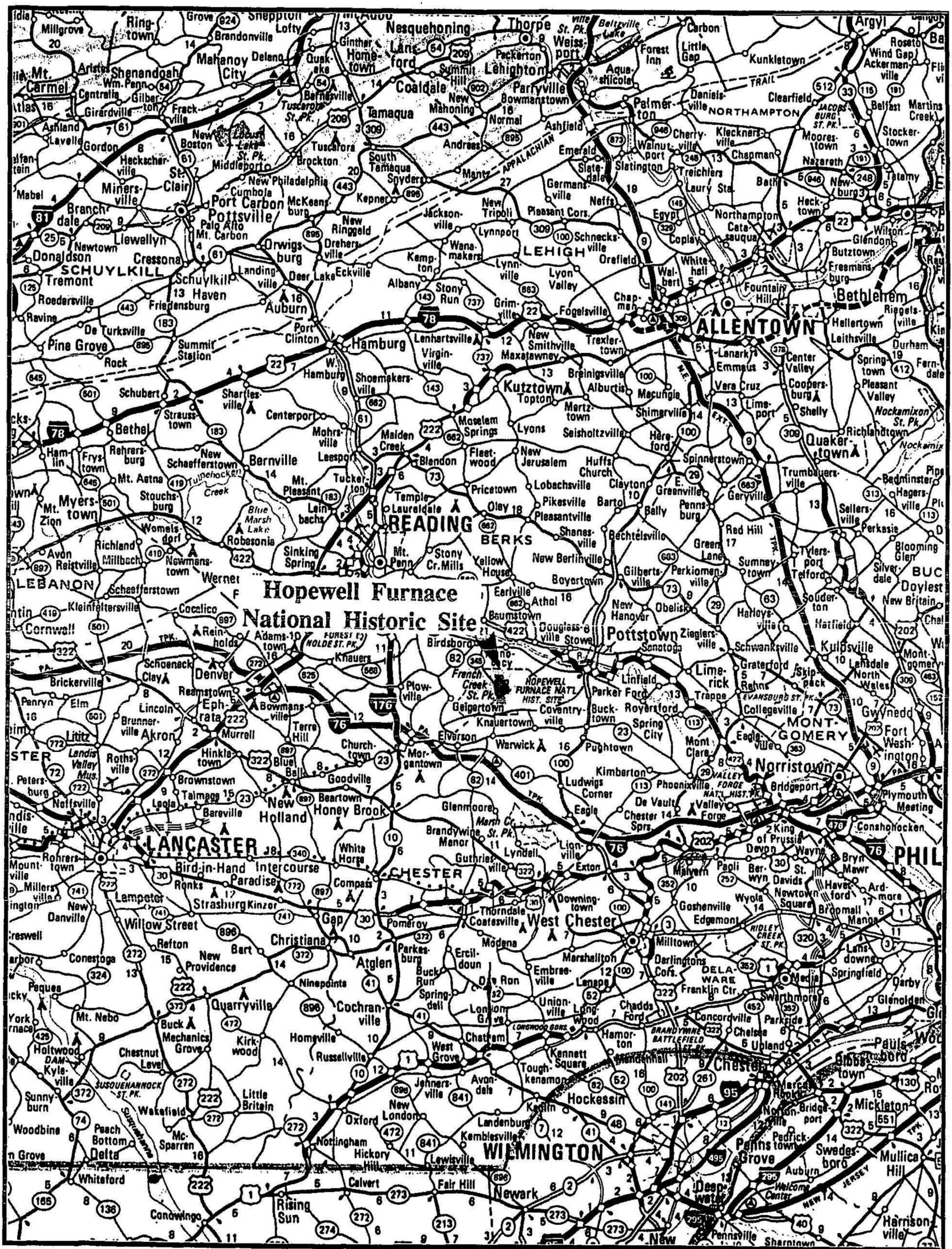


Figure 1.1. Location Map

Approximate Scale: 1 inch= 10 miles

Source: American Automobile Association. New Jersey and Pennsylvania.

Falls Church, Virginia: American Automobile Association, 1989.

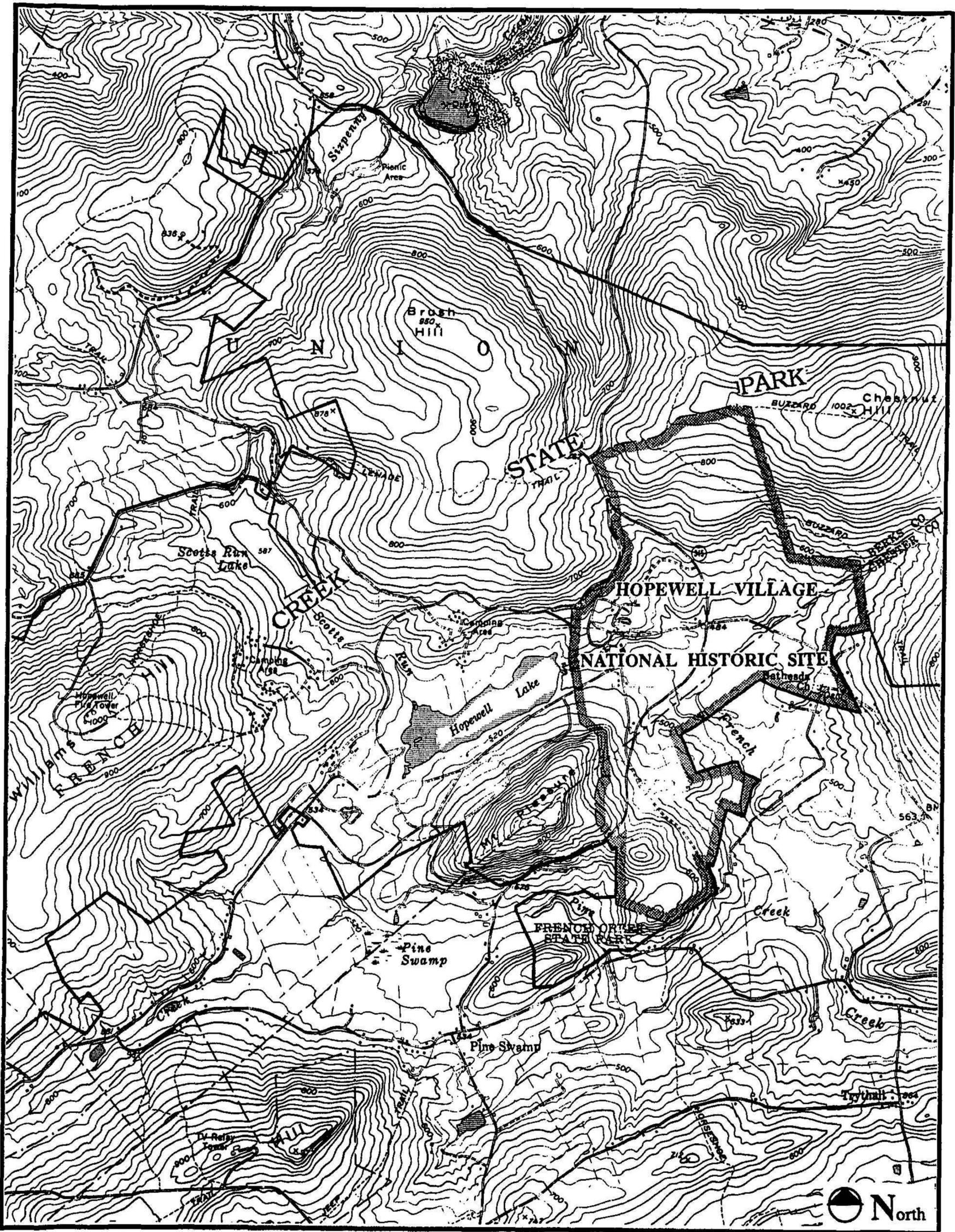


Figure 1.2 United States Geological Survey. Elverson, Pennsylvania Quadrangle.  
 7.5 Minute Series 1956, rev. 1974.  
 Scale: 1 inch = 3,000 feet

## **PURPOSE OF REPORT**

From the date of its acquisition in 1935 and its establishment as a National Historic Site in 1938, the National Park Service has directed historical studies and archeological investigations of Hopewell Furnace National Historic Site in order to guide preservation and interpretation efforts at the site. Early investigations centered on documenting the history of the site. The vast majority of studies conducted over the years concentrated on the buildings and structures comprising the village core area. These studies included historic structure reports, archeological reports, restoration plans, and reconstruction plans. During the 1950s and 1960s park activities more heavily focused on the physical restoration and reconstruction of buildings tied to furnace operations. To date few reports have addressed the composition of the historic landscape or assessed its relationship to the existing landscape.

This report examines Hopewell Furnace's cultural landscape through the documentation and evaluation of its character-defining landscape features including those features dating after the park's establishment. These later features were often ignored due to their more recent construction dates and include Civilian Conservation Corps and Mission 66 related resources. Most of the earlier reports focused on Hopewell Furnace's village and industrial core areas; this report extends its investigations beyond these confines and looks at the overall historic landscape.

The purpose of this report is to document, analyze, and evaluate Hopewell Furnace National Historic Site's cultural landscape characteristics and is strongly founded in the site's landscape history. The report also provides recommendations for treatment alternatives that reflect the site's cultural landscape characteristics and the park's overall mission.

## **HISTORIC OVERVIEW AND CONTEXT**

Hopewell Furnace, a cold-blast, charcoal-fueled iron furnace, operated between 1771 and 1883. Mark Bird, the furnace's first owner, oversaw the production of cannon, shot, and shells for use during the American Revolution. During the second quarter of the nineteenth century Clement Brooke led the furnace through its most prosperous period producing among other items cast iron stoves for heating and cooking. After 1844 Hopewell Furnace focused its operations on the production of pig iron; however, rapid developments in the iron industry began to overshadow Hopewell's capabilities. The Civil War generated large demands for pig iron and the subsequent expansion of railroads and its need for iron prolonged Hopewell's existence. By 1883, however, Hopewell Furnace had outlived its competitive usefulness. With the growing use of coke and hot-blast anthracite furnaces during the second half of the nineteenth century, Hopewell, like most other cold-blast charcoal furnaces, could no longer compete and ceased its iron production.

For over fifty years following its closing Hopewell Furnace received little attention or maintenance. In 1935 the United States purchased nearly six thousand acres of land in and around Hopewell Furnace for use as a recreation demonstration area. In 1938 a small percentage of this land was designated Hopewell Village National Historic Site. The National Park Service set the site's current (1995) boundaries in 1946. Following the site's acquisition the National Park Service conducted numerous historical studies and subsequently restored or reconstructed many resources within the park. In 1985 the park's

named changed from Hopewell Village National Historic Site to Hopewell Furnace National Historic Site emphasizing the importance of the furnace to the area's existence.

## **SIGNIFICANCE**

Beginning during the early Colonial period and continuing through the mid-nineteenth century charcoal furnaces produced virtually all of Pennsylvania's and the nation's iron. No significant technological changes affected the industry through the late 1830s. Eighteenth and nineteenth century furnaces were best suited to areas with abundant hardwood forests, iron ore, limestone, and sufficient streams for water power. After this date other methods of iron production began to advance and locating close to raw materials was not as crucial. While cold-blast charcoal furnaces continued operating into the last quarter of the nineteenth century, their numbers had quickly diminished.<sup>4</sup>

Hopewell Furnace outlasted many of Pennsylvania's charcoal-fueled iron furnaces. While neither the oldest, largest, nor longest operating iron furnace in Pennsylvania – Hopewell Furnace is typical of eighteenth and nineteenth century Pennsylvania iron furnaces. The 1985 National Register of Historic Places Nomination for Hopewell Furnace National Historic Site states two specific areas of significance for Hopewell Furnace; significance derived from its associations with the American Revolution through its relationship with its first owner Mark Bird and the products manufactured at the furnace as well as significance derived as a representative example of a cold-blast charcoal furnace and its longevity as an industrial community.<sup>5</sup>

Resources constructed outside the site's designated period of significance (1771-1883) are considered non-contributing according to the National Register nomination form. Resources associated with two subsequent time periods (Civilian Conservation Corps and Mission 66), however, may have acquired significance and will be reevaluated as part of this study.

## **METHODOLOGY AND SCOPE OF PROJECT**

This Cultural Landscape Report describes the historic evolution of Hopewell Furnace and delineates the character-defining features of the historic landscape through identification, documentation, analysis, and evaluation. The report also provides recommendations for future research and the preservation treatment of the historic landscape.

The history of Hopewell Furnace is documented in a plentiful collection of source material held at Hopewell Furnace National Historic Site. The collection includes both primary and secondary written documentation, oral history transcripts, historic maps and atlases, aerial photographs and historic photographs. Primary written documentation includes volumes of day books, ledgers, and journals maintained by the furnace's owners and operators throughout the nineteenth century. Other written documentation includes National Park Service reports on archeological and architectural investigations undertaken prior to the rehabilitation, reconstruction, and restoration of buildings and structures at the site.

---

<sup>4</sup> Gerald G. Eggert, *The Iron Industry in Pennsylvania*, Pennsylvania Historical Studies No. 25 (Harrisburg, Penn.: The Pennsylvania Historical Association, 1994), 5, 16.

<sup>5</sup> Jacox and Boyle, "Hopewell Furnace."

The site's evolution was compiled through the use of primary and secondary documentation. Historic photographs, plans, and drawings provided useful information on landscape elements existing after 1880 especially when used in combination with the written record and oral interview transcripts. Data relating to elements dating from the late 1860s through the 1880s relied heavily on oral interview transcripts of former employees and residents as well as the written record. The written record and second or third hand oral interview transcripts were relied upon for elements dating from before the 1860s. Information regarding landscape elements dating from all periods relied heavily on historical research conducted during the 1930s and 1950s by National Park Service historians Roy Edgar Appleman and Russell A. Apple. Historic structure reports and archeological reports prepared by consultants and park service personnel have provided additional information regarding the site.

Hopewell Furnace's library and archive supplied the bulk of research information to the team. Additional research was conducted at, but not limited to, the Historical Society of Berks County, Chester County Historical Society, French Creek State Park, and the Insurance Company of North America archives (CIGNA).

Extensive site investigations were undertaken at Hopewell in addition to conducting documentary research of the historic landscape. During field visits, conducted throughout the seasons, team members inventoried and photographed the various characteristics on the 848 acre site and its environs. Because prior research focused on the village core area, only a few existing maps extended beyond this area, and these tended to be sketchy and incomplete. In order to balance the treatment of outlying and core elements, the team had to be inventive with extant materials.<sup>6</sup> Dr. Robert Martin and his students from Kutztown University made available some GIS mapping of the site; however, this once again was limited to a small portion of the site. The team made extensive use of twentieth century aerial photographs, numerous site visits during the fall of 1994 and spring of 1995, and a geographical positioning system unit to accurately locate site elements. Site elements were located on 100 and 400 scale mylar plans and then transferred to AutoCAD Release 12 electronic mapping (upgraded to AutoCAD Release 13). Plotted plans focused upon the core elements (100 scale) and overall site (400 scale).

Evaluation of the integrity of the historic character of the site was made using procedures presented primarily in National Register Bulletin 30 *Guidelines for Evaluating and Documenting Rural Historic Landscapes* and *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Historic Landscapes*. Following documentation of the site's evolution an analysis was conducted with respect to the site's existing conditions. The team re-photographed many historic views to better study landscape changes over time. Once inventoried and mapped, landscape components were evaluated in order to determine patterning and historic significance. From this information cultural landscape character areas and management zones were delineated.

---

<sup>6</sup> To determine the history of a stand of trees in the northeast corner of the site a variety of source materials were utilized. The USGS name of the area, "Chestnut Hill," indicated that American Chestnut presumably dominated this portion of the site until the early twentieth century Chestnut blight, or its consumption for charcoal prior to this date; a 1936 forest cover type map from French Creek State Park indicated that this area was covered by mixed oak species of 21-40 years of age; the 1987 Russell study indicated that mixed oak and black cherry continued to dominate this portion of the site; site inventory suggests that the shallow soils and rocky conditions of the area may have produced trees of smaller stature than their age suggests. As a result, it appears that the trees in this portion of the site are approximately a century old.

## SUMMARY OF FINDINGS

The 848-acre Hopewell Furnace National Historic Site constitutes less than twenty percent of the historic Hopewell Furnace property. Nevertheless, the National Historic Site is a significant cultural landscape that incorporates elements from the property's five identified periods of significance. This report documents existing conditions at the site, details the historic evolution of the property and its landscape, and evaluates and analyzes its contributing character-defining features. A recommendation is presented for preservation, to protect and preserve both character-defining features and the landscape as a whole, recognizing the importance and contributions of all the periods of significance to the site's current appearance. General and specific treatment recommendations are offered that will aid in achieving the preservation of the landscape while enhancing interpretive opportunities.



**2.0 INVENTORY OF  
EXISTING CONDITIONS**



## 2.0 INVENTORY OF EXISTING CONDITIONS

### SITE DESCRIPTION

#### Inventory and Documentation of Existing Conditions

The KFS team inventoried the existing landscape of Hopewell Furnace National Historic Site in 1994-1995. Cultural landscape components examined within the existing 848.06-acre site included: vegetation, buildings and structures (including ruins), circulation, views, and small scale features, etc.<sup>1</sup> Detailed technical reports and graphic resources relating to site features were utilized in documenting existing conditions for the site, and are referenced by footnotes and in the bibliography.

Both contributing and non-contributing features were identified and mapped onto AutoCAD® Release 13 plans. Buildings and site features discussed in this section are keyed to AutoCAD® Existing Conditions Circa 1995 plans with numbers assigned by the National Park Service. A numerical listing of buildings, ruins, and significant site elements is included in Appendix A.

#### Current Resources

Hopewell Furnace National Historic Site constitutes less than 20 percent of the historic Hopewell Furnace property, much of which is now part of French Creek State Park, which borders the National Historic Site to the north and west. Hopewell Furnace National Historic Site includes the industrial and residential core of the historic furnace operation, including the furnace and its associated buildings and structures, and residences occupied by owners and workers. The National Historic Site also includes agricultural fields and outlying farmsteads historically associated with the furnace property and with several privately held farms that bounded the property, as well as wooded areas historically associated with the charcoaling operations that provided the furnace with fuel. In essence Hopewell Furnace National Historic Site, although only a fraction of the historic furnace property, includes examples of most of the various types of land use and activities associated with the furnace throughout the property's history.

Hopewell Furnace National Historic Site may be conveniently divided into a central area that includes the industrial village with its furnace, ancillary structures, residences, the village meadow, and the National Park Service's interpretive and maintenance facilities. This central core is nestled among rolling wooded hills, including Mt. Pleasure to the south, Brush Hill to the northwest, and Chestnut Hill to the northeast. Hopewell Lake, located west of the National Historic Site in French Creek State Park, feeds French Creek, which flows east and south through the site. The northern portion of the site is predominantly wooded, while the central and southern portions maintain the landscape tradition of this part of upland Pennsylvania, with open fields, some bounded by the remains of stone walls, and isolated stands of woods. Several of the farmsteads associated with these fields have fallen into ruins and been reclaimed by the forest.

---

<sup>1</sup> Michael Baker, Jr., Civil Engineer & Surveyor "Property Line Map, Hopewell Village National Historic Site, Birdsboro, PA," Drawing No. NHS-HV 9384, April 1, 1946, with survey to reset #14-18, 1992, HOFU Maintenance Center, Map Flat File - Vegetation, HOFU Property Line Map, USGS Topo drawer.

The historic village core, incorporates numerous interpreted structures associated with the iron furnace and its work force, as well as a large meadow. Located just north of the historic core are visitor support facilities, including a parking area and Visitor Center. Further north of the village core are National Park Service buildings that serve the site's maintenance and staffing needs. This area includes buildings dating from the 1930s through the 1980s. Several historic buildings are currently used as staff residences. These include Tenant House No. 3, located within the village core, the Nathan Care House, located just south of the village core on property not historically owned by the furnace, the Church House, located east of the village core near the intersection of Mark Bird Lane and Pennsylvania Route 345, and the Thomas Lloyd House, located on the south side of Hopewell Road (historically Reading-Valley Forge Road).<sup>2</sup>

### Primary Features

The primary features of Hopewell Furnace National Historic Site result from its rural setting and historic uses. These include large forested areas with pockets of agricultural open spaces. Within the National Historic Site's boundaries are several building clusters associated with supporting the operation of the furnace. The Bethesda Baptist Church cluster supported the cultural life of nearby residents, while other outlying structures housed furnace workers and farmers. The Thomas Lloyd House cluster (Figure 2.1), with its associated stone walls, fences, and farm roads is an example of a primary rural landscape feature located within a setting of agricultural fields or meadows surrounded by woods.



Figure 2.1. Thomas Lloyd Complex, 1995. Menke & Menke photo.

---

<sup>2</sup> The Thomas Lloyd House, as with the Nathan Care House, is located on property not owned by the furnace until the twentieth century.

Without question, the primary focus of Hopewell Furnace National Historic Site is the historic village core. This unique complex of buildings and structures contains the Ironmaster's House, the Furnace and its associated Cast House and outbuildings, the Village Barn and several Tenant Houses, as well as other supporting structures. Threaded through the village are remnants of roads dating from the eighteenth century and the head and tail water raceways necessary for the operation of the furnace. An important complement to the structural elements of the village is the landscape setting, which is centered upon French Creek meandering through the meadow east of the village center (Figure 2.2). Pennsylvania Route 345 provides a delineated boundary edge to the east, while forested hillsides surround the village on the other sides.

### Access

Hopewell Furnace National Historic Site is located near Exits 22 and 23 of the Pennsylvania Turnpike, where the site is identified as a local attraction. Primary vehicular access from both the north and south is via Pennsylvania Route 345, a two lane asphalt-surfaced road. Portions of this road follow historic road alignments; however, the historic alignment through the center of the historic village was abandoned in the late 1930s with the design and construction of the present PA Route 345 By-pass, which loops to the east of the village core, through former agricultural fields, and diverts automobile traffic around the core of the historic village (Figure 2.3). When approaching from the south on PA Route 345, a brief glimpse of the village may be seen from the road just before one reaches the Hopewell Furnace entrance road.

The principal east-west public road in the National Historic Site is Hopewell Road, which is known as Mark Bird Lane west of PA Route 345, where it serves as the principal visitor access road to the historic site, leading uphill to the Visitor Center and parking areas. As one approaches the Visitor Center, there are views to the south, down into the village core. Views to the south from Mark Bird Lane also include open fields with livestock and orchards. From the parking areas immediately north of the Visitor Center one walks downhill to the interpreted portion of the site. A gate across Mark Bird Lane just west of PA Route 345 is closed when the park is closed to the public.

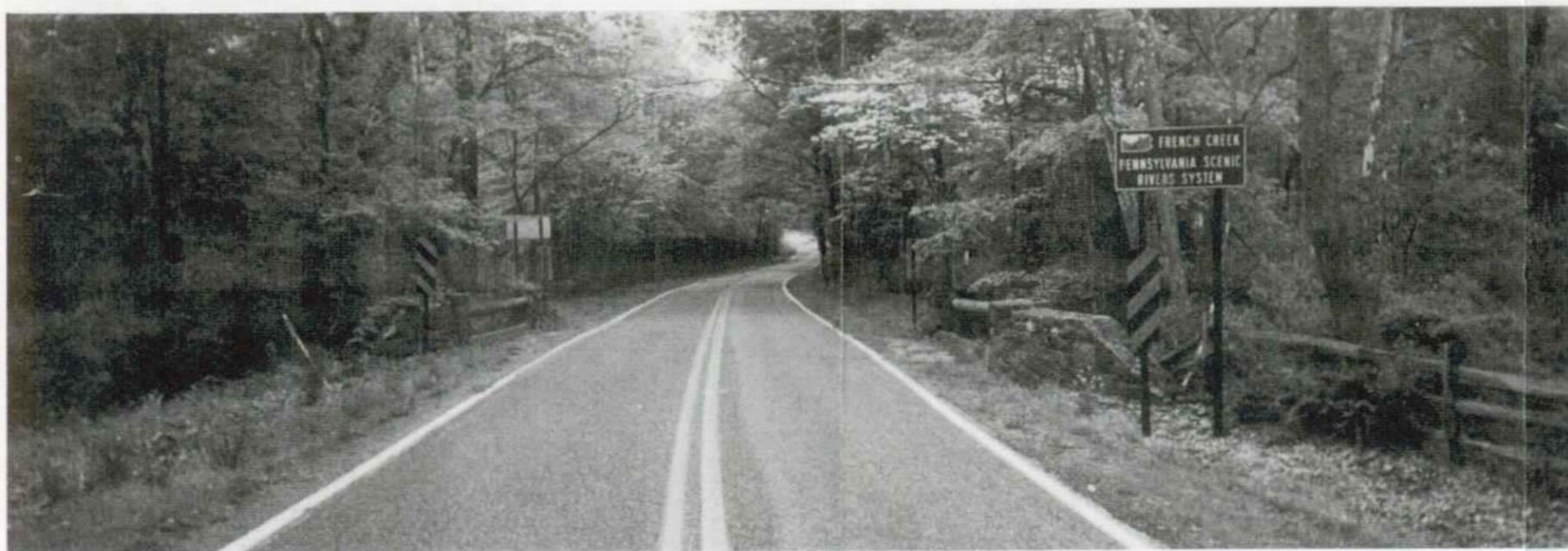
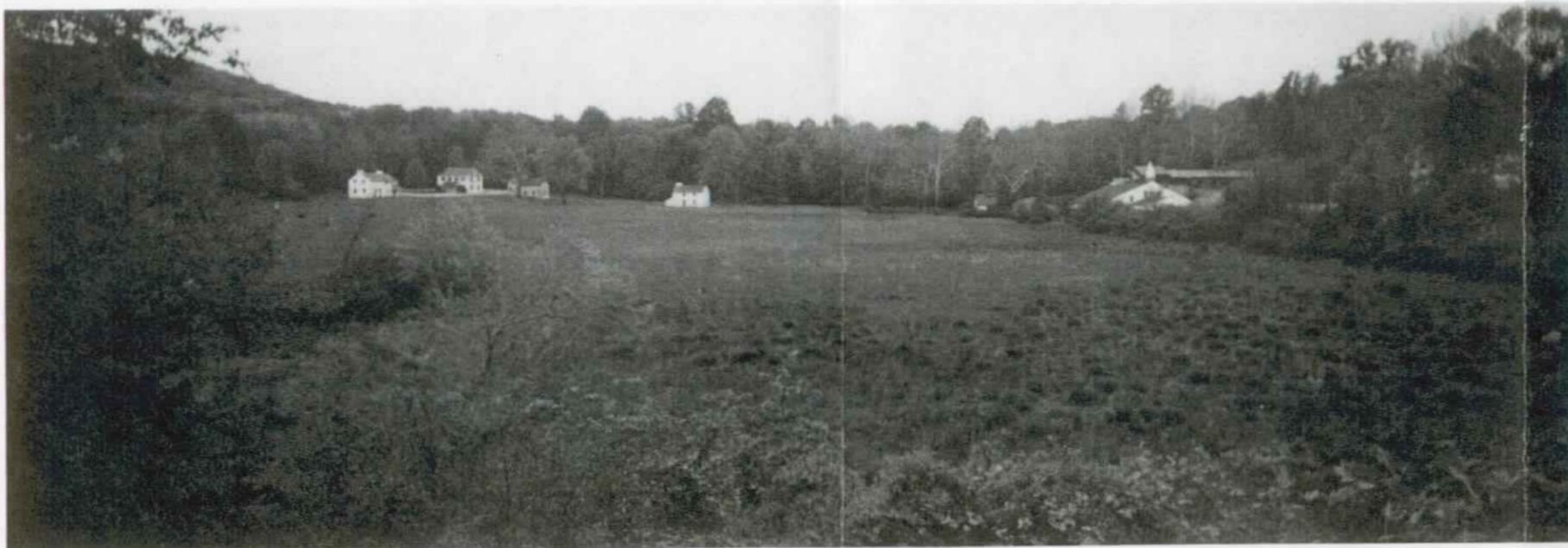
Most of the site lacks public vehicular access. Shed Road, located off PA Route 345, provides access to numerous hiking trails in the northeast sector of the site. Within the interior of the site are a number of roads closed to the public, most of which are unpaved. Some of these roads originally provided access to farms or led off site to mines, while others date from the 1930s and were constructed by the Civilian Conservation Corps. Trails provide pedestrian access throughout much of the site's forested areas (Figure 2.4). Most of these trails either originate or terminate in French Creek State Park, located west of the National Historic Site. There is no direct public road access between French Creek State Park and the village core.

### Site Use

The principal mission of Hopewell Furnace National Historic Site is to "preserve and interpret the site as representative of an iron-making community and a significant way of life and work in the late eighteenth and the nineteenth centuries."<sup>3</sup> The site is divided into

---

<sup>3</sup> Derrick M. Cook, "Statement for Management: Hopewell Furnace National Historic Site," October 1993), 6. On file at Hopewell Furnace National Historic Site.



Figures 2.2 and 2.3. Primary features include the village (top) with the meadow and French Creek surrounded by woods. Access from the north and the south is from PA Route 345, here (below) seen as French Creek passes under a 1930s stone bridge. Menke & Menke photos, 1995.



Figure 2.4. Raccoon Trail, 1995. Menke & Menke photo.

four management zones. Resource types overlap the zone boundaries, and none of the zones are managed exclusively for the protection of the primary resource type.

The Historic Zone encompasses approximately 347 acres. It is considered by the National Park Service to be the most significant of the site's four management zones. The western section of this zone includes the furnace complex and the core village, including the village meadow and neighboring fields. Bethesda Church and its associated carriage house are considered part of the Historic Zone, although this cluster of buildings is not contiguous to the core village. Many of the buildings in this zone are interpreted. Tenant House No. 3 is used as a staff residence, as are the Church House and the Care House, both of which are located just outside the core village. These staff residences are not open to the public. The village's large meadow is used to pasture horses, sheep, and cattle. These animals are used to augment the site's interpretive program. Fields within this area are left fallow or are used for hay.

Immediately north of the core village is the Park Development Zone. This twenty-seven-acre zone includes the Visitor Center, parking areas, maintenance complex, water treatment plant, and other structures required for park operations, maintenance, and visitor service. Two modern staff quarters (Buildings 98 and 99) are located within this zone.

The Historic Zone and Park Development Zone are surrounded by the approximately 471-acre Natural Zone. This zone is generally wooded, and includes streams, trails, and other recreational facilities. An additional staff residence, the Lloyd House, is located within this zone. Hidden and uninterpreted in the woods are the ruins of several former farms and residences, including the Woodlot and Brison Houses (Figure 2.5). Also hidden, and currently relatively unused, is the approximately 50-acre Baptism Creek Picnic area, built by the CCC in the 1930s and presently known as the Environmental Study Area (ESA). The ESA includes a picnic shelter, footbridges, springhouse, and hiking trails.

There are numerous open spaces within the Natural Zone that are maintained in field crops, some contracted to outside parties (Figure 2.6). Hikers, bird watchers, equestrian riders, and other recreational users utilize the well marked trails within the Natural Zone. Maps of the trails are available at the Hopewell Furnace Visitor Center, as well as at adjacent French Creek State Park.

A final management zone is the three-acre Special Use Zone, a right-of-way corridor for an electric power line that runs north-south across the northeastern corner of the site. This narrow corridor is kept cleared of vegetation and has a service structure and signal tower in addition to the power lines.

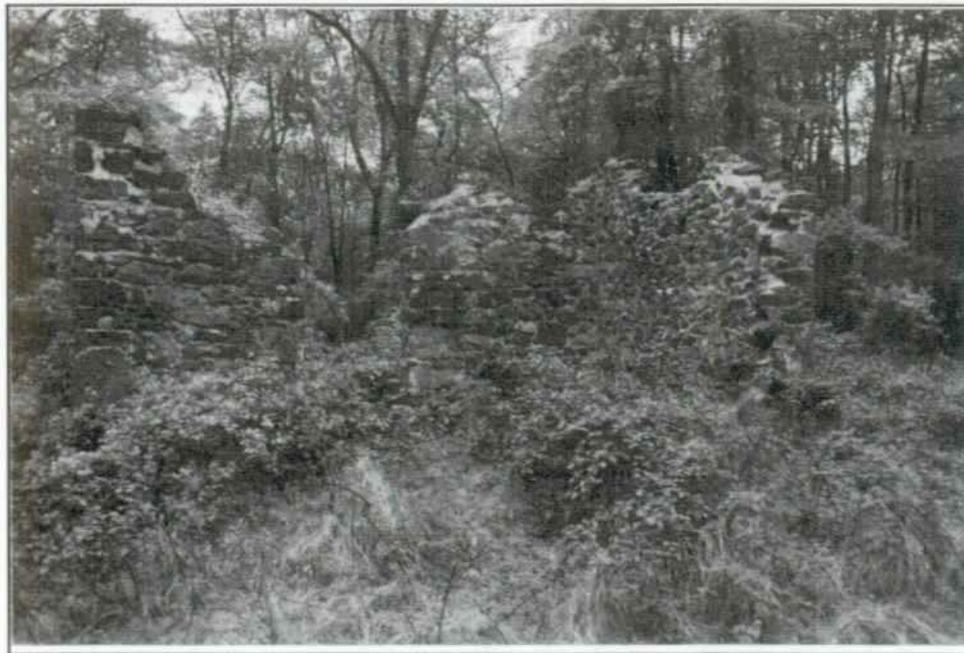


Figure 2.5. Woodlot House Ruins off Hopewell Road (partially obscured by vegetation), 1995. Menke & Menke photo.

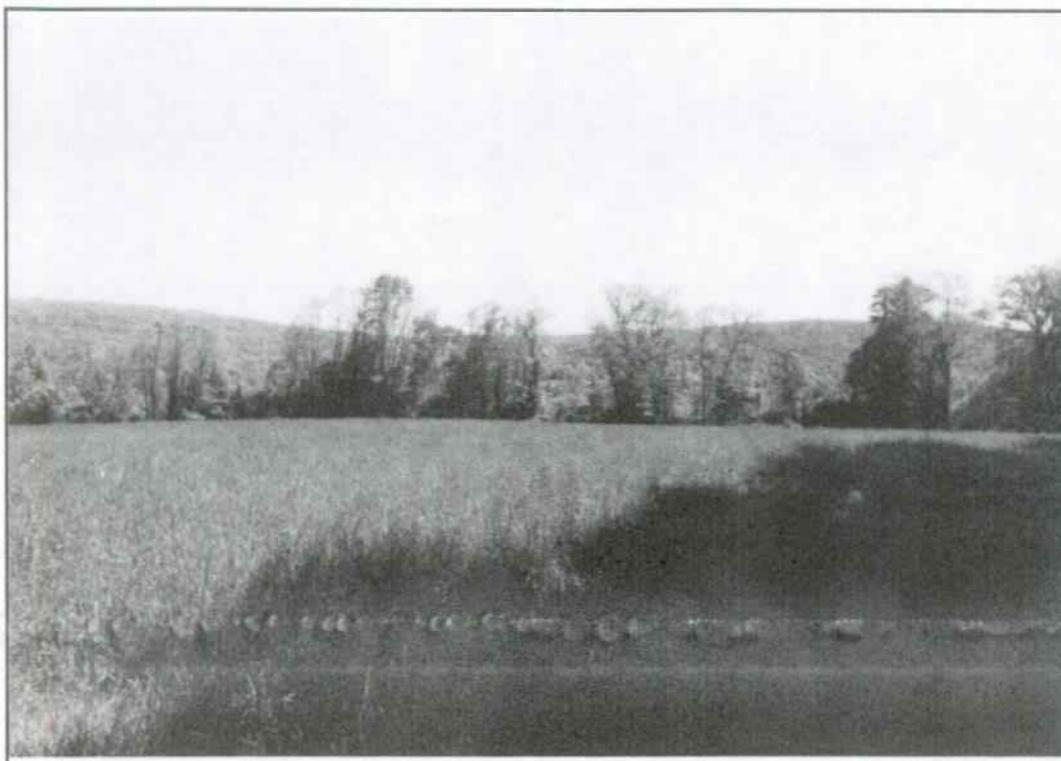


Figure 2.6. Open Field No. 8 in the southern portion of Hopewell Furnace National Historic Site, 1995. Menke & Menke photo.

## NATURAL FEATURES

### Slopes

A full range of slopes exist at Hopewell Furnace National Historic Site, from relatively level areas near the stream banks, to areas so steep that trails are provided with steps. Most of the steeper slopes (8-25%+) are covered with dense forest, and most of the moderate slopes (3-8%) are maintained as cultivated open fields. The shallower sloping areas (0-3%) are poorly drained, and are reverting to wetland areas (see discussion below).

The Visitor Center, located on a slope above the core village, is easily accessible from the parking areas. A picture window and balcony at the upper level of the Visitor Center provides views downhill into the core village (Figure 2.7). Although most of the slopes within the core village are moderate, the transition between the Visitor Center and the village, where the Furnace, Cast House, Blacksmith Shop, and Tenant Houses are located, is relatively steep, rendering the village inaccessible to some visitors. Because of the steep slopes, there are a series of walls and stairs that connect the various levels of the core village.



Figure 2.7. View from Visitor Center into the village, 1995. Menke & Menke photo.

## Soils

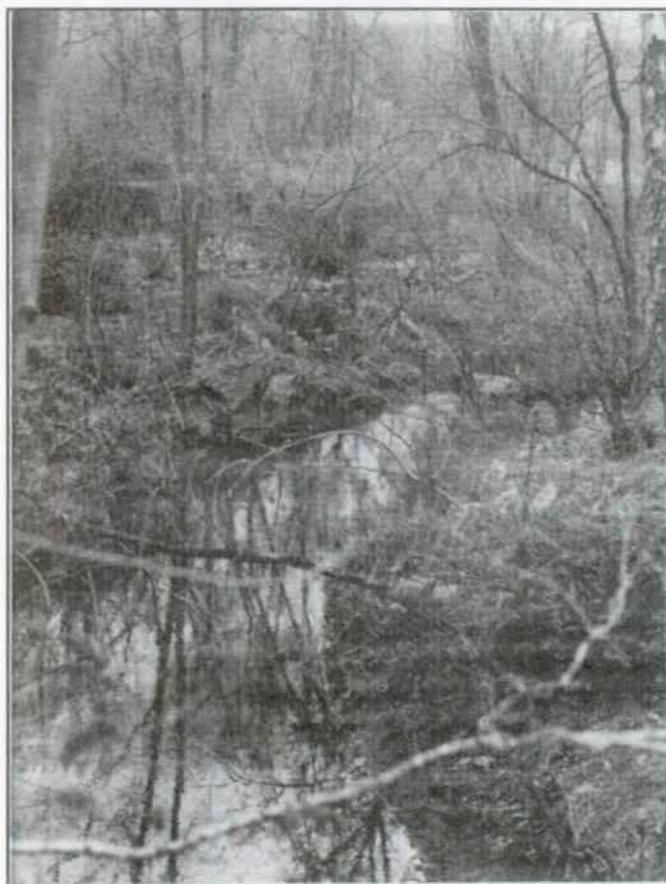
Given the diversity of the topography at Hopewell Furnace National Historic Site, which ranges from steeply sloping wooded hillsides to relatively level open fields, it is not surprising that a wide variety of soils are also present on the site. These vary from shallow, rocky, well-drained soils to marshy alluvial deposits that support dense wetland growth (Figure 2.8). A number of the open areas retained on the site are extremely fertile and continue to support crops.<sup>4</sup>

## Streams and Drainage

French Creek is the major stream flowing through the site (Figure 2.9). The creek enters the National Historic Site property from the west, where it is fed by Hopewell Lake. It passes south of the furnace complex, separating the industrial portion of the village core from the Tenant Houses. East of the main village street the creek flows along the north side of the village meadow and then curves to the south, passing under PA Route 345 and exiting the site. The presence and course of this stream were a principal reason for Mark Bird's location of an iron furnace, which utilized the stream's waterpower, at this site. Other nearby streams were utilized to augment the waterpower provided by French Creek. Spout Run, north of the core village, and Baptism Creek, in the eastern portion of

---

<sup>4</sup> A full listing and description of the site's soils may be found in Sharpe and Neff's 1993 "Hopewell Furnace National Historic Site Water Resource Management Plan," Final Report.



Figures 2.8 (above) and 2.9 (left). Top photo of Upland forested areas near Shed Road revealing well-drained, stony soil conditions. Bottom photo of French Creek at PA Route 345. Menke & Menke photos.

the site, were collected along the East Head Race. Remnants of this raceway are extant, although the race is dry and the diversionary dams in disrepair. These streamlets

originated in numerous springs, and some of their associated springhouses are still extant (Figure 2.10).

All the streams within the site are near the headwaters of their runs, and therefore are little affected by upstream events. French Creek, which provided much of the water supply for the Furnace, is dammed west of the site. During the 1930s, this dam and the resulting Hopewell Lake were greatly enlarged to provide recreational opportunities for what is now French Creek State Park. Hopewell Dam controls the flow of French Creek through the site.



Figure 2.10. Springhouse along Lenape Trail, 1995. Menke & Menke photo.

## Vegetation

Approximately 75 percent of the 848-acre Hopewell Furnace site (635 acres), consists of second growth woodland. An additional 16.5 percent of the site (approximately 140 acres) are actively maintained as open space in pasture, perennial forage crops, hay, turf, and rough and tall grasses (Figure 2.11).<sup>5</sup> To the casual visitor, the wooded portions of the site appear to be a uniform mature canopy of deciduous trees with little understory growth. The woods actually consist of distinct stands that may be clearly differentiated by species type.<sup>6</sup> These include areas of Mixed Oak-Black Birch; Chestnut Oak-Scarlet Oak and Black Cherry; Tulip Poplar-Oak; Tulip Poplar-Red Maple; High Density Red

<sup>5</sup> Roger Stone, et. al., "Hopewell Furnace NHS Field Maintenance Plan," May 1992.

<sup>6</sup> Center for Coastal and Environmental Studies Rutgers University, "Vegetative Species," 1987. Map on file at HOFU Maintenance Center.

Maple; Red Maple with an understory of Arrowwood; Red Maple-Sycamore; Red Cedar; White Ash-Tulip Poplar; Slippery Elm; and Black Walnut.



Figure 2.11. An open field with a forest stand in the background off Hopewell Road, 1995. Menke & Menke photo.

To the north, the forest is dominated by Oak (*Quercus spp.*), Tulip Poplar (*Liriodendron tulipifera*) and Black Birch (*Betula nigra*). To the south (Mt. Pleasant), tree species primarily include Chestnut Oak (*Quercus prinus*), Scarlet Oak (*Quercus coccinea*), Black Cherry (*Prunus serotina*), and Tulip Poplar (*Liriodendron tulipifera*). Areas central to the site, near the juncture of French and Baptism Creeks, contain a preponderance of Red Maple (*Acer rubrum*) with an understory of Arrowwood (*Viburnum dentatum* or *recognitum*). However, in *all* areas it must be noted that the woods are relatively devoid of understory plants because of the closure of the overhead canopy and the recent increase in browsing by white-tailed deer (Figure 2.12). A number of detailed reports have recently been prepared on the vegetation of Hopewell Furnace.<sup>7</sup>

<sup>7</sup> Davis, Edinger, Andersen, Wilkinson and Belfornti, "A Natural Areas Inventory of Berks County, Pennsylvania, 1991; Carl J. Mikan, David A. Orwig and Marc D. Abrams, "Age structure and successional dynamics of a pre-settlement-origin chestnut oak forest in the Pennsylvania Piedmont," and "Successional Dynamics of Old Growth Chestnut Oak", n.d. (circa 1992); Emily Russell, "Vegetation Study Hopewell Furnace National Historic Site," New Brunswick: Rutgers University, March 1987; William Sharpe and William Neff, "Hopewell Furnace National Historic Site Water Resource Management Plan," Final Report, November 1993; Gerald L. Storm, et al., "Plant Community Development in Historic Forest Stands at Hopewell Furnace National Historic Site," July 1994.



Figure 2.12. Lowland forest in poorly drained soils near the confluence of Baptism and French Creeks, 1995. Note the lack of understory plants on account of intensive deer browsing. Menke & Menke photo.

The National Park Service identifies thirteen to fifteen distinct fields at Hopewell Furnace, although the field crops in a number of these are the same (Figure 2.13).<sup>8</sup> The site's Field Maintenance Plan categorizes field crops as: Pasture, Perennial Forage Crops, Turf, Rough Grass, Tall Grass Cover, Fields under Agricultural/Special Use Permits [hay], Pasture, Apple Orchard [turf grass], and Headrace Protection [all grass]. Notably absent at the site are historical field crops, such as corn, oats, and wheat. The absence of these historically appropriate crops is largely a result of the threat of potential damage from grazing deer. Of particular note at the edges of the fields, especially along fieldstone walls, are a number of invasive species, including bittersweet, barberry, and honeysuckle.

The core village contains mature specimen vegetation. A 1973 plan delineating "Tree Species and Locations" was field verified in 1995. Little change in tree species and location has occurred within the core village over the past two decades. Trees include Red Ash, Black Gum, Black Oak, Black Walnut, Eastern Catalpa, Eastern Red Cedar, Flowering Dogwood, Hackberry, Pin Oak, Redbud, Slippery Elm, Sugar Maple, Sycamore, Tulip Poplar, and White Ash. Not noted on the 1973 plan, but in evidence in 1995, are boxwood and lilac in the terraced garden of the Ironmaster's House. Some of these plants, notably the Serviceberry and Flowering Dogwood [as well as the ground

---

<sup>8</sup> Roger Stone, "Hopewell Furnace NHS Field Maintenance Plan," May 1992.

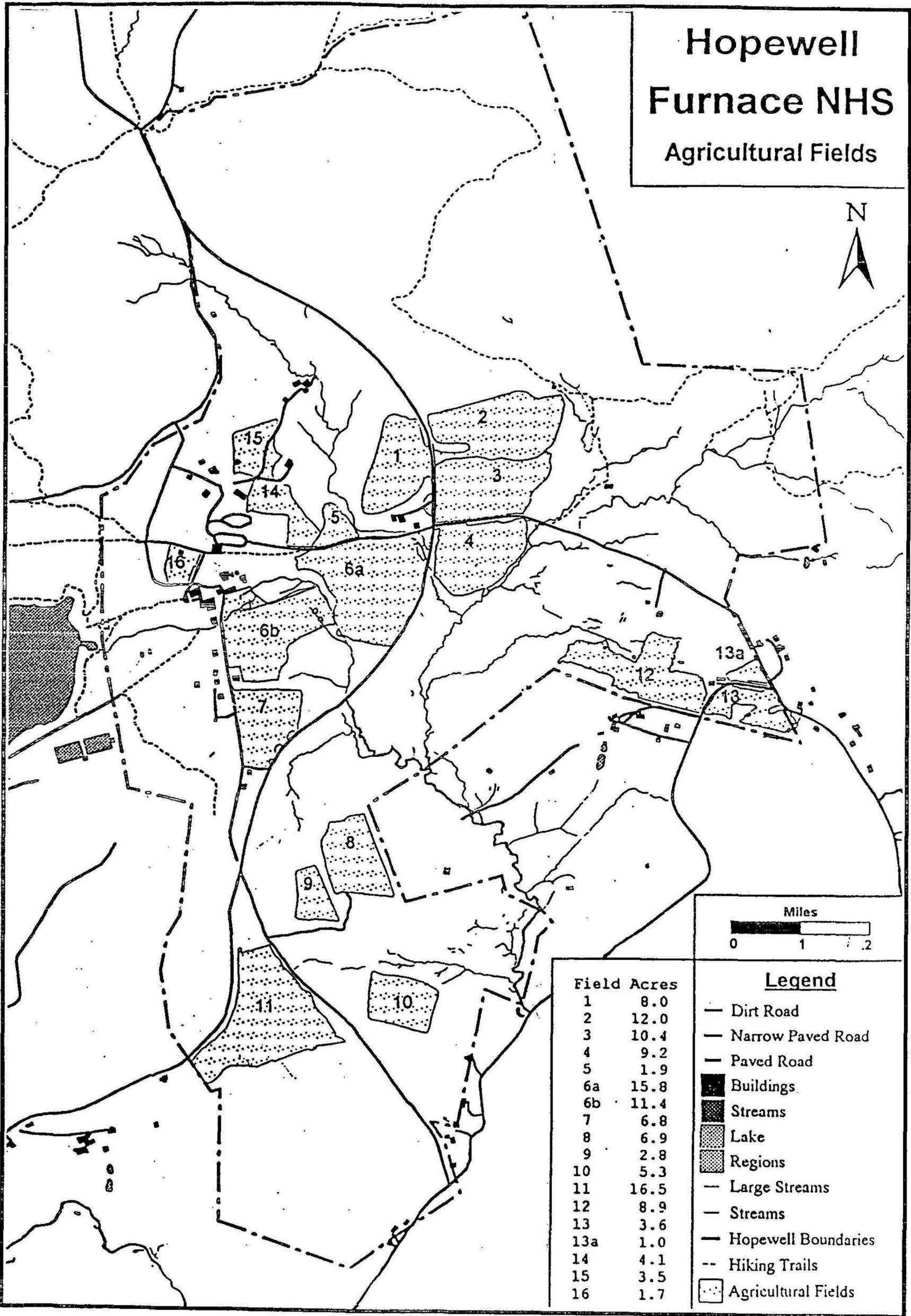


Figure 2.13 Map of Agricultural Fields.

cover *Vinca minor* not mentioned] were planted in the 1950s in association with the construction of the Visitor Center.

The predominant trees in the core village are Sycamore (*Platanus occidentalis*) Black Walnut (*Juglans nigra*) and Tulip Poplars (*Liriodendron tulipifera*). The Apple Orchard, which is located near the Visitor Center and visitor parking areas, has been replanted several times. Apple location and type are mapped on the 1991 "Apple Orchard Plan." twenty-five distinct types are noted, including Baldwin, Delicious, Jonathan, Greening, Macintosh, Northern Spy, Rome, Summer Rambo, and York (Figure 2.14).



Figure 2.14. Apple Orchard and Visitor Parking Area, 1995. Menke & Menke photo.

## Wetlands

Wetlands currently exist throughout the site, particularly in stream edge situations with slopes of less than 3 percent and in areas of silt soils underlain with rocky conditions. The largest areas are in close proximity to the juncture of French and Baptism Creeks, on either side of PA Route 345 (Figure 2.15). The presence of historic drainage channels in this area suggests that the area was historically cultivated. Field investigation indicates that the historic drainage channels that helped keep this area drained have fallen into disrepair. Consequently, the area has become wetter, supporting more non-tidal, palustrine wetland species of plant material (this phenomenon was particularly investigated in the 1994 Vanderwerff report).<sup>9</sup>

<sup>9</sup> William D. Vanderwerff, "The Vascular Flora of Hopewell Furnace National Historic Site, October, 1994. During the course of the present study, the site was being surveyed by others to determine the number and extent of on-site wetlands.



Figure 2.15. Wetlands with a small tributary and skunk cabbage near French and Baptism Creeks, east of PA Route 345, 1995. Menke & Menke photo.

### **3.0 LANDSCAPE HISTORY**

### 3.0 LANDSCAPE HISTORY

#### INTRODUCTION

The history of Hopewell Furnace is documented in a plentiful collection of primary and secondary source materials held at Hopewell Furnace National Historic Site. The collection includes written documentation, oral history transcripts, historic maps, and historic photographs. Additional documentation includes detailed National Park Service reports on archeological and architectural investigations. Previous researchers used these source materials to document the physical appearance of the village core, concentrating on the built environment, and the social history of the people who lived and worked at Hopewell Furnace. This report represents an effort to expand the scope of these investigations to include all the various elements that comprise the cultural landscape of Hopewell Furnace National Historic Site. Existing source materials were re-examined with an eye towards evidence that documented changes in the cultural landscape. The principal sources utilized for this report include the extensive "Documentation for the Historical Base Maps: 1830-1840," prepared by National Park Service historian Russell A. Apple in June 1956 and revised by Earl J. Heydinger in December 1965; Joseph E. Walker's definitive 1966 social history of the furnace; and the extensive and highly detailed historic structures reports and archeological reports prepared by National Park Service personnel for virtually every building in the site's historic core.<sup>1</sup> This overview reflects this goal, and does not include any detailed discussion of the iron-making process or the social history of the furnace community. It is directed towards illuminating changes on the land.

The available sources often provide only partial information regarding cultural landscape features at Hopewell. The operation of an iron furnace required substantial forests to provide fuel to the furnace as well as large areas of land for the cultivation of farm crops, gardens, and orchards to nourish the furnace workers. The documentary evidence, however, seldom provides locational references for specific farm fields, gardens, or forests. Similarly, the documentary records contain numerous references to tenants and tenant houses, but do not provide any locational information, making it impossible to determine the physical location of non-extant tenant houses using only documentary evidence.<sup>2</sup> It is also impossible, in many instances, to determine whether a documentary reference to a specific building, such as a smokehouse, actually refers to the building currently extant on the site. A consistent flaw in much of the previous interpretation of historic land records is a mistaken belief that references to "buildings, tenements, or messuages" refers to actual buildings on the property.<sup>3</sup> This phrase is, in actuality, standard legal language and does not signify either the presence or absence of buildings on a parcel of land. Efforts to date specific buildings based upon this misinterpretation of historic deeds are, therefore, suspect.

---

<sup>1</sup> Russell A. Apple, "Documentation for the Historical Base Maps: 1830-1840," June 1956, 6-11. Typescript on file at Hopewell Furnace National Historic Site (hereafter HOFU). Joseph E. Walker, *Hopewell Village: The Dynamics of a Nineteenth Century Iron-Making Community* (Philadelphia: University of Pennsylvania Press, 1966); Historic structures reports and archeological reports on file at HOFU.

<sup>2</sup> Apple, "Documentation," 6-11. Additional archeological investigations may help locate former tenant houses.

<sup>3</sup> *Ibid.*, I-4.

Oral histories, many collected as early as the 1930s with individuals whose memories of the site dated to the late 1860s, constitute a major source of information regarding the physical appearance of Hopewell Furnace. The limitations of these interviews are obvious, since the interviewees could offer no direct testimony regarding the appearance of the site prior to the late 1860s, nearly fifteen years after the cessation of molding and ninety years after the establishment of the furnace. The interviews, while not totally reliable even for the post-1870 period, are, however, an invaluable resource for documenting the appearance of the property in the second half of the nineteenth century and the early twentieth century.<sup>4</sup>

## SETTLEMENT AND DEVELOPMENT: 1770-1800

In the early 1770s, Mark Bird built his new iron furnace on the edge of a meadow where French Creek flows between Mount Pleasure and Brush Hill in Union Township, Berks County, Pennsylvania, very near the Chester County line. The local environment strongly influenced Bird's decision to build in this particular location. French Creek and its tributaries offered an adequate supply of waterpower to turn the wheels that powered the furnace's blast machinery. The sloping topography north of French Creek allowed the furnace stack to be sited against a hill, simplifying construction of the charging bridge, by which the various raw materials used to produce iron were dumped into the top of the furnace. The raw materials required to produce iron, including iron ore, limestone for flux, and charcoal for fuel, were readily available within a few miles of the furnace site.

The site's most significant flaw was also a result of local environmental conditions. Situated between two hills and bisected by a creek, the site tended to be marshy. The area around the furnace flooded during spring and fall freshets and remained somewhat wet and boggy throughout a considerable part of the year. Bird's work crews dug drainage ditches to convey water away from the furnace's buildings and into French Creek. Over the years, the slag that resulted from the operations was dumped around the furnace, altering the course of French Creek and effectively raising the elevation of the working area at the core of the site. The marshy conditions remained unaltered in other areas of the site. The Tenant Houses lining the west side of the main road through the village all had boardwalks leading from the house to the road, with small wood footbridges spanning a ditch alongside the road that carried water from a spring on Mount Pleasure to French Creek. Likewise, the northern portion of the village's principal meadow or pasture remained marshy.

Bird acquired the core of the furnace property in 1769, purchasing thirty-three acres from Owen Hugh.<sup>5</sup> It is unclear whether there were buildings on the site at this date, although one tradition holds that Hugh had a residence on the property located near the present barnyard, on the north side of French Creek. Bird inherited most of the larger furnace tract from his father, William Bird, in 1761. The elder Bird, who operated a forge in Birdsboro, owned a large amount of woodlands in Union Township.<sup>6</sup> In 1763 his son possessed 8,050 acres in Union Township, of which probably about half had been inherited from his father. Over the next century, the chestnut and hickory trees that grew on these acres were cut and converted into the charcoal that fueled the furnace.

---

<sup>4</sup> Ibid., 16-19.

<sup>5</sup> Walker, *Hopewell Village*, 20.

<sup>6</sup> William Bird was a successful ironmaster who, in 1761, owned two forges and a furnace, with more than 3,000 acres of land. Gerald G. Eggert, *The Iron Industry in Pennsylvania*, Pennsylvania Historical Studies No. 25 (Harrisburg, Penn.: Pennsylvania Historical Association, 1994), 20; W. David Lewis and Walter Hugins, *Hopewell Furnace National Historic Site*, Handbook 124 (Washington, D.C.: National Park Service, 1983), 29.

Despite its proximity to French Creek, the furnace utilized other waterpower sources during its first years of operation. An East Head Race extended approximately one mile from its point of origin on Baptism Creek to the furnace, while a West Head Race extended nearly two miles, part of that distance across land not owned by Bird. The lack of control over the furnace's water supply inherent in this condition forced the furnace owners to dam French Creek west of the furnace and build a new West Head Race in the first decade of the nineteenth century. Tradition holds that Bird's slaves dug the East Head Race ca. 1770. The original West Head Race probably dates from the same period, and certainly from before ca. 1800.<sup>7</sup> Both head races were open ditches, with stone retaining walls at slopes, and were probably lined with clay to reduce the loss of water resulting from leakage. The races generally conformed to the site's contour lines, gently transporting water downhill from their sources to the waterwheel at the furnace.

The availability and location of transportation facilities also influenced Bird's decision as to the furnace's location. Bird recognized the importance that adequate transportation facilities played in determining the financial viability of a furnace operation. He located Hopewell near an existing public road, officially opened in 1758 from a point on the west bank of the Schuylkill River, opposite Reading, in Berks County, via Scarlet's Mill, to Coventry Forge in Chester County.<sup>8</sup> This road passed approximately two hundred yards north of Bird's furnace site. A private road, built and maintained by Bird, connected the furnace property to the public road. Private roads linked the furnace with the Hopewell and Jones Mines. Shortly after operations began at the furnace a public road was opened between the Jones Mines and the Schuylkill River, passing conveniently near the furnace and further improving the furnace's transportation links. By the close of the eighteenth century a network of public and private roads linked the furnace with mines and markets, binding the isolated location into the local and regional economy. Hopewell Furnace remained dependent upon roads and highways throughout its history, since it never benefited from direct access to canals or railroads. The road connections established in the eighteenth and early nineteenth centuries remained critical to Hopewell's success throughout the history of its operation.<sup>9</sup>

Hopewell Furnace began operating ca. 1771, the date borne on a carved stone in the furnace's cast arch. The 1788 *Pennsylvania Gazette* advertisement for public sale of the furnace property states that Hopewell Mine had supplied ore to the furnace for seventeen years, which corroborates the date stone in the cast arch. The early furnace site included a number of buildings essential to the operation of the works. These included the furnace, a water wheel, a charging bridge, a cast house, the ironmaster's house, a blacksmith shop, a store, a barn, and housing for workers. Several of these buildings are currently extant, either rehabilitated or reconstructed based on historical and archeological evidence (Figure 3.1). It is impossible, however, to determine whether the buildings mentioned in the eighteenth century furnace records are the same buildings presently located at the site. It is possible that buildings presently located at the site replaced earlier buildings that served similar functions as those erected during the first years of operation. Indeed, documentary evidence suggests that the Cast House reconstructed in the mid-1960s (Building 33) reflects a building erected ca. 1816, not the original eighteenth century Cast House. The

---

<sup>7</sup> Apple, "Documentation," I-20, I-31, II-7-II-10, II-134-II-136.

<sup>8</sup> It is important to note that most roads in the area existed long before their formal recognition as public roads. The opening of a public road should not be taken to signify that no road existed along that route prior to the date of the official opening.

<sup>9</sup> Walker, *Hopewell Village*, 206-207.

appearance of the eighteenth century Cast House is unknown, although the location of the furnace's hearth clearly indicates that the building occupied roughly the same location as the later Cast House.<sup>10</sup>



Figure 3.1. View of Office & Store (Bldg. 3), Barn (Bldg. 2), and Ironmaster's House (Bldg. 1) looking north, ca. 1915. HOFU archive photo.

The documentary and archeological record clearly indicates that the original water wheel, which provided power to the blast machinery, was oriented north-south, at right angles to the east-west orientation of the present wheel. The present waterwheel, based upon the ca. 1805 wheel, measures five feet in width and twenty-two feet in diameter. It is somewhat smaller than the original north-south wheel, which is estimated to have measured thirty feet in diameter.<sup>11</sup> It is possible that the original wheel was not sheltered from the elements by a wheel house. The first documentary reference to a wheel house dates from 1818, a period in which the furnace underwent extensive repairs and alterations. The wheel house is referred to as "new" at that date.<sup>12</sup> In addition to the wheel and cast house, the operation of the furnace also necessitated a charging bridge, by which the raw materials were placed into the furnace from above. The extant bridge is covered, and is known as the Bridge House (Building 10). It is not known whether the earliest charging bridge was protected from the weather.

<sup>10</sup> "Historic Building Survey Report on Cast House," Part I (22 November 1960); "Historic Structures Report: The Cast House and Molding Sheds," Part II (January 1964); "Historic Structures Report: Cast House and Molding Shed - Buildings No. 33 and No. 37," Part III (August 1966). All on file at HOFU Library.

<sup>11</sup> The present waterwheel is a reconstruction of a wheel installed ca. 1805 that was smaller than, and oriented at right angles to, the original wheel described here. Apple, "Documentation," I-11.

<sup>12</sup> *Ibid.*, II-124.

Early documentary records indicate that Hopewell Furnace included a number of buildings during its first years of operation. Testimony in an 1810 court case suggests that a portion of the Ironmaster's House (Building 1) existed as early as 1772.<sup>13</sup> The earliest portion of the house appears to be the northwest portion of the present main block. The Ironmaster's House has been enlarged and altered on numerous occasions, attaining its present appearance in the 1870s. Other buildings mentioned in eighteenth century documentary records of the furnace include a Blacksmith Shop and an Office & Store, both crucial elements of the operation and both first mentioned in the records in 1784; a barn, which Bird needed to shelter the sixteen horses, twenty-one cows, and forty-six sheep he owned in 1779, according to Union Township tax records; and housing for the furnace employees. Tradition maintains that the present Blacksmith Shop and Office & Store date from the eighteenth century and that the reconstructed Barn (Building 2) approximates the eighteenth century building.<sup>14</sup>

The April 1788 *Pennsylvania Gazette* sale advertisement provides a sketchy portrait of the furnace property less than twenty years after Bird began operations at Hopewell. The property contained 4,338 acres, with a six percent allowance for roads and highways. First growth timber occupied about eight hundred acres of the tract, less than twenty percent of the total. An additional two hundred to three hundred acres, an additional five to seven percent, consisted of second growth timber fit for cutting. The advertisement claimed that this second growth forest had more timber "on it than ever." Fuel consumption is suggested by a statement that the entire tract was thought to possess sufficient timber to serve the furnace for six blasts, each producing eight hundred to nine hundred tons of iron. At the end of this period there would be "a considerable quantity of timber from the young growth now coming forward, sufficient to supply the furnace for a number of years."<sup>15</sup>

The *Pennsylvania Gazette* advertisement states that the tract included fifty to sixty acres of "good watered meadow made," which might "be increased to 90 acres at small expense." This suggests that Bird converted the wetlands along the south side of French Creek into meadows, possibly by constructing drainage works or by clearing the marshy land of trees and brush.<sup>16</sup> The furnace tract included an "excellent young bearing orchard" by 1788, consisting of approximately 250 apple trees. The presence of this orchard, located between the Ironmaster's House and Brush Hill, in approximately the location of the present parking lot orchard, clearly indicates that Bird intended Hopewell Furnace to be a permanent presence in the landscape, with agricultural operations supporting the furnace.<sup>17</sup>

The only buildings specifically mentioned in the 1788 sale advertisement are workers' housing. The advertisement states that the property includes "a sufficient number of houses to accommodate the workmen."<sup>18</sup> The number and location of these buildings, as well as the nature of their construction, is unknown. Tradition and previous scholarship suggest that the stone buildings known as Tenant Houses 1 and 2 (Buildings 19 and 20) may date from the late eighteenth century or the first quarter of the nineteenth century

---

<sup>13</sup> Ibid., II-71.

<sup>14</sup> Ibid., II-43-56, II-69-75, II-124-126.

<sup>15</sup> *Pennsylvania Gazette* (2 April 1786).

<sup>16</sup> The advertisement suggests the presence of improved land on the property with the possibility of increasing the amount of improved acreage; however, it is unclear if the improved land was used for pasture, field crops, or some other use.

<sup>17</sup> *Pennsylvania Gazette* (2 April 1786).

<sup>18</sup> Ibid.

(Figure 3.2).<sup>19</sup> The evidence is inconclusive. It seems likely that some of the earliest workers' housing consisted of log cabins demolished during the nineteenth century (Figure 3.3). The location of these buildings, and indeed their very existence, cannot be conclusively determined based upon the available documentary records.<sup>20</sup>



Figure 3.2. View of Tenant House 1 (Bldg. 19) looking northwest, ca. 1954. HOFU archive photo.

Bird's furnace stood within an established agricultural community comprised of individual farms established prior to the construction of the furnace. While the furnace tract may have been dominated by first and second growth chestnut woods, the countryside south of the furnace was largely cultivated farmland. Thomas Lloyd occupied a 134-acre farm just east of the furnace property in Chester County. Lloyd built Bethesda Church (Building 79), presently located within Hopewell Furnace National Historic Site, in 1782 to serve the religious needs of the area's residents. Construction of this meeting house indicates that the area surrounding the furnace supported a population of some size by this date. Most of the area's residents were farmers. Many of these farmers, along with their sons, worked for the furnace during the slack periods of the agricultural season as woodcutters or

<sup>19</sup> Apple, "Documentation," II-141-142, II-149-150.

<sup>20</sup> It should also be noted that several tenant houses were located at the iron mines, several miles from the furnace.

laborers.<sup>21</sup> Hopewell Furnace contained its own agricultural lands as well. In 1795 Ironmaster James Wilson demanded that a minimum of 1,000 bushels of lime be placed on the furnace's arable lands and that clover be planted. Three years later Samuel Cox farmed the two fields flanking the furnace race (probably the East Head Race located north and east of Building 27). Cox planted these fields with corn and had other undisclosed fields planted with buckwheat. Cox's share-cropping agreement with the furnace also permitted the mowing of the meadow to the "haves".<sup>22</sup>

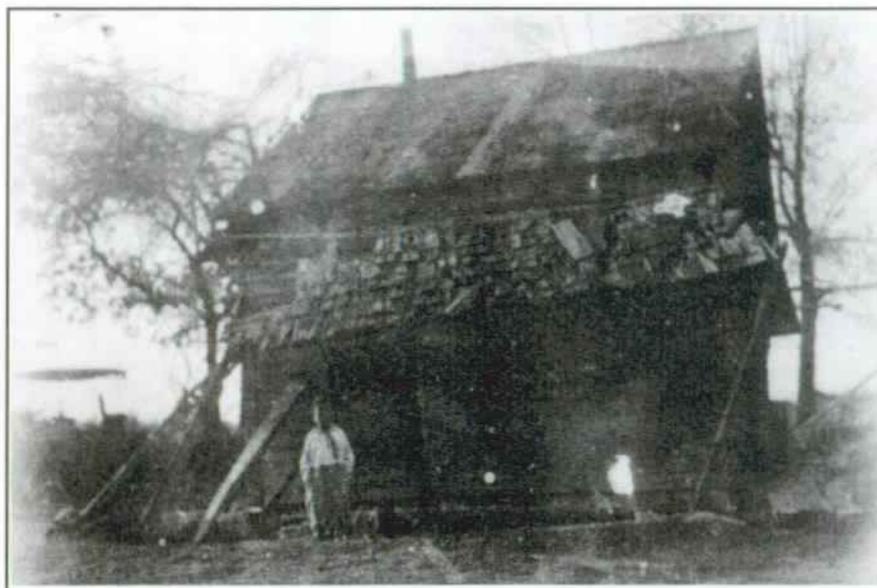


Figure 3.3. View of "Log House at Hopewell National Historic Site." Unknown location. Octavius Bull photograph taken between 1900-1907. On file at Chester County Historical Society, Photo No. CCHS#1816.

Bird suffered financial setbacks, at least partially as a result of not being paid for work performed during the Revolutionary War years. In 1784, when he appealed for a tax reduction, he stated that the furnace had not run for some time. This appeal followed two sharp reductions in his tax liability the previous years.<sup>23</sup> A flood in the fall of 1786 further complicated Bird's position. Hopewell apparently suffered damage as a result of this flood, but the nature and extent of the losses is unknown.<sup>24</sup>

In April 1786 Bird offered to sell Hopewell Furnace, Birdsboro Forge, and Spring Forge. The sale advertisement in the *Pennsylvania Gazette* described the furnace property as consisting of four thousand acres of land and three banks of iron ore "all within a reasonable distance." The terms of the sale required the buyer of the furnace to supply the two forges with "a certain quantity of pig iron at a stipulated price" for the next four years. The furnace was described as currently in blast, with "a provision of five thousand cords of

<sup>21</sup> Apple, "Documentation," I-5-6; Walker, *Hopewell Village*, 229-254..

<sup>22</sup> Walker, *Hopewell Village*, 122, 125. Cox's sharecropping agreement required him to clear, fence, plow, and sow the field at his own expense. The agreement allowed Cox to keep two-thirds of the corn harvested above the head race and half the corn harvested below the head race. He also received half the buckwheat or other summer grain that he planted.

<sup>23</sup> *Ibid.*, 29.

<sup>24</sup> *Ibid.*, 30.

wood and eight hundred loads of ore." The furnace property also included five teams of horses. Apparently the bids for the property proved inadequate, as no sales transaction was recorded.<sup>25</sup>

Two years later, in 1788, Bird again offered Hopewell Furnace at a public sale. Cadwallader Morris and James Old purchased the 5,163-acre tract.<sup>26</sup> The change in ownership did not bring prosperity to the furnace, despite the fact that it was the second largest, in terms of production, of the fourteen furnaces in Pennsylvania in 1789. During the next twelve years the furnace property changed hands at least five times, as various partners sold and resold their shares of the property. Ownership of the furnace remained unsettled until 1800, when the property came under the control of Daniel Buckley and his brothers-in-law, Thomas and Matthew Brooke. From this date, through 1883, when the furnace ceased operations, Hopewell remained in the hands of Buckley and Brooke families (Figure 3.4).<sup>27</sup>

### **GROWTH AND PROSPERITY: 1800-1845**

The new owners of the furnace made extensive improvements to the furnace property during the first decade of the nineteenth century. Perhaps the most significant of these improvements entailed the damming of French Creek and the construction of a new West Head Race. As noted above, the original West Head Race was not located entirely on furnace property. During the first years of the nineteenth century a court action convinced Buckley and the Brooke brothers of the need to secure their waterpower sources. A dam was erected across French Creek a short distance west of the furnace and a new head race was constructed to convey the water to the waterwheel at the furnace. The new West Head Race delivered water to the wheel at a lower elevation than the original West Head Race, which apparently necessitated the installation of a new wheel measuring twenty-two feet in diameter, eight feet smaller than the original thirty-foot overshot wheel. Additionally, the wheel pit was reoriented to an east-west direction, at right angles to the original north-south pit.<sup>28</sup>

The construction of the dam on French Creek, the reorientation of the wheel pit, and the installation of the new waterwheel probably occurred ca. 1805. Furnace records note the employment of a millwright on the furnace wheel in April 1805. Two years later, in 1807, the dam broke or was damaged on three separate occasions. These events strongly suggest a ca. 1805 date for the alteration of the waterwheel and the construction of the new West Head Race. Presumably, the original West Head Race was abandoned at this date.<sup>29</sup>

Furnace records document several other improvements at Hopewell during the first years of the Buckley and Brooke ownership of the property. In 1801 Thomas "Loid" [probably Lloyd] was paid for logs and timber, as well as rafters, shingles, and straw, for a Coal House. The records do not indicate whether this was for a new building or for repairs to an existing building. Presumably, a coal house existed from the beginning of the furnace's operation in order to protect the charcoal from the elements.<sup>30</sup>

---

<sup>25</sup> *Pennsylvania Gazette* (26 April 1786).

<sup>26</sup> Walker, *Hopewell Village*, 32.

<sup>27</sup> *Ibid.*, 32-37.

<sup>28</sup> Apple, "Documentation," II-86; Walker, *Hopewell Village*, 40.

<sup>29</sup> Apple, "Documentation," II-118.

<sup>30</sup> Walker, *Hopewell Village*, 40.

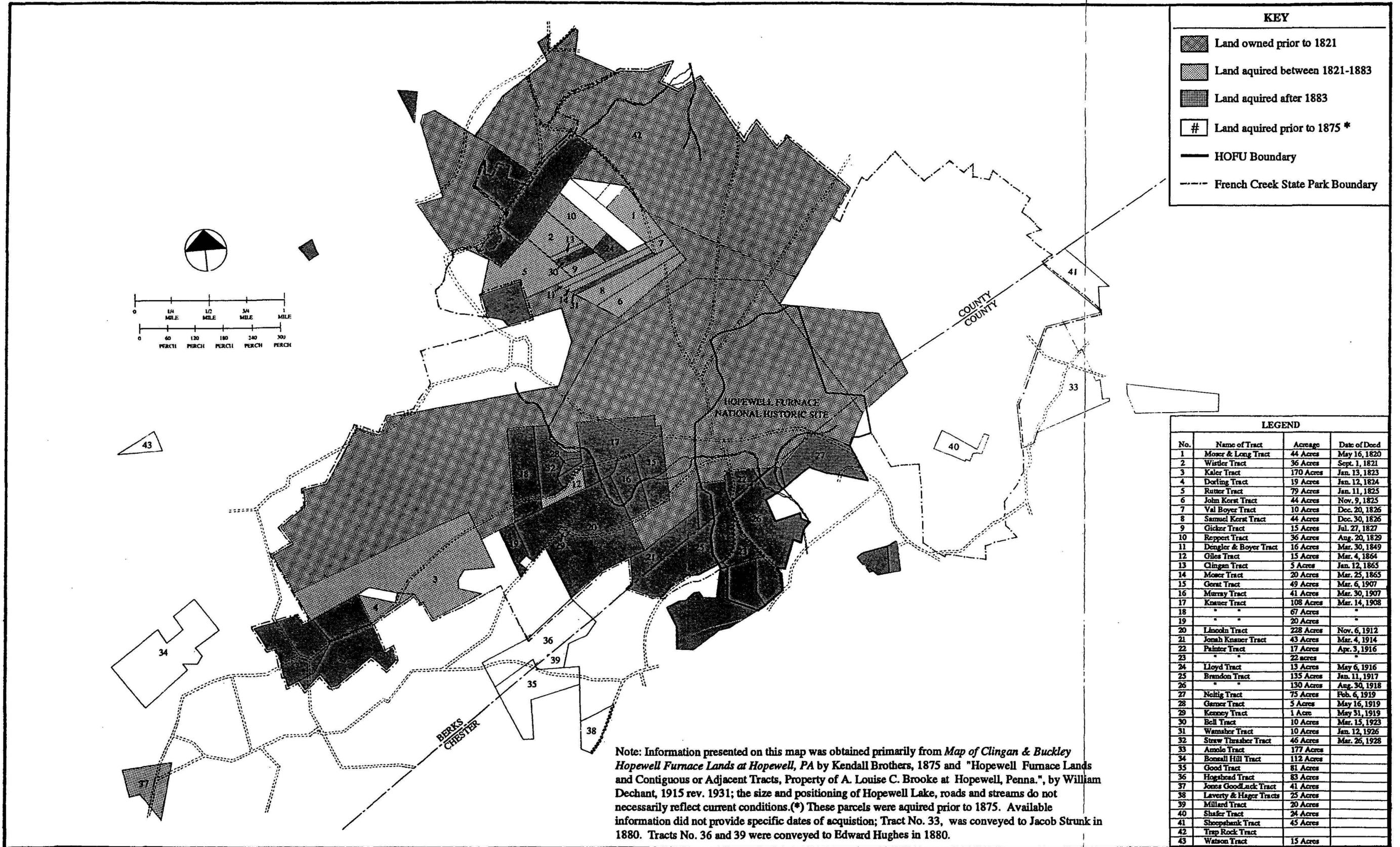
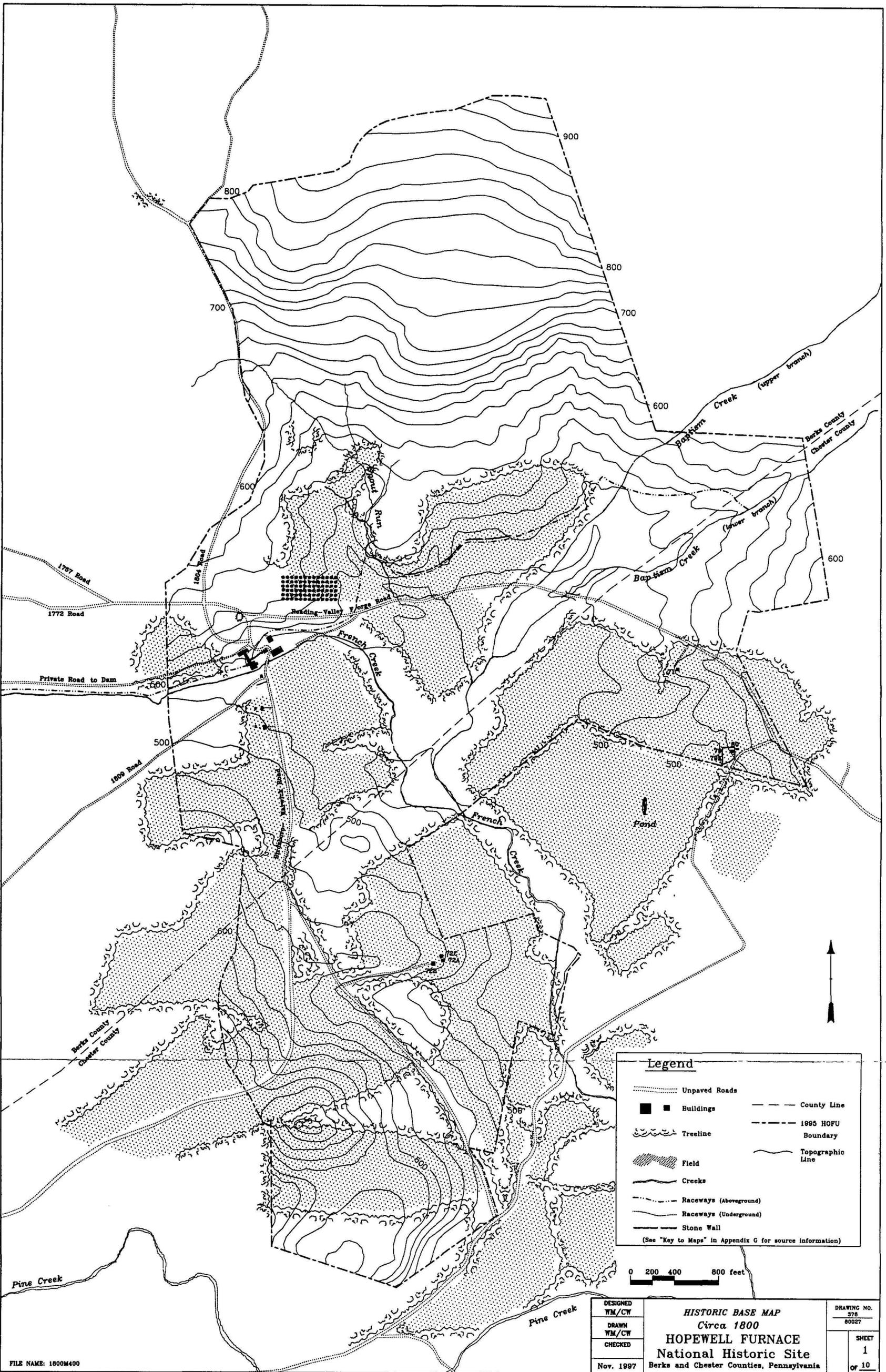


Figure 3.4. Hopewell Furnace Boundaries.

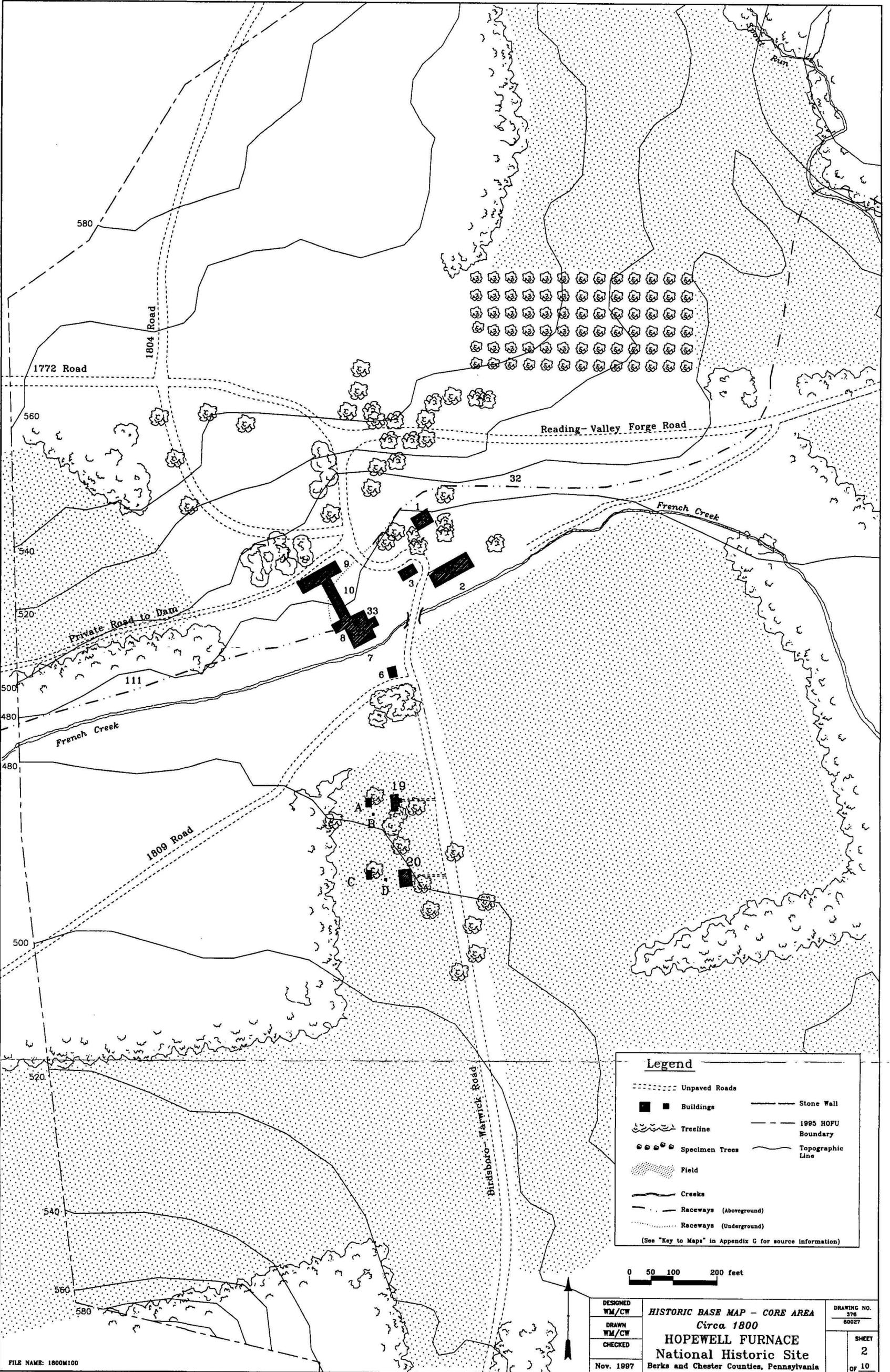


FILE NAME: 1800M400

DESIGNED  
WM/CW  
DRAWN  
WM/CW  
CHECKED  
Nov. 1997

**HISTORIC BASE MAP**  
Circa 1800  
**HOPEWELL FURNACE**  
National Historic Site  
Berks and Chester Counties, Pennsylvania

DRAWING NO.  
375  
80027  
SHEET  
1  
OF 10



FILE NAME: 1800M100

**Legend**

- Unpaved Roads
- Buildings
- Stone Wall
- 1985 HOPU Boundary
- Topographic Line
- Treeline
- Specimen Trees
- Field
- Creeks
- Raceways (Aboveground)
- Raceways (Underground)

(See "Key to Maps" in Appendix G for source information)

0 50 100 200 feet

DESIGNED WM/CW	<b>HISTORIC BASE MAP - CORE AREA</b> Circa 1800 <b>HOPEWELL FURNACE</b> National Historic Site Berks and Chester Counties, Pennsylvania	DRAWING NO. 376 60027
DRAWN WM/CW		SHEET 2
CHECKED		OF 10
Nov. 1987		

ON MICROFILM

Farming continued at Hopewell during this early time period. In 1804 Elishu Bard performed numerous farming activities for Hopewell's owner Matthew Brooke. Part of Bard's work included planting the "front lot" with flax during the month of May. Later that year he sowed this same lot, as well as the barn lot and the meadow, with turnip seed. In October, Bard brought rails to fence the turnip ground. During the year Bard and his sons also fertilized the garden with dung, plowed potatoes in the garden, cleared the orchard of brush, and cut clover in the orchard. In addition to Bard, Hopewell Furnace employed twelve people to work the furnace's farm fields between 1805 and 1807.<sup>31</sup>

The construction and repair of housing is a recurring topic in furnace records throughout the nineteenth century. During the first decade of ownership by Buckley and the Brooke brothers the records note construction of a log house in 1803 and a stone tenant house in 1806. Apple tentatively identified the 1806 house as the west section of the present Boarding House (Building 24).<sup>32</sup> He based this identification on an analysis of the number of perches of masonry contained in the walls of the building, compared to the number of perches for which the masons were paid in 1806. The masons received payment for 156 perches, while the west section of the Boarding House contains, according to Apple's calculations, approximately 140 perches.<sup>33</sup>

The reference to a log house in the records raises the possibility that some, perhaps even most, of the early tenant and workers houses at the furnace were impermanent log structures. Records suggest that the furnace owned ten to fifteen houses during the mid-nineteenth century, and perhaps even more.<sup>34</sup> Available documentary records cannot account for all of these buildings, which suggests that some may have been log cabins of an impermanent nature, which the furnace records did not record as assets.

The precise location of non-extant tenant houses is unknown, although their general location may be deduced from the available evidence. In general tenant houses appear to have been located along the Birdsboro-Warwick Road in the present village core, along the 1809 Road (to Jones Mine), and along the north shore of Hopewell Lake. The four extant Tenant Houses – two single houses, a twin house, and the Boarding House – are located in the village core, flanking a road, laid out in 1804 and officially declared public in 1805, that extends from Warwick Furnace to Birdsboro via Hopewell. A private road probably existed along this alignment prior to 1804. Five years later a new access road to the Jones Mine was declared public, after probably existing as a private road for some time. An unknown number of tenant houses, perhaps three to five, lined this road.<sup>35</sup> It is known that at least three houses stood along the north shore of Hopewell Lake prior to the 1930s.<sup>36</sup> These houses were likely erected after construction of the dam ca. 1805. The opening of the 1804 and 1809 roads combined with the flurry of construction activity

---

<sup>31</sup> *Ibid.*, 123-124, 425. The location of the "front" field is unclear. Bard's reference to a garden may refer to a garden that Park Service Historian Apple located southeast of the barn.

<sup>32</sup> Apple, "Documentation," II-144; Walker, *Hopewell Village*, 44.

<sup>33</sup> These are "cubic perches," 16.5 feet long, 1 foot tall, and 1 foot deep. Apple, "Documentation," 11-15.

<sup>34</sup> *Ibid.*, 6-11.

<sup>35</sup> In 1939 the chimneys of two houses were extant in this area. One of these ruins was designated the Strouck House (Building 90) by the National Park Service. *Ibid.*, II-142-143.

<sup>36</sup> The ruins of one of these houses, designated the Frees' House (Building 36) by the National Park Service, were extant in the mid-1950s. The other two were presumably submerged by the expanded Hopewell Lake in the 1930s. *Ibid.*, I-18-19.

during the first decade of the nineteenth century suggests that tenant houses, historically known along these roads, may date from the first decade of the nineteenth century.<sup>37</sup>

Hopewell Furnace failed to prosper during the first years of the nineteenth century, despite its new owners' efforts to improve the physical plant. In fact, between 1808 and 1816 the furnace was out of blast entirely, at least partly because of a series of law suits that threatened the owners' title to the property.<sup>38</sup> During this period little work occurred at the furnace beyond routine maintenance. A stamp mill, installed at the furnace in 1805, was used to crush slag so as to recover beads of iron in the waste product. The stamp mill continued to operate until at least 1816, when the furnace again began full operations.<sup>39</sup>

In 1816 the owners of the furnace reorganized as Daniel Buckley & Company, partially as a result of the death of several members of the earlier firm. The new partnership spent approximately \$8,000 to repair and upgrade the furnace property in preparation for a resumption of operations. In March 1816 the Hopewell store reopened, and by July 1816 the furnace was again in blast, probably with a new Cast House. The owners supplemented the basic furnace operation by erecting a cupola to refine pig iron and expand the molding operations at the furnace. Popular in the early nineteenth century, cupolas remelted pig and scrap iron, removing impurities and permitting finer casting. Cupolas were constructed of sheet iron and could measure as much as eighteen feet tall. The larger units received their blast from the same waterpowered blast machinery as the furnace. The location of the cupola is unknown; however, it is generally thought to have been located west of the furnace, near the Wheel House (Building 8).<sup>40</sup>

Furnace records document other physical improvements either constructed or in place by 1820. These include the "new" Wheel House described above, which was probably an entirely new building housing the reoriented water wheel, although not necessarily the first wheel house at the furnace, and the introduction of water pipe between the Spring House (Building 17) and the Ironmaster's House. This last improvement, documented as extant in 1816, introduced running water into the Ironmaster's House.<sup>41</sup>

The furnace had yet to reestablish itself in the market when the Panic of 1819 drove the entire economy into a depression. Daniel Buckley & Company weathered this economic storm, and the furnace emerged into its greatest period of prosperity. Improvements in the region's transportation network, as exemplified by the completion of the Schuylkill Navigation Canal in the early 1820s, provided the furnace's manager, Clement Brooke, an opportunity to cut transportation costs and improve Hopewell's position within the regional market. By the mid-1820s the road network in the vicinity of the furnace was essentially complete. Roads and road traces that are presently evident as landscape features all existed by this date, with the exception of PA Route 345 loop road around the core village, which was constructed by the Civilian Conservation Corps between 1937 and 1938.<sup>42</sup>

---

<sup>37</sup> Other known tenant house locations include the Maddis House (Building 46), located "near the dam;" the Brison House (Building 77) and the Wood Lot House (Building 76), a pair of stone ruins located in the eastern portion of the furnace property; and the Manning House (Building 30), a log ruin located near Spout Run. *Ibid.*, passim.

<sup>38</sup> Walker, *Hopewell Village*, 49.

<sup>39</sup> *Ibid.*, 47-49.

<sup>40</sup> Walker, *Hopewell Village*, 55; Apple, "Documentation," II-130-131.

<sup>41</sup> Apple, "Documentation," II-62, II-124.

<sup>42</sup> Walker, *Hopewell Village*, 56.

Brooke concentrated upon the production of stoves, finished goods that commanded a relatively high price and for which a considerable demand existed during this period. The casting of stove plates remained the cornerstone of the furnace's operations until 1844, when casting ceased. Brooke's success at turning Hopewell into a profitable venture is evident in the fact that during the 1820s Daniel Buckley & Company acquired new mine and forest lands, purchasing eight tracts, totaling approximately 265 acres, on the north slope of Brush Hill and two tracts, totaling approximately 189 acres, on the south slope of Williams Hill. Hopewell's owners purchased nearly five hundred acres of land between 1800 and 1845.<sup>43</sup> These tracts provided additional sources for charcoal and iron ore, which the successfully operating furnace consumed in considerable quantities.

During the second half of the 1820s, as the furnace began to recover from the economic downturn associated with the Panic of 1819, the partners embarked upon a number of new construction projects. By 1832 at least twelve skilled moulders worked at the furnace casting stove plates and other items. Their presence at the furnace may have necessitated new construction to accommodate their needs. For example, oral tradition holds that some of the moulders slept in the loft of the Carpenter's Shop (Building 35). The need for wood molds for sand casting suggests the need for a carpenter's shop during the period from 1820 to 1844, when molding was a major activity at the furnace. This building was demolished ca. 1900 and has not been reconstructed as part of the furnace complex.<sup>44</sup>

It is known that several of the moulders ate in the basement of the Ironmaster's House. Documentary evidence suggests that the Bake Ovens (Building 16) located east of the Ironmaster's House were erected in 1823, a period coincident with Hopewell's emergence from the economic depression of the early 1820s and the furnace's increasing commitment to the production of stove plates. The influx of moulders during this period may have provided the impetus for the construction of the Bake Ovens.<sup>45</sup> Additional provision for the moulders appears to have been made in 1828, when the documents record payment for masonry work "at Smoke House."<sup>46</sup> The present wood frame Smoke House (Building 41) is clearly a different building than that described in 1828. Management documents date the present building to ca. 1867, based upon the details of its construction and materials. The Ironmaster's House also experienced changes during this period, with the east wing added ca. 1826 and the south addition to the main block added ca. 1828.<sup>47</sup>

---

<sup>43</sup> Walker, *Hopewell Village*, 56; William H. Dechant & Son, "Hopewell Furnace Lands and Contiguous or Adjacent Tracts, Property of a Louise C. Brooke at Hopewell Penna." (August 1915, rev. to January 1931). Map on file at HOFU archive.

<sup>44</sup> Apple, "Documentation," II-105-107. The decision not to reconstruct the Carpenter's Shop, which is well illustrated in a pair of photographs from the late-nineteenth century, appears to have been based upon two bits of information. For many years this building had been known as the Wheelwright Shop. Park Service historians examining the furnace records determined that no wheelwright worked at the furnace prior to 1837, which suggested that the building dated from late in the site's interpretive period. Perhaps more compelling was archeological information that suggested that the footprint of the shop would have overlapped the footprint of the South Casting House, making it impossible for these two buildings to have existed at the same time. Review of the archeological data casts some doubt upon this conclusion. Combined with the strong oral tradition linking the moulders to the Carpenter's Shop, this suggests that the building probably did date from the period of interpretation. Stuart W. Wells, "Hopewell Furnace Historic Scene Report - Draft" (March 1994), 18-24. On file at HOFU archive.

<sup>45</sup> Apple, "Documentation," II-63-II-66.

<sup>46</sup> *Ibid.*, II-24.

<sup>47</sup> Diann Jacox and Joseph Boyle, "Hopewell Furnace" *National Register of Historic Places Nomination*, 7:7-8. On file with the Pennsylvania Historical and Museum Commission, Harrisburg, Pennsylvania.

In 1826 a tenant house with an excavated cellar was completed. This building may be the John Church House (Building 27), constructed for one of Clement Brooke's in-laws and located on the north side of the entry road into the site, just west of PA Route 345. The Church House has an excavated basement, unlike the other extant Tenant Houses, which suggests that it may be the house completed in 1826.<sup>48</sup> Other housing constructed during this period of expansion includes the east addition to the Boarding House, which appears to date from ca. 1830 (Figure 3.7).<sup>49</sup>

Work at the furnace proper also occurred during the late 1820s. Documentary evidence suggests that in 1828 the furnace underwent major masonry repairs. Archeological evidence suggests that at approximately this date the South Casting Shed, probably dating from ca. 1816, was removed and a new shed, corresponding to the present reconstructed South Casting Shed in terms of its floor area, was erected. The larger Casting Shed may have been required to meet the space requirements of the moulders.<sup>50</sup>

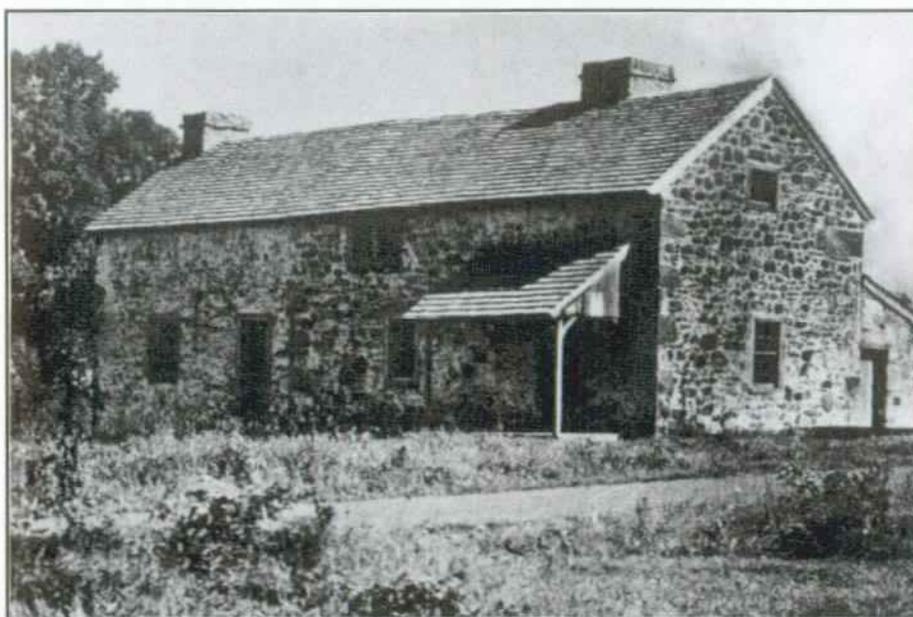


Figure 3.7. View of Boarding House (Bldg. 24) looking southeast, ca. 1954. HOFU archive photo.

In 1831 the partnership that owned Hopewell Furnace was reorganized. M. Brooke Buckley, Clement Brooke, and Charles Brooke each owned one-third of the new partnership, which was known as Clement Brooke & Company.<sup>51</sup> This reorganization of the firm coincides with significant changes to the landscape surrounding the Ironmaster's House at Hopewell. Documentary and archeological evidence suggests that in the late 1820s and early 1830s the grounds surrounding the house were developed as a formal garden, with walks, steps, a greenhouse, and planned beds and plantings. This work coincides with the residence of Clement Brooke and his family in the house, strongly

<sup>48</sup> Presumably the John Church Barn (Building 28) also dates from this period. Apple, "Documentation," I-24.

<sup>49</sup> *Ibid.*, II-144-147.

<sup>50</sup> Norman M. Souder, "Architectural Data Section" in "Historic Structures Report: The Cast House and Molding Sheds - Part II," 4-7.

<sup>51</sup> Walker, *Hopewell Village*, 57.

suggesting that Clement Brooke or his family conceived of and oversaw the development of this portion of the site.

The remains of a Greenhouse (Building 13), portions of the north, east, and west walls of the building, are located in the garden area, adjacent to the 1757 road (Reading-Valley Forge Road). In the 1950s Park Historian Russell A. Apple reviewed the extant furnace records and concluded that large purchases of glass in March 1829 related to the construction of the greenhouse. The appearance of this building remains unknown. Oral tradition holds that part of the Greenhouse was used as a vineyard. If this tradition is accurate the payments noted in furnace records to a "vine dresser" in 1832 tend to confirm the ca. 1829 construction date for this building.<sup>52</sup>

The horticultural activities undertaken at Hopewell during the late 1820s and early 1830s included planting of a new orchard, and possibly the replacement of old trees in the original orchard. In 1829 furnace records document the purchase of 160 apple trees, with an additional 304 trees purchased in 1834. These figures represent a substantial orchard. Later documents specifically refer to two orchards at Hopewell. The new orchard was probably located east of the garden between Reading-Valley Forge Road and the East Head Race. By 1835 there is also mention of a peach orchard at Hopewell.<sup>53</sup>

Between 1825 and 1827 Hopewell Furnace employed twenty-one farm workers. In 1829 Isaac Hayer contracted with Hopewell Furnace to farm thirty acres of land. He planted this acreage with summer and winter grains. Half of his product went to Clement Brooke. Hayer also had one half acre for potatoes and one half acre sown with flax. The agreement stipulated that Hayer was responsible for making and repairing fencing around his fields. Common grain crops farmed at Hopewell included wheat, corn, oats, buckwheat, and rye. Often straw was harvested as a by-product of these grains and following a harvest the field would often be planted with clover.<sup>54</sup>

Hopewell Furnace not only farmed land in the immediate vicinity of the furnace, but also owned farmland in the neighboring townships. Clement Brooke leased farms in East Nantmeal Township to Henry Shick and James Reperts during the 1820s. In 1836 Henry Close rented a farm in Robeson Township from Brooke. Additionally, area farmers supplemented Hopewell Furnace's agricultural production with grains, fruits, meats, dairy products, and vegetables.<sup>55</sup>

The formalization of the Ironmaster's Garden in the early 1830s included the construction of a variety of walls, steps, and walkways (Figure 3.8). Construction of the Garden Fence took place in 1832-1833, when masons were credited with nearly 103 days of work on "the stone fence."<sup>56</sup> The first section of Garden Fence is located on the south side of the garden and separates the garden from the adjacent road. It is, in effect, a two-foot high stone retaining wall extending from the southwest corner of the Ironmaster's House to the East Head Race. Photographs from the late-nineteenth century depict a wire fence atop this stone wall (Figure 3.9). The second section of Garden Fence extended from the East Head Race, along the 1825 Road, and terminated at a gate located immediately south of the southernmost garden terrace wall (no longer extant). This second section of Garden Fence

---

<sup>52</sup> Apple, "Documentation," II-11A-II-20.

<sup>53</sup> Walker, *Hopewell Village*, 133-134; Apple, "Documentation," II-1-II-3, II-6-II-7.

<sup>54</sup> Walker, *Hopewell Village*, 122-123, 425; Stuart Wells, "Historic Scene Report," 39.

<sup>55</sup> Walker, *Hopewell Village*, 121-123, 133, 200.

<sup>56</sup> Apple, "Documentation," II-34.

consisted of a stone wall surmounted by a picket fence approximately two feet in height. The third section of fence began at the garden gate and continued along the west end of the garden, parallel to the 1825 road, and along the 1757 road east to a point east of the Summer/Ice House ruins. It may have been a simple wood picket fence, later replaced with a wire mesh fence. No evidence exists to suggest that the stone Garden Fence existed in this location.<sup>57</sup> It is important to note that the west edge of the garden cannot be precisely located. In 1932, construction of a paved road by Berks County obliterated the west end of the garden and any associated fence or wall was removed. The road was returned to its nineteenth century configuration in the mid-1950s, but the precise location of the edge of the garden could not be determined.

Additional work in the garden area during 1832 included construction of the stone steps in the garden and, probably, the garden terraces, although the furnace records do not mention these latter features. The terraces appear to have been used to separate different areas of the garden. Oral tradition holds that, west of the main path, the terrace immediately north of the East Head Race had a vegetable garden at its west end and flowers at the east end. The intermediate terrace, located between the two retaining walls, is described as containing both a vineyard and a large raspberry patch. The upper terrace apparently supported beehives. East of the main path were flowers and boxwoods.<sup>58</sup>

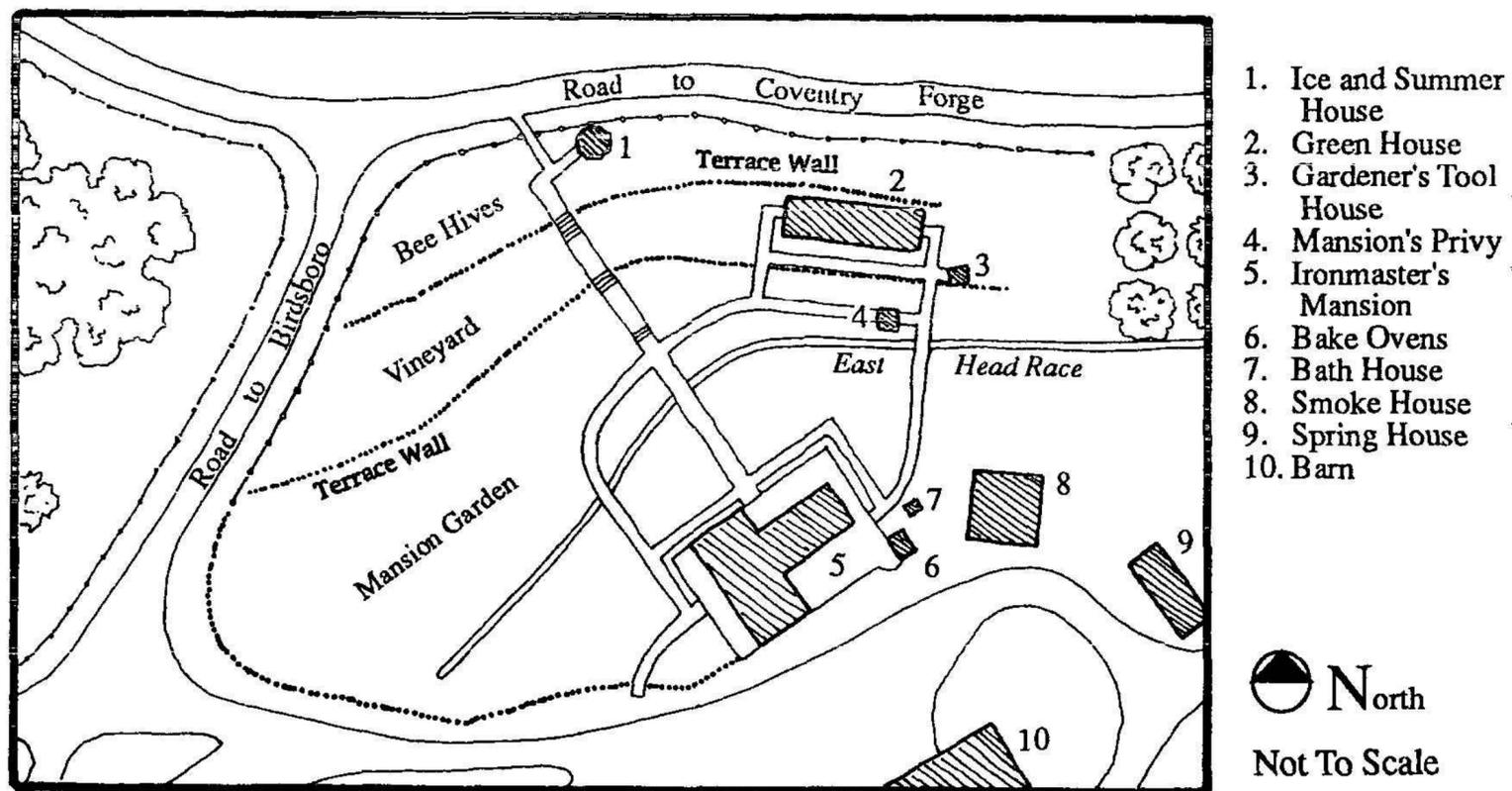


Figure 3.8. Tracing of garden section taken from Apple's "Historical Base Map, 1830-1840."

Additional buildings in the garden included a Gardener's Toolhouse, in ruins by the mid-1950s. This building is described in oral interviews as a wood frame building measuring approximately eight feet by ten feet. The date of its construction is unknown, but it would appear likely that it dated to the period of the wholesale garden improvements in the early

<sup>57</sup> Ibid., II-30-II-36.

<sup>58</sup> Ibid., II-39.



Figure 3.9. View of Ironmaster's House (Bldg. 1) looking northeast. N.d., probably twentieth century. HOFU archive photo.

1830s.<sup>59</sup> The garden also sheltered the Ironmaster's Privy, which provided toilet facilities to the residents of the Ironmaster's House prior to the introduction of plumbing into the house in the 1870s.<sup>60</sup> Archeological investigations conducted in 1962 revealed an earlier privy. Since a privy was a necessary feature of the site from the earliest days of the operation in the 1770s, it seems likely that there may have been more than two privy pits in the garden during the history of the furnace.

Near the point where the main garden path met the 1757 road, at the north end of the garden, was a combination Ice House and Summer House (see Figure 3.8 No. 1). According to oral tradition, the Summer House, a lattice work structure covered with vines, was octagonal in plan, with benches lining the inside walls. The Summer House sat atop the Ice House, the walls of which projected one to three feet above grade. The Ice House was a stone-walled pit, approximately fifteen feet square and twenty feet deep, used to store ice for the residents of the Ironmaster's House. Hopewell Lake provided the ice during the winter months. The Ice House is first mentioned in furnace records in 1834, when an employee is credited with two days work at the structure. This reference appears to relate to an existing building, rather than to a construction project. This date does suggest, however, that the Ice House may have been constructed during the improvement of the garden in the early 1830s. The Summer House is not mentioned in furnace records. It is impossible, therefore, to determine whether it was built at the same time as the Ice House, or was a later addition to the earlier, utilitarian structure.<sup>61</sup>

<sup>59</sup> Ibid., II-20-II-21.

<sup>60</sup> Ibid., II-21. It is likely that servants continued to use the privy after 1870.

<sup>61</sup> Ibid., II-25-II-28.

Brooke authorized other landscape work at the furnace during the 1830s. In 1831, 107 panels of four-rail fence were installed near John Wert's house, the Boarding House. The extent of the fencing and the location stated suggests that this fencing may have been used to enclose the meadow located between the Boarding House and French Creek on the east side of the village road. There is also evidence that both sides of Birdsboro-Warwick Road were later fenced and that some Hopewell tenants grazed their stock along the grassy areas between the road and fence.<sup>62</sup>

The furnace owned both draft animals and general livestock. Draft animals at Hopewell included horses, oxen, and mules. In 1832 the furnace owned eighty-four horses, and in 1850 the furnace's draft animals totaled 50. The furnace probably did not house all these animals in the village core. Some may have been housed at neighboring farms, with tenants, at the furnace's mines, or with teamsters who used the animals to haul furnace product. The Village Barn (Building 2), located south of the Ironmaster's House, housed approximately thirty-six horses, mules, cows, oxen or steers. A stable, measuring approximately twenty-four feet by twenty-six feet, (no longer extant) was located south of this barn. Another barn, located on the north side of Reading-Valley Forge Road between the Ironmaster's House and the Church House, measured approximately seventy feet by forty feet. (probably in the vicinity of the current entry road).<sup>63</sup> In addition to draft animals the furnace kept cows, poultry, sheep, and hogs to provide meat, milk, eggs, leather, and wool. A forty-foot square pen located east of the barn housed hogs and chickens. Pasture lands close to the furnace would probably have been used for draft animals and milk cows.<sup>64</sup>

Production at Hopewell peaked during 1836-1837, when over 720 tons of iron were produced at the furnace. The furnace's owners reported that the furnace consumed approximately six thousand cords of wood per year in 1837, of which four thousand cords came from furnace-owned lands. The remaining two thousand cords were purchased, presumably from local landowners. During this period the company paid for construction of a public school at the furnace, which suggests the presence of a sizable population within the immediate area. This supposition is confirmed by Union Township tax records, which assessed the company for ten tenant houses in the township in 1837.<sup>65</sup>

Hopewell Furnace continued to produce stoves and stove castings into the early 1840s. Then, in 1844, stove-casting was halted at the furnace and the skilled moulders who had comprised the elite of the local work force departed to seek employment elsewhere. From this date until the furnace ceased operations in 1883 the principal product of Hopewell was unrefined pig iron.<sup>66</sup> Following the cessation of molding, in 1848, Clement Brooke retired

---

<sup>62</sup> Apple, 'Documentation,' II-144-147; Wells, "Historic Scene Report," 24.

<sup>63</sup> Insurance Company of North America, "Survey of the Property of Edward S. Buckley and Maria L. Clingan," Insurance policy dated July 19, 1879. On file at CIGNA Archives, Philadelphia, Pennsylvania. It is unclear how early the barn and stable were constructed on the property. The barn was probably demolished by the early twentieth century and the CCC demolished the stable ca. 1930s.

<sup>64</sup> Walker, *Hopewell Village*, 126-129; Wells, "Historic Scene Report," 39-46.

<sup>65</sup> *Ibid.*, 6-11.

<sup>66</sup> The exact reasons for the cessation of casting at Hopewell are unknown. However, the timing of the decision coincides with the expansion of anthracite iron production in the United States. Anthracite iron, produced using anthracite coal rather than charcoal as a fuel, was preferred by rolling mills. Additionally, the depletion of forest and ore reserves forced many charcoal furnaces out of business. Walker, *Hopewell Village*, 59-60.

from active management of the furnace and moved to Pottstown. In 1850 Charles M. Clingan, Brooke's son-in-law, became manager of the furnace.<sup>67</sup>

### **DECLINE: 1846-1883**

During the late 1840s a number of changes affected the cultural landscape at Hopewell Furnace. Perhaps the most significant of these affected the appearance of the furnace complex itself. With the cessation of molding the South Cast House was no longer required. It appears, based upon fairly limited evidence, that this building may have been demolished ca. 1847. Oral tradition cannot place this building at the site in the 1860s, clearly indicating that it had been removed prior to that date.

In 1853, in an attempt to adjust to the changing technology of iron production, an Anthracite Furnace (Building 11) was erected at Hopewell. This operation proved very short-lived, largely due to technical problems using anthracite to smelt the iron ore available to the furnace, and by 1857 the machinery from the new furnace had been removed to Monocacy.<sup>68</sup>

Physical changes in the Hopewell landscape during the years prior to the Civil War included installation of scales in the Bridge House ca. 1847 and construction of a brick Kiln House (Building 39) ca. 1849. The scales facilitated accurate formulation of the furnace charge, while the Kiln House was apparently used to make charcoal. The Kiln House apparently failed to produce the desired quantity or quality of charcoal, and was converted to a residence prior to the 1870s.<sup>69</sup>

A half-acre plot of ground, located near the Kiln House, was used as a vegetable garden by mid-century. A second garden plot, comprised of about one-quarter acre was located immediately west of the barnyard and surrounded by a white picket fence. Tenant houses contained fenced gardens to protect the plantings from chickens and rabbits. Common vegetables found in Hopewell's gardens included onions, beets, lettuce, tomatoes, peas, radishes, cauliflower, cucumbers, squash, eggplant, and salsify.<sup>70</sup>

In 1856, Nathan Care, a furnace employee, acquired a parcel immediately south of the furnace property along Birdsboro-Warwick Road. A log house may have stood on the parcel at the time of this sale. Care built a two-story stone house ca. 1856-1857 (Building 25) and added a barn to his property ca. 1859 (Building 26). These buildings presently form the southern limit of the village, although they did not become part of the furnace property until ca. 1916.<sup>71</sup>

The Civil War revived Hopewell's fortunes, as the skyrocketing demand for iron drove prices up so rapidly that production costs ceased to be a financial issue. Pig iron that commanded thirty dollars per ton before 1860 brought eighty dollars per ton in 1864 and reached ninety-nine dollars a ton before prices began to slip.<sup>72</sup> The increase in business

---

<sup>67</sup> Ibid., 60-61.

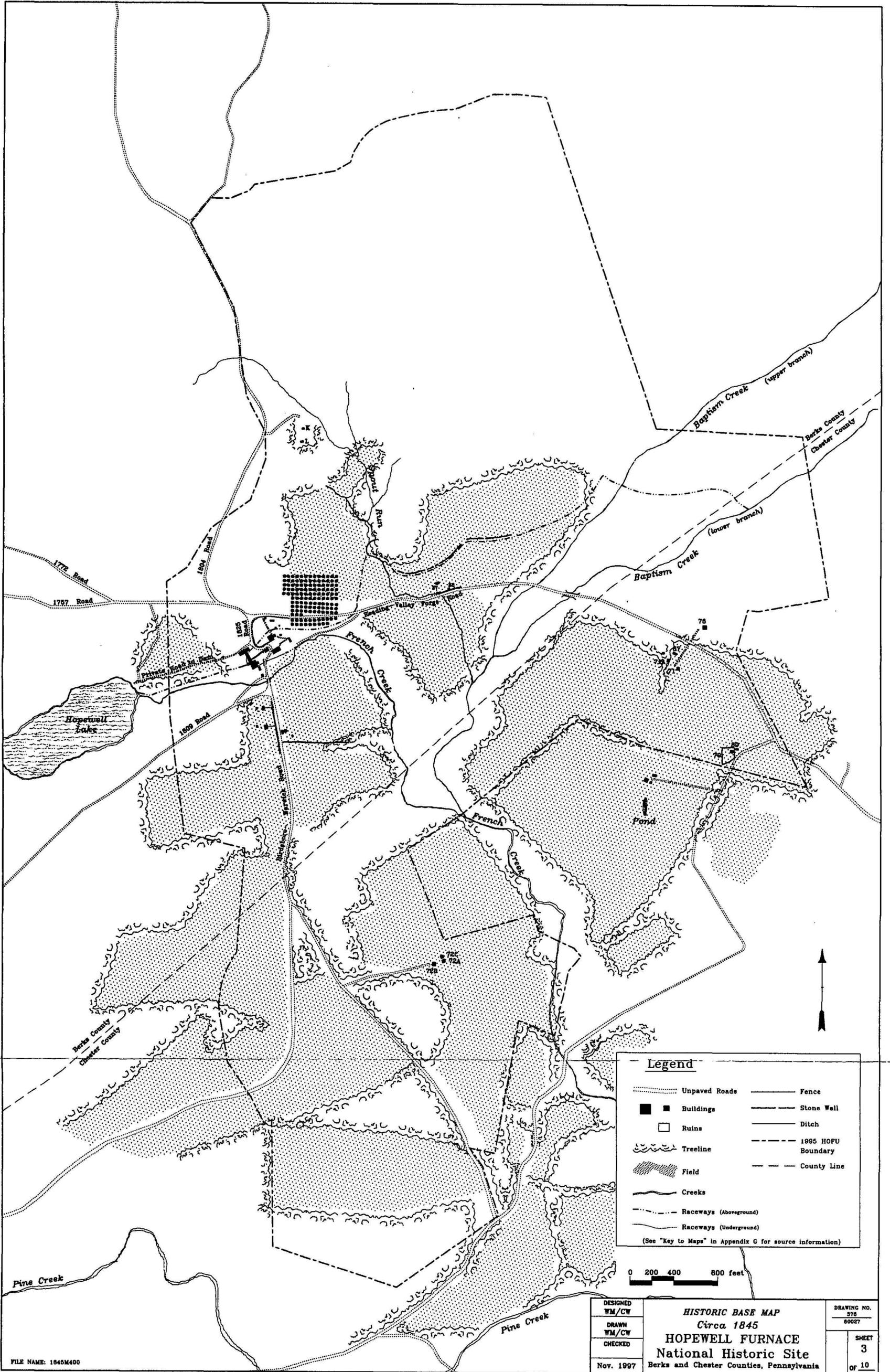
<sup>68</sup> Ibid., 63.

<sup>69</sup> Apple, "Documentation," II-99-II-102.

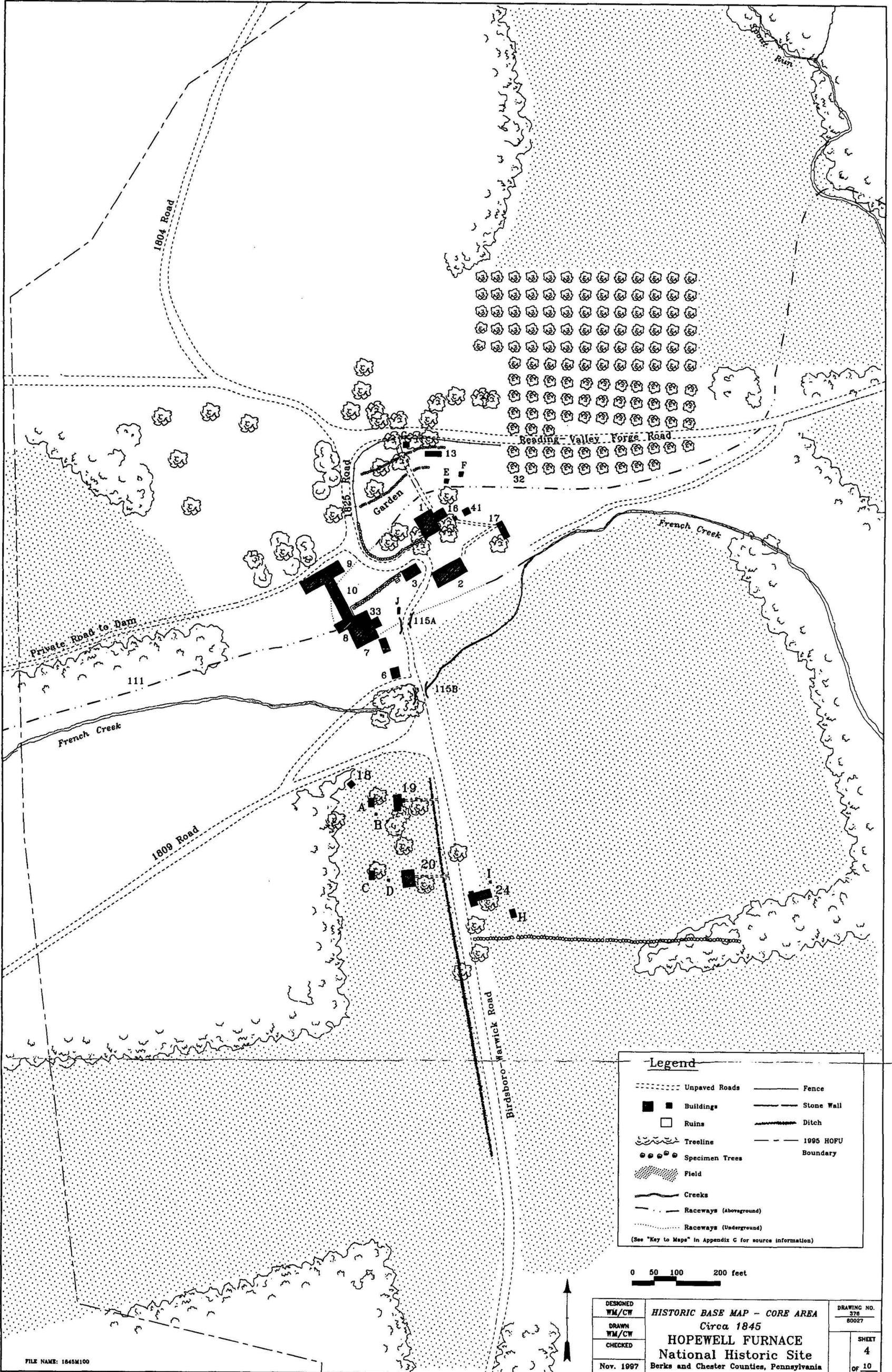
<sup>70</sup> Walker, *Hopewell Village*, 132-133; Wells, "Historic Scene Report," 28-29.

<sup>71</sup> Apple, "Documentation," I-7-I-9; Dechant & Son, "Hopewell Furnace Lands."

<sup>72</sup> Walker, *Hopewell Village*, 64.



FILE NAME: 1845M400



3.11. Hopewell Furnace 1845 Base Map, core area.

FILE NAME: 1845M100

**Legend**

--- Unpaved Roads	— Fence
■ Buildings	— Stone Wall
□ Ruins	— Ditch
~ Treeline	--- 1995 HOFU Boundary
● Specimen Trees	
▨ Field	
— Creeks	
— Raceways (Aboveground)	
— Raceways (Underground)	

(See "Key to Maps" in Appendix G for source information)

0 50 100 200 feet

DESIGNED WM/CW	<b>HISTORIC BASE MAP - CORE AREA</b> Circa 1845 <b>HOPEWELL FURNACE</b> National Historic Site Berks and Chester Counties, Pennsylvania	DRAWING NO. 378 80027
DRAWN WM/CW		SHEET 4
CHECKED		of 10
Nov. 1997		

stimulated repairs to the furnace in 1869, which included new interior fire brick walls in the furnace stack.<sup>73</sup>

Physical changes to the Hopewell landscape during the decade of the 1860s appear to include the construction of Tenant House No. 3 (Building 21) and its associated barn (Building 23). In 1864 Union Township taxed the furnace owners on ten tenant houses. Three years later, in 1867, the owners were taxed for ten single houses and one double house, which suggests that Tenant House No. 3 was erected between 1864 and 1867. The Tenant House Barn has an 1862 date scratched into the interior plaster, which tends to support a ca. 1860 date for these two buildings.<sup>74</sup> An 1860 map of the property depicts three houses located on the north side of Hopewell Lake. During the 1930s the Civilian Conservation Corps raised the height of the dam and increased the lake from twelve acres to sixty-two acres. Two of the tenant houses were presumably submerged beneath the lake at this date. Other tenant houses in Union Township were probably located along the road to Jones Mine, south of French Creek. In ca. 1869 a double house, half of which was occupied by a store, was erected on the west side of the Birdsboro-Warwick Road, south of Tenant House No. 3 (Figure 3.12). Known variously as the Stubblebine House, the Boone Store, and Tenant House No. 4 (Building 22), this building burned ca. 1891. The parcel was not owned by the furnace until the twentieth century.<sup>75</sup>

Other changes during this period include alterations to the Ironmaster's House and the continued deterioration of the furnace complex. By ca. 1867 the roof of the North Molding Room had apparently collapsed. Oral tradition suggests that the Cleaning Shed on the east side of the Cast House had been demolished prior to the 1860s, since the building was not remembered by those interviewed.

During the 1870s operations at the furnace were sporadic. In 1874, and again in 1877-1878 the furnace was out of blast. In 1870 the Clingan family altered the Ironmaster's House, adding a second floor toilet and extending the porch and the first story windows that opened onto the porch. Additional construction work during this period included a series of frame additions to the barn (ca. 1870) and a new schoolhouse (ca. 1870) located approximately one-half mile west of the earlier schoolhouse along the 1809 Road (Figure 3.12).<sup>76</sup>

An increase in the price of iron stimulated Hopewell owners to resume operations in 1880. At this date Edward S. Buckley emphatically instructed his managers to cut as much wood on the property as possible and turn it into charcoal to fuel the furnace.<sup>77</sup> During the first half of the 1880s a number of alterations were made to the furnace and its associated buildings. These changes included re-roofing of the Wheel House, whose roof was rebuilt to connect to the Bridge House roof and the construction of a new Charcoal House (ca. 1880). In ca. 1881 a boiler was installed in the Wheel House to provide auxiliary power during periods of low water, and in 1882 an Ore Roaster (Building 34) was erected against the retaining wall between the furnace and the Office & Store. This piece of equipment was designed to remove impurities from the iron ore, thus improving the quality of the resulting iron.<sup>78</sup>

---

<sup>73</sup> Ibid., 65.

<sup>74</sup> Apple suggests (based primarily on oral tradition) Tenant House No. 3 was constructed for Hopewell employee John Shafer between 1845 and 1854. Apple, "Documentation," 150-151.

<sup>75</sup> Apple, "Documentation," I-13-15.

<sup>76</sup> Ibid., II-139-141.

<sup>77</sup> It is not clear how much timber was cut or from where on the property it was harvested.

<sup>78</sup> Walker, *Hopewell Village*, 65-66.

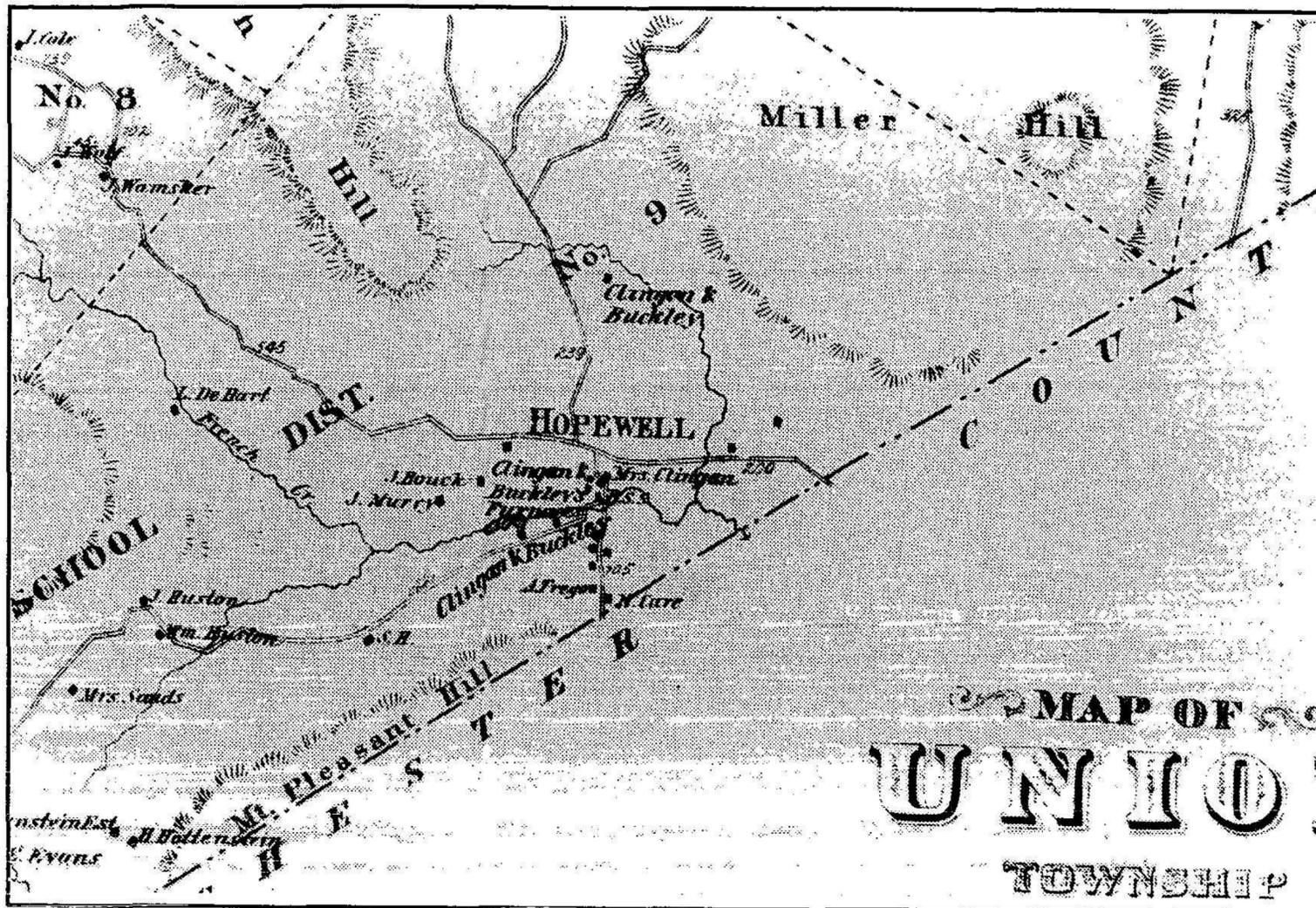


Figure 3.12. Part of Union Township near Hopewell in 1876. Map reproduced from F. A. Davis *Illustrated Historical Atlas of Berks County, Pennsylvania* Reading, Penn.: A. M. Davis, 1876.

None of these last gasp efforts restored the furnace to profitability. In 1883 the furnace, according to Union Township tax records, owned only five tenant houses in the township, a fifty percent decline in a decade. The five houses no longer on the books in 1883 may have been sold to tenants, although records of such transactions do not survive, or they may have simply been demolished, especially if they had been constructed of log. Finally, on 15 June 1883, Hopewell Furnace went out of blast for the last time. After a period of approximately 112 years, iron ceased to be produced at Hopewell (Figures 3.13 and 3.14).<sup>79</sup>

### SHUTDOWN AND SURVIVAL: 1883-1935

At the date of Hopewell's last blast the furnace was owned by Edward S. Buckley, heir of M. Brooke Buckley; and Maria T. Clingan, daughter of Clement Brooke and widow of Charles Clingan. Even though Hopewell Furnace no longer produced iron the property continued to generate income for its owners. The furnace company maintained its record books through March 23, 1896. During this time period the company kept records on the sales of remaining pig iron, iron ore, and wood. Additionally, the furnace maintained records on payments for freight bills, farm operations, house rentals, and royalties for stone quarried on the property.<sup>80</sup>

<sup>79</sup> Ibid., 66.

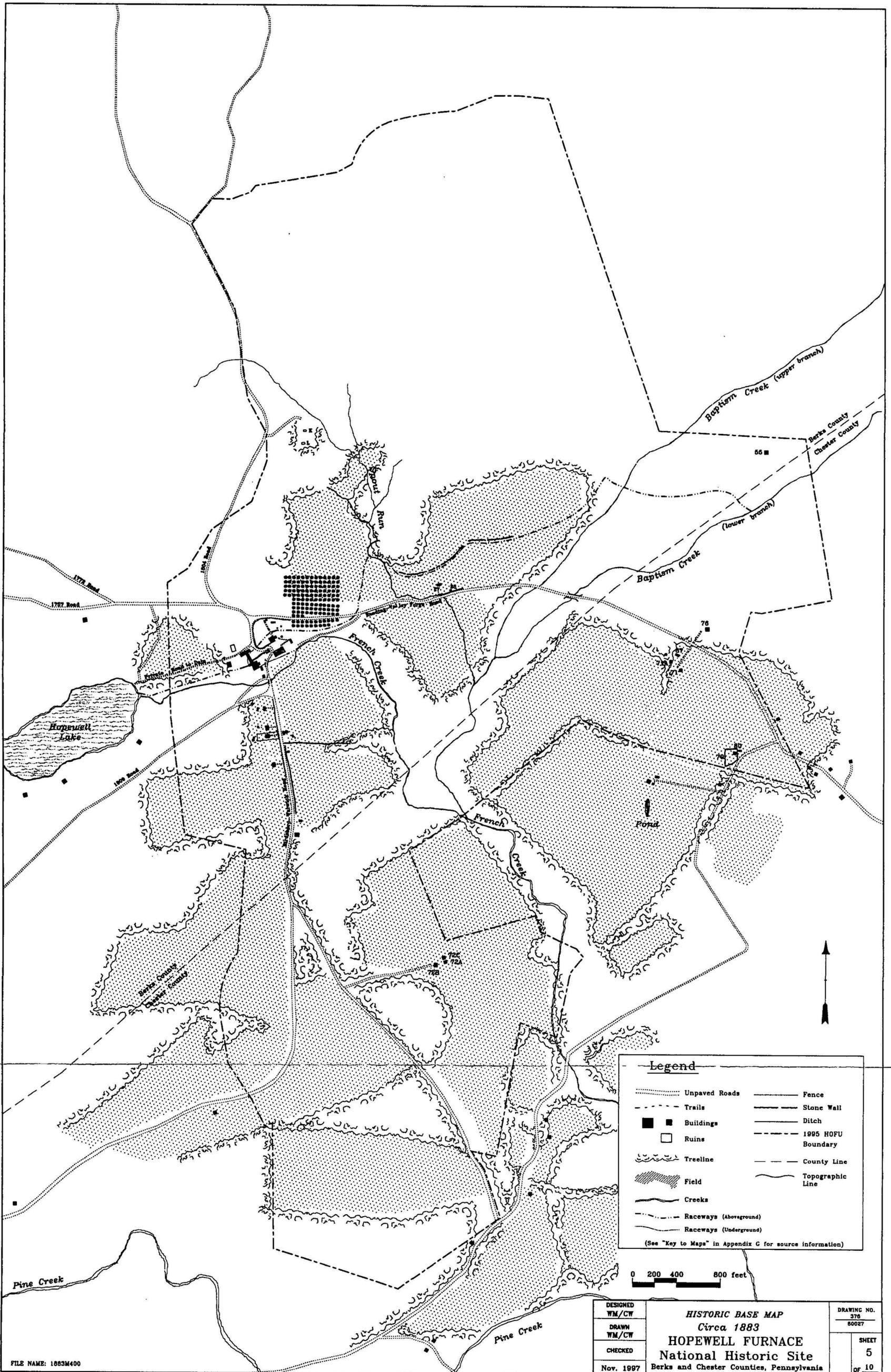
<sup>80</sup> Ibid., 66-67.



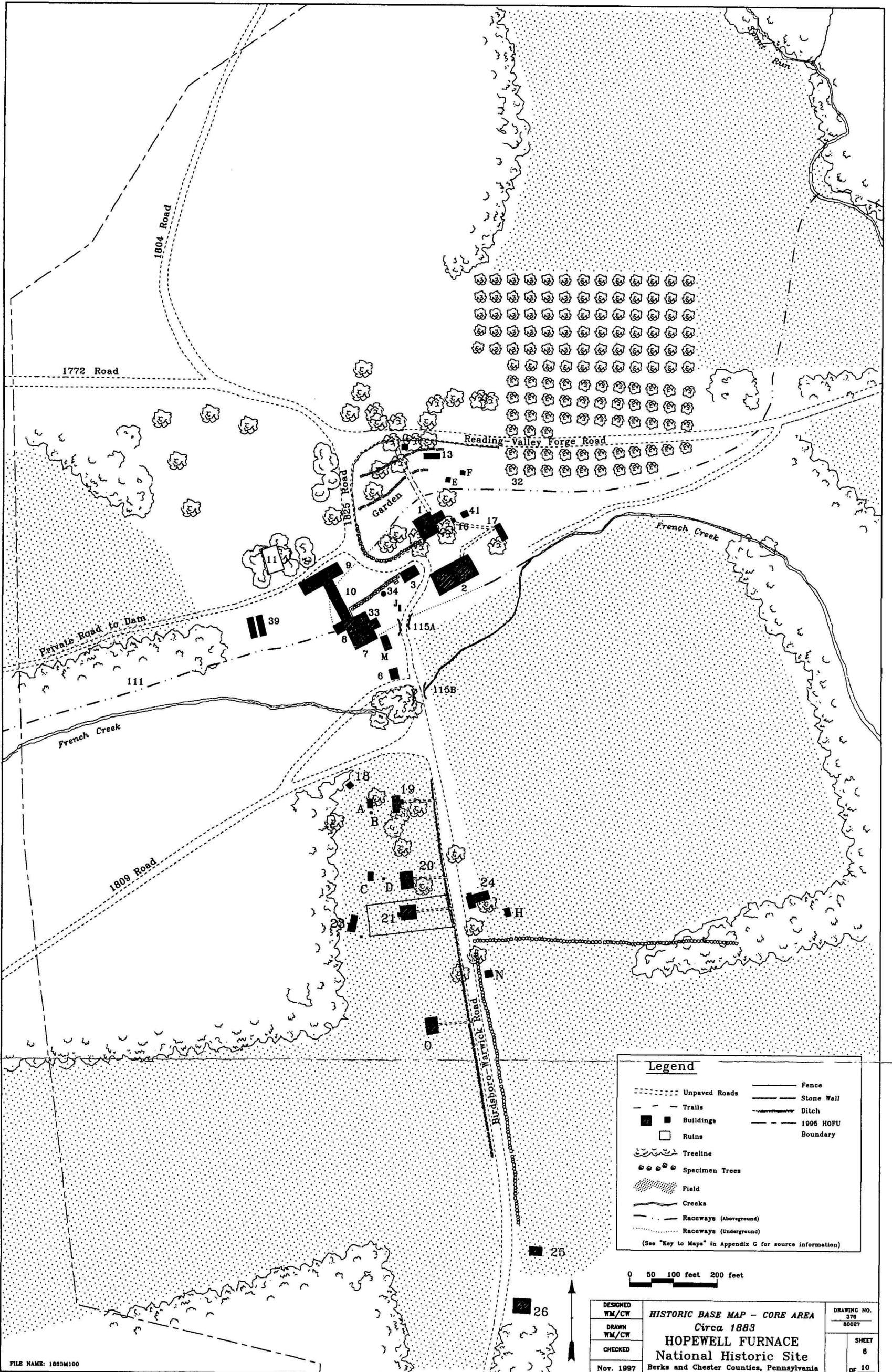
Figure 3.13. View of furnace grouping including Carpentry/Wheelwright Shop in foreground (Bldg. 35, demolished), Ore Roaster on right (Bldg. 34, stabilized ruin), and Furnace (Bldg. 7) with Cast House (Bldg. 33) and Charcoal House (Bldg. 9) looking north, ca. 1887. HOFU archive photo.



Figure 3.14. View of Office & Store (Bldg. 3), Barn (Bldg. 2), and Ironmaster's House (Bldg. 1) looking north, ca. 1890. HOFU archive photo.



3.16. Hopewell Furnace 1883 Base Map, core area.



Despite the property's ability to generate a certain level of income through the sale of available product and raw materials (existing pig iron, wood, charcoal), Edward S. Buckley frequently expressed his discouragement for Hopewell's income producing potential. In 1886 Buckley indicated that he had been spending his own money on taxes and repairs at the furnace property and proposed that he and Maria Clingan divide the remaining pig iron for whatever profit they could manage. In September 1886 the Reading Railroad purchased 100 tons of the nearly 360 tons of pig iron that remained at the furnace and by 1888 company records suggest that all Hopewell's iron had been sold. Three years later, however, Buckley was still not optimistic about finding a buyer for the property and offered to sell his portion to any interested person for \$25,000. In 1894 Maria Clingan offered to trade her share in two Philadelphia store buildings in exchange for Buckley's half interest in Hopewell. Buckley agreed to the transaction and his half share of the property was then transferred to Clingan's children; Charles B. Clingan, Alan Hunter Clingan, and A. Louise Clingan Brooke.<sup>81</sup>

The woodlands associated with Hopewell continued to provide income for the new owners. Hopewell's forests, under the management of Charles and Alan Clingan, provided wood for fence posts and rails. These were cut in large lots and then sold at market. Furnace records from the period indicate that this was a major operation. Additionally, in 1902 Hopewell's woodlands supplied charcoal again; however, instead of using it for its own furnace operations the charcoal was sold to Philadelphia iron manufacturers. In addition to the wood sold as fence posts and the charcoal produced for resale, Hopewell's owners received money for stone quarrying on company owned lands. In 1894 Richard Humphreys agreed to quarry stone on Hopewell property and in 1906 A. Louise Clingan Brooke sold quarrying rights on approximately 3,000 acres to the Schuylkill Stone Company for \$157,000. The later agreement included 2,829 acres of Hopewell Furnace lands.<sup>82</sup>

Hopewell's iron mines, located northwest of Warwick in Chester County, also provided income for the Clingans. The Pottstown Iron Company leased Hopewell mines as early as 1883 and continued to mine ore through 1913. At that date the Eastern Steel Company of Pottstown purchased nearly a rail car load of ore a day mined at Hopewell.<sup>83</sup>

The majority of activity at Hopewell during the first thirteen years following closure of the furnace focused on the sale of existing inventories (remaining pig iron) and of raw materials (wood, iron ore, stone, and charcoal). With the iron furnace no longer in blast the buildings, structures, and infrastructure directly associated with furnace operations received little attention or maintenance. As a result, buildings fell into disrepair and the surrounding area became overgrown. In 1887, only four years after the furnace ceased operations, the Carpentry (Wheelwright) shop neared collapse, the South Molding Room had vanished, as had the Cleaning Shed, and the furnace itself began to disintegrate (Figure 3.17). By 1896 only a portion of the Cast House's (Building 33) wood structure remained

---

<sup>81</sup> Ibid., 67.

<sup>82</sup> Lewis and Hugins, *Hopewell Furnace National Historic Site*, 67; Walker, *Hopewell Village*, 68-69; William H. Dechant & Son, "Hopewell Furnace Lands and Contiguous or Adjacent Tracts, Property of A. Louise C. Brooke At Hopewell, Penna.," August 1915, rev. to January 1931. On file at HOFU archive. The Dechant map notes that the Birdsboro Stone Company signed a thirty-year lease on August 2, 1906 with Brooke for "the purpose of quarrying, crushing, removing, and selling stone only." It is unclear where, or to what extent, quarrying occurred. The Birdsboro Stone Company operated a stone crushing plant approximately two and one-half miles north of Hopewell Village.

<sup>83</sup> *Breou's Official Series of Farm Maps, Chester County, Pennsylvania* (Philadelphia: W. H. Kirk & Co., 1883); Walker, *Hopewell Village*, 68-69.

in front of the furnace stack and the area in front of the Cast House and North Molding Room had become overgrown with grass (Figure 3.18). Other areas removed from the furnace complex also showed signs of deterioration. Circa 1893 the Boone House (Tenant House No. 4) had reportedly burned. Other tenant houses apparently did not fair much better. One tenant noted that the house he then lived in was "in a state of disrepair with its roof leaking, porch falling off, and fences rotting." The brick kiln house (Building 39 -

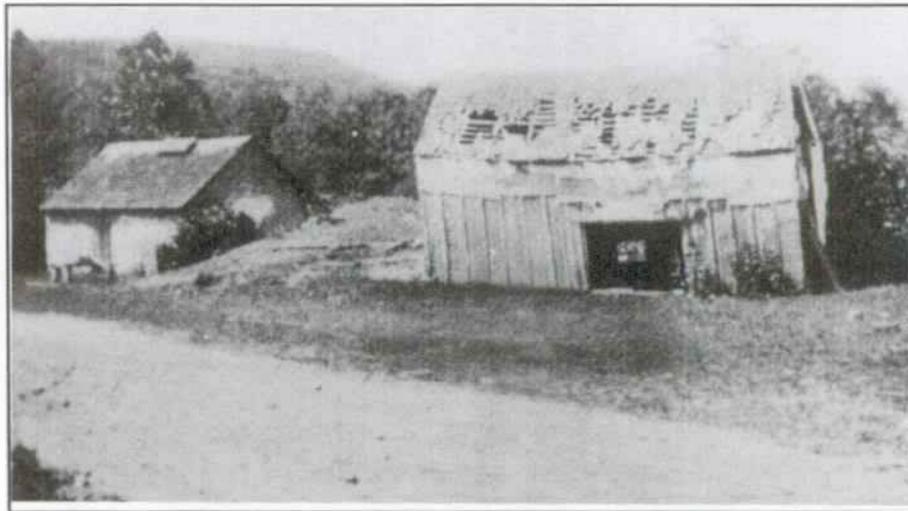


Figure 3.17. View of Carpenter's Shop/Wheelwright Shop (Bldg. 35 - demolished) and Blacksmith Shop (Bldg. 6) looking southwest, ca. 1895. HOFU archive photo.



Figure 3.18. View of Furnace (Bldg. 7), Bridge House (Bldg. 10), and remains of Cast House (Bldg. 33) looking west, ca. 1896. HOFU archive photo.

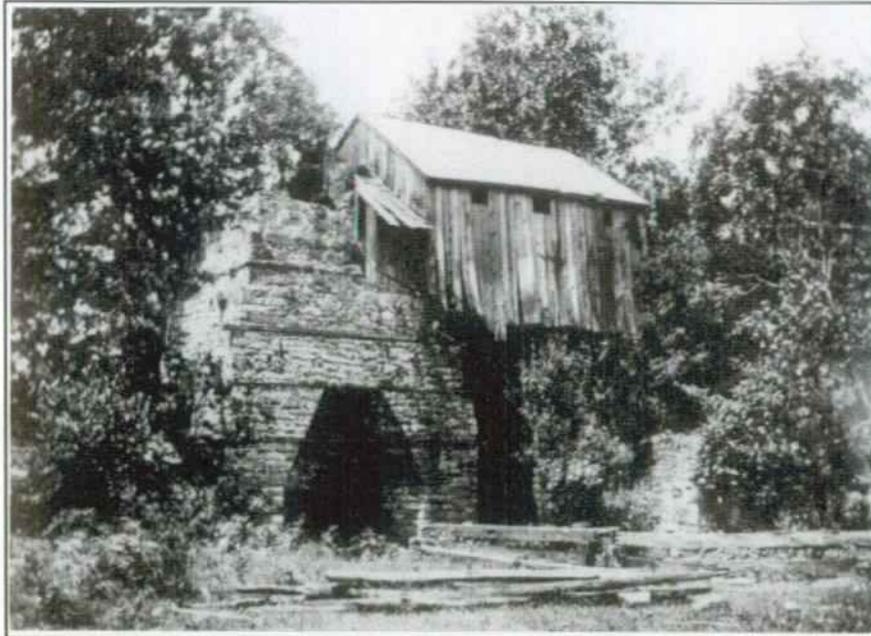


Figure 3.20. View of Furnace (Bldg. 7), Bridge House (Bldg. 10) looking west, ca. 1896. HOFU archive photo.

Despite the lack of furnace related activity the Clingans purchased a substantial amount of land between 1907 and 1928. Out of a total of 1,016 acres purchased during this period approximately 450 acres were acquired (between 1907 and 1908) south of the village area and included the Painter, Lloyd, and Brandon tracts, among others. The tracts purchased during the 1910s and 1920s appeared concentrated west of Hopewell Lake and included portions of Mount Pleasure (Figure 3.21). A ca. 1920 aerial view of the property reveals that the majority of these tracts contained agricultural lands divided (often by fence or stone wall) into numerous farm fields. It is unclear why these purchases were made; however, the large amount of farmland acquired may suggest increased agricultural activities at Hopewell.<sup>86</sup> By the 1980s and 1990s many of these fields were combined (especially in the Thomas Lloyd and Harrison Lloyd tracts), while others reverted to forest, creating less open space than may have existed historically. This is evident on the southern section of the Harrison Lloyd tract as well as the area west of the furnace and southwest of the Care property.<sup>87</sup>

In 1926 the principal barn (Building 2) associated with the Ironmaster's House was almost completely reconstructed. The new barn incorporated portions of the stone walls from the ca. 1817 building and a ca. 1830 addition; however, all frame members of the earlier barn were removed to allow for the new construction. The new barn, as constructed, created a

---

<sup>86</sup> Dechant & Son, "Hopewell Furnace Lands."

<sup>87</sup> Edward F. Heite, "Report of Archaeological Survey in Two Tracts at Hopewell Furnace National Historic Site," Berks and Chester Counties, PA, May 1988, 27; Edward F. Heite, "Report of Archaeological Surveys on 198 Acres at Hopewell Furnace National Historic Site," Berks and Chester Counties, PA., May 1989, 26, 33. On file at HOFU library

presently a stabilized ruin), located on the south side of the private road leading to Hopewell Dam, was probably abandoned sometime before 1900 and by this date the Care Log Cabin, located near the boarding house, was removed from the site in order to use the area as an agricultural field.<sup>84</sup> A north facing photograph of the Birdsboro-Warwick Road taken ca. 1914 shows a static village area with high wildflowers along the west and east sides of the road. By this date the east side of the road included utility poles and the fence line bordering the road was obscured by underbrush (Figure 3.19).



Figure 3.19. View of Birdsboro-Warwick Road looking north, ca. 1914. Photograph reproduced from Cornelia L. E. Brooke *Forges and Furnaces in the Province of Pennsylvania*.

The site certainly received less active supervision following the closure of the furnace. The Clingans continued to use the Ironmaster's House as a summer residence through 1915, with general maintenance of the site left to a caretaker. Harker A. Long acted as caretaker through 1896 and following Long's departure Nathan Care assumed the role of caretaker.<sup>85</sup> In each case the caretaker occupied the rear wing of the Ironmaster's House. With a site as large as Hopewell it may be presumed that specific maintenance efforts were focused only on active areas of the site, such as the actively farmed fields, while other areas, such as the old industrial core surrounding the furnace, were essentially abandoned (Figure 3.20).

---

<sup>84</sup> Lewis and Hugins, *Hopewell Furnace*, 67; Apple, "Documentation," I-13 and 35; Walker, *Hopewell Village*, 69.

<sup>85</sup> Walker, *Hopewell Village*, 67-68.

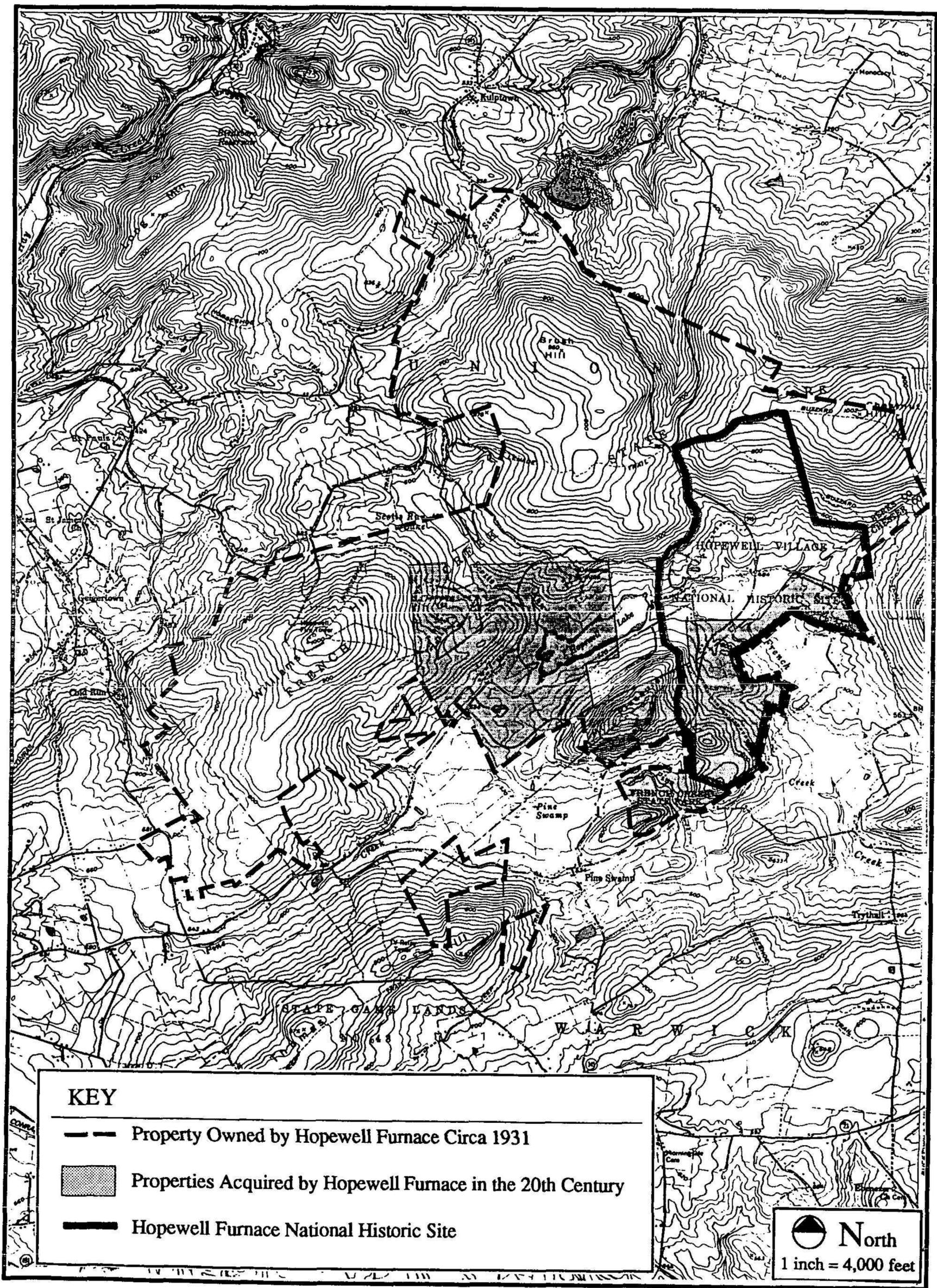


Figure 3.21. Twentieth century land acquisitions by Hopewell owners.

large unified structure and may have been intended to accommodate dairy operations<sup>88</sup>. Four years earlier, in 1922, Nathan Care, Jr. changed the grade between the Ironmaster's House and the barn. The work eliminated the steep grade between the south side of the Ironmaster's House and the north side of the barn by shifting the soil from one area to the other. This eliminated the need for steps near the Bake Ovens and required construction of retaining walls to hold soil around the sycamore trees at the southeast corner of the Ironmaster's House.<sup>89</sup> While buildings and areas directly related to furnace operations continued to fall into disrepair the amount of activity that centered near the barn, as well as the large land acquisitions during this period, suggests that the site supported agricultural activities into the second quarter of the twentieth century.<sup>90</sup>

In 1932 Berks County road crews realigned portions of the 1804 and 1825 roads through the Hopewell Furnace property, especially in the vicinity of the Office & Store. Reconstruction of this stretch of road substantially changed the physical appearance of this portion of the site. The work entailed demolishing a large portion of the stone wall between the Office & Store (Building 3) and the Bridge House (Building 10). Construction of the road covered the Ore Roaster (Building 34), as well as the foundations of the Cast House (Building 33) and Carpenter's Shop (Building 35 - Wheelwright Shop). The new road passed in close proximity to both the Blacksmith Shop (Building 6) and the Furnace remains. The realigned road continued on a relatively straight course north, past the Charcoal House (Building 9) and cut off part of the Ironmaster's House yard and eliminated a portion of the west garden wall. This realignment reduced the road's previously steep grade and eliminated the dangerous tight turn between the Barn and Office & Store (Figure 3.24).<sup>91</sup>

Between 1883 and 1935 Hopewell Furnace changed dramatically. The abandonment of the industrial core contributed to the deterioration of the remainder of the site. The supporting functions that once facilitated the successful operation of Hopewell Furnace were no longer needed. By 1935, despite apparent agricultural use, the overall site represented only a trace of its former self.

## **THE CIVILIAN CONSERVATION CORPS: 1935-1938**

In 1935 the federal government purchased approximately 5,500 acres of land in and around Hopewell Furnace for use as the French Creek Recreation Demonstration Area. The land was purchased primarily from Brooke family descendants. A. Louise Brooke received approximately \$87,000 from the United States for just under 4,000 acres of Hopewell Furnace land and she also received \$11,301 for an additional 459 acres. The Brooke family lands were divided into four separate tracts that included Hopewell Furnace lands,

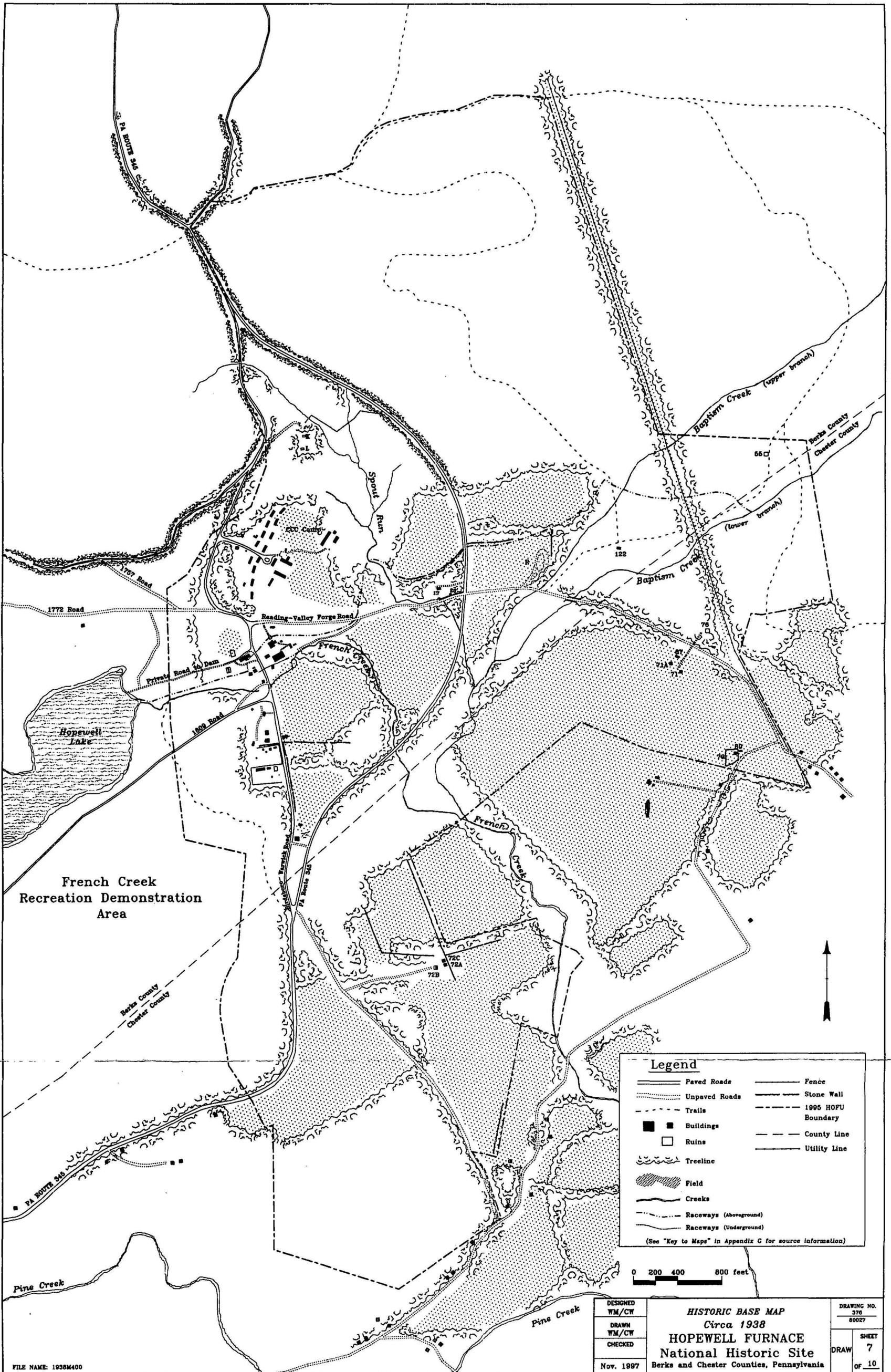
---

<sup>88</sup> It is unclear how this barn functioned; however, its large size taken with the recent purchases of agricultural lands, and the prevalence of dairy farms in the area, may suggest dairy operations at Hopewell.

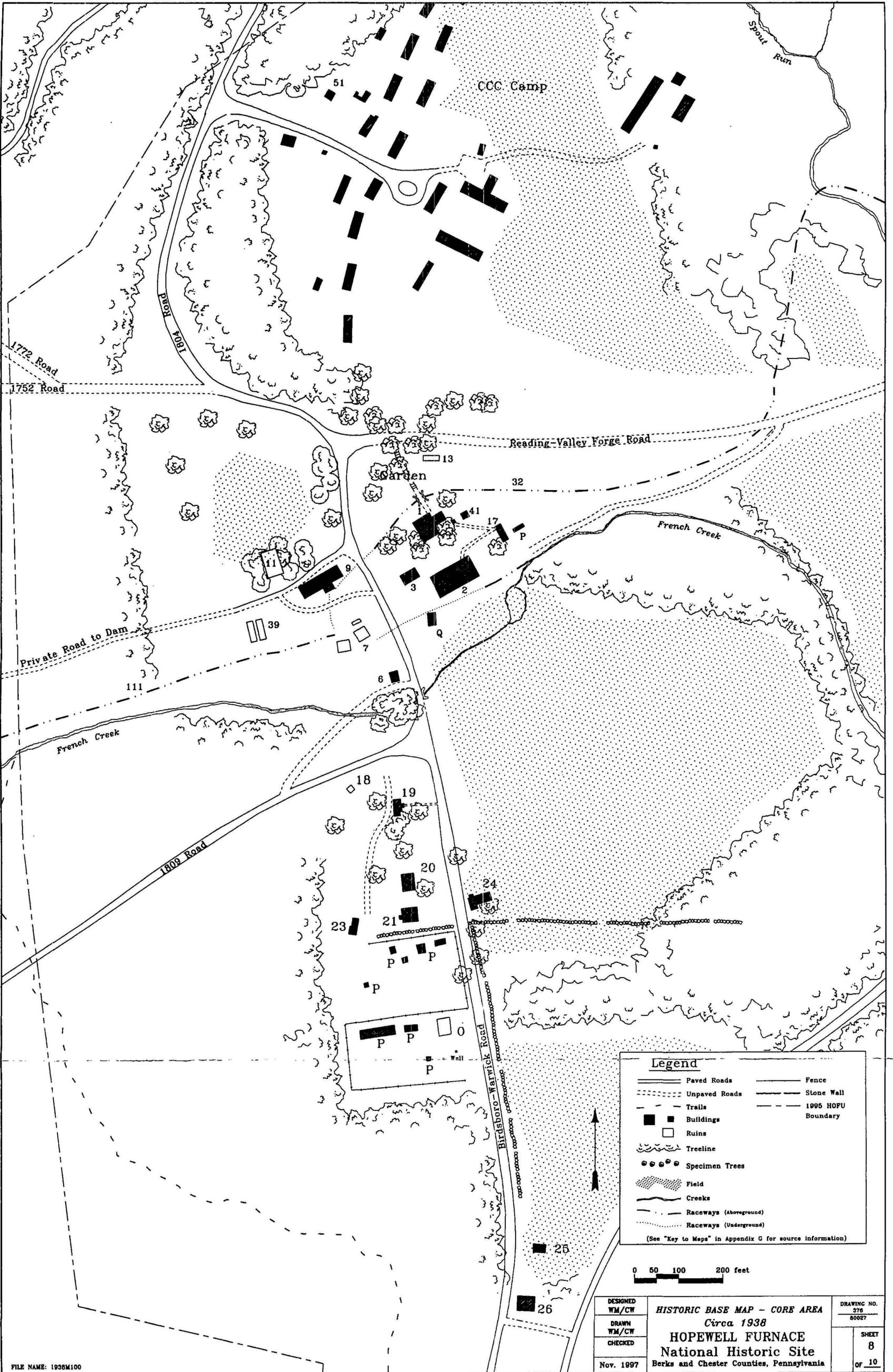
<sup>89</sup> Apple, "Documentation" II-55 and II-56. The existing grade north of the barn appears to conform more closely to the 1920s grade than the steep grade that existed prior to 1922.

<sup>90</sup> A ca. 1920s aerial photograph shows the extent of farm fields around Hopewell Furnace. Included are farm fields north and west of Hopewell Lake and the large area south of Coventry Road from Birdsboro-Warwick Road east to Bethesda Church. Additionally, the area immediately west of current PA Route 345, south of furnace lands, shows regenerated growth that previously functioned as farmland.

<sup>91</sup> National Park Service, "Development Plan - Residence, Utility & Village Areas, Part of Master Plan, Hopewell Village National Historic Site," December 1956. On file at HOFU archive; Apple, "Documentation" II-36; Roy Appleman, "Map of Hopewell Village & Ruins," December 31, 1935. On file at HOFU archive.



3.22. Hopewell Furnace 1938 Base Map.



3.23. Hopewell Furnace 1938 Base Map, core area.

FILE NAME: 1938M100

DESIGNED WM/CW	<b>HISTORIC BASE MAP - CORE AREA</b> Circa 1938 <b>HOPEWELL FURNACE</b> National Historic Site Berks and Chester Counties, Pennsylvania	DRAWING NO. 378 80627
DRAWN WM/CW		SHEET 8
CHECKED		OF 10
Nov. 1997		

ON MICROFILM



Figure 3.24. View of Birdsboro-Warwick Road looking north, ca. 1940. HOFU archive photo.

the Good Tract, the Lavery and Hager Tract, and the Shafer Tract. Most of the land fell within Union Township, Berks County. The United States government purchased approximately 1,200 acres of adjacent land from the John T. Dyer Quarry Company for about \$17,211. Smaller, additional purchases were also made at this date, with approximately sixteen tracts acquired for the proposed recreation demonstration area.<sup>92</sup> Acquisition of the lands was ". . . for use as a public park and recreation area, for the restoration of structures of historic interest, the conservation of natural resources, the preservation of scenic beauty, forestation and reforestation, and for use in connection with the construction of certain improvements for the purposes of the project."<sup>93</sup>

Establishment of the French Creek Recreation Demonstration Area fell under Title II of the National Industrial Recovery Act (NIRA) of June 16, 1933. This section of NIRA established the Public Works Administration (PWA), which, among other activities, constructed roads and public buildings. As part of the New Deal the PWA's purpose, in part, was to create employment through the establishment of public works projects.<sup>94</sup> In December 1934 the Civilian Conservation Corps (CCC) established Camp SP-7 in the vicinity of Hopewell Furnace to begin work on the recreation demonstration area. A

---

<sup>92</sup> Chester County Historical Society, vertical file, "Hopewell National Park - Warwick Township Lands." Miscellaneous newspaper articles on file at the Chester County Historical Society, West Chester, Pennsylvania.

<sup>93</sup> Walker, *Hopewell Village*, 69-70; Derrick M. Cook, Superintendent, "Statement for Management, Hopewell Furnace National Historic Site," October 1993. On file at HOFU library; Lewis and Hugins, *Hopewell Furnace*, 68. Work at the park does not appear to have included reforestation.

<sup>94</sup> Richard B. Morris, ed., *American Encyclopedia of American History* (New York: Harper & Brothers, 1953), 342 and 345.

second camp, SP-17, was established near Hopewell Lake the following year.<sup>95</sup> The primary focus of CCC activity at French Creek Recreation Demonstration Area was to clear away underbrush, build automobile roads, construct foot and bridle paths, lay out camping sites, and assist in excavating several lakes. To accomplish this the CCC transferred a contingent of men from Putnumville, Vermont to French Creek Recreation Demonstration Area. The two camps employed a total of approximately four hundred men. Camp SP-17 was located in what is presently French Creek State Park, while Camp SP-7 was centered at Hopewell Furnace near the present locations of the utility area and Quarters 98 and 99. This camp consisted of approximately twenty buildings including barracks, mess halls, garages, an administration building, and officer's quarters. The majority of the camp consisted of barracks (approximately ten buildings). Each barrack held twenty-two men and was sixty feet in length. One plan called for converting the barracks into recreational camping cabins following the CCC's departure from the site, with each cabin capable of holding three apartments.<sup>96</sup> This plan was not implemented, and the buildings at Hopewell were subsequently dismantled. Only three buildings (an oil house, pump house, and storage building) remain at Hopewell from the CCC's period of occupation. The pump house (Building 51) is located next to park quarters (Building 98). The other two buildings (Buildings 66 and 67) are located northeast of the maintenance building.<sup>97</sup>

In the 1930s, following years of disuse and neglect, the buildings, structures, and lands formerly associated with Hopewell Furnace were in varying degrees of deterioration. Certain core buildings such as the Ironmaster's House, Church House, Blacksmith Shop, Office & Store, Boarding House, and Tenant Houses 1-3, while in need of repairs and maintenance, were still extant. Other buildings, including the Carpenter's Shop (Wheelwright Shop), Cast House, Molding Sheds, School House, and numerous tenant houses and outbuildings, as well as gardens and fence lines, were in ruin or had already disappeared from the site. Other features, such as charcoal hearths, roads and trails, and outlying house sites, were being enveloped by the countryside. The furnace stack, once the primary focus of the village now lay in relative isolation and was in serious need of stabilization.

Shortly after the site's purchase, National Park Service historian, Roy A. Appleman, conducted historical research of the Hopewell Furnace area (Figure 3.25). Following his investigations Appleman noted the site's evident historical significance and recommended that it be restored and the village preserved. Early in 1936 Appleman prepared a proposed restoration plan for Hopewell Furnace. Appleman believed that Hopewell Furnace's fundamental components had changed very little from Colonial times through the Civil War

---

<sup>95</sup> John C. Paige, *The Civilian Conservation Corps and the National Park Service, 1933-1942: An Administrative History*, (Washington, D.C.: National Park Service, 1985), 38, 40-42. Individual parks and the National Park Service designed projects for the CCC to complete at parks. Park Superintendents or regional directors supervised the work and the Washington Office of the NPS had the right of approval for all projects.

<sup>96</sup> Chester County Historical Society, vertical file, "Hopewell National Park - Warwick Township Lands." Miscellaneous newspaper articles on file at the Chester County Historical Society, West Chester, Pennsylvania.

<sup>97</sup> Walker, *Hopewell Village*, 69; National Park Service, "Topography - Hopewell Village, French Creek Recreational Demonstration Project," 1938. On file at HOFU archive; Jacox and Boyle, "Hopewell Furnace National Register Nomination."

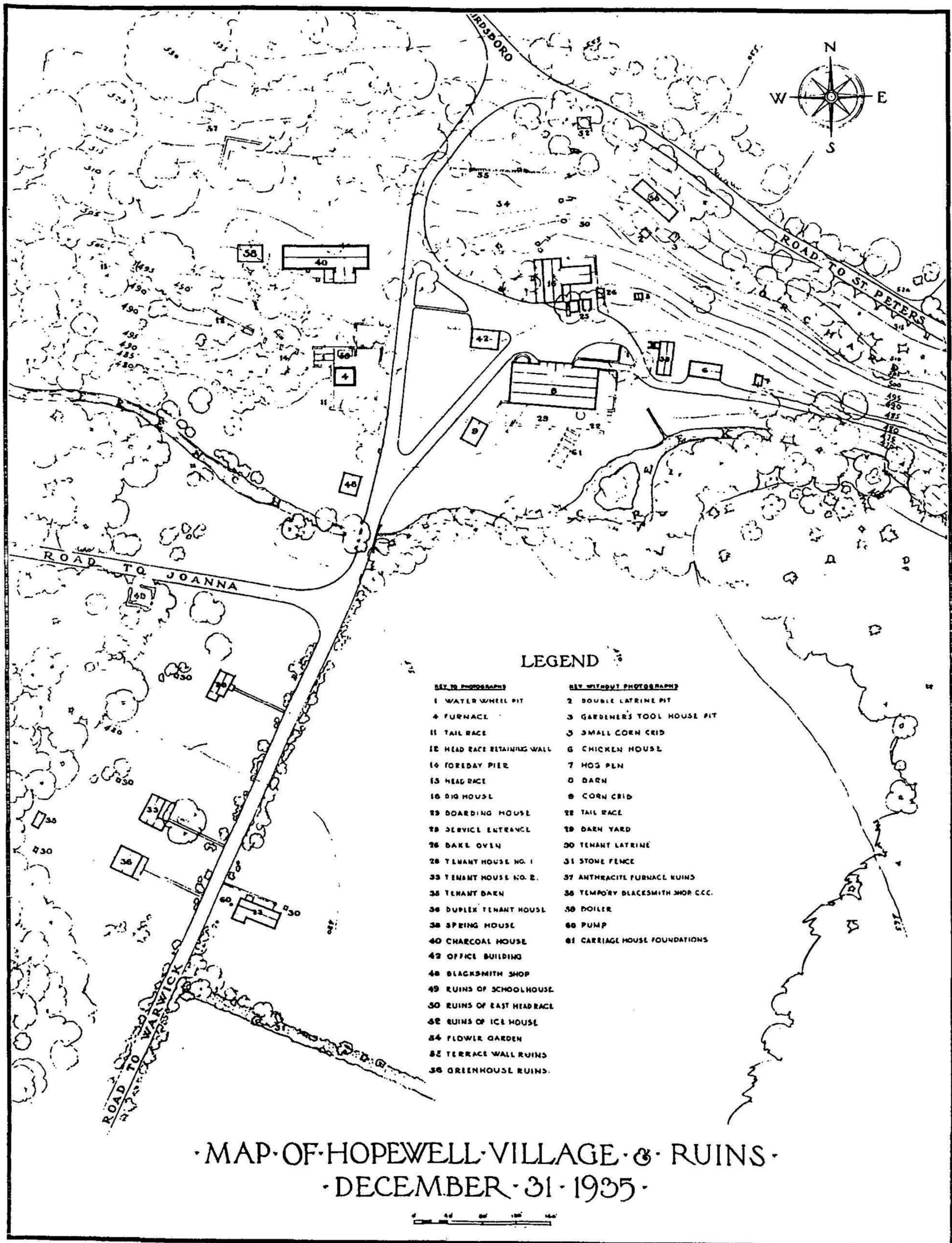


Figure 3.25. Appleman, Roy Edgar. "Map of Hopewell Village & Ruins." December 31, 1935. On file at Hopewell Furnace National Historic Site. Approximate Scale: 1 inch = 175 feet

era and proposed restoring Hopewell to its 1785-1800 time period.<sup>98</sup> Based on his recommendations the CCC, with additional funding from the Works Progress Administration (WPA), began stabilization of the furnace stack, cleaned the water wheel pit, recorded buildings, and conducted archeological investigations. In addition to its limited restoration efforts, the CCC constructed trails, picnic shelters, and camp sites as part of the creation of French Creek Recreation Demonstration Area.<sup>99</sup>

In 1936 the CCC began work on a planned ten- to fifteen-acre picnic area in the vicinity of Baptism Creek, east of the proposed bypass road (PA Route 345). The plan included a covered picnic shelter (Building 122 - extant) and approximately 130 picnic tables with benches. The CCC also constructed approximately thirty-five fireplaces with stones taken from the nearby hillside. This phase of the project included construction of one vehicular and two pedestrian bridges across Baptism Creek as it wound through the picnic area. Later plans proposed the construction of additional bridges. Project plans also called for a springhouse and reservoir. The picnic area also included an adjacent, crescent-shaped, parking area located north of Hopewell Road and capable of holding a hundred cars.<sup>100</sup> The picnic area has been used as an environmental study area since the 1970s. A majority of elements related to the CCC picnic area, including picnic tables, fireplaces and drinking fountains, have been removed or have fallen into decay. The parking area is no longer used but is still evident and regularly mowed.

West of Hopewell's village core area the CCC enlarged Hopewell Lake (currently part of French Creek State Park). This new development focused on recreational activities and included beaches and swimming areas. Constructed between 1936 and 1938, the new dam was approximately eight feet higher than the original, and increased the lake's area from approximately twelve acres to sixty-two acres. Enlargement of the lake presumably covered two of three tenant houses originally located along the north side of the lake. The stone ruins of the third tenant house (Frees' House) were extant at the time of the lake's construction. The new dam and lake resulted in the destruction of the old Hopewell dam and its West Head Race connection. The new dam included a concrete ogee spillway put into use in June 1938.<sup>101</sup>

In 1937 the federal government, in a probable effort to help preserve Hopewell Furnace's village core area, began construction of a bypass road (PA Route 345) east of the village. The bow-shaped road (completed in 1939) diverted automobile traffic around the village core and connected to Birdsboro-Warwick road, on the south, below the Nathan Care barn. It connected to Birdsboro-Warwick Road, on the north, approximately one thousand feet south of Shed Road.<sup>102</sup> Birdsboro-Warwick Road was closed to public traffic within the

---

<sup>98</sup> Much of Appleman's research was based on extensive oral interviews with former Hopewell employees. Harker A. Long, Hopewell employee from 1867 through 1896, provided Appleman with a majority of the information used in his report. Long, however, could only relate information told to him for the period prior to the date of his arrival at Hopewell in 1867. Subsequent investigations have added to the understanding of the site's history; however, little definitive documentary evidence exists for the pre-1860 time period.

<sup>99</sup> Lewis and Hugins, *Hopewell Furnace*, 70.

<sup>100</sup> Chester County Historical Society, vertical file "Hopewell National Park - Warwick Township Land." Miscellaneous newspaper articles on file at the Chester County Historical Society, West Chester, Pennsylvania.

<sup>101</sup> Apple, "Documentation," I-12; Hopewell Furnace National Historical Site Building Maintenance Records, Hopewell Dam file. On file at Maintenance Building, HOFU.

<sup>102</sup> National Park Service, "Base Map - Hopewell Village National Historic Site," 1937. On file at HOFU archive.

village core area in 1955.<sup>103</sup> During the 1930s the Reading-Valley Forge Road (1757 Road) was upgraded from dirt pavement to macadam. These improvements extended from the bypass to the eastern park boundary<sup>104</sup>. Other road improvements completed at the site by 1938 included upgrading the 1809 Road (road to Joanna) pavement to macadam and the 1932 straightening of the 1804 and 1825 Roads near the furnace. Many of the earlier road improvements used significant amounts of the slag piled near the furnace.<sup>105</sup> The area surrounding the Tenant Houses also received approximately one-foot of fill in order to raise the yard levels and mitigate wet conditions that existed there.

The government's intervention and the subsequent CCC activity at Hopewell Furnace resulted in dramatic changes to the site. These early efforts slowed what had become an unchecked deterioration of the site and its constituent parts. Activities included clearing overgrown areas and stabilizing historic fabric. Important as well were investigations intended to understand the site and its historic components. Another aspect of the government's intervention included the transformation of the site into a recreation demonstration project. This included construction of picnic grounds, campgrounds, and group camps, reconstruction of Hopewell Lake, and the construction of various hiking trails. The government's physical presence at the site also contributed to changes through the clearing and construction of CCC camps and the introduction of truck trails used during construction.

#### **THE NATIONAL PARK SERVICE: 1938-Present**

In August 1938 the government's involvement with Hopewell Furnace changed. At this date acting Secretary of the Interior E. K. Burlew designated approximately 214 acres of land within the French Creek Recreation Demonstration Areas as Hopewell Village National Historic Site. Boundaries for the park followed the west side of the Pennsylvania Route 345 bypass road (under construction in 1938) on the east. The west boundary followed the old Birdsboro-Warwick Road on the north from its junction with the bypass road south approximately two thousand feet. At this point the boundary continued southwest approximately one thousand feet. It then followed an irregular diagonal line to the southeast for approximately three thousand feet. It then continued south to the south junction of the old Birdsboro-Warwick Road and the bypass road, approximately seven hundred feet south of the Nathan Care House.<sup>106</sup>

Establishment of Hopewell Village as a National Historic Site emphasized the historic qualities and components of the site. In 1938 the CCC located, mapped, and partially restored the East Head Race. Around this date they also restored the furnace's tail race and in 1940 part of the site's apple orchard was replanted. In 1941 the park constructed a new garage and a frame addition to the John Church House (Building 27) as part of the building's renovation to employee quarters. By the end of 1941 the CCC had terminated its activities at Hopewell Furnace as a result of the United States' entry into World War

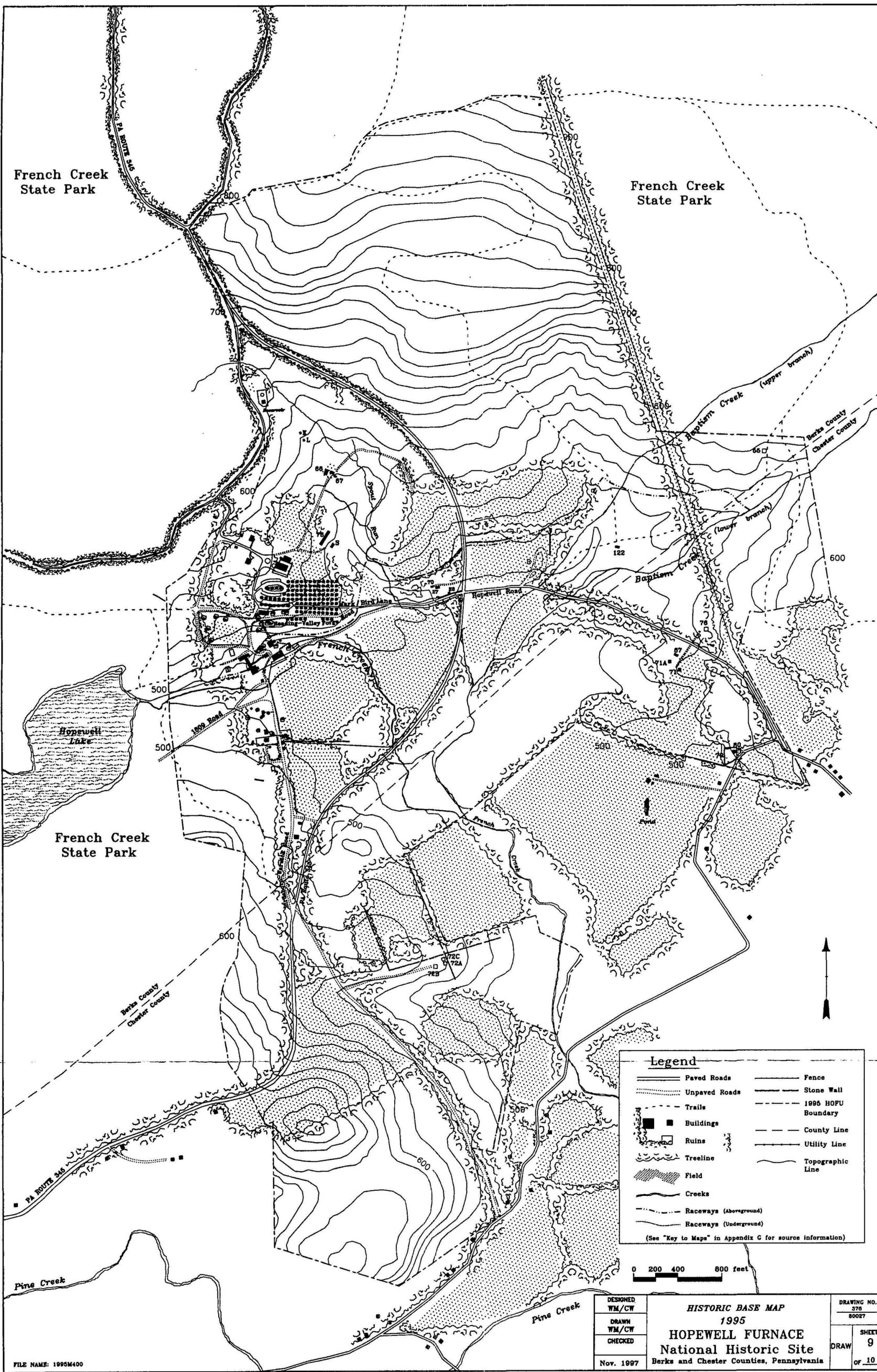
---

<sup>103</sup> Thomas & Newswanger, "Hopewell Furnace Historic Structures Report and Engineering Study," 2 vols., dated 30 June 1987. On file at HOFU library.

<sup>104</sup> Jacox and Boyle, "Hopewell Furnace National Register Nomination."

<sup>105</sup> Lewis and Hugins, *Hopewell Furnace*, 70.

<sup>106</sup> Federal Register 2039, Aug. 3, 1938; National Park Service, "Base Map," Hopewell Village National Historic Site, 1937. On file at HOFU archive.



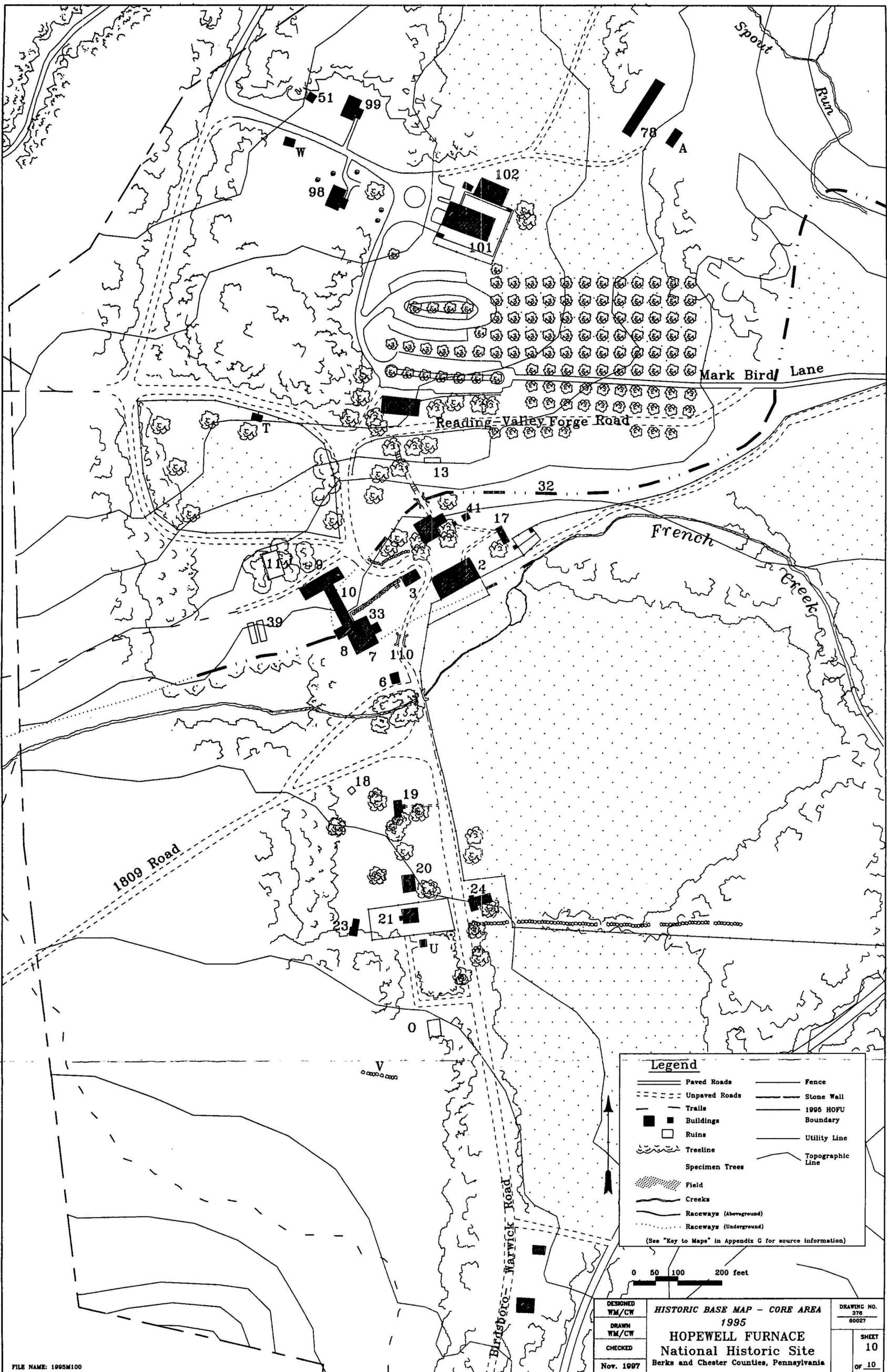
3.26. Hopewell Furnace 1995 Base Map.

FILE NAME: 1995M400

DESIGNED WM/CW	<b>HISTORIC BASE MAP</b> <b>1995</b> <b>HOPEWELL FURNACE</b> <b>National Historic Site</b> Berks and Chester Counties, Pennsylvania	DRAWING NO. 378 80027
DRAWN WM/CW		SHEET 9
CHECKED		DRAW
Nov. 1997		OF 10

ON MICROFILM

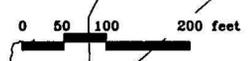
3.27. Hopewell Furnace 1995 Base Map, core area.



**Legend**

	Paved Roads		Fence
	Unpaved Roads		Stone Wall
	Trails		1995 HOFU Boundary
	Buildings		Utility Line
	Ruins		Topographic Line
	Treeline		Field
	Specimen Trees		Creeks
	Raceways (Aboveground)		Raceways (Underground)

(See "Key to Maps" in Appendix G for source information)



DESIGNED WM/CW	<b>HISTORIC BASE MAP - CORE AREA</b> 1995 <b>HOPEWELL FURNACE</b> National Historic Site Berks and Chester Counties, Pennsylvania	DRAWING NO. 378 80027
DRAWN WM/CW		SHEET 10
CHECKED		OF 10
Nov. 1997		

FILE NAME: 1995M100

II.<sup>107</sup> During the War the CCC camp was used as a rest area for French and British sailors.<sup>108</sup>

In June 1942 the lands associated with the French Creek Recreational Demonstration Project were added to Hopewell Village National Historic Site. Just over four years later the Secretary of the Interior authorized the withdrawal of all lands acquire in the 1942 legislation ". . . which in his opinion are not required for historic-site purposes." These lands reverted back to a recreation demonstration area. The following year the United States government deeded approximately 5,000 acres of land to the Commonwealth of Pennsylvania for use as French Creek State Park. The National Park Service retained approximately 848 acres for Hopewell Village National Historic Site.<sup>109</sup> During the operating period of the furnace (pre 1883) the owners of Hopewell Furnace controlled just over half the area contained within the established boundaries for the historic site. The remaining portion, located south and east of the Boarding House, functioned as adjacent farmland, and was not acquired by Hopewell's owners until the twentieth century.

During World War II the park engaged in minimal activities. Following the war, in 1948, the Nathan Care House (Building 25) was modernized for use as quarters and a Quonset hut was constructed near the Tenant Houses (subsequently removed). During the 1950s restoration and improvement projects increased at the park. In 1951 the West Head Race was reconstructed and by 1954 a new entrance road and parking area had been completed. During 1955 the park restored the Spring House, Bake Ovens, and Bethesda Church carriage shed.<sup>110</sup>

In July 1956 the National Park Service developed a ten-year capital improvements plan entitled Mission 66. Mission 66 was planned, in part, to contribute to a rejuvenation of the National Park System for its fiftieth anniversary (to be held in 1966). After years of general neglect following World War II, the plan called for construction of modern roads, visitor centers, well-planned trails, campgrounds, interpretation centers, and the introduction of new utilities throughout the National Park system. The plan budgeted a billion dollars for the ten-year program and had support from both Congress and President Dwight D. Eisenhower.<sup>111</sup>

Mission 66 efforts at Hopewell Village National Historic Site included construction of a new visitor center (Building 100), two employee quarters (Buildings 98 and 99) , and a maintenance building (Building 101). These buildings were completed in 1959 and are located north of the 1757 Road (Reading-Valley Forge Road). The two living quarters were constructed near the southern end of the former CCC camp along a service road connecting the parking area with the 1825 Road to Birdsboro. A planned third quarters was not constructed. The maintenance building was constructed east of the quarters in a designated utilities area. The Visitor Center replaced a small visitor shelter located at the parking area. Following completion of the new Visitor Center, park personnel relocated

---

<sup>107</sup> Apple, "Documentation," I-23, I-31, and I-37; Morris, *Encyclopedia of American History*, 342; Jacox and Boyle, "Hopewell Furnace National Register Nomination," 7:4-14.

<sup>108</sup> Lewis and Hugins, *Hopewell Furnace*, 72.

<sup>109</sup> Walker, *Hopewell Village*, 70; Cook, "Statement for Management," 33-34.

<sup>110</sup> Jacox and Boyle, "Hopewell Furnace National Register Nomination," 7:4-14; Apple, "Documentation."

<sup>111</sup> Hal Rothman, *Preserving Different Pasts: The American National Monuments* (Chicago: University of Illinois Press, 1989), 222; James A. Glass, *The Beginnings of a New National Historic Preservation Program, 1957 to 1969* (Nashville, Tenn.: American Association for State and Local History, 1990), 5.

the visitor shelter to an area near the school house site. This shelter was demolished in 1972.<sup>112</sup>

Between 1957 and 1959 the park reconstructed a number of buildings and structures including the Bridge House, furnace bank and retaining wall, the connecting shed, and the cooling shed (Figure 3.28). During this time period the Park Service brought slag from Joanna mine to recreate the slag piles around the furnace. They also completed a number of Historic Structures Reports including reports on Tenant Houses 1 & 2, the Charcoal House, and the Bridge House. During this period the park changed the interpretive period it sought to present at the site. Ongoing research shifted the park's interpretive effort from the furnace's colonial period of operation to that of the 1820s through 1840s, when the furnace experienced its greatest prosperity.<sup>113</sup>

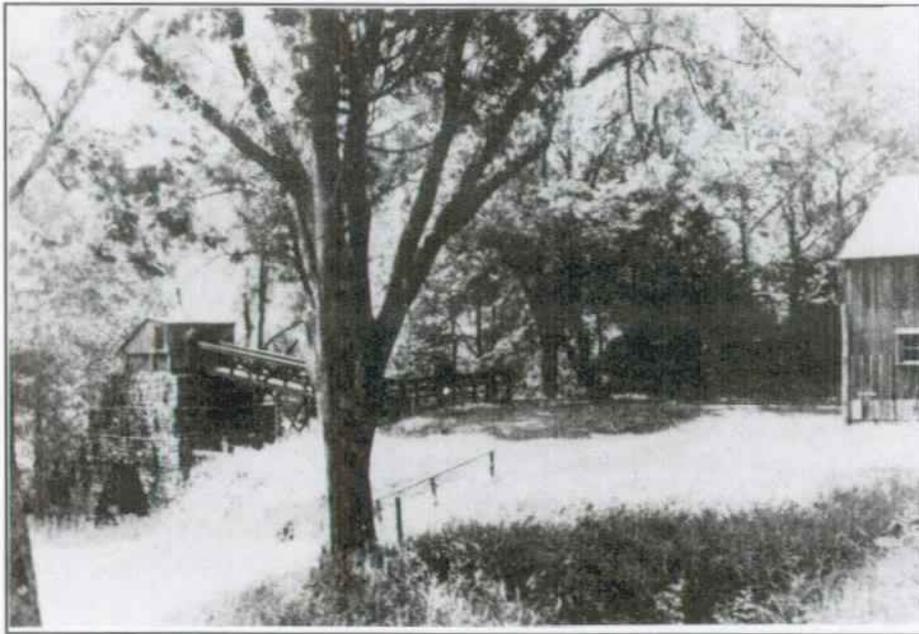


Figure 3.28. View of Furnace remains (Bldg. 7) and Bridge House prior to reconstruction, ca. 1949. HOFU archive photo.

Extensive amounts of rehabilitation and reconstruction work continued at the site through the 1960s, with particular emphasis placed on the industrial core. This work included reconstruction of the Cast House and Cleaning Shed, as well as the restoration of the Office & Store and Charcoal House. In 1965 the area surrounding the Blacksmith Shop was regraded and lowered to improve drainage from the reconstructed Cast House to French Creek. The Park Service also stabilized the ruins of the Anthracite Furnace, Ore Roaster, and Carpenters' (Wheelwright) Shop during this period. Work outside the primary industrial zone included restoration of Tenant Houses 1 & 2, as well as the reconstruction of the Barn, Smoke House, and Boarding House.<sup>114</sup> In 1964 the park demolished the Harrison Lloyd House. Ruins of the house (Building 72B) and its associated outbuildings

---

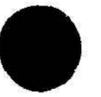
<sup>112</sup> National Park Service, "Development Plan - Residence, Utility & Village Areas," 1956, revised 1961. On file at HOFU archives; Jacox and Boyle, "Hopewell Furnace National Register Nomination," 7:4-14.

<sup>113</sup> *Ibid.*; Apple, "Documentation."

<sup>114</sup> *Ibid.*

(Buildings 72A and C) are still evident along the Harrison Lloyd Road, southeast of PA Route 345.

The park continued restoration and stabilization efforts throughout the 1970s and 1980s. During this time period outlying house ruins were stabilized including those of the Boone House, Woodlot House, and Brison House. The exterior of the Ironmaster's House was restored in 1979-1980 and the Blacksmith Shop was once again restored in 1981, following a fire. The park has continually tried to retain the rural character and setting of the site and provide as complete a representation of Hopewell Furnace's rural-industrial history as possible. In 1985 the name of the site changed to Hopewell Furnace National Historic Site.



## 4.0 ANALYSIS AND EVALUATION

### INTRODUCTION

Hopewell Furnace National Historic Site contains less than 20 percent of the property owned by Hopewell Furnace during its period of operation. The National Historic Site includes the industrial and residential cores of the furnace property as well as some of the woodlands and farms owned by the furnace. Additionally, the National Historic Site includes agricultural lands acquired by the owners of the furnace property in the twentieth century. These farms were privately owned prior to their acquisition by the furnace. Although it comprises only a fraction of the property owned by the furnace during its heyday, Hopewell Furnace National Historic Site, does incorporate property associated with most of the various types of land use and activities connected with the operation of the furnace.

The analysis and evaluation of the cultural landscape characteristics of Hopewell Furnace National Historic Site is based on an examination of the historical record and the documentation of existing landscape resources within the National Historic Site's boundaries. A summary discussion of the cultural landscape characteristics is documented through each of Hopewell Furnace's historic periods. These cultural landscape characteristics are defined in *National Register Bulletin 30* and are intended to aid in the evaluation and documentation of rural landscapes.<sup>1</sup> The characteristics represent the natural and cultural forces instrumental in shaping the land for human needs and the resultant physical components that remain evident on the landscape. The character-defining features are grouped into the following categories: response to natural features, land use and activities, patterns of spatial organization, circulation, boundaries, vegetation, clusters, buildings and structures, archeological sites, and small-scale elements. With this information, the overall significance of the landscape is addressed according to National Register Criteria.

### CULTURAL LANDSCAPE CHARACTERISTICS

#### Response to the Natural Environment

##### *1770-1800: Settlement and Development*

Natural features significantly influenced the siting of Hopewell Furnace in the eighteenth century. The site offered abundant timber resources, ample water courses, and adequate agricultural lands; all necessary for the operation of a charcoal-fueled iron furnace. Deposits of iron ore and limestone, essential ingredients in the iron making process, were located within a few miles of the furnace site. The surrounding area also offered additional timber and agricultural land to supplement that on furnace property.

The site's topography partially determined the location of the furnace (Figure 4.1). The steep slopes of Brush, Chestnut, and Williams Hills enabled logs to be skidded or otherwise conveyed downhill, taking advantage of gravity, to clusters of pits where the logs were converted into charcoal. Construction of the furnace against the slope of Brush Hill facilitated charging the furnace from above and eliminated the need for extensive charging bridges.

---

<sup>1</sup> Linda Flint McClelland, et al., *National Register Bulletin 30: "Guidelines for Evaluating and Documenting Rural Historic Landscapes,"* (Washington: National Park Service, n.d.), 3-6. Bulletin 30 outlines eleven landscape characteristics, ten of which are applicable to Hopewell's landscape.

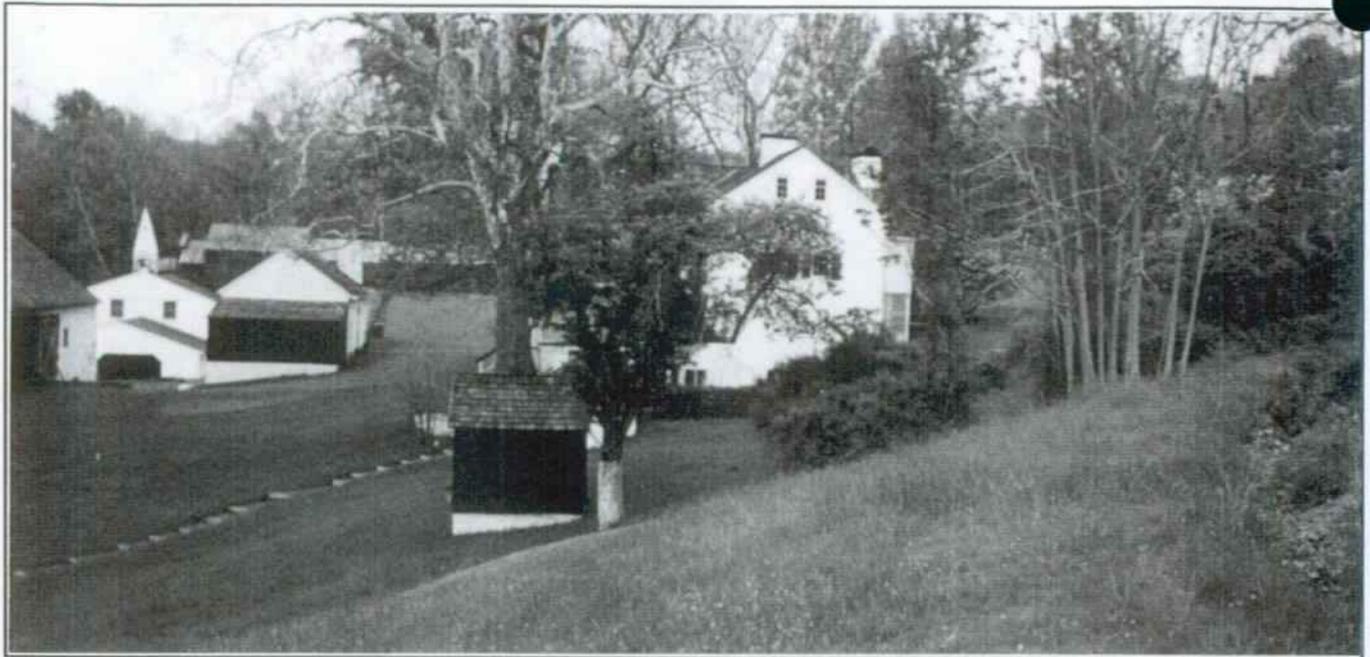


Figure 4.1. The sloping topography made it simpler to load raw materials into the furnace from above. The Ironmaster's House occupies a commanding position above the furnace complex. The East Head Race, visible on the right, carries water from distant portions of the property to the furnace. Menke & Menke photo, 1995.

The topography also permitted the tapping of French and Baptism Creeks and Spout Run at elevations sufficient to generate the necessary waterpower for operating the furnace. The location of the furnace permitted these streams to be tapped near their sources and the furnace owners constructed the East and West Head Races to assure maximum use of available water. Original owner Mark Bird also converted the wetlands south of French Creek through construction of drainage works, furnishing the site with "good watered meadow made."

Field stone, common throughout the site, served as a natural building material. The stone buildings at Hopewell are typical examples of the vernacular architecture found throughout this portion of Pennsylvania. These buildings reflect the permanence of stone masonry construction rather than a representative sample of the eighteenth century built environment. It is likely that wood and log buildings also occupied the site during this period, as they did at farms and settlements elsewhere in the region. The vast majority of the wood and log buildings have deteriorated and disappeared from the landscape, while a significantly higher percentage of masonry buildings survive.<sup>2</sup>

#### *1800-1845: Growth and Prosperity*

Natural features continued to play a significant role during this period. The surrounding environment served a similar role to that described for the previous period, providing the

<sup>2</sup> David H. Fischer, *Albion's Seed: Four British Folkways in America* (New York: Oxford University Press, 1989), 476; Philip E. Pendleton, *Oley Valley Heritage, The Colonial Years: 1700-1775* (Birdsboro, PA: The Pennsylvania German Society, 1994), 55-100.

resources required for operations at the furnace. The furnace's owners, however, continued to modify the site's natural features to better serve their needs. These modifications are evident in the damming of French Creek and the construction of a new West Head Race ca. 1805. During the 1830s the furnace's owners tempered the natural environment along the slope above the Ironmaster's House through the construction of terraced gardens. Tenants south of French Creek responded to wet conditions near their houses by extending boardwalks from their homes to the roadway.

#### *1846-1883: Decline*

Hopewell Furnace's owners exploited and managed the site's natural features during this period of Hopewell's operation in much the same fashion as during the two previous periods. The surrounding environment continued to provide resources for the operation of the furnace.

#### *1883-1935: Shutdown and Survival*

The basic natural features present during the operation of Hopewell Furnace remained extant during this period of occupation; however, curtailment of iron-making operations resulted in significant changes in the type of activities supported by the site. Closure of the furnace meant that the creeks and head races were no longer used for waterpower. Management of these areas, as well as those directly associated with the former industrial operations, largely ceased during this period. The change in management and manipulation of the environment resulted in many unused areas becoming overgrown.

Timber continued to be harvested from the property, providing the furnace owners with income from the sale of fence posts and charcoal; however, the overall scale of operations declined. Additionally, lease agreements were signed for the quarrying of stone on furnace lands. The purchase of arable lands south and west of the furnace property facilitated expanded agricultural practices by the property owners.

#### *1935-1938: The Civilian Conservation Corps*

The federal government acquired the property in 1935 for development as French Creek Recreation Demonstration Area (RDA). The portion of the RDA that became Hopewell Furnace National Historic Site comprised less than 20 percent of the historic Hopewell Furnace property. The National Historic Site's boundaries excluded significant natural features associated with the furnace's operations, including Hopewell Lake and the majority of timber land located west of the furnace.

During this period the National Park Service and the Civilian Conservation Corps exploited the site's natural features for recreational purposes. The wooded hillsides were developed as a setting for hiking trails and picnic sites. The hillsides also supplied stone for fireplaces, picnic shelters, and other construction projects. This pattern of development is evident near Baptism Creek, where a picnic area was developed, as well as in neighboring French Creek State Park.

The government greatly enlarged Hopewell Lake for fishing, swimming, and boating activities. Development of the site during this period, as well as near the end of the last period, reflected the expanded use of automobiles within American society. A new by-pass road was cut through existing agricultural lands east of the core village, creating a new boundary demarcation. The Warwick-Birdsboro Road, which passed through the heart of the village, had been straightened in 1932 to eliminate an awkward turn between the Office/Store and the Village Barn. This work reflected a disregard for the site's natural topography and the

imposition of a modern technological solution upon the landscape. The new alignment necessitated demolition of a substantial portion of the wall between the Cast House and the Office/Store, and destroyed the west end of the Ironmaster's House garden.

#### *1939-Present: The National Park Service*

The National Park Service's focus has been on interpreting Hopewell Furnace as a late-eighteenth and nineteenth century charcoal iron furnace and its associated village. In this respect the property's natural features function as an artifact, instead of providing resources for the operation of the furnace. The Park Service's focus on the core village has resulted in a return to a less managed landscape. The lack of attention paid to historical modifications of the landscape, including clearing drainage ways, harvesting timber, and farming agricultural fields, has resulted in reemerging wetlands and the natural reforestation of historically farmed areas. The former is evident in the village meadow, while the latter is evident along PA Route 345 and in the fields formerly associated with the Thomas and Harrison Lloyd properties. The prohibition of hunting within the boundaries of the National Historic Site has contributed to an explosion in the deer population and extensive browsing of deer within the park. The destructive grazing habits of the local deer population has hampered the regeneration of some forests and has contributed to the elimination of much of the forest understory. Additionally, the deer population has partly determined how the Park Service interprets the site's agricultural history by precluding establishment of large vegetable gardens and the planting of row crops in the agricultural fields, as occurred during most of the site's history. The location of the Visitor Center and parking areas exploits the site's topography in order to provide visitors with a panoramic overview of the historic industrial village immediately upon their arrival at the site.

#### *Response to the Natural Environment Analysis Summary*

The siting of Hopewell Furnace responded directly to the natural environment. The site's ample water courses and timber resources supported the operation of the furnace, while its topography directed the placement of the furnace itself, as well as many of the site's other buildings and structures. The soils, slopes, and forests surrounding the furnace property led to establishment of independent farms that also supported furnace operations. Following closure of the furnace in 1883 the site's natural features continued to facilitate timbering, quarrying, and farming. The response to, and management of, the natural environment changed dramatically following the site's acquisition by the United States government in 1935. After this date the site's natural features were viewed as supporting recreational and interpretative activities.

The basic components comprising Hopewell Furnace's natural environment have remained relatively consistent through each of the site's periods of historical significance. These features include topography, water courses, timberlands, and agricultural lands. At present the evidence of historic responses to Hopewell's natural environment most closely corresponds to that implemented after the National Park Service acquired the property in the late 1930s, with a central, interpreted core surrounded by a large natural area. The entry road to the parking areas and Visitor Center also reflect the NPS's response to the site's natural environment.

Evidence of earlier historical responses to the natural environment remain visible. These include the location of the furnace and reconstructed bridge house against the slope of Brush Hill, which clearly depicts one of the historic responses to the site's topography. The continued presence of French, Spout, and Baptism Creeks is reminiscent of historic responses to the natural watercourses (Figures 4.2a and 4.2b), while the continued presence of

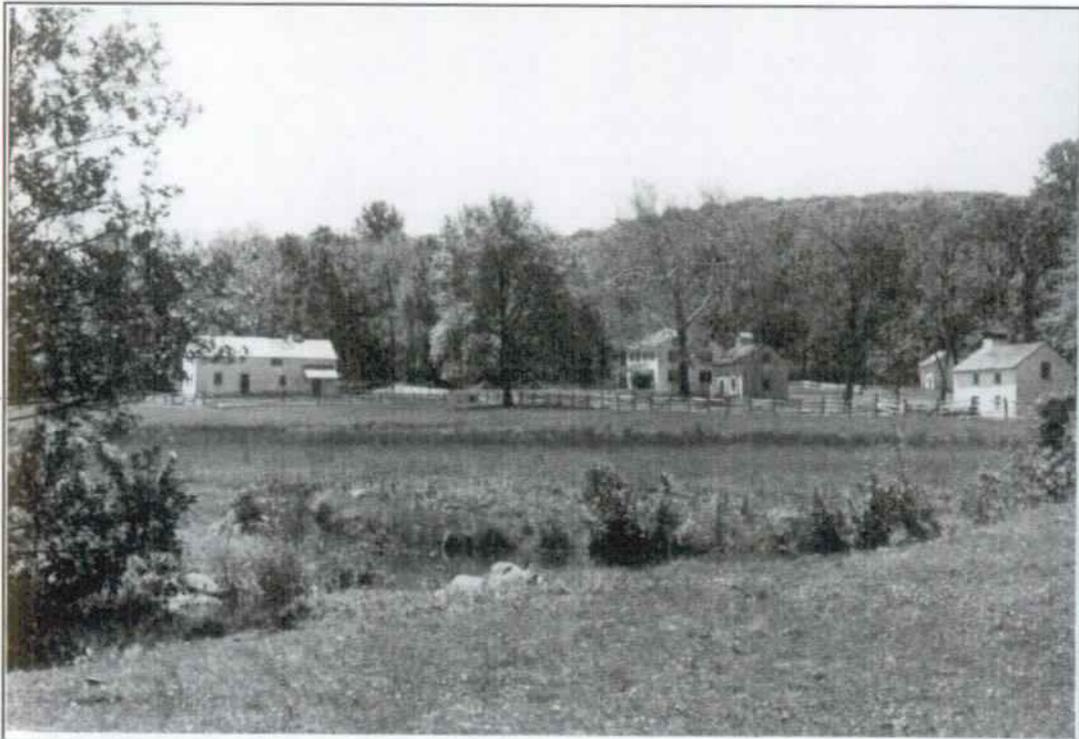


Figure 4.2a and 4.2b. French Creek in Hopewell Village in 1936 (top) and 1995 (bottom). View to southwest towards Boarding House and Tenant Houses. Though presently viewed primarily as an aesthetic amenity, the Creek played a vital role in the economy of the Village, the Furnace, and the later dairy operation. Top photo HOFU archive, bottom photo Menke & Menke.

woodlands and agricultural fields also represents evidence of past responses to the environment.

### Land Use and Activities

#### *1770-1800: Settlement and Development*

Land use activity during this period focused upon the operational needs of the furnace, which, with its ancillary and support buildings, comprised the core of the property. Surrounding this core were a variety of other land uses and activities, all of which supported the operation of the furnace in some fashion. In some instances different uses and activities occupied the same physical space.

The siting of the furnace was largely determined by the natural environment. As noted above, the furnace siting took advantage of the natural topography and the proximity of waterpower sources. Additionally, the furnace was located near the existing east-west public road that connected Scarlet's Mill, near Reading, with Coventry Forge in Chester County. Once the location of the furnace was determined the remainder of the property was developed to serve the needs of the furnace. The Ironmaster's House occupied a commanding location on the hillside northeast of the furnace complex. Between the house and the furnace lay the store, blacksmith shop, and carpenter's shop, which functioned as adjuncts to the furnace operation, while also providing commercial services to area residents. Workers' housing occupied the area south of French Creek, which served as a boundary between the industrial area surrounding the furnace and the residential village.

Areas devoted to agriculture within the village core were intermingled with residential areas. The residents of tenant houses presumably maintained vegetable gardens, probably fenced to keep out hogs and other animals. The Village Barn occupied a prominent location in close proximity to the Ironmaster's House, while an orchard lay north of the house. The barns and animal pens and coops in the village supported the local community and the furnace operations, and were surrounded by large open fields filled with cultivated crops and pasture. Fields and pasture land were concentrated in the area south of French Creek and east of the main north-south road through the village.

To the south and east of the village core lay other farms, most independently owned, laid out in accordance with the common agricultural practices of the area. These practices included houses and outbuildings near a road, but with easy access to the surrounding fields and woodlots. Bethesda Church, located east of the village core, served as an important institutional center for the families that owned and operated these farms, as well as for many furnace workers.

North and west of the site's core lay the woodlands that provided the furnace with charcoal. Charcoal pits and huts were not scattered haphazardly through the woods, but were concentrated in areas accessible to the wagons that hauled the charcoal to the furnace. Some furnace employees workers may have lived near the woods in which they worked. It is possible that the Brison and Woodlot sites may represent this pattern of use and activity, since they do not appear to be historically associated with sizable agricultural efforts, although this theory remains speculative and the precise date of construction for these two buildings has yet to be determined.

### *1800-1845: Growth and Prosperity*

Land use and activities during this period changed little from those of the previous period. The operation of the furnace remained the primary focus of all activity at the site and the primary land use activities during this period are closely linked to the production of iron and the support of the work force that produced that iron. During this period Hopewell produced much of its food, mined its own ore, and supplied power and fuel from its own land. The furnace depended upon the area's road network to transport its products to markets. The condition of the roads and the siting of major buildings in close proximity to these roads were critical considerations in the development and use of the property.

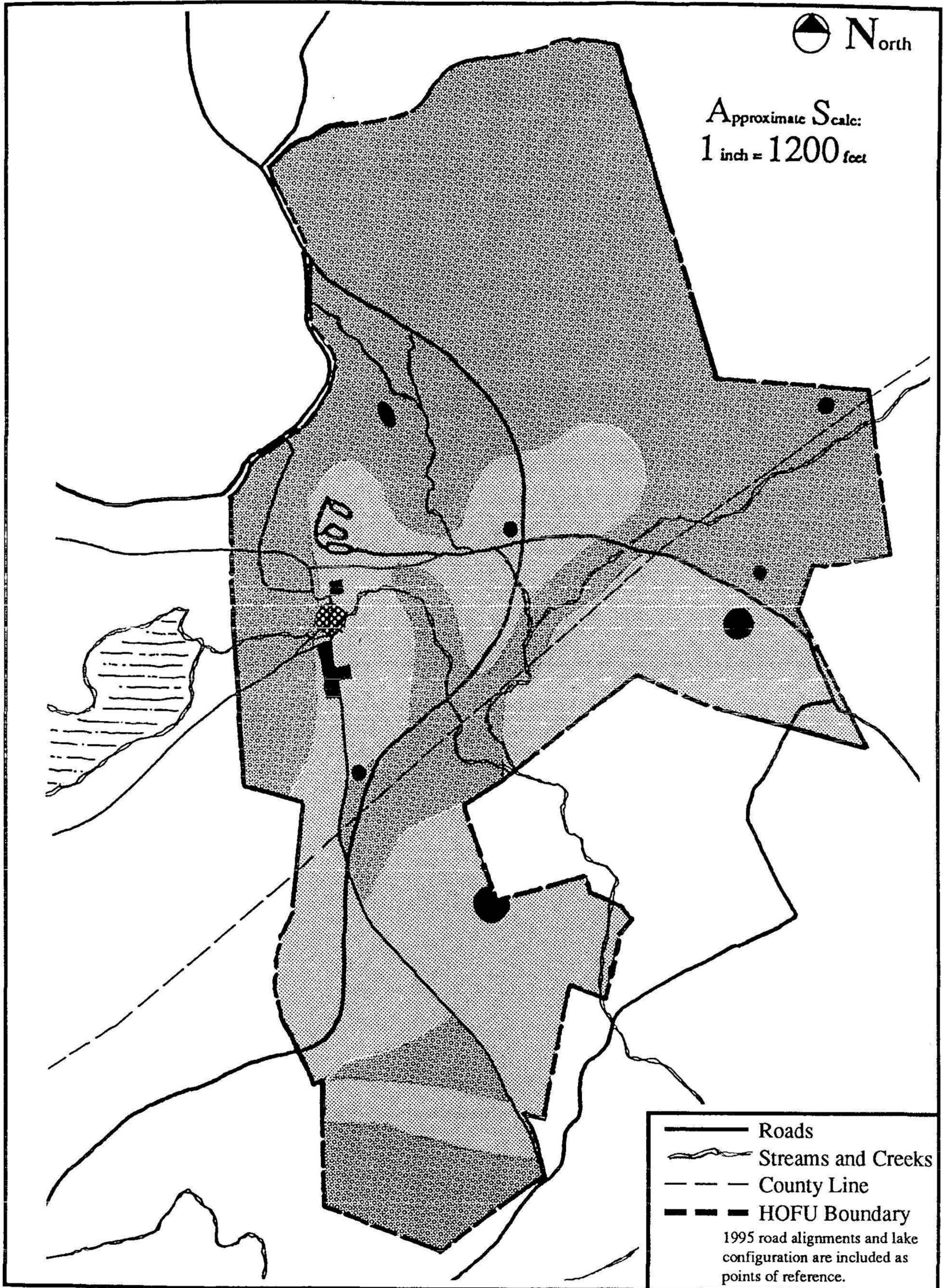
The furnace prospered during this period, and the physical plant and work force expanded accordingly. New buildings were constructed to shelter expanded industrial operations and to shelter the increased work force. This expansion resulted in a more intensive development of the property's industrial and residential core. Evidence suggests that additions and alterations to the Cast House during this period permitted increased productivity, an expansion probably undertaken in response to market demand for the furnace's product. Similarly, it appears that additional tenant houses, most no longer extant, were constructed to provide housing for the larger work force employed during these years. Consequently, while land use and activities during this period remained essentially the same as in the previous period, the intensity of the activity increased in conjunction with the increased intensity of operations at the furnace.

Land use west of the furnace complex changed significantly during this period as a result of an effort to obtain a secure waterpower source wholly owned by the furnace. French Creek was dammed west of the furnace, creating Hopewell Lake, and a new West Head Race was built to carry the impounded water to the furnace. The course of French Creek in the immediate vicinity of the furnace was altered by the placement of furnace slag in low areas prone to seasonal flooding.<sup>3</sup>

It is presumed that the amount of acreage under cultivation expanded during this period, as a result of the increased size of the work force and the general expansion of furnace operations. The documentary record does not indicate the location of any new fields brought under cultivation during this period. The lands utilized for agricultural purposes lay in close proximity to the three area creeks, and presumably enjoyed a greater concentration of topsoil and better moisture retention than other areas of the site, rendering them well suited to crop production. While the amount of acres under cultivation likely increased, it appears that the types of crops grown at Hopewell changed little during this period. Some fields provided more than one crop, as exemplified by the replanting of the flax field later the same year with turnips, and in the underplanting of the orchard with clover for hay. The site's farmers did, however, improve their farming methods through the use of new and improved farm implements. The willingness of the furnace owners to invest in agricultural machinery suggests that they viewed their agricultural operations as essential to the success of the furnace. They were progressive farmers, as were many of their neighbors in southeastern Pennsylvania, and employed technology to increase yields.

---

<sup>3</sup> Flooding was presumably more prevalent during this period, due to the modest earthwork dam that formed Hopewell Lake. The existing Hopewell Dam, which provides significantly greater control over the lake, was not constructed until the late 1930's.



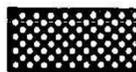
			
Industrial Core	Residential	Agricultural	Woodlands

Figure 4.3. Land Use: 1769-1883

The land immediately surrounding the Ironmaster's House was developed as a garden during this period. This formal landscape, with terraces, walkways, a greenhouse, and other amenities, all separated from the industrial activities across the road by a stone wall and fencing, clearly defined the Ironmaster's House as a distinct area within the site. While the garden certainly provided items of utility, such as vegetables, berries, and honey, one of its major purposes clearly seems to have been the provision of pleasure to the ironmaster, his family, and their visitors. In this, the Ironmaster's House Garden is unique among the utilitarian and functional landscapes that predominate at Hopewell.

The ratio of open to wooded spaces in the Hopewell tract is thought to have remained relatively constant during this period. Approximately 15,000 cords of wood, the equivalent of 375 acres of woodland, were reportedly consumed annually during the height of the furnace's operations. Most of this wood is thought to have been cut and converted to charcoal on Hopewell land, primarily from woodlands west of the current national historic site and presently located within French Creek State Park. There is evidence that cutover woodlands were left to regenerate, rather than being brought into cultivation, as was common elsewhere in southeastern Pennsylvania. It is likely that the furnace owners recognized that allowing the woodlands to regenerate assured them of a reliable supply of charcoal for the furnace. Maintaining the woodlands was likely a rational economic decision on the part of the furnace owners.

#### *1846-1883: Decline*

Land use and activities during the years between 1846 and 1883 remained essentially the same as for the previous two periods (Figure 4.3). The cessation of stove-casting at Hopewell in 1844 marked the beginning of a long period of retrenchment and decline that ultimately led to the closure of furnace operations in 1883. During this period the contraction of operations resulted in less intensive land use and activity throughout the site.

It is assumed that as the work force shrank some tenant houses within the village were abandoned. Likewise, the intensity of the furnace's agricultural operations probably also declined. Neighborhood farmers who provided goods and services to the furnace during flush times likely turned their attention to other markets during these years.

#### *1883-1935: Shutdown and Survival*

After the furnace ceased operations in 1883 the property experienced a basic reorganization of land uses and activities (Figure 4.4). The industrial core of the property was essentially abandoned, with the furnace, cast house, and other ancillary buildings and structures allowed to deteriorate. Area laborers, including those who occupied the furnace's tenant houses, sought employment elsewhere, and many of the tenant houses were abandoned, or allowed to deteriorate. The Ironmaster's House became a summer residence for the property's owners and a year-round residence for the caretakers.

Agricultural activities at the site shifted significantly after the cessation of furnace operations. Row crops appear to have been largely abandoned in favor of a substantial dairying operation. A number of area farmers began dairying during this period. These farms are characterized by large barns and fenced fields that included pasture, corn, and oats.<sup>4</sup> At Hopewell the village barn was remodeled and converted into a dairy barn. Fields formerly given over to wheat were

---

<sup>4</sup> Henry F. Bridgens and A. R. Witmer, *Atlas of Chester County, Pennsylvania* (Lancaster, PA: A. R. Witmer, 1873), Sheet 55. On file at the Chester County Historical Society, West Chester, Pennsylvania.

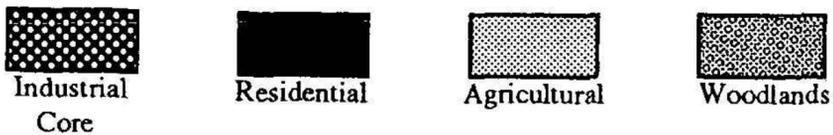
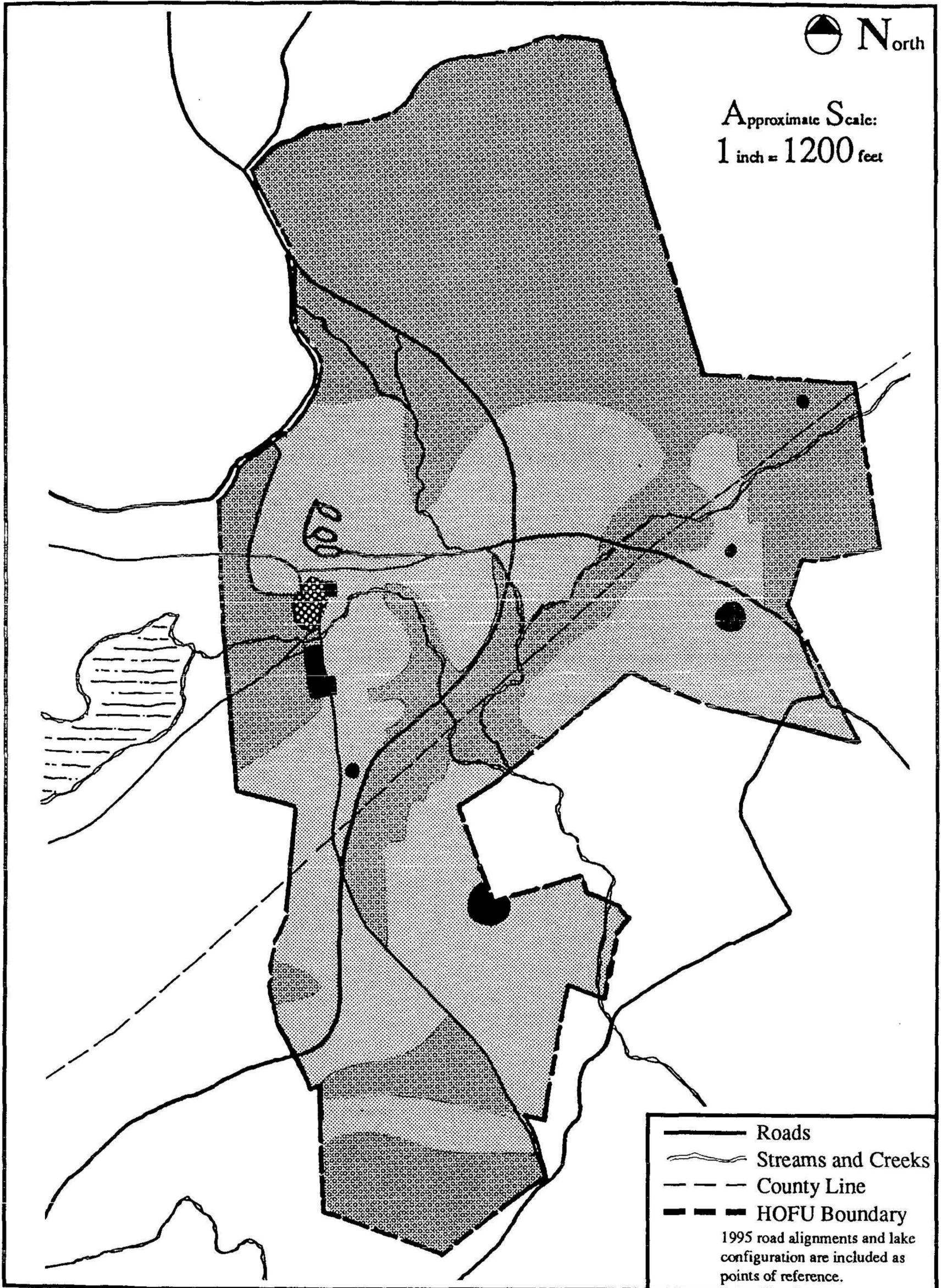


Figure 4.4. Land Use: 1883-1935

presumably converted to pasture. Additionally, herds of sheep and extensive chicken coops occupied portions of the property during this period. The sheep appear to have been sheltered in the Village Barn, while plans indicate a concentration of chicken coops on the west side of the Birdsboro-Warwick Road south of Tenant House No. 3.

The continued use of agricultural fields, both as pasturage and to grow animal feed crops, distinguishes the Hopewell property from many other areas of southeastern Pennsylvania, in which successional forest growth overtook open fields.<sup>5</sup> It is likely that many formerly unenclosed fields were fenced during this period in order to control the herds of animals kept at Hopewell. The seriousness of the efforts made to transform Hopewell into a productive agricultural property is suggested by the owners' acquisition of a number of adjacent farm properties, largely located south of the furnace property, during this period. These acquisitions may have facilitated expansion of the dairy operation.<sup>6</sup>

While the village and the agricultural lands of Hopewell Furnace experienced a significant change in land use patterns during this period the woodlands north and west of the village, the majority of the furnace property, continued to be exploited for their raw materials until federal acquisition of the property in the 1930s. The owners of Hopewell profited from the production and sale of charcoal and timber from these woodlands and from the quarrying of natural rock and iron ore. The forests continued to be cut throughout this period, but the commodity produced shifted from charcoal to post and rail fencing and other wood products.

#### *1935-1938: The Civilian Conservation Corps*

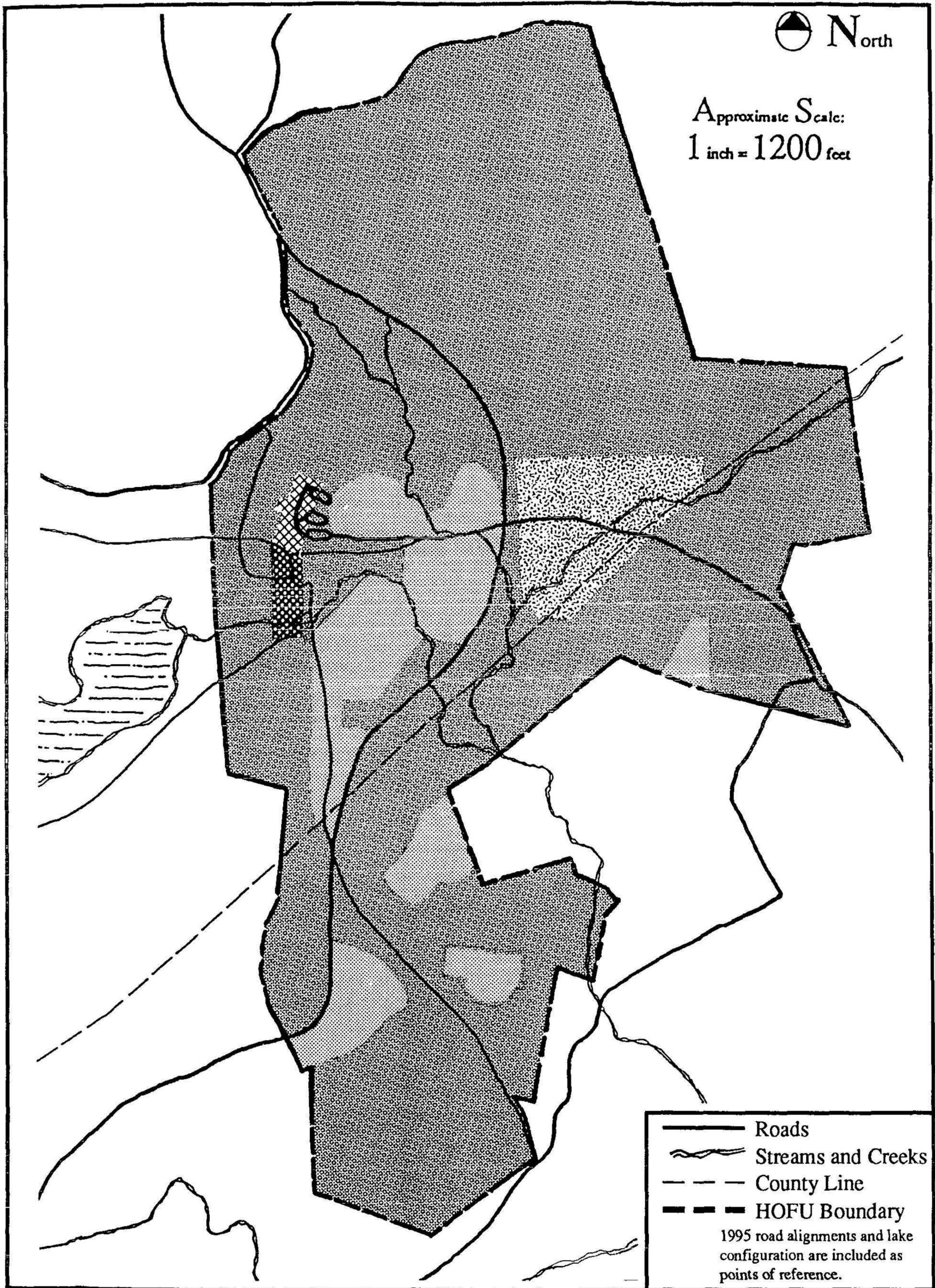
After 1935, and the acquisition of the Hopewell property by the federal government, land use and activity patterns shifted dramatically (Figure 4.5). The federal government began to develop the entire property as the French Creek Recreation Demonstration Area, with group camps for organized recreational camping, picnic areas, and trails and lakes for recreation. Two Civilian Conservation Corps (CCC) camps furnished the work force employed in this development work.

Within the present boundaries of Hopewell Furnace National Historic Site the center of activity shifted away from the traditional locus, at the furnace and Ironmaster's House, to the CCC camp located in a meadow north of the present maintenance complex. The traditional village was documented as a historic site and a significant effort made to stabilize and preserve the furnace stack. The village, including the industrial core, the Ironmaster's House and grounds, the residential area centered on the Tenant Houses, and the agricultural areas associated with the Village Barn and meadow, became an interpreted historic site and ceased to function as a living community. This shift in emphasis is exemplified by the construction, by the CCC, of a bypass road that circled the village to the east and diverted traffic from the main north-south village street. This altered the site from an active crossroads community to an outdoor museum, significant for its historic associations and located at the end of an access road. As a result, the historic village core became more physically isolated from its surrounding environment than at any point in its previous history.

---

<sup>5</sup> See the *Harvard Forest Models* (1941) regarding successional forests in New England.

<sup>6</sup> Local farmland purchases are shown on Wm. H. Dechant, "Hopewell Furnace Lands and Contiguous or Adjacent Tracts, Property of A. Louise C. Brooke At Hopewell Penna.," (August 1915, rev. to January 1931). On file at Hopewell Furnace National Historic Site. The purchases are largely located in the southern portion of the current property and totaled more than five hundred acres. These parcels, which added over a third of the current acreage to the site, were purchased as recently as the 1910s. Prior to their purchase they were independent farmsteads.



North

Approximate Scale:  
1 inch = 1200 feet

— Roads  
 ~ Streams and Creeks  
 - - - County Line  
 - - - HOFU Boundary  
 1995 road alignments and lake configuration are included as points of reference.

Industrial Core      Agricultural      Woodlands      CCC Camp      Recreational

Figure 4.5. Land Use: 1935-1938

The site's outlying agricultural areas and woodlands also experienced a significant shift in usage during this period. The federal government valued the wooded acreage surrounding Hopewell Lake and Hopewell Furnace for its recreational potential. Increasing urbanization and upgraded roads made naturalistic landscapes located near major urban areas more accessible to urban populations. Workers cleared brush, built roads (including temporary truck roads used for construction), foot and bridle paths, laid out camp sites and picnic areas (one on the existing Hopewell Furnace property), enlarged Hopewell Lake (now part of French Creek State Park), and erected temporary buildings. The intention was to transform the landscape into a recreational asset.

### *1938-Present: The National Park Service*

The focus of the National Park Service's stewardship of the site has been to maintain and preserve the industrial heritage of the furnace and its support structures (Figure 4.6). Land use and activities reflect this mission and resemble those implemented in the previous period. The historic village core, comprising the furnace complex, the Ironmaster's House and garden, the tenant housing south of French Creek, and the Village Barn and its associated meadow, are maintained as a "Historic Zone" devoted to the interpretation of the site's history. In essence, this area functions as an outdoor museum.

North of the historic village core is an area designated as the "Park Development Zone." This area contains visitor services facilities, including the Visitor Center and parking lot, park maintenance facilities, and some staff quarters. This pattern of usage in this area dates from the CCC period. The site of the CCC camp is located within the Park Development Zone. Prior to federal acquisition of the property much of this area was woodland. An orchard occupied the approximate location of the visitors parking lot.

The National Park Service designates most of the site outside the historic village core as a "Natural Zone." It is used as a natural recreation area with hiking and bridle trails located throughout the woods. The maintenance, stabilization, and interpretation of the historic resources located within this zone is a low priority. Bethesda Church is the notable exception to this trend. Additionally, several historic houses in this zone have been altered and remodeled for use by Park Service staff.

### *Land Use Summary*

The basic pattern of land use and activity at Hopewell Furnace remained remarkably stable throughout the history of the site. Significant shifts in land use and activity are associated with major changes in the property, such as the cessation of furnace operations and federal acquisition of the property. This applies to those portions of the current property acquired in the early twentieth century, as well as to those portions held by the furnace since the eighteenth century. It is important to note that the present site constitutes only about 20 percent of the property owned by the furnace in the eighteenth and nineteenth centuries. Nevertheless, the stability of land use patterns is apparent.

The historic industrial core of the site, centered on the furnace and its supporting structures, remained a functioning charcoal iron furnace from the 1770s to the 1880s. After the furnace ceased operations this portion of the property was largely abandoned. At present it is interpreted, using a combination of historic buildings and reconstructions, as a circa 1820-1840 charcoal iron furnace.

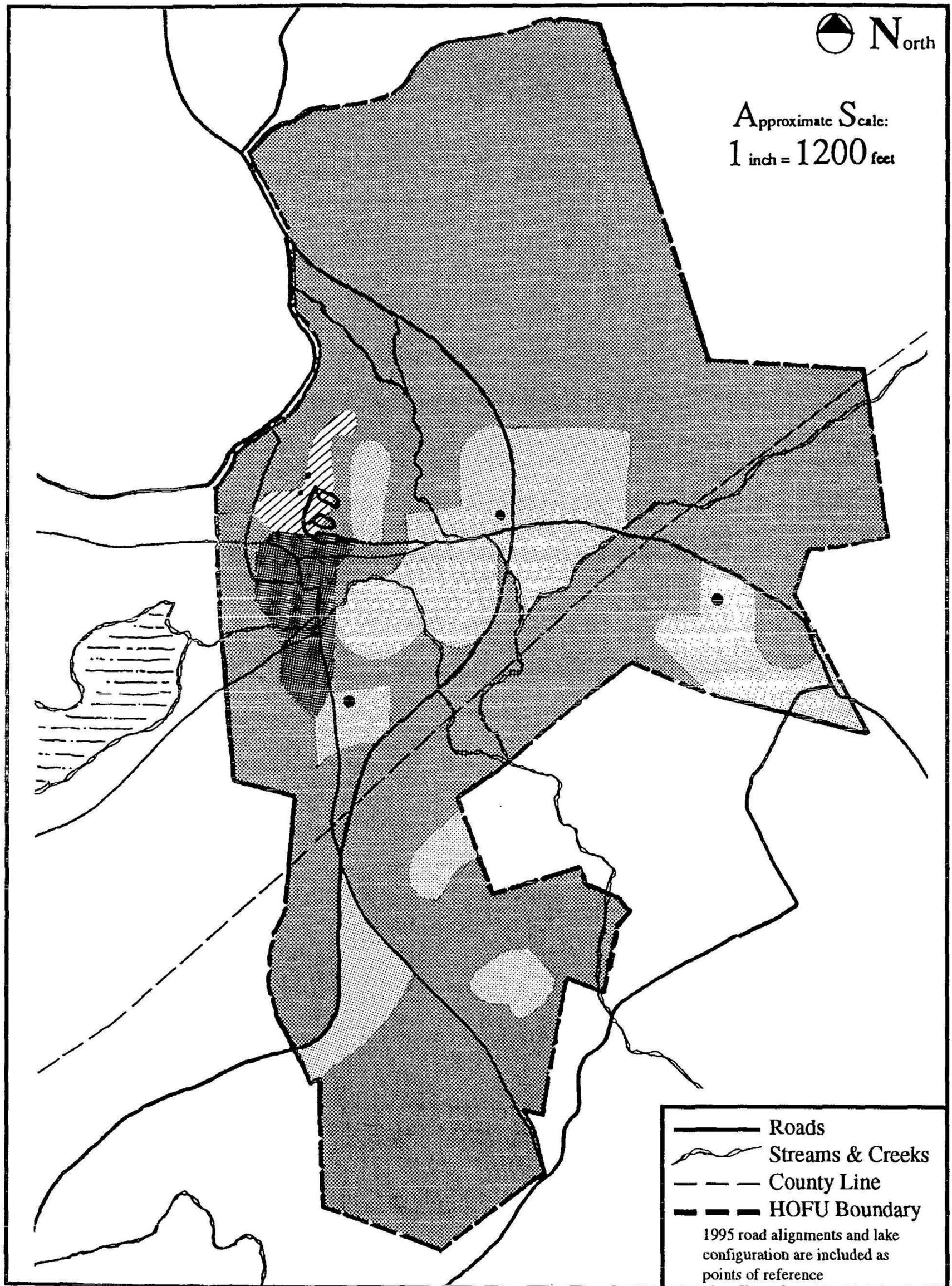


Figure 4.6. Land Use: 1938-1995.

In close proximity to the historic industrial core were the Ironmaster's House, which remained in use as the residence of the property's owners from the eighteenth century until the second quarter of the twentieth century. This area experienced many changes, including development of the garden in the 1830s and numerous alterations to the house, but it remained the property owner's residence. It is presently interpreted as the owner's residence.

Workers' housing occupied the area south of French Creek, from as early as 1800. With the cessation of furnace operations in the 1880s this area was at least partially abandoned. The surviving buildings are presently interpreted as the residences of furnace employees. Likewise, the Village Barn and its associated meadow served the agricultural needs of the furnace community from the eighteenth century through the shutdown of the furnace. After that date the barn and fields continued to serve an agricultural use, first as a dairy farm and later, after federal acquisition of the property, as part of the interpretive program for the historic iron-making village.

Land usage outside the historic village core also demonstrates a remarkable continuity. Areas devoted to agricultural use, either by the furnace owners or by independent farmers, largely remained in agricultural use until federal acquisition of the property. A major shift from row crops to dairy farming occurred in the late nineteenth century, but agricultural land largely remained in agricultural use until the 1930s. After the federal government acquired the property many of these former farms, fields, and pastures were allowed to revert to nature. Field drainage systems and boundary walls and fences were not maintained. Actively farmed land was abandoned or only used for hay. This shift away from productive agricultural use represents one of the most significant changes in land use and activity at Hopewell.

Like the agricultural areas, the site's woodlands remained in a consistent use for much of the site's history. Until the closure of the furnace in the 1880s the woods were used as a renewable source of charcoal fuel for the furnace operation. After the 1880s the woods continued to provide charcoal, only for outside markets, as well as other timber products, such as fence posts and rails. The woods produced valuable commodities for the property owners until the federal government acquired the site. Since federal acquisition in the 1930s the woods have been managed as a natural zone. They are no longer logged. There are no longer active charcoal pits and huts. Many of the roads and trails that laced the woodlands have disappeared, or been converted into recreational hiking trails. This marks a significant change in land use and activity.

In sum, land use and activity at Hopewell Furnace displays a remarkable longevity. Within the historic village core the patterns of former usage and activity remain apparent, although only by means of the National Park Service's interpretive efforts. Outside the village core the integrity of the historic patterns of land use and activity have been more greatly compromised. This is particularly true of those areas that functioned as agricultural farms, fields, or pasture during the years prior to the 1930s. Much of this acreage has been allowed to return to a "natural" appearance, obscuring the historic patterns of use and activity. This obscuring of historic patterns is also evident in the site's woodlands. Once exploited for charcoal and wood products, they are now maintained as a natural area. This severs the historic link between the woods and the furnace.

## Patterns of Spatial Organization

### *1770-1800: Settlement and Development*

The patterns of spatial organization at Hopewell Furnace closely reflect the land uses and activities described in the previous section. As with land use and activities, the patterns of spatial organization at the site were strongly influenced by the natural environment. Throughout the more than one hundred years that the furnace operated both land use and activity and patterns of spatial organization changed little. This continuity is largely a result of the fact that all activity at the furnace served the needs of the iron-making operation.

The industrial core of the site was focused upon the furnace and its associated buildings and structures, located against a hill alongside French Creek. The topography facilitated loading raw materials into the top of the furnace stack and the creek provided waterpower. The location of the area's public roads also influenced the siting of various types of activity and the corresponding patterns of spatial organization. Northeast of the furnace, up a slope and across a road, lay the Ironmaster's House and its associated grounds. South of French Creek lay the Tenant Houses of the furnace workers. The Tenant Houses were sited with generous adjacent open space presumed to have been organized into gardens, animal pens, and domestic use areas. Fencing may have denoted boundaries between individual activity areas. The Tenant Houses were strung along the main north-south road through the village, in close proximity to both agricultural fields and the furnace. Agricultural activity within the core village clearly included both small vegetable gardens associated with individual Tenant Houses, and the fields and pastures associated with the Village Barn.

Outside the core village, farmsteads, most independently owned, formed the dominant pattern of spatial organization south and east of the village. Most area farms focused upon the farmhouse and outbuildings at the center of the property, often located in close proximity to a road, with fields and woodlots arranged around this central grouping (see Figure 4.7).<sup>7</sup> Bethesda Church represents a distinct pattern of spatial organization within this larger agricultural landscape that surrounds the furnace and its village. The church served an institutional function, and was attended by both area farmers and furnace workers.

The furnace's woodlands, largely on land presently included within French Creek State Park, stretched west and north of the village. Some workers apparently lived in temporary charcoal huts and wood structures in these areas, well removed from the village core.<sup>8</sup>

### *1800-1845: Growth and Prosperity*

The patterns of spatial organization at Hopewell Furnace remained largely unchanged during this period. As previously noted, the intensity of activity increased, as the furnace prospered, but the basic organization of the site, and the surrounding properties appears to have changed little from that of the previous period. The center of the site remained the furnace complex.

---

<sup>7</sup> This plan was assembled based on the interpretation of numerous sources held by HOFU. The conjectural pattern of land use shown on the plan is intended to represent circa 1840.

<sup>8</sup> The Forest Type Study accompanying report mentions a huge tulip poplar, over one hundred feet tall, near Baptism Creek east of the picnic area. It is noted as "near the ruined stone remains of a former dwelling house whose original resident worked as a collier at Hopewell Furnace." Charles H. Stearns, "Revised Type Mapping Report," French Creek Project (Birdsboro, PA: July 1939). This is assumed to be the Brison House, which is located near the spring sources of the upper branch of Baptism Creek and the dam that diverted water into the East Head Race.

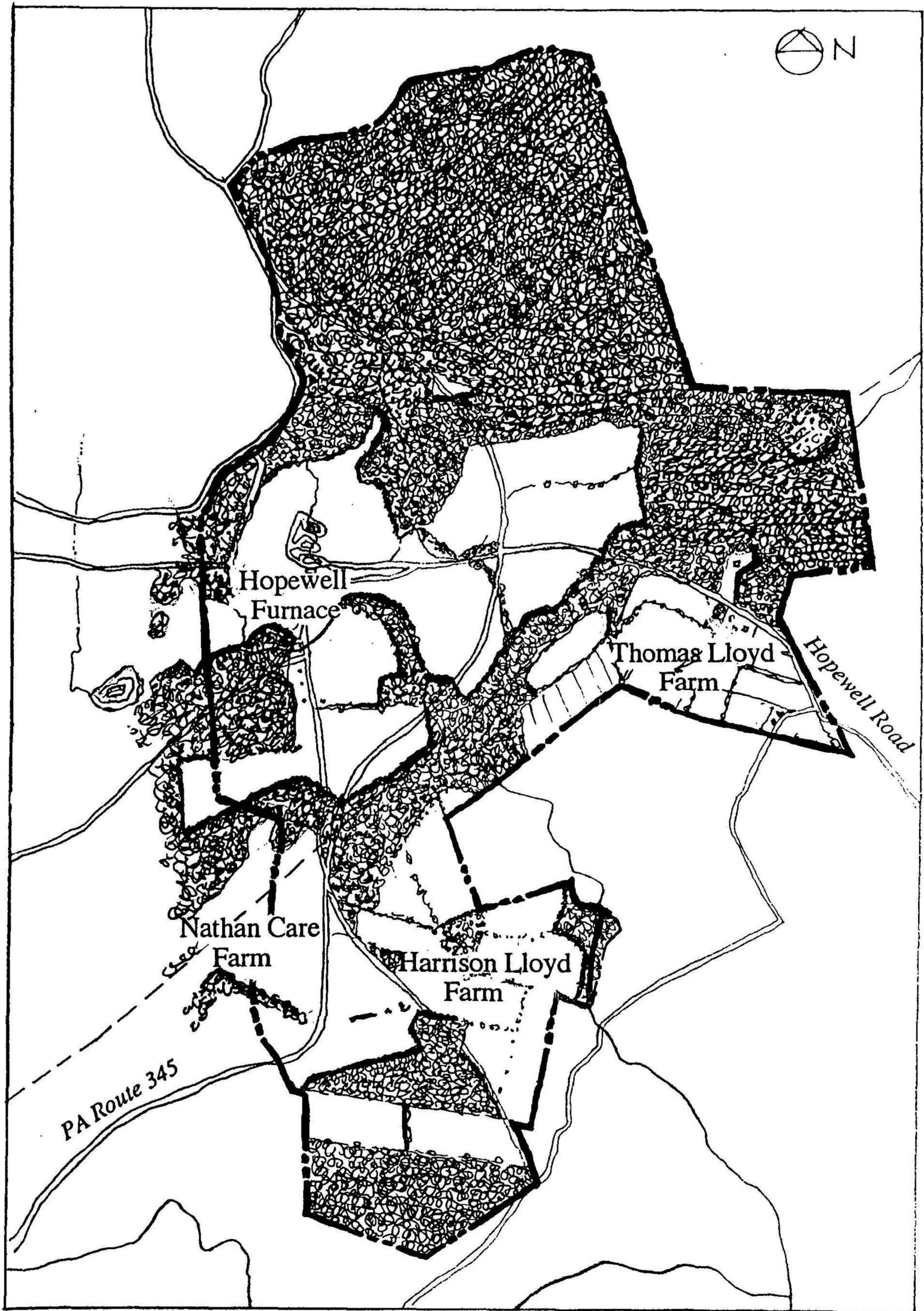


Figure 4.7. Patterns of open and wooded spaces.

The owners' residence occupied a commanding position near the furnace and tenant housing lined the village street. It is known that several additional houses were located north of the 1809 Road, near Hopewell Lake, during this period. The formal establishment of this road in 1809, and the creation of Hopewell Lake in the first decade of the nineteenth century suggests that these dwellings may date from the period between 1800 and 1810. However, it is likely that the road predated its formal establishment as a public thoroughfare, and the dwellings could date from a slightly earlier period.

Exploitation of the property's woodlands increased significantly during this period, with as much as three hundred acres of woods being cut for charcoaling each year. The furnace property included approximately three thousand to four thousand acres of woodlands. Cut over tracts appear to have been crudely fenced in order to facilitate regeneration of the timber for future harvesting. It is assumed that spatial patterns and organization of open, cultivated areas during this period resembled that of the prior period. The increased activity at the furnace may have led to the establishment of new fields, although documentary sources provide no clear descriptions of such activity.<sup>9</sup>

#### *1846-1883: Decline*

The slow decline of the furnace operations between 1846 and 1883 resulted in a reduction of industrial and agricultural activity at the site, as compared with the previous period. However, while the intensity of activity declined, the patterns of spatial organization, as described above, changed little. Many patterns remained, including the industrial core of the site, the Ironmaster's House and its associated gardens, the workers' residences within the village and near the lake, the agricultural fields and farms south and east of the village, and the woodlands north and west of the village. Although activity on the property shifted increasingly away from manufacturing and towards agriculture with the furnace's decline, the patterns of spatial organization remained relatively unchanged during this period.

#### *1883-1935: Shutdown and Survival*

Land use at the site shifted from industry to agriculture with the cessation of furnace operations. Landscape elements once vital to the furnace, such as the water raceways, were not maintained and became derelict. In an apparent attempt to create a viable working dairy farm, farmland adjacent to the furnace tract was purchased in the early twentieth century and incorporated into the Hopewell landscape. The property's acreage increased to 5,340 acres, and while the adjacent farms were consolidated into the Hopewell landscape, it does not appear that any new roads or facilities were constructed to unify these various parcels and create a single cohesive agricultural landscape. Indeed, some of the agricultural fields associated with the Nathan Care and the Thomas and Harrison Lloyd farms fell into disuse during this period and became unmanaged woodland. Vegetation grew adjacent to roads and along the stone walls or piles that delineated field boundaries obscuring views across the fields and concealing the boundary structures.

The industrial core of the property ceased to have a function during this period and was abandoned and allowed to become derelict. The Ironmaster's House and its associated gardens remained in use as a summer residence and as the year-round residence of the property's caretaker.

---

<sup>9</sup> Stone walls, or piles of stones cleared from fields, are extant along the edges of several former agricultural fields. It is believed that these walls represent field demarcations that predate 1845.

### *1935-1938: The Civilian Conservation Corps*

Spatial organization during this period reflected the land use activities of the CCC. The historic village was documented and the furnace rehabilitated and restored for interpretation as a historic resource. The village ceased to contain multiple uses and, instead, became a single unified entity, a historic site devoted to the preservation and interpretation of the site's iron making past.

The CCC camp, located north of the village in an area associated with the furnace's charcoal woodlands, developed as a major new node of activity during this period. CCC Camp SP-7 and nearby camp SP-17 housed and supplied approximately 400 workers. The CCC significantly enlarged Hopewell Lake, by building a new, higher dam. They developed numerous recreational facilities on the property, including the Baptism Creek Picnic Area, currently designated the Environmental Study Area, and the group camps and recreational facilities within French Creek State Park. Construction roads and truck trails extended throughout the property. These roads provided access to borrow pits, stone field boundaries that were robbed to provide building material, and construction sites.

Construction of the bypass road east of the village, presently PA Route 345, resulted in significant changes to the spatial organization of the property (Figure 4.8). The removal of vehicular traffic from the Birdsboro-Warwick Road, effectively separated the core village from the historic road network that had carried the furnace's products to market. The core became a protected historic resource, essentially an outdoor museum separate and distinct from its surroundings. In addition to disconnecting the core village from its historically significant position as a crossroads community, the re-routed PA Route 345 also disrupted the historic continuity of the agricultural fields through which it passed. These large open tracts were, as a consequence, subdivided by the bypass into smaller units. This altered the historic patterns of spatial organization and introduced an entirely new series of views. While these views are not associated with any historical period prior to the 1930s, the bypass does provide the sense of moving through wooded areas into an open space. The bypass cut the open area associated with the Church Farmhouse into several smaller units, eliminating the sense of unified open space that had previously characterized this area north of Reading-Valley Forge Road.

Outside the village core, farmland and woodland acquired by the federal government ceased to be considered an economic resource and was, instead, developed and maintained as a natural or recreational resource. Woods were allowed to invade the perimeters of former fields and the walls or stone piles that delineated individual fields were allowed to deteriorate. Charcoal roads were abandoned, although in some instances they were incorporated into the new recreational trail system. Following federal acquisition of the property the complex spatial organization of the previous years was simplified into a historic, interpreted core and a natural periphery used for recreational hiking and other activities.

### *1938-Present: The National Park Service*

The management of the site by the National Park Service represents a continuation of the patterns of spatial organization introduced to the site by the CCC, with a number of minor refinements and changes. Construction of the present entrance road, Visitor Center, and parking area during the 1950s improved vantage points and overall views of the core village, the most historically significant portion of the site in terms of Park Service management objectives and policies of the period. At present the National Park Service's buildings, including the Visitor Center, maintenance area, and living quarters, occupy the highest ground at the site and, particularly in the case of the Visitor Center, are clearly visible to visitors



Figure 4.8. 1937 aerial view of the Hopewell Furnace site with PA Route 345 as a new organizational structure. This view shows the broad curve of the by-pass road (PA Route 345) under construction. Also evident are the dam earthworks for the expanded Hopewell Lake (to the left), the CCC Camp SP-7 (center), and the curvilinear parking area for the Baptism Creek Picnic Area (now the Environmental Study Area) (at right). Other light areas are presumed to be borrow areas that provided rock, clay, and soil for construction of the dam, roads and parking areas. HOFU archive photo.

throughout their tour of the village. This is a significant departure from the past, when the Ironmaster's House occupied the highest ground within the village, commanding the industrial area and Tenant Houses spread at its feet.

The Park Service has also altered the patterns of spatial organization outside the core village. Most of this area is managed as a natural or recreational zone. Consequently, the historic patterns of agricultural use have been lost to a large extent. Extant historic buildings, such as the Nathan Care House and Barn, the Church House, have been rehabilitated as staff quarters and no longer reflect the spatial organizations associated with their agricultural past. In a

similar fashion, the Harrison Lloyd Farm retains only a few fields of crops and none of the associated buildings survive.

Although the Thomas Lloyd House is also used as a staff residence, its farm cluster retains the essential spatial relationships and organization between farm buildings, fields, and field boundaries. In areas adjacent to this and other historically independent farms, the variety of field and property delineations (fences, walls, and stone piles) are now notably absent or obscured by vegetation. Bethesda Church is located near the Thomas Lloyd farm. Once visually connected to the Lloyd farm by open fields, views from and to the church are now blocked by woods.<sup>10</sup>

### *Spatial Organization Summary*

The spatial organization of the Hopewell Furnace property closely reflects the patterns of land use that characterized the property throughout its history. The needs of the furnace operation determined land use and site organization for more than a century. As with land use, significant shifts in the patterns of spatial organization are associated with major changes in the use and ownership of the property.

Throughout the period from 1770 to 1883 the property was organized around the furnace and its associated support structures. In close proximity to this industrial core were the Ironmaster's House and grounds, the tenant housing of a portion of the furnace's work force, and the primary agricultural buildings, fields, and pastures associated with the property. At a greater distance from the furnace were additional tenant houses, most of which cannot be located with any precision, and a series of independently-owned farms. The periphery of the property was dominated by the charcoal woods that supplied the furnace with its fuel.

After the cessation of furnace operations in 1883 the central focus of the property shifted from the furnace to the Ironmaster's House, which became the focal point of a fairly extensive agricultural operation and dairy farm. During this period the industrial core of the site, and to a lesser extent the tenant housing associated with the furnace, were abandoned.

Federal acquisition of the property in the 1930s resulted in the most significant changes to the historic patterns of spatial organization. Activity at the site focused on the CCC camp, located north of the core village. The village was essentially reorganized into a single entity, an outdoor museum dedicated to the preservation of the site's industrial and social history. The former agricultural fields and farmsteads, and the surrounding charcoal woods, were managed as a natural or recreational area, a previously unknown pattern of organization at Hopewell.

After 1938, the National Park Service refined the patterns of spatial organization introduced by the Civilian Conservation Corps. At present the site is organized into a historic core village, the primary focus of preservation and interpretation efforts, a Park Service support area, approximately corresponding to the area occupied by the CCC camp, and outlying natural and recreational zones. This pattern of spatial organization, although much simpler than that of previous periods, still permits earlier patterns of organization to be discerned by the visitor. This is largely the result of the preservation and interpretation programs implemented within the core village.

---

<sup>10</sup> Thomas Lloyd built the church on his property. His relative, David Lloyd, served as pastor. The connection between Bethesda Church and the Thomas Lloyd farm extend beyond its visual connections.

In sum, although the present patterns of spatial organization at Hopewell Furnace National Historic Site are greatly simplified from those of previous periods, the historic patterns are readily discernible. This is particularly true within the core village. In the peripheral areas of the site, those historically associated with agricultural activities and the exploitation of the woodlands, much of the subtlety and diversity of the historic patterns of spatial organization have been lost. This is largely a result of the management of these areas as natural and recreational areas, rather than as active farms and a heavily used forest resource.

### Circulation

#### *1770-1800: Settlement and Development*

During the period of the furnace's operation Hopewell's circulation system, including pedestrian walks, charcoal trails, and the roads that connected the furnace to distant markets, all served the functional needs of the furnace (Figure 4.9). Indeed, the location of the furnace appears to have been partially influenced by the site's proximity to the public road connecting Scarlet's Mill, near Reading, to Coventry Forge in Chester County.

The principal public road of this period was the 1757 east-west road connecting Coventry Forge to Scarlet's Mill. The road's alignment passed approximately 250 feet north of the furnace and formed the northern boundary of the Ironmaster's House grounds. Additional roads were laid out in the area shortly after the establishment of the furnace. These roads connected Hopewell Furnace to other nearby furnaces, supplies, and population centers. The 1757 Road was known by various names throughout its history (Reading-Valley Forge Road, Reading Road, Coventry Forge Road, St. Peters Road, and Baptism Road.) The approximate trace of this road is presently visible north of the Ironmaster's House and extending east through the "old" orchard toward Saint Peters and Coventry Forge and west, north of the Cedar Pasture.

The site's major north-south road, known as the Birdsboro-Warwick Road, probably existed in some form during this period, but was not designated a public road. It passed through the center of the village, crossed French Creek on a bridge near the furnace, and passed between the Village Barn and the Office & Store before connecting with the Reading-Valley Forge Road just west of the Ironmaster's House. South of French Creek, in the vicinity of the Tenant Houses, this road was likely lined with wood fences on both sides. Cattle grazed along the edge of the roadway.<sup>11</sup>

The road to Jones Mine, located south of French Creek, was another major roadway during this period. The road appears to have crossed French Creek at a ford located just west of the Blacksmith Shop. This road intersected the Birdsboro-Warwick Road in the immediate vicinity of the Blacksmith Shop.

All the roads of this period were unpaved. Wagon wheels rutted the roads, which were likely dusty in the summer and muddy during the winter. Minor dirt roadways connected the main roads with area farmsteads, including the Thomas and Harrison Lloyd farms. Numerous charcoal trails led through the woods to clusters of charcoal pits where cut timber was converted into the charcoal that fueled the furnace. Pedestrian paths included boardwalks leading from the Birdsboro-Warwick Road across the marshy ground to the Tenant Houses. The ground nearest the furnace was likely more compacted and therefore probably did not

---

<sup>11</sup> Stuart Wells, "Draft: Hopewell Furnace Historic Scene Report," 1994, 24. On file at Hopewell Furnace National Historic Site.

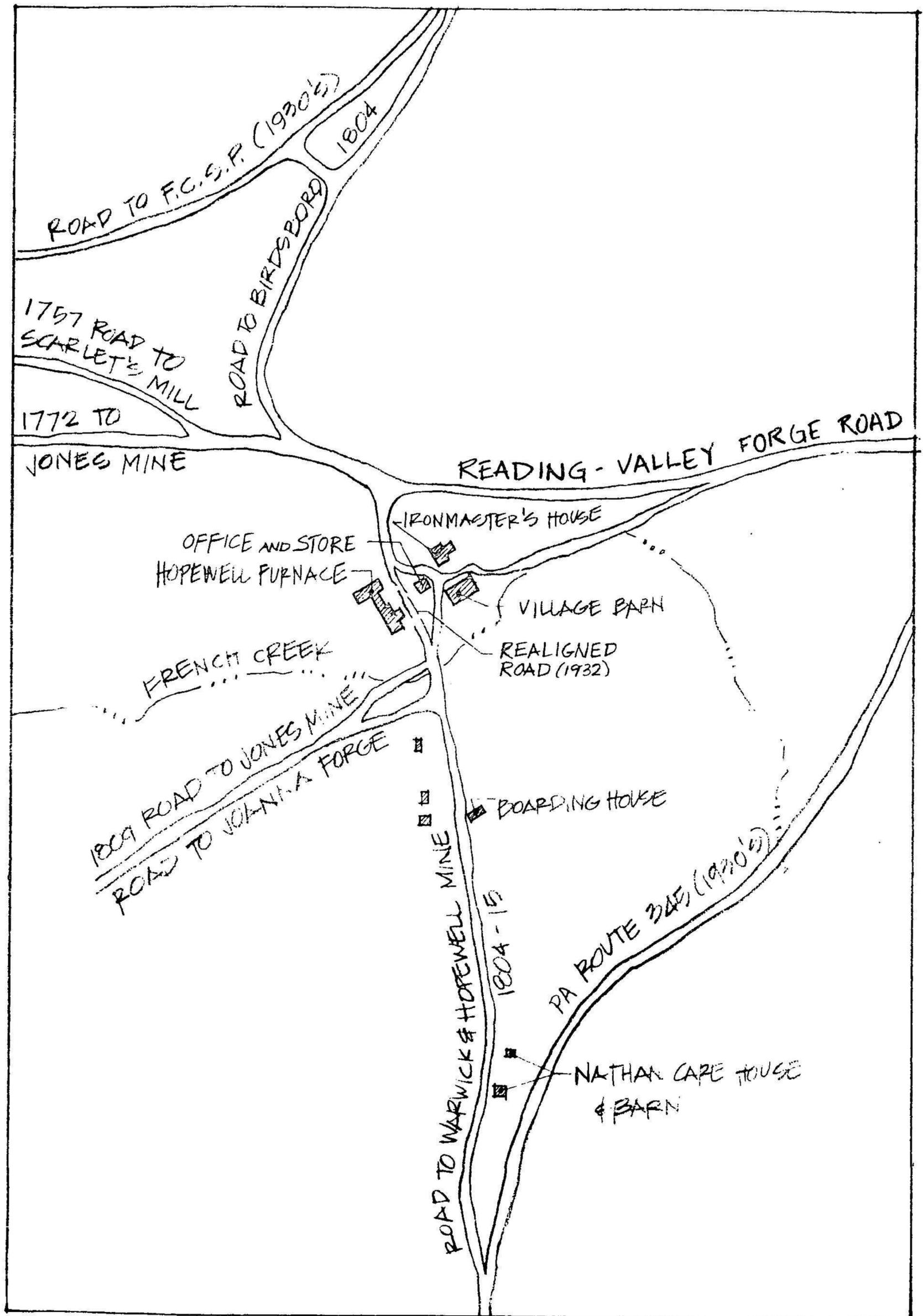


Figure 4.9. Historic Roadways.

require board walkways. It is also probable that slag from the furnace operations was utilized to fill low lying areas near the furnace.

#### *1800-1845: Growth and Prosperity*

As Hopewell Furnace lacked canal or rail connections, it relied solely upon the local roads to carry its products to market. Both the north-south (Warwick to Birdsboro) and east-west (Valley Forge to Reading) roads were critical to the furnace's economic prosperity. Both roads delivered iron ore to the furnace, from the Hopewell and Jones Mines respectively, and both provided outlets to market for the furnace product.

During this period of growth and expansion the circulation system at Hopewell reached its essential mature form. In fact, by 1815 all of the area's major roads had been designated as public roads. New connections completed during this period included a northern road to Birdsboro, laid out in 1804, a road south to Warwick laid out in 1814-1815, and a road to Joanna Furnace established in 1809. As during the previous period, all these roads were unpaved, although some evidence suggests that furnace slag was used to improve the road surfaces.

Charcoal trails from the previous period continued to be utilized during this period. The expansion of furnace operations strongly suggests that this network of roads was probably expanded during this period. These roads were likely little more than rough wagon traces through the woods. Their routes probably were altered as wear and erosion made specific routes impassable. Slag may also have been used to improve the road surfaces.

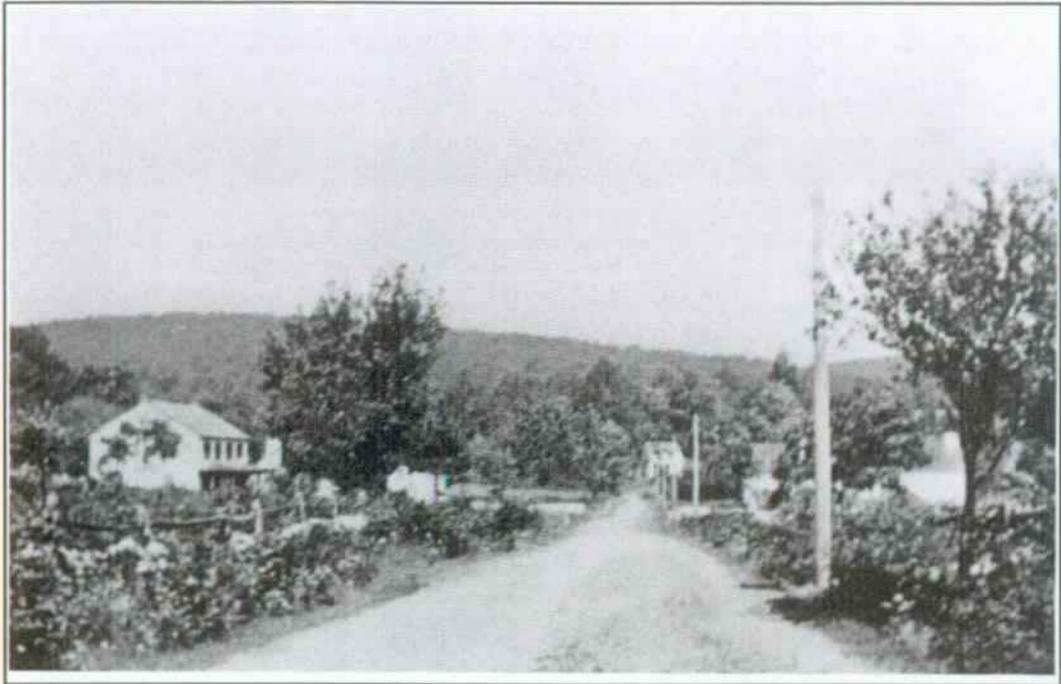
Pedestrian paths added in this period included the series of formal paths, with stairs, benches, and other amenities, laid out in the Ironmaster's House garden during the late 1820s and early 1830s. These paths represented the development of the garden as a formal landscape feature. The earlier appearance of this portion of the site is unknown.

#### *1846-1883: Decline*

Documentary evidence provides little information regarding circulation elements during this period of the furnace's history. However, it is assumed that the circulation network, including public roads, charcoal roads, and pedestrian paths, differed little from that described for the prior period. The decline of the furnace probably resulted in the abandonment of many charcoal roads, although continued exploitation of the property's woodlands necessitated some maintenance of these features.

#### *1883-1935: Shutdown and Survival*

Beginning in the twentieth century several of the area's roads were realigned, paved, and otherwise improved to accommodate motorized vehicles (Figures 4.10a and 4.10b). Berks County realigned and paved the Birdsboro-Warwick Road in 1932. This work included elimination of the sharp curve between the Village Barn and the Office & Store. The realigned road simply continued along the straight alignment through the village, passing immediately east of the furnace stack and over the site of the casting shed foundations. Portions of the stone wall between the furnace and the Office & Store were demolished and substantial quantities of fill introduced to permit the maintenance of a straight alignment from the lower portion of the village to the intersection with Reading-Valley Forge Road northwest of the Ironmaster's House. The west end of the Ironmaster's garden was destroyed as part of this work.



Figures 4.10a (top ) and 4.10b (bottom). Birdsboro-Warwick Road in 1914 and 1995. Two views of the village street looking north from between Tenant House No. 3 and the Boarding House. The early view shows what appears to be a post and rail fence on top of a stone wall on the west side of the road. Top photo HOFU archive, bottom photo Menke & Menke.

Unpaved, crushed stone-surfaced roads extant during this period included the Harrison Lloyd Road (called Laurel Road on some maps and roughly corresponding to the alignment of a portion of the present Horse Shoe Trail). Other unpaved roads included dirt roads within the Harrison Lloyd and Thomas Lloyd farm properties, as well as north of the present maintenance complex. The dirt road leading to the Manning house remained on plans as late as 1937.

Wood walks to the Tenant Houses are seen in 1930s plans, and were necessary because of the wet conditions in this area (a swale is seen between the roadway and Tenant Houses in 1930s photographs). It is assumed that the garden walks in the Ironmaster's House garden were maintained throughout this period, since the house continued to be used as a residence. The walks depicted in early National Park Service plans, surfaced with loose stones between brownstone steps, and with a wood foot bridge over the East Head Race may reflect a ca. 1830 design or late-nineteenth century modifications to the original design. By the end of this period many pedestrian walkways throughout the site were in extremely poor repair.

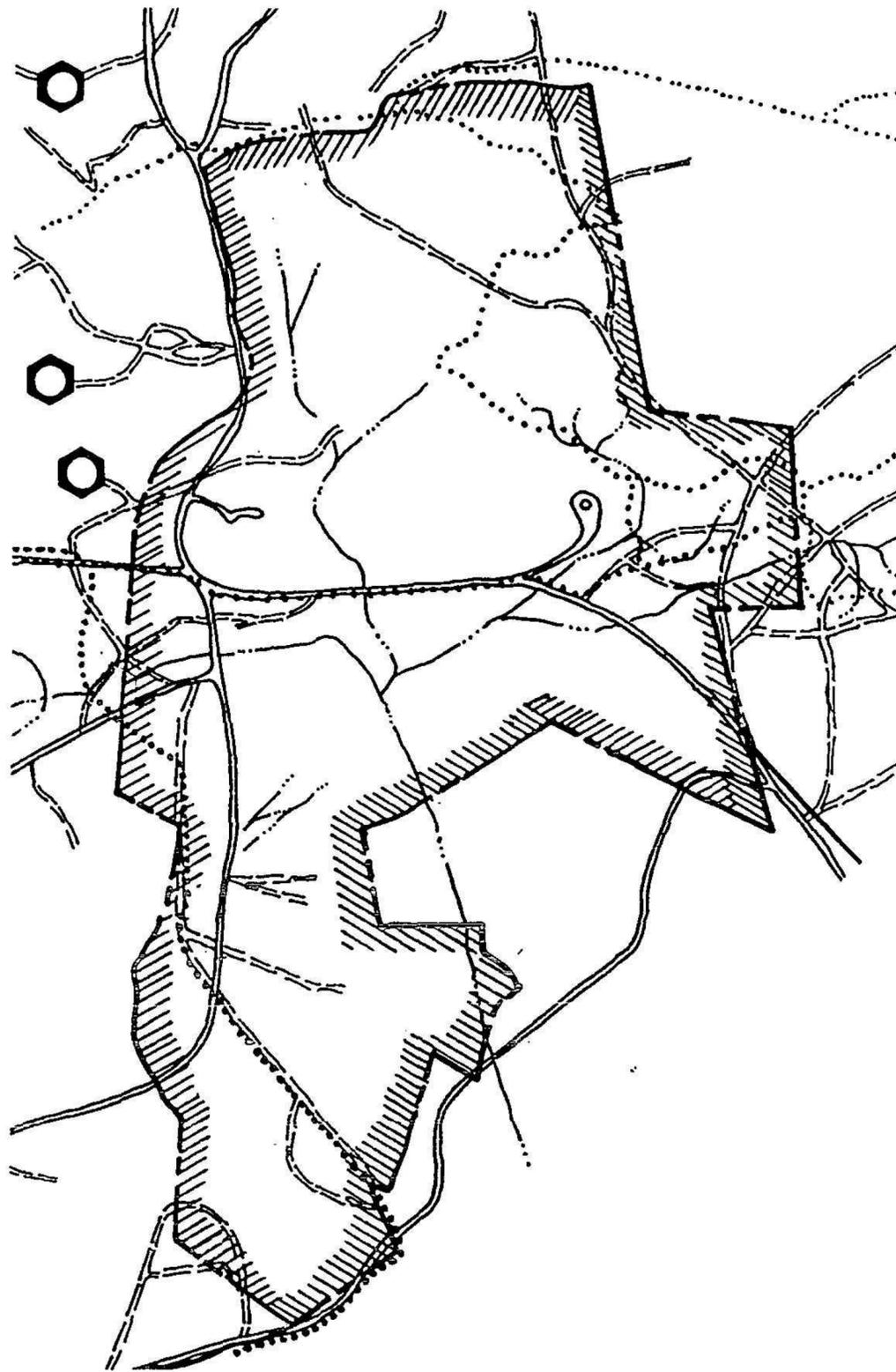
### *1935-1938: The Civilian Conservation Corps*

Circulation patterns changed dramatically during this period (Figure 4.11). Between 1937 and 1939, the Civilian Conservation Corps (CCC) built a bypass road that diverted automobile traffic around the village to the east. A portion of PA Route 345, a two-lane asphalt-surfaced road, traversed woodlands and fields and dramatically changed traffic patterns. The bypass protected the core village from automobile traffic, but at the cost of isolating the village from the transportation system that had proved so crucial to the economic success of the furnace and its surrounding community. Construction of the bypass also resulted in construction or improvement of several bridges and culverts in the rustic CCC style, including the PA Route 345 crossing of French Creek, two crossings of branches of Baptism Creek by Reading-Valley Forge Road (Hopewell Road), and the crossing of Spout Run by Mark Bird Lane. Also associated with this work was the construction of a driveway leading to the Church House from PA Route 345.

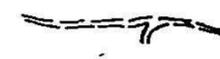
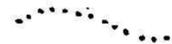
The north-south village road retained its 1932 alignment during this period. However, period photographs indicate that this road was extensively regraded, lowering the grade of the road and raising the grade of the yard areas surrounding Tenant House Nos. 1-3.

The CCC built numerous temporary roads during their occupation of the site. These were used to haul earth from borrow pits, provide access to old stone field walls that were robbed for use as gravel and crushed stone, and for a variety of other construction-related activities. A 1937 aerial photograph of the area depicts major cutting and filling in the area, with all roads appearing to be disturbed by the trucking of cut (areas on Field 4, south of the road leading to the Harrison Lloyd House) and fill (PA Route 345 alignment, CCC camp and dam areas). The CCC also constructed a major (100-car) parking area near Baptism Creek, in association with a picnic area. Aerial photographs do not indicate any large visitor parking near the furnace during this period.

A major activity undertaken during this period involved the construction, by the CCC, of new hiking trails. It is presumed that some former charcoal and logging roads were cleared of successional growth and widened for use as hiking trails; however, comparison of 1930s plans and 1990s trail maps suggests that most of the extant hiking trails do not follow the alignment



Graphic Key

-  Existing HFNHS Boundary
-  Paved roads
-  Streams, water bodies
-  Trails (Including charcoal trails)
-  Charcoal pits identified in the 1930's
-  Trails (1995)

Redrawn from:

- "Department of the Interior, National Park Service, Branch of Planning and State Cooperation, Recreational Demonstration Projects, "Forest Type Map, French Creek Project," Berks County, PA., 1"=1000 feet, September 11, 1936.
- "Hiking Trails, French Creek State Park including Hopewell Furnace National Historic Site, Elverson, PA.," Commonwealth of Pennsylvania, Department of Environmental Resources, Office of Parks and Forestry, Bureau of State Parks, June, 1994, scale: 2-9/16 inches=one mile.
- Some aspects added by Menke & Menke for clarification.

(North is up, scale is approximately 1 inch = 1/4 mile)

Figure 4.11. Note that all of the known charcoal hearths found during the 1930's are outside of the existing HFNHS boundaries. Contrary to common belief, there is no apparent correlation between the historic charcoal trails and nature trails developed during and after the CCC period, although portions of the Lenape Trail (center) and Horse-shoe Trail (southern end) do follow historic roads.

of former charcoal roads. They are largely new trails, constructed by the CCC in the 1930s (see Figure 4.11).<sup>12</sup> Trails created and/or altered by the CCC include Boone Trail (near Hopewell Lake), Lenape Trail (mostly north of Reading-Valley Forge Road), Mill Creek Trail (along the northern boundary of the site) and Raccoon and Buzzard Trail (mostly east of PA Route 345). The Horse Shoe Trail in one section follows a portion of a nineteenth century roadway that passes through the historic Harrison Lloyd farmstead. Most of these trails link to trails that either originate or continue into French Creek State Park.

Pedestrian paths in the Ironmaster's House are not known to have been altered or rehabilitated during this period. The regrading that occurred near the Tenant Houses altered the pedestrian connections between these houses and the Birdsboro-Warwick Road; however, the wood plank boardwalks connecting the houses to the road appear to have remained extant during this period.

### *1938-Present: The National Park Service*

The National Park Service made several major changes to the site's core area roads as part of Mission 66 site improvements (see Figure 4.12). In 1955 public vehicular traffic was banned from the roads in the core village and the macadam and asphalt surfaces on these roads removed. The dirt roads more closely approximated the appearance of these features during the period of the furnace's operation. In 1956 the NPS continued this effort to return the core village to its supposed nineteenth century appearance by realigning the Birdsboro-Warwick Road to its pre-1932 alignment through the village. This work entailed reconstruction of the retaining wall between the furnace and the Office & Store.

In association with the construction of the present Visitor Center, completed in 1959, the National Park Service built a new entrance road, extending from PA Route 345 to a pair of visitor parking lots located immediately north of the Visitor Center. The entrance road, presently known as Mark Bird Lane, incorporated portions of the old Reading-Valley Forge Road alignment, particularly near its intersection with PA Route 345.<sup>13</sup> The entrance road continues beyond the parking lots, connecting to the NPS maintenance area and extending past several staff quarters to the west boundary of the park, where it connects to the modern road network.

The main visitor parking area was constructed under Mission 66 and consists of a paved lot with a central landscape feature. The auxiliary parking area, located north of the main lot, is turf, with concrete car stops indicating parking bays. Both parking areas are located within one of the replanted village orchards, resulting in an overlay of modern support services atop a feature intended to represent a historic site element. This may generate confusion as to whether the orchard is intended as part of the historic scene or as a mid-twentieth century landscape designed to complement the parking area.

---

<sup>12</sup> Even allowing for mapping discrepancies, a detailed comparison of the 1936 Forest Type Study plan with French Creek Trail Plans reveals only minor correlations between the charcoal trails of that date and the present hiking trails, and then only over short segments. It is probable that the charcoal trails were ephemeral in nature and did not conform to the design requirements for 1930s hiking and equestrian trails. Trails that pass through the property show the lowest correlation between the historic and current alignments. It should be noted, however, that several extant trails follow historic roadways (such as Jones Mine, Scarlett's Mill, and Hopewell Roads).

<sup>13</sup> National Park Service, U. S. Department of the Interior, Division of Design & Construction Eastern Office, "General Development Plan - Part of the Master Plan, Hopewell Village National Historic Site," Feb. 1956, Rev. On file at Hopewell Furnace National Historic Site.

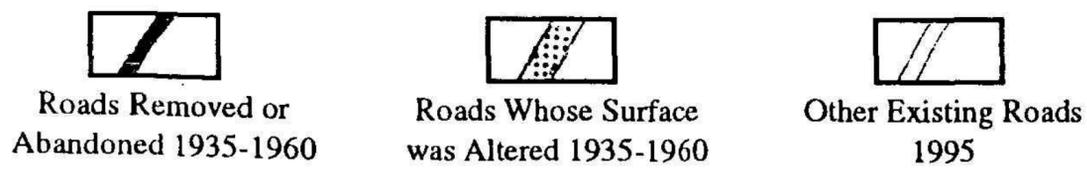
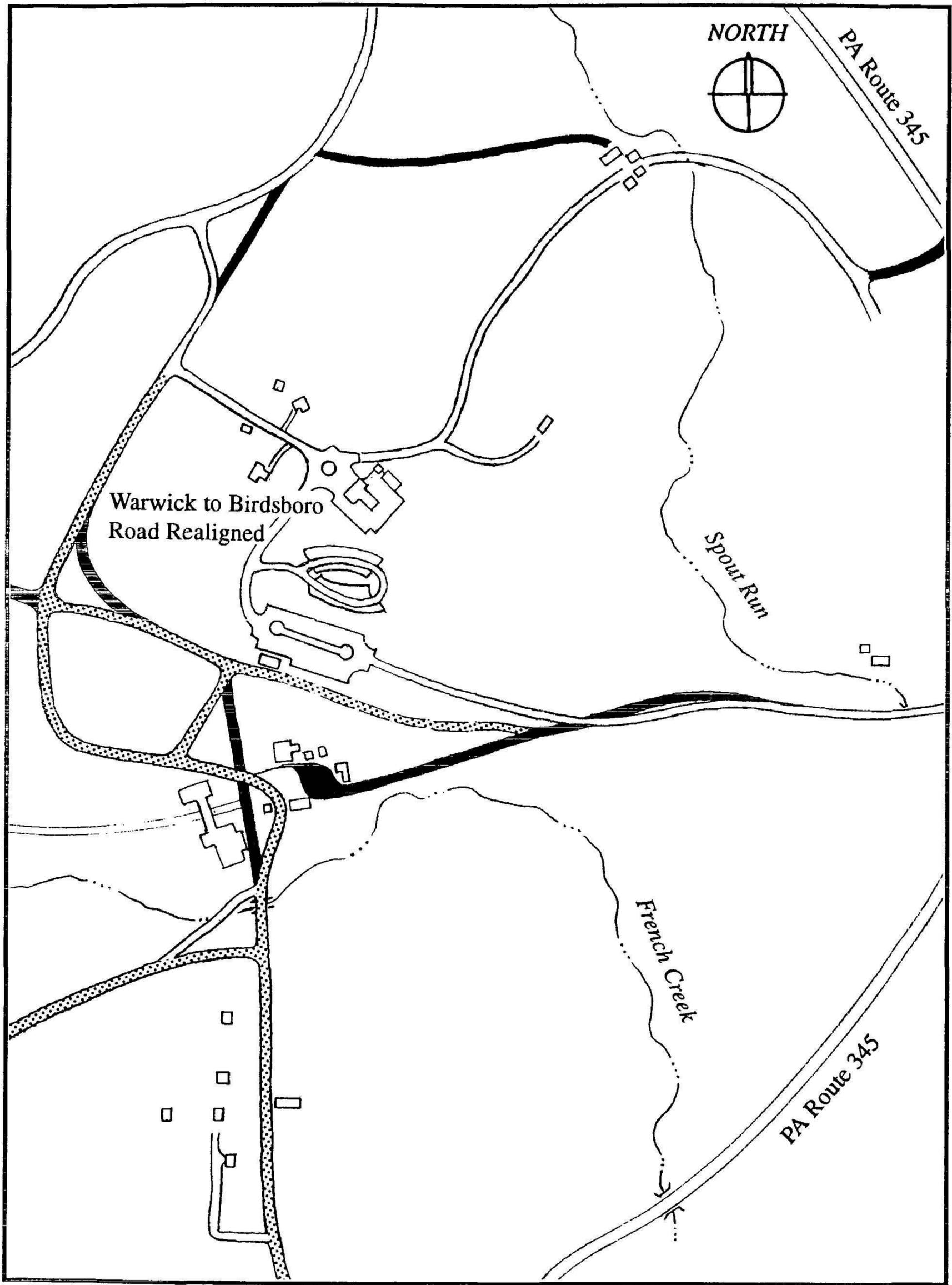


Figure 4.12. Hopewell Core Area Roads, 1935-1970

The National Park Service alterations to the site's circulation network effectively transformed Hopewell Village from a crossroads community to an outdoor museum reached by a long entry drive. Closing off the historic roads eliminated vehicular traffic from the core village, protecting it from the potentially adverse impacts associated with road widening, surface improvements, and highway signage. A side effect of this management decision has been that the village is now significantly more isolated than at any time in its past history. This, unfortunately, masks the central role that the network of roads played in the furnace's history. These roads presently function as pedestrian trails, leading visitors between the various historic buildings and interpretive exhibits and features and their historic function is not readily apparent.

The Birdsboro-Warwick Road is of primary importance to the core village, with buildings and structures fronting on or in close proximity to the roadway. Indeed, many sources refer to this road as the village street. However, the road system that resulted from Mission 66 gives the visitor the mistaken impression that the entrance road (Reading-Valley Forge Road) served as the major access to the village.

Trails in Hopewell National Historic Site are not clearly identified as associated with the history of the property. There are no interpretive panels or maps at trail heads or along the trails. Additionally, there are numerous abandoned roads and trails, particularly in the southern portion of the Environmental Study Area (ESA) and adjacent to the Woodlot House, Thomas Lloyd House, and Harrison Lloyd ruins. Some wood pedestrian bridges are in need of repair, reflecting the lower maintenance priorities presently afforded to areas outside the core village.

Functional pedestrian walkways and areas paved with concrete are located in proximity to the Visitor Center. Handicapped accessibility is limited within the village below the Visitor Center because of steep slopes. There are also hazards associated with loose slag on the village walks. Currently, the north-south village road is reserved for pedestrian and restricted National Park Service vehicle use from the Visitor Center south to just past the Boarding House (where a gate crosses the roadway).

Historic roads in the core village are primarily perceived as wide pedestrian trails providing a connection to French Creek State Park. They are predominantly surfaced with tamped earth, mixed with site stones, with the exception of pedestrian pathways in the interpreted village area, which are predominantly covered with dark crushed stone and/or slag material.

The National Park Service allows access from various portions of the site, including numerous pathways leading from adjacent French Creek State Park trails. Internal flow is usually determined by the visitor, who may enter any open structure, although the current brochure lists twelve points of interest starting with the anthracite furnace and ending with the Ironmaster's House.

### *Circulation Summary*

The basic circulation network at Hopewell Furnace National Historic Site was in place by ca. 1815. The major roads associated with this network remain clearly visible, with the possible exception of the Reading-Valley Forge Road east of its junction with the Birdsboro-Warwick Road. This latter road was partially obscured by construction of the present site entrance road in the late 1950s. The National Park Service removed twentieth century paving materials from roads in the core village and returned the Birdsboro-Warwick Road to its historic alignment in the mid-1950s (Figure 4.13). In general, the basic pattern of the site's major historic roads is readily discernible. Within the core village these roads largely function as pedestrian

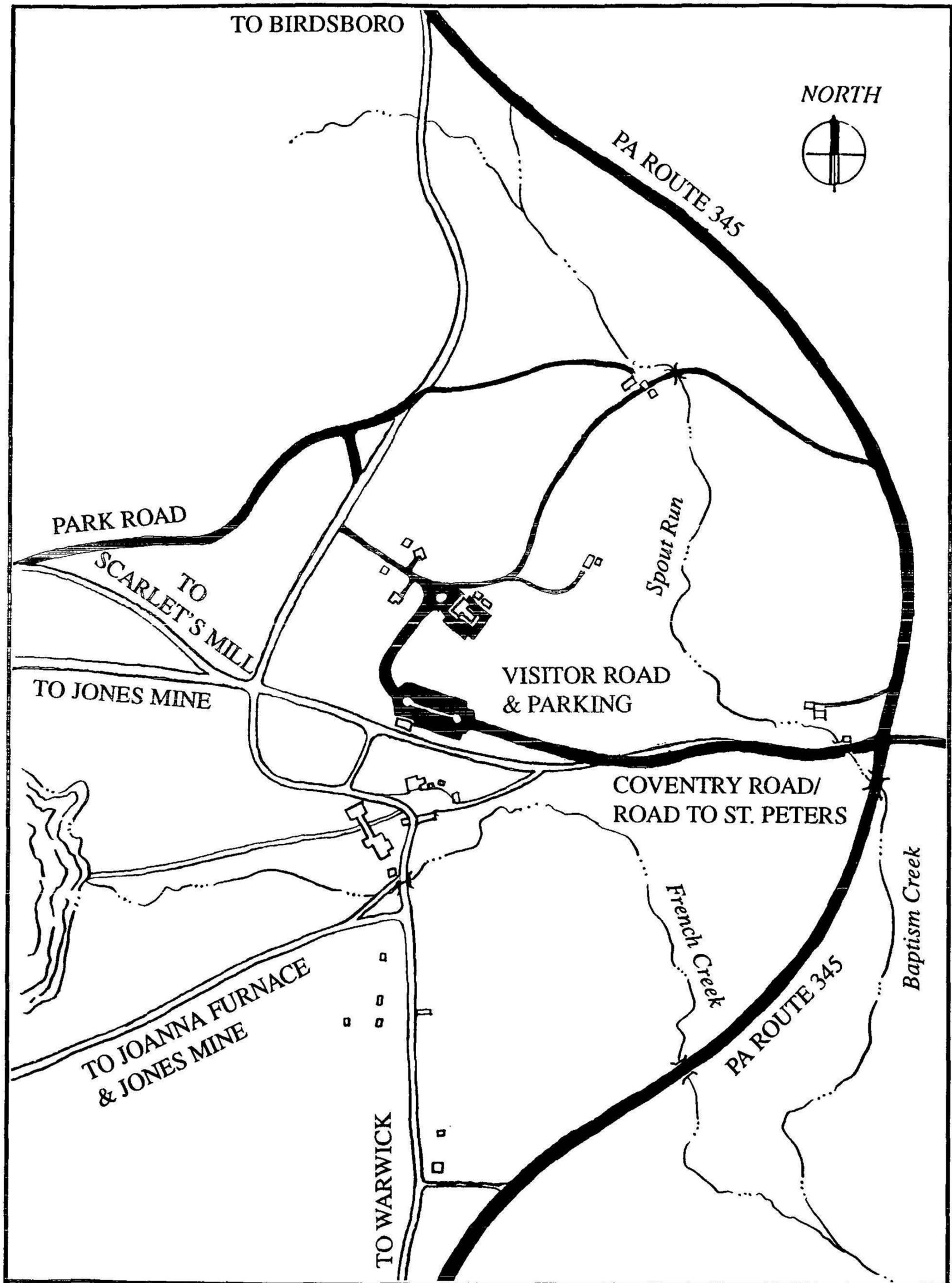


Figure 4.13. Hopewell Core Area Roads ca. 1815-1954

Pre-1930's  
Roads

Post-1930's  
Roads

Structures

walkways for visitors. These roads retain a considerable degree of integrity in terms of their alignment and general appearance.

The CCC-constructed bypass road (PA Route 345) introduced a significant intrusion into the existing landscape. This road passes through areas associated with woodlots and agricultural fields, sub-dividing these areas and creating a major new visual boundary east of the core village. Construction of the present site entrance road in the late 1950s obscured portions of a historic road alignment and introduced another new circulation element into the landscape.

Construction of the bypass enabled site managers to divert automobile traffic away from the core village. This effort to protect the resource unfortunately resulted in its physical isolation. The vibrant crossroads community of the eighteenth and nineteenth century now appears as a quiet, pastoral, outdoor museum.

While evidence of eighteenth and nineteenth century charcoal roads may be discerned in the site's wooded areas, it is clear that most of the present trail system does not follow charcoal road alignments. The trail system is a legacy of the CCC and should be interpreted as such. Outlying area roads and trails are not actively interpreted or maintained as an integral component of Hopewell's program. Instead they are viewed as extensions of the French Creek State Park trail system.

Paths and other pedestrian circulation features within the core village, including those at the Ironmaster's House gardens, appear to reflect late-nineteenth century conditions in terms of location, materials, and general appearance. A considerable portion of these resources have been rebuilt to serve current interpretive and circulation needs. The reliance, during reconstruction and rehabilitation of these features, upon oral interviews with informants whose memories extended to the late-nineteenth century strongly suggests that the present features most closely resemble conditions from this time period.

### Boundary Demarcation

#### *1770-1800: Settlement and Development*

Natural and constructed boundaries delineated land use throughout the history of the Hopewell Furnace site. During the earlier periods of the site's history there is scant documentation detailing the location and appearance of constructed boundaries. Consequently, the discussion of these boundary features is heavily dependent upon inferences and conclusions drawn from later periods. It is assumed that natural boundaries probably functioned in a similar fashion throughout the history of the site.

Natural landscape features, such as French Creek, served as boundaries in several areas. French Creek effectively divided the industrial area surrounding the furnace from the housing area south of the creek. The creek also separated the Village Barn, and its associated pens and enclosures, from the meadow, but this boundary is less sharply defined, since animals could travel freely between the two areas. Other natural features that served as boundaries include the slopes that separate the area of the Ironmaster's House from the furnace and the worker housing in the village below.

The principal boundaries at Hopewell are those constructed by the site's occupants. These include wood fences, stone walls, piles of stones at field edges, raceways, and roads. These elements often delineated separations in land use and activities, such as the edge between

agricultural fields and woodlands or the boundaries between private residential areas and public work spaces.

Within the core village it is known that walls and fences served as boundaries during this earliest period of the site's occupation. Fences are noted in the Hopewell records prior to 1800. Fence types described for later periods include post and rail fencing, worm fencing with a stone base, and picket fencing. The type of fencing used during this period is not known. Fencing appears to have been used sparingly during this period, largely to confine livestock and protect cultivated areas from incursions by animals. Later, as the site became more developed, additional fencing was constructed to delineate boundaries between fields and roads, distinguish the Ironmaster's House gardens from the remainder of the site, and enclose Tenant House yards.<sup>14</sup> The date of this philosophical shift in attitudes regarding fencing is unknown. It is assumed that different fence types were introduced as fencing began to serve different functions, and that much of the earliest fencing was simple, requiring a minimal investment in labor and materials to construct.

Outside the core village it is known that the furnace owners required contract farmers to fence their fields. The furnace owners also appear to have required crude fencing around cutover portions of the woodlands. This fencing, perhaps no more elaborate than piles of branches and brush around the perimeter of a cleared area, prohibited hogs, cattle, and deer from eating the new shoots sprouting from the stumps. This practice, known as coppicing, assured a healthy crop of second growth timber that could be harvested for conversion into charcoal within twenty-five to thirty years. No physical evidence of this fencing survives.

Stone walls or fences are also present at the site. The earliest may date from this period. These features largely represent the efforts of farmers to clear stones and rocks from agricultural fields. In some instances farmers laid the stones into walls and in others they simply created rough piles of stone and rock along the field boundaries. The remnants of these walls or piles are found throughout the southern portion of the property, which was largely owned by independent farmers until the twentieth century. Extant examples, often in deteriorated condition and seldom completely enclosing a former or present field, exist in fields associated with the Thomas Lloyd, Harrison Lloyd, Church, and Nathan Care farms. These stone walls form important boundaries, depicting and delineating the agricultural areas of the site and its adjacent farms. Stone walls are also found demarcating the Bethesda Church yard and cemetery. Although not designed as a boundary, the stone retaining wall that forms the north side of the East Head Race clearly divides the large open area now designated as Fields 1 through 6 near the Church House (Figure 4.14).

Roads also served as boundaries during this early period. In the core village, the Birdsboro-Warwick Road served as a boundary between the Tenant Houses on the west and the village meadow on the east. This boundary may have been reinforced with roadside ditches and fencing, although the fencing known to have existed along both sides of the road likely dates from a later period. This road also delineated the boundary between the furnace area, where industrial operations were conducted, and the Ironmaster's House and grounds. Similarly,

---

<sup>14</sup> In the colonial period, it was not unusual for animals to roam freely. Owners wishing to protect their gardens and fields were required to erect fences to keep free roaming animals from damaging their property. Sometimes, animals were fitted with yokes to prevent them from passing through open spaces in fences. Pigs were fitted with rings in their noses to keep them from digging under fencing. Pendleton, *Oley Valley Heritage*, 35.



Figure 4.14. The East Head Race forms a boundary in Field 1 next to the Church House, as well as separating Fields 2 and 3 to the east, 1995. The fence and road are post-1930 additions that have divided a single large field into the present Fields 1 and 2. Menke & Menke photo.

Reading-Valley Forge Road separated the orchard, planted in 1788, from the Ironmaster's House and its grounds, as well as separating the Church House fields from the village meadow.

#### *1800-1845: Growth and Prosperity*

The growth and expansion of furnace operations during this period resulted in more and more sharply defined boundaries at Hopewell, particularly in the core village. It is likely that the shift in attitudes towards fencing described above, from a method to protect crops from animals to a means of delineating fields, gardens, and other land use activities, occurred during this period. Furnace records specifically mention post and rail fencing during this period, including installation of 107 panels of four-rail fence near the village meadow in 1831. This fencing may represent the first enclosure of the meadow or the first construction of a boundary delineation between the meadow and the Birdsboro-Warwick Road. Furnace records also indicate the construction of three and five-rail fencing, at unknown locations, during this period.

Fencing continued to fulfill its earlier role as a means of confinement and exclusion. The combination of stone and wood fencing (sometimes described as "cow high, hog tight, and horse strong") noted in Wells' Historic Scene report may have been quite prevalent within the core village as a means to confine animals to pens and pastures or exclude them from fields and

gardens. Hogs are first mentioned in the Hopewell records in 1804, although they were likely present at the site during the eighteenth century. There may have been as many as one hog for every two people in the village, some penned and many running free.<sup>15</sup> It is likely that much of the present open space surrounding the Tenant Houses was divided by fencing into separate plots for plants and animals, and probably further divided to separate draft animals from hogs and chickens. Fenced areas are presumed to have included vegetable plots, flower gardens, particularly those developed near the Ironmaster's House in the late 1820s and early 1830s, and fields.<sup>16</sup>

The development of the Ironmaster's House garden may have included decorative fencing, such as wood picket fencing or ornamental metal fencing during this period. No documentary evidence exists to support this supposition for the early nineteenth century; however, such fencing clearly did exist in this area during the late nineteenth century.

Area roads continued to reinforce boundaries during this period, as their surfaces and width were improved with increased traffic. Reading-Valley Forge Road separated the new orchard, planted in 1829, from the old orchard. It is likely that the expansion of agricultural activities during this period brought more fields into production and resulted in the construction of additional stone field boundaries.

#### *1846-1883: Decline*

Boundary demarcations during this period closely approximated those of the previous period. Natural features, roads, and fencing continued to delineate areas associated with particular land uses and activities. Post and rail fencing, with three, four, or five rails, appears to have been the most common form of wood fencing during this period. Picket fencing is clearly indicated in period photographs, particularly around vegetable gardens and as a boundary between the Ironmaster's House grounds and the adjoining portions of the site.<sup>17</sup> Photographs also indicate the presence of wire fencing at the Ironmaster's House grounds. Fencing depicted in photographs of the Tenant Houses appears to be a combination of wood picket fencing and crude palings (Figure 4.15).

The stone walls south of the Boarding House may date from this period. They delineated the boundary between the furnace property and Nathan Care's land, which was an independent farm during this period. The construction of Tenant House No. 3 in the 1860s, also probably resulted in the construction of additional fencing in this portion of the site. Fencing also

---

<sup>15</sup> Wells, "Historic Scene Report"; Walker, *Hopewell Village*, 130, 132. Rupp mentions 688 swine in Union Township in 1840, implying one hog for every two people (population 1,298 at that date). Walker mentions that only two hogs could run free per family (implying that if one owned more than two that the rest were penned). Wells notes that Hopewell Furnace listed 5-10 hogs for the tax records, although these could be breeding or penned hogs only, with others running free and not counted, nor may it have included the workers' animals.

<sup>16</sup> Much of the research on fencing comes from Walker, *Hopewell Village*, 122-132 and Stuart Wells, "Draft Historic Scene Report," 24-31. Walker's research discusses farmers enclosing new fields in 1798 (p. 122), Elishu Bard fencing the turnip ground near the Hopewell Village Barn in 1804, placing worm fencing with stone trunnels (p. 123), and an 1829 contract between Isaac Hayer and the furnace owner to repair fences (p. 122). Recollections by Harker Long of whitewashed picket fencing at vegetable gardens in core area; Stuart Wells describes variety of fences in core area, including 3-, 4- and 5-rail fencing, picket fencing near residences, and stake and rider fencing in wooded areas. Stuart Wells, "Historic Scene Report," 25-31.

<sup>17</sup> See photograph 101.04 (page D 2) believed to be Octavius Bull and assistant standing along the Village Road near the Ironmaster's House. The light colored picket fencing in the background appears to follow the East Head Race.

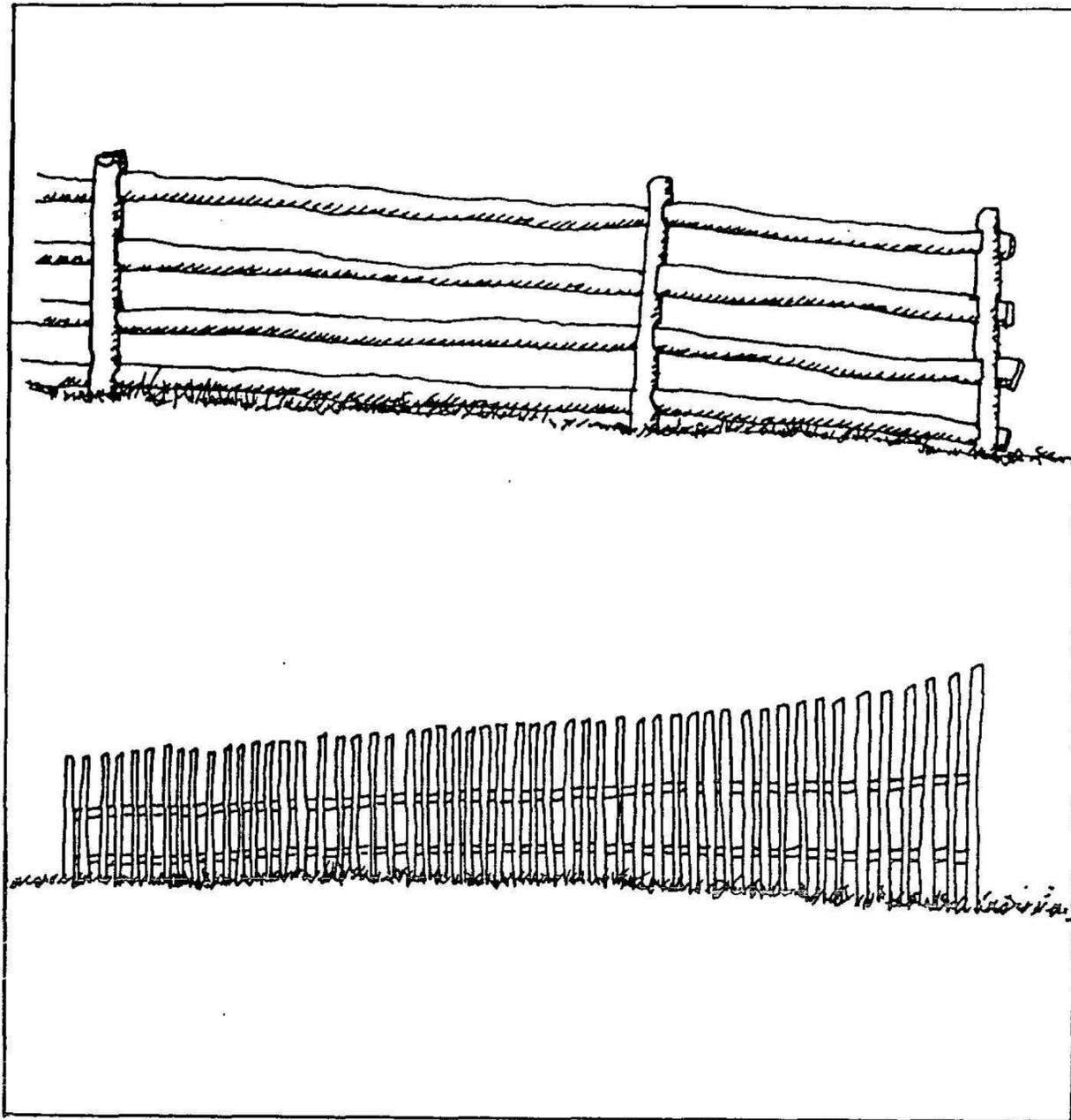


Figure 4.15. Fences at Hopewell Furnace from historic photographs. Top, four-rail fencing ca. 1920 near the Cedar Pasture and Charcoal House; bottom, picket fencing near East Head Race at the Ironmaster's House, ca. 1890. HOFU archive photos.

surrounded the site's two known major vegetable gardens, one dating from before 1870 and located near the Kiln House and the other located near French Creek adjacent to the Village Barn. The adoption of new plows that cut deeper into the cultivated fields probably raised additional stones and rocks to the surface, from where they were removed to the walls and stones piles at the field edges.

#### *1883-1935: Shutdown and Survival*

The cessation of operations at the furnace resulted in the abandonment of portions of the core village. As a result, fencing, raceways, and other boundary demarcations fell into disrepair, obscuring earlier patterns of land use and activity. In other instances, particularly the realignment and paving of area roads, earlier boundaries were reinforced and reemphasized.

The focus of the property during this period was the Ironmaster's House, and historic photographs document a variety of fence types in this area. The extant low stone wall appears to have been surmounted by wood picket fencing and wire fencing to create a more distinct separation between the garden and the adjoining roadway. Recollections of the turn of the

century appearance of this area by Mary Krewson, recorded in 1941, recalled goose pens in the garden. Harker Long's recollections included the presence of a 40-foot square area separated into pens for chickens and hogs.<sup>18</sup>

Tenant house fencing probably fell into disrepair during this period, while the post and rail fencing around the meadow, which was used for the dairy operation, was likely maintained. A 1914 photo shows post and rail fencing south of Tenant House No. 3 (see Figure 4.10a). The establishment of dairy operations during this period, and the associated purchases of farm parcels at the southern end of the property, probably assured the maintenance of field perimeter fencing.<sup>19</sup>

After the dairy farm ceased operations and other agricultural activities were abandoned, some open fields reverted to woods and wood fencing fell into disrepair and disappeared. Woodlands began to encroach on former agricultural fields, particularly along the unmaintained perimeters, forming formidable boundaries to the fields and roadway edges. As a result the site's appearance became more enclosed and less open than during previous periods.

### *1935-1938: The Civilian Conservation Corps*

When the federal government acquired the Hopewell property for development as a recreation demonstration area in the 1930s, it did not distinguish the furnace property from the remainder of the tract. The boundaries eventually established for Hopewell Furnace National Historic Site bore little relationship to the historic boundaries of the property and included most of the farm parcels acquired by the furnace in the early twentieth century. The creation of French Creek State Park effectively separated the National Historic Site from most of the woodlands that had supplied the furnace with fuel. Charcoal pit sites, quarries, and Hopewell Lake were not included within the Historic Site boundaries, while charcoal pits associated with Warwick Furnace and historically independent farms and woodlands were included.<sup>20</sup> Consequently, the present property boundaries of Hopewell Furnace National Historic Site do not reflect the boundaries of the furnace during any period of its operation.

Surveys conducted by the federal government during this period indicate significantly less wood fencing at the site than in previous periods. This fencing may have been salvaged for other uses or otherwise removed prior to the federal acquisition of the property. Existing condition maps from this period indicate a line of worm fencing in the woods near the ruins of the Manning House, located well north of the core village, and additional fencing along a portion of Reading-Valley Forge Road and near a series of chicken coops south of Tenant House No. 3. With these exceptions the majority of the site is depicted as surprisingly free of fencing. Some stone walls and piles used to denote field boundaries remained extant during this period. The federal surveys and existing conditions maps concentrate almost exclusively on the core village area, leaving the majority of the site undocumented.

---

<sup>18</sup> Wells, "Historic Scene Report," 43; Walker, *Hopewell Village*, 132. Walker mentions reading records revealing that fowl were laying eggs in the springhouse, chick and chicken house, hog house, coal house, and calf stable.

<sup>19</sup> Several large parcels of land that are currently part of the Hopewell NHS were acquired as late as 1919 by A. Louise C. Brooke, then owner of the furnace property. The boundaries of her ownership and the boundaries of Hopewell Furnace NHS rarely coincide. Research has not found adequate explanations for these purchases.

<sup>20</sup> The Warwick Furnace charcoal pits were identified by Heite in 1988 and 1989. They comprise two rough concentrations, one located immediately south of the Berks-Chester County line largely to the east of the former Birdsboro-Warwick Road, the other located west of Birdsboro-Warwick Road and south of the former Harrison Lloyd Farm.

The construction of the bypass road, PA Route 345, created a major new boundary element. Overlaid across fields, pastures, and wooded areas, the new road effectively separated the core village from outlying agricultural fields. The bypass created new edges to formerly open space, necessitating new fence lines to separate pastures and fields from the highway.

*1938-Present: The National Park Service*

The National Park Service has constructed a significant amount of new fencing at the site. Much of this fencing consists of four-rail wood post and rail fencing, a historically appropriate fence type, and is located in historically appropriate locations along roads and field boundaries. The presence of PA Route 345 necessitated fencing the east boundary of the meadow, which historically extended east of the PA Route 345 alignment, to prevent site animals from wandering onto the road. This fencing did not exist at any date prior to the federal acquisition of the site.

The Park Service has erected wood picket fencing separating the Visitor Center from the Ironmaster's House gardens and enclosing the front and rear yard areas of Tenant House No. 3. Photographic evidence from the late-nineteenth century and historical documentation from earlier in that century suggests that much more small scale fencing existed at the site throughout the period of the furnace's operation than is presently represented. Much of this fencing enclosed animal pens and gardens.

The National Park Service has introduced a variety of non-historic fence types. The Ironmaster's House garden includes temporary black plastic fencing, while the Cedar Pasture contains an electrified post and wire fence. Some of the temporary fences are removed during visitor hours. Fencing near the maintenance complex is, for security purposes, predominately chain link fencing.

The Park Service has also constructed gates to control access into the property and to prevent access to areas not open to the public. These gates include the main entry gate on Mark Bird Lane, which is closed when the park is not open to the public, gates located across access roads that extend between the core village and French Creek State Park, and gates that control access to agricultural fields and trail areas. Most of these gates constitute new boundaries that did not exist prior to federal acquisition of the property.

Remnants of stone walls are extant in the woods near most outlying buildings and ruins. These features indicate the locations of former farmsteads and agricultural fields. In many instances they are overgrown and difficult to discern. The vegetation associated with the reforestation of former fields has created and altered boundaries. This has created thick new, predominantly deciduous, hedgerow-type boundaries along stone walls, former field edges, stream banks, and roadway edges. This vegetation has at times created new boundaries and altered existing boundaries (Figure 4.16a and 4.16b).

New sharply defined vegetative boundaries include two power line right-of-ways that are kept clear of taller vegetation. Extending south from the Mill Creek Trail is an overhead power line, whose easement functions as part of the site's boundary. A second overhead power line extends west from the Thomas Lloyd farm to PA Route 345, where it moves underground. These corridors form linear landscape elements that function as strong visual boundaries (Figure 4.17).



Figure 4.16a (top) and 4.16b (bottom). Invasive vegetation obscures the field and East Head Race boundary edges, 1954 and 1995. Top photo reproduced from Kurjack *Hopewell Village* (Washington, D.C.: National Park Service, 1954), bottom photo Menke & Menke.



Figure 4.17. Low vegetation under power lines at Hopewell's northeast boundary, 1995. Menke & Menke photo.

#### *Boundary Demarcation Summary*

Throughout Hopewell's history boundaries changed according to land acquisition, ownership, land use, and activities. The present property boundaries do not reflect the boundaries of the furnace property at any point in its history. The property constitutes only about 20 percent of the historic furnace tract. Significant areas of woodland owned by the furnace were detached from the property and established as French Creek State Park. Much of the southern portion of the site is comprised of farmland purchased by the furnace owners in the first quarter of the twentieth century. These tracts have only marginal associations with the history of the furnace. Consequently, the present property boundaries only reflect federal decisions regarding the appropriate bounds for the National Historic Site.

The natural features that serve as boundaries at Hopewell, particularly the topography of the core village and the location of French Creek, fulfilled these functions throughout the history of the property. Vegetative boundaries, specifically the edges between fields and woods, have changed more dramatically. At present the site is more heavily wooded than during the

nineteenth century. This is a result of changes in the use of the land and of maintenance priorities. Some fields are no longer kept clear of encroaching vegetation.

Roadways served as important boundaries from the earliest periods of the site's history. As noted in the previous section, most of the historic road alignments remain readily discernible and continue to function as visual boundaries. The 1930s bypass road, PA Route 345, constitutes a major new boundary, framing views to and from the core village and necessitating the construction of field fencing in locations where none had previously existed.

Wood fencing, stone walls, and stone field boundaries comprised perhaps the most significant delineators of land use and activity throughout the history of the site. No wood fencing survives from the period of the furnace's operation. The National Park Service has erected a considerable amount of post and rail fencing around the perimeter of fields in the core village. This is an appropriate type of fencing and, with the significant exception of the fencing along PA Route 345, the majority is located in historically appropriate locations. No examples of the historic fencing used to protect cutover portions of the woodlands survive.

The stone walls and field boundaries that delineated many of the agricultural fields within the site survive only in remnants. The CCC robbed stone from these features, which it crushed for use as gravel, during the 1930s. Hedgerows, invasive vegetation, and successional forests have obscured many of the extant remnants.

Evidence suggests that a considerable amount of small scale wood fencing existed within the core village during the period of the furnace's operation. This fencing surrounded vegetable and flower gardens and penned animals. The National Park Service has constructed some small examples of this fencing, particularly around Tenant House No. 3, but it seems clear that much more of this type of fencing existed during the nineteenth century. Precise details regarding the appearance and location of this fencing do not exist, for any period, but late-nineteenth century photographs provide some details and offer valuable evidence that may be interpolated for other portions of the site.

Non-historic fence types introduced by the National Park Service within the core village are visually intrusive. NPS boundary gates and support area fencing fill important functional needs and are not readily apparent to the casual visitor.

Vegetation comprises an important boundary element in many locations. The limited agricultural operations presently conducted at the site, combined with the National Park Service's maintenance priorities, have resulted in a significant encroachment of invasive vegetation and successional forest growth along former field edges, property boundaries, and roadways. This has created boundaries that lack the sharp distinctions that characterized the property in previous periods.

### Vegetation

#### *1770-1800: Settlement and Development*

Vegetation at Hopewell Furnace may be broken down into four categories: gardens, orchards, agricultural fields, and forests. Each of these categories will be discussed for each period of historic significance.

Documentary evidence is scant regarding the location and plant types grown in gardens during this period. It is assumed that gardens were maintained near the Ironmaster's House and the

Village Barn. Gardens also are likely to have existed near Tenant Houses. Gardens likely included herbs and flowers as well as vegetables, and were likely fenced in some fashion to protect them from animals. Vegetables known to have been grown at Hopewell included onions, radishes, lettuce, cauliflower, tomatoes, salsify, peas, squash, eggplant, cabbages, potatoes, turnips, beets, and pickles (cucumbers).

An orchard was extant at Hopewell as early as 1788, when furnace records document the planting of 250 fruit trees. There are extensive references in the furnace records to apple products, including dried apples and apple jack. At various dates the furnace store sold apples, plums, prunes, quinces, cherries, cider, vinegar, and peaches.<sup>21</sup>

Wheat, rye, and corn were the major field crops at Hopewell, with share croppers, such as Samuel Cox (1798), and farmers, such as Elishu Bard (1804), providing grain crops for consumption at the furnace. The wheat and rye were likely reserved for human consumption, while the corn was used as animal feed.<sup>22</sup> Corn (probably flint or field corn *Zea indurata*) was grown at Hopewell "above and below" the furnace. This is interpreted to mean that current Fields 1, 2, and 5, all located above or north of the East Head Race, as well as portions of Fields 2, 3, 4, and 6, located below or south of the race, were planted in corn.

Buckwheat was grown at Hopewell as early as 1798 by Samuel Cox. *Fagopyrum saggitatum* or *F. tataricum* is a three-foot tall cereal-like plant, Asian in origin, that grows well in areas too poor or wet for other grains, and therefore could have grown in areas adjacent to French Creek. Oats (*Avena sativa*) were also grown at Hopewell, a conclusion based upon descriptions of summer and winter grains grown by Samuel Cox, Elishu Bard, and Isaac Hayer.

Hay was harvested from the meadows at Hopewell and used as livestock feed. Timothy is a grass known to have been planted in Hopewell's pastures. Hay can also be produced from clover, which was planted between the trees in the orchard, rye, and oats.

The forest surrounding the core village was used to produce charcoal to fuel the furnace. Hopewell records indicate that the woods north of the furnace were cut before the 1770s. The woods of this period are assumed to have been a climax forest prior to initial harvesting.<sup>23</sup> The successively regenerating woods were predominantly chestnut until the arrival of blight in the early twentieth century, when mixed oaks would have assumed a dominant position within the woodlands. "Seed trees" were retained in areas cut, and the stands roughly fenced to keep animals from consuming the shoots sprouting from stumps (Figure 4.18).<sup>24</sup> Remnant

---

<sup>21</sup> Walker, *Hopewell Village*, 133; Pendleton, *Oley Valley Heritage*, 36.

<sup>22</sup> Walker, *Hopewell Village*, 122-4; Pendleton, *Oley Valley Heritage*, 32-33. Estimates suggest that the foodstuffs required for each ton of furnace product amounted to twenty bushels of wheat and rye, fifty-seven pounds of pork, forty-three pounds of beef, and two bushels of potatoes. Not able to be interpolated, but also listed, were one-half ton of hay, ten pounds of butter, \$1.00 in fruits and vegetables, and \$1.43 in depreciation in the value of horses. Our analysis assumes a yield of thirty bushels of wheat per acre, thirty-five bushels of rye per acre, (see further analysis in "Hopewell Farming Data" in Appendix).

<sup>23</sup> Species noted in 1936 as predominant included scarlet oak (*Quercus coccinea*), black oak (*Quercus velutina*), white oak (*Quercus alba*) and chestnut oak (*Quercus prinus*). A stand of beech, birch, and maple is noted just north of the CCC camp location.

<sup>24</sup> These were especially noted on the Harrison Lloyd farmstead, where stumps from oaks had regenerated with from two to four trunks of approximately 100 year old trees, widely spaced among a younger, even aged forest stand.



Figure 4.18. An example of tree stumps sprouting new timber near the Nathan Care House, 1995. Menke & Menke photo.

specimens extant on the site (one hundred years and older) are likely to have been border (or witness) trees dating from this period demarcating earlier and/or existing property boundaries.

Most are oaks, although numerous other species were utilized as border trees, most commonly American chestnuts, and hickories in the Hopewell Furnace area.<sup>25</sup> Studies of these and other

---

<sup>25</sup> This summary relies on previous vegetation studies of the site by Russell, Mikan et al., and Vanderwerff, as well as on-site investigations conducted during this study by arborist Bill Graham of the Morris Arboretum, consultant to Menke & Menke. Graham cored sample trees throughout the park, read and analyzed previous studies and plans, and submitted field data and a report, which is included as an appendix. An earlier narrative report of local forest conditions by forester Charles Stearns (1939) was noted by Russell, although she was unable to procure the accompanying plan that delineated forest types for the Hopewell and French Creek areas. This missing graphic may have also hampered the use of this report by 1994 Mikan and Abrams study, as it was not referenced. As part of this study, the map and report were analyzed together, and the accuracy of the 1930s studies was confirmed. Graham noted that in some areas, particularly where invader or short-lived successional species were shown on the 1930s plan, that these have died and been replaced by other tree species (i.e. red maples (*Acer rubrum*), tuliptrees (*Liriodendron tulipifera*) and sweet birch (*Betula lenta*)) that follow the initial reforestation effort.

trees utilized as survey property markers suggest that the pre-settlement forest was dominated by mixed oaks, American chestnut, and hickories, with very little incidence of birch or maple.

### *1800-1845: Growth and Prosperity*

The expansion of the furnace operations during this period likely necessitated an expansion of agricultural activity. The agricultural landscape during this period was typical of the lower hillsides of Chester and Berks Counties, and included row crops for workers and their families and field crops for the furnace's animals. Large areas were devoted to vegetables, fields crops (such as corn, oats, wheat, rye, and buckwheat), and pasture. A large plot of land near the Village Barn was planted in the spring with flax and later planted with turnips as a winter crop.<sup>26</sup> Furnace records note only two small vegetable gardens, one-quarter to one-half-acre in size, located near the furnace and the Village Barn. An 1833 formula for analyzing the amount of farm products required to produce one ton of furnace product, suggests that seven acres of potatoes would have been consumed at Hopewell, substantially more than could have been produced in these two small plots. This suggests the presence of additional, undocumented, vegetable gardens, in addition to the individual gardens that probably existed alongside the various Tenant Houses, or significant purchases of produce from area farmers.

Ornamental gardens probably existed only in the vicinity of the Ironmaster's House, where development of gardens began as early as 1829. The first documentary evidence for the plantings in this terraced garden dates from a later period in the site's history, and the nature of the plantings during this period is unknown. Ornamental gardens were probably not developed near the Tenant Houses, although many of the vegetables and herbs grown during this period had decorative qualities.

Furnace records document ongoing maintenance within the orchards during this period, as well as the planting of new trees.<sup>27</sup> A peach orchard existed at Hopewell in 1835. A new orchard, probably located east of the Ironmaster's House, was planted circa 1844. Clover was planted as a hay crop under and among the orchard trees, and was harvested several times during the growing season for use as livestock feed.<sup>28</sup>

---

Mikan and Abrams, "Vegetation, Edaphic and Historical Analysis of Charcoal Hearths at Hopewell Furnace National Historic Site, Pennsylvania," (1994) lists a series of eighteen tree species that were utilized by local surveyors, and analyzes their incidence statistically. The study found that black oaks (*Quercus velutina*) comprised the greatest incidence, while white oaks (*Quercus alba*), American chestnuts (*Castanea dentata*) and hickories (*Carya spp.*) comprised over half the other tree species utilized. The incidence order of trees noted is as follows: black oak (33.1%), white oak (16.6%), American chestnut (15.4%), hickory (14.6%) chestnut oak (6.8%) and Spanish oak (Pin oak?) (4.3%). Occurring in lesser numbers (in order of incidence) were blackgum, poplar, scarlet oak, ash, birch, maple, walnut, sugar tree (sugar maple?), buttonwood (sycamore?), ironwood, lightwood and yew. Mikan and Abrams reported that the oldest trees within the Hopewell site were 127 and 130 years old (i.e. growing since the 1860s), and were located in the northeast and southeast portions of the site, away from the core village. The study also located and studied a stand of trees uncut from the colonial period on the northeast slopes of Mt. Pleasure, overlooking the core village. The oldest of these trees is believed to date from 1627.

<sup>26</sup> Walker, *Hopewell Village*, 123.

<sup>27</sup> Walker *Hopewell Village*, 123-124, 133. A young Hopewell orchard contained 250 trees in 1787-1788. In 1829 160 new apple trees were bought. Another 304 trees were purchased in 1834, and in 1844 furnace records mention a "new" orchard.

<sup>28</sup> *Ibid.*, 122-4. Red clover (*Trifolium pratense*), a short lived perennial, is the presumed variety, although the specific variety is not mentioned in furnace records. In 1804 Elishu Bard cut clover planted in the young orchard. In 1829 Isaac Hayer contracted with the furnace to plant clover seed. Stuart Wells thinks that clover was also part of a crop rotation system at Hopewell, in which clover was planted after harvesting corn and grains

Animals were an important component of the Hopewell landscape. Livestock mentioned in furnace records include horses, oxen, mules, cattle, dairy cows, hogs, dogs, and sheep. Cats are not mentioned in the records, but were likely residents of the community. In 1840 cattle were the most numerous type of farm animal, constituting 39 percent of the total number of livestock, followed in importance by hogs (27 percent), sheep (22 percent), and horses (12 percent). Horses were more common at the furnace; however, because they were used to haul raw materials to the furnace and transport finished products to market. Hopewell reportedly maintained eighty-four horses in 1832.<sup>29</sup> These animals consumed large amounts of feed, much of which was likely produced at the furnace.

The principal field crops grown at Hopewell likely remained the same as in the previous period. The site's agricultural landscape generally reflected patterns typical of the surrounding area. Wheat (*Triticum vulgare*) and rye (*Secale cereale*), usually referred to as grain or summer and winter grain, were major crops at Hopewell. Walker quotes an 1833 formula for calculating the amount of wheat or rye typically consumed to produce one ton of furnace product. This formula suggests that 400 acres of rye and/or 467 acres of wheat would have been required to support the furnace population during the peak years of production during this period. This is considerably more open field acreage than is presently extant, particularly if acreage for corn and other crops is deducted. Accordingly, it is assumed that some food products were supplied by local independent farms or were purchased from nearby towns, such as Birdsboro.<sup>30</sup>

In 1840, wheat represented 13 percent, and rye 22 percent, of the grain crops grown in Union township. Oats accounted for 35 percent of the township's grain crops, equal to the production of wheat and rye combined. Buckwheat comprised only one percent of the township's grain crops. The township produced 1,719 tons of hay in 1840. Production of hay at Hopewell may have represented a significant portion of this total. According to the 1833 formula cited by Walker the furnace may have produced 350 tons of hay, over 20 percent of the township's output.<sup>31</sup>

During this period of growth and prosperity, the furnace is thought to have consumed over an acre of forest each day to supply its fuel needs. In the 1820s, the furnace owners acquired 265 acres on the north slope of Brush Hill and two tracts, totaling 189 acres, on the south slope of Mt. Williams, presumably to expand their wood cutting/charcoal operations. Adjacent farmsteads not owned by the furnace provided wood for furnace operations. Charcoal hearths were placed near the lumbering areas and the charcoal was transported from these areas to the furnace by wagon.

#### *1846-1883: Decline*

Vegetation during this period resembled that of the previous period. The gradual decline of the furnace may have resulted in the practicing of a less intensive agriculture during this period. Vegetable gardens are known to have existed adjacent to the Ironmaster's House, near the

---

to fix nitrogen in the soil. Bees make sweet honey from clover, particularly white clover (*T. repens*), and bee hives are reported to have been maintained in the Ironmaster's House garden.

<sup>29</sup> Walker, *Hopewell Village*, 126.

<sup>30</sup> *Ibid.*, 122-4.

<sup>31</sup> Walker, *Hopewell Village*, 120; Rupp, 251.

Tenant Houses, and near the Charcoal Kiln.<sup>32</sup> Harker Long's recollections of this period include a quarter-acre area vegetable garden located west of the barn and enclosed with white picket fencing, a acre plot by the Charcoal Kiln, and a "back field" with vegetables.<sup>33</sup> It seems likely that these vegetable gardens could supply only a small portion of the produce consumed by the village population. It is probable that each house had its own garden areas devoted to herbs and vegetables during this period, which would have primarily been tended by the women and children of the family.

Evidence suggests little change in the orchards, animals, meadows, and woodlands during this period. Furnace records note the presence of chickens, ducks, geese, and turkeys during the 1850s. These fowl are thought to have had the run of the village, rather than being penned.

### *1883-1935: Shutdown and Survival*

The decline of furnace operations led to a reduction in the village population. As the Tenant Houses were abandoned it is likely that their associated gardens fell into disrepair and eventually vanished. The Ironmaster's House garden appears, on the other hand, to have been expanded during this period, probably as an adjunct to the building's use as a summer residence. Most information pertaining to specific plantings in this garden dates from this period, largely from a circa 1940 interview with Mary Krewson and rough sketches that she provided.<sup>34</sup> It is likely that Krewson's recollections reflect the garden's late-nineteenth century appearance. She remembered several site elements with related plantings that are no longer extant, including rustic lattice garden seats covered with ivy and arbors covered with trumpet creeper vines (*Campsis* or *Bignonia*) and grapes. Flowers and herbs included several beds of bluebells (*Mertensia*), an "old fashioned" garden bed, as well as poppies (*Papaver*), foxglove (*Digitalis*), mignonette, sage (*Salvia*), rosemary (*Rosemarinus*), thyme (*Thymus*), daylilies (*Hemerocallis*), violets (*Viola*), daffodils, and red, yellow, and pink rambler roses (*Rosa*). Other specimen shrub plantings included boxwood lining the walk (*Buxus* spp.), lilacs near the house (*Syringa* spp.), rose of sharon (*Hibiscus syriacus*), mock orange (*Philadelphus coronarius*), snowball bush (*Viburnum opulus sterile*), and a spirea hedge (*Spiraea* spp.) near the picket fence at the north boundary of the garden. The garden incorporated both formal flower gardens and vegetable gardens, with some mixing of the two, in the form of herbs, in the formal spaces.

Numerous specimen trees in the core village, generally located close to residences, appear to date from this period. These include willows (*Salix* spp.), sycamores (*Platanus occidentalis*), black walnuts (*Juglans nigra*), black gums (*Nyssa sylvatica*), red cedars (*Juniperus virginiana*), ailanthus (*Ailanthus altissima*), flowering dogwoods (*Cornus florida*), and catalpa (*Catalpa* spp). Some of these may have escaped their original boundaries, in particular the black walnuts, red cedars, catalpa and ailanthus. Other core trees that have achieved mature specimen status include black oak (*Quercus velutina*), red ash (*Fraxinus pensylvanica*), white ash (*Fraxinus americana*), and tulip poplar (*Liriodendron tulipifera*). A large quantity of mature trees exist in the Core Village, however, few appear to date from before 1883.

---

<sup>32</sup> The Charcoal Kiln was used as a residence during part of this period, so this garden may have been associated with the building's occupants.

<sup>33</sup> Walker, *Hopewell Furnace*, 120 and 133, Wells, "Historic Scene Report," 29 (Wells also lists historic seeds sold locally on page 31); Rupp, 251.

<sup>34</sup> USDI NPS Division of Construction--Eastern Division, "Plan of Mansion Gardens, Ironmaster's House," NHS-HV, August 1, 1956 #MHS-HV (described as an accurate copy of sketch made by Mrs. M. A. Krewson). See also Drawing NHS-HV-3001, and pencil trace by Dennis Kurjack of statistical data base plan based on her recollections and other research.

Comparison of historic photographs with the present scene indicates that many of these trees date from the last quarter of the nineteenth century (and indicate that a few specimens presently appear much as they did fifty years ago). Based on core samples, and the subsequent counting of annual growth rings, Morris Arboretum arborist Bill Graham estimates that a large sycamore located between the Greenhouse ruins and the Ironmaster's House dates from the late nineteenth century. Core samples suggest that a number of trees within the Core Village date from before 1850 and include: a 62" d.b.h. sycamore located between the Village Barn and the Springhouse (circa 1840), a 42" oak located along a field path adjacent to French Creek between the Village Barn and Mark Bird Lane (circa 1825), and a 43" black oak located south of the Boarding House near the stone wall along Birdsboro-Warwick Road (circa 1825).<sup>35</sup> Efforts should be made to preserve these older trees.

There are trees noted in historic accounts that no longer exist in the Core Village. These include a willow (*Salix spp.*) described in a drawing by Lafayette Houck with branches cut close to the trunk, thereby forcing long straight shoots (Figure 4.26). A detailed survey of the area near the Ironmaster's House from the 1930s noted large sycamores, as well as large numbers of the exotic Tree of Heaven (*Ailanthus altissima*). Most of the *Ailanthus* were subsequently removed, although a cluster remains east of the Bake Oven. The mature Indian Bean or caltrops (*Caltalpa speciosa*) are still found in the Ironmaster's Garden area. Also noted on this survey are numerous pear and cherry trees now missing from the apple orchard.

An analysis of early twentieth century photographs, in conjunction with documentary records reviewed by Walker and Wells, indicates that in the southern two-thirds of the site numerous cultivated fields, mostly on independent farms, existed during this period. These were likely planted with wheat, rye, oats, buckwheat, and corn. Farm houses and their associated outbuildings were surrounded by from six to ten of these open fields, some of which may have been planted with the same crop.<sup>36</sup> As Hopewell's owners began to acquire adjacent tracts and begin a dairy operation in the early twentieth century, it is likely that the site began to assume the appearance of the local dairy farms seen in turn of the century photographs (Figure 4.19).

The orchard is likely to have been stabilized, but not replanted with new trees, during this period. A newer orchard appears south of Tenant House No. 3 during this period, in proximity to a number of sheds described in contemporary documents as chicken coops.

---

<sup>35</sup>Mature trees located within the Village Core include (group by species): **Black Walnut** (*Juglans nigra*) – Black walnuts appear throughout the Core Village and along field edges. Examples found near the Ironmaster's House, Tenant Houses, and Nathan Care farm range from 17" to 36" dbh. Largest specimens are seen in the southern portion of Core Village south of the Boarding House. A 36" dbh black walnut located in this area could date as early as 1850. It is likely that black walnut trees were present on the site prior to 1850, but no evidence suggest that they were part of a grove or other organized planting. **Sycamore** (*Plantanus occidentalis*) – The American sycamore is especially suited to the moist soils found near the Core Village. Core samples of a specimen located near the Ironmaster's House suggests that it is not more than 115 years old. A specimen located east of Tenant House No. 2 it about the same size; however photographs from the 1930s suggest this tree might be older. A number of sycamore stumps are noted on a 1930s survey of the Core Village. **Tuliptree** (*Liriodendron tulipifera*) – A 36" dbh specimen is located just west of the Ironmaster's House. Other large examples of this species are located in the Core Village, especially at field/woods fringe areas and along hedgerows. A 31" dbh tuliptree is located at the stone wall south of the Boarding House. **Others** – Other large specimens are found in the Core Village and include white and green (or red) ash (*Fraxinus americana* and *F. pennsylvanica*) red maple (*Acer rubrum*), black locust (*Robinia pseudoacacia*), hackberry (*Celtis occidentalis*) black cherry (*Prunus serotina*), and shagbark hickory (*Carya ovata*).

<sup>36</sup> These include the Church farm, the Thomas Lloyd farm, the Harrison Lloyd farm, and the Nathan Care farm. Other than the Church farmhouse and barn, no evidence has been found to indicate that the other farms were owned by or under furnace control during the nineteenth century.

Changes in the relationship between forests and fields shown on the accompanying 1883 and 1938 plans indicate that a number of formerly open areas reverted to successional wooded stands during this period. The encroaching forest overtook large portions of open space on the Thomas Lloyd, Harrison Lloyd, and Nathan Care farms. South of the Nathan Care House and Barn is a stand of birch and maple, indicative of open fields that have reverted to successional wooded stands (see 1883 and 1938 historic plans). Other fields remained agricultural well into the twentieth century (see Figure 4.20).<sup>37</sup>

In outlying areas, portions of the wooded stands east of PA Route 345 and south of Hopewell Road (Reading-Valley Forge Road) indicate tree cover typical of open cultivated areas that are suddenly abandoned. These include tulip poplar (*Liriodendron tulipifera*), gray birch (*Betula populifolia*), and red maple (*Acer rubrum*). However, other portions of these woods include scarlet oak (*Quercus coccinea*), black oak (*Quercus velutina*), chestnut oak (*Quercus prinus*), and white oak (*Quercus alba*), suggesting that these were formerly forested stands.



Figure 4.19. An agricultural field, typical of the Hopewell vicinity that was farmed for many periods of tenancy, with a view toward Mt. Pleasure. Note the cut-over base of the mountainside and the corn fields in the foreground of what appears to be present-day Field 2.

Specimen plantings at the Thomas Lloyd, Harrison Lloyd, and Nathan Care farms exist near the extant and demolished site buildings, and are presumed to date from this period. Species include ailanthus, catalpa, mulberry (*Morus spp.*), and spruce (*Picea spp.*). Core samples taken by arborist Bill Graham of the Morris Arboretum, indicate that the wooded area near the Harrison Lloyd farm contains trees aging from seventy-two to eighty-five years of age. These areas show clear evidence of trunks emerging from the stumps of mature trees cut ca. 1900. Mature specimen trees (at historic field edges and in the CCC Picnic Area) are somewhat older, ranging from 100 to 118 years of age.

<sup>37</sup> This assemblage is based on the interpretation of numerous sources held by HOFU. The conjectural pattern of land use shown on the plan is intended to represent circa 1840.



Figure 4.20. Historic field division ca. 1880-1920.

Dramatic change in the forests continued throughout this period, particularly in terms of the loss of old-growth forest. The chestnut blight of the early decades of the twentieth century dramatically altered the makeup of forested stands, with oak and maple regenerating from stands earlier dominated by the fast growing American chestnut. Outlying forest stands continued to be cut after the cessation of furnace operations and the wood marketed as fences or charcoal. This continued the economic role of the forests well into the twentieth century.

North of the village core the woods are noted on a 1936 NPS plan as dating from 1880-1920, indicating that the timber stands in these areas were cut prior to that period.<sup>38</sup> South of Hopewell Lake, most of the slopes of Mt. Pleasure are noted on this plan as containing stands of oaks growing since 1880-1920. Numerous trees within the wooded stands date from the 1910s-1930s, and represent the last cutting of timber on the property prior to federal acquisition of the land.<sup>39</sup>

Several forest fires were documented during this period in close proximity to the core village, although most affected acreage outside the current property. These included a 1,448-acre fire on the Dyer Tract in 1925, which affected the portion of the site east of the power line near the Woodlot and Brison ruins. A fire on Brush Hill in 1927 affected 25 acres (all off the existing site). In 1930, a fire destroyed 224 acres on Mt. Pleasure, southwest of the Nathan Care House and Barn.<sup>40</sup>

#### *1935-1938: The Civilian Conservation Corps*

During the CCC era no effort was made to maintain the gardens, orchards, or agricultural fields at Hopewell Furnace. It is likely that lease arrangements allowed local farmers to cut hay in some former agricultural fields, but no documentary evidence has been discovered to verify this supposition. During this time period the property's woodlands were viewed as a recreational and natural asset, rather than as an economic asset, as had been the case in all previous periods of the site's history. When the CCC arrived at Hopewell Furnace the area adjacent to Baptism Creek was filled with oak trees, some noted on period plans as dating from the 1860s. These seventy-year old specimens contrasted sharply with the predominantly cleared landscape of the area and appeared to the designers of the recreation area as a valuable

---

<sup>38</sup> The age of these woods was determined from forester analysis and National Park Service, Branch of Planning and State Cooperation, Recreational Demonstration Projects, "Forest Type Map, French Creek Project," Berks County, Pa., September 11, 1936. The plan indicates woods in the area north of the Visitor Center dating from 40-60 years, or between 1876 and 1896, approximately the time of the cessation of furnace operations.

<sup>39</sup> Emily W. B. Russell, "Vegetation Study Hopewell Furnace National Historic Site," (New Brunswick, NJ: Rutgers University, 1987), 36. This report also quotes the earlier 1989 Heite study, which described in greater detail the site evidence of the logging operations. The Mikan and Abrams study noted that it was only after the intense logging efforts ended that non-oak species of forest trees began to become established in the Hopewell woodlands.

<sup>40</sup> These burned areas are noted on the 1936 drawing previously cited. Emily Russell's vegetation study of HOFU noted that "a changing fire regime in the post-colonial period may have affected forest composition, especially the increase in fire frequency associated with the nineteenth century logging operations and near railroads, and the decrease in the twentieth century due to improved fire-fighting techniques," (page 1). These changes substantially affected the look of both Hopewell's and adjacent landscapes.

natural resource.<sup>41</sup> The construction of the Baptism Creek picnic area represented an effort to locate a modern recreational facility within this valuable natural resource.

The CCC clearly attempted to preserve woodlands as a natural resource during its construction of trails and recreational facilities throughout the property. However, some CCC construction activities adversely affected site vegetation. Truck trails and construction roads disrupted agricultural fields and destroyed woodland vegetation. The woods immediately surrounding Hopewell Lake were cut to facilitate expansion and development of the lake as a recreational asset. Construction of CCC Camp SP-7 and the Baptism Creek Picnic Area, with its adjacent 100-car parking area, resulted in a loss of vegetation in both these areas. Likewise, construction of the bypass road, PA Route 345, disrupted agricultural fields, dividing Field 1 from Fields 2 and 3, and Field 6 from Field 4. The construction of the new highway across these fields dramatically altered the landscape around the Church farm (see Figure 4.14).

#### *1938-Present: The National Park Service*

At present the core village appears as an inactive pastoral landscape, rather than as a working industrial and agricultural landscape (Figure 4.21). Large areas of mown lawn and slag piles covered with grass and weeds do not accurately convey the historic appearance of the site.

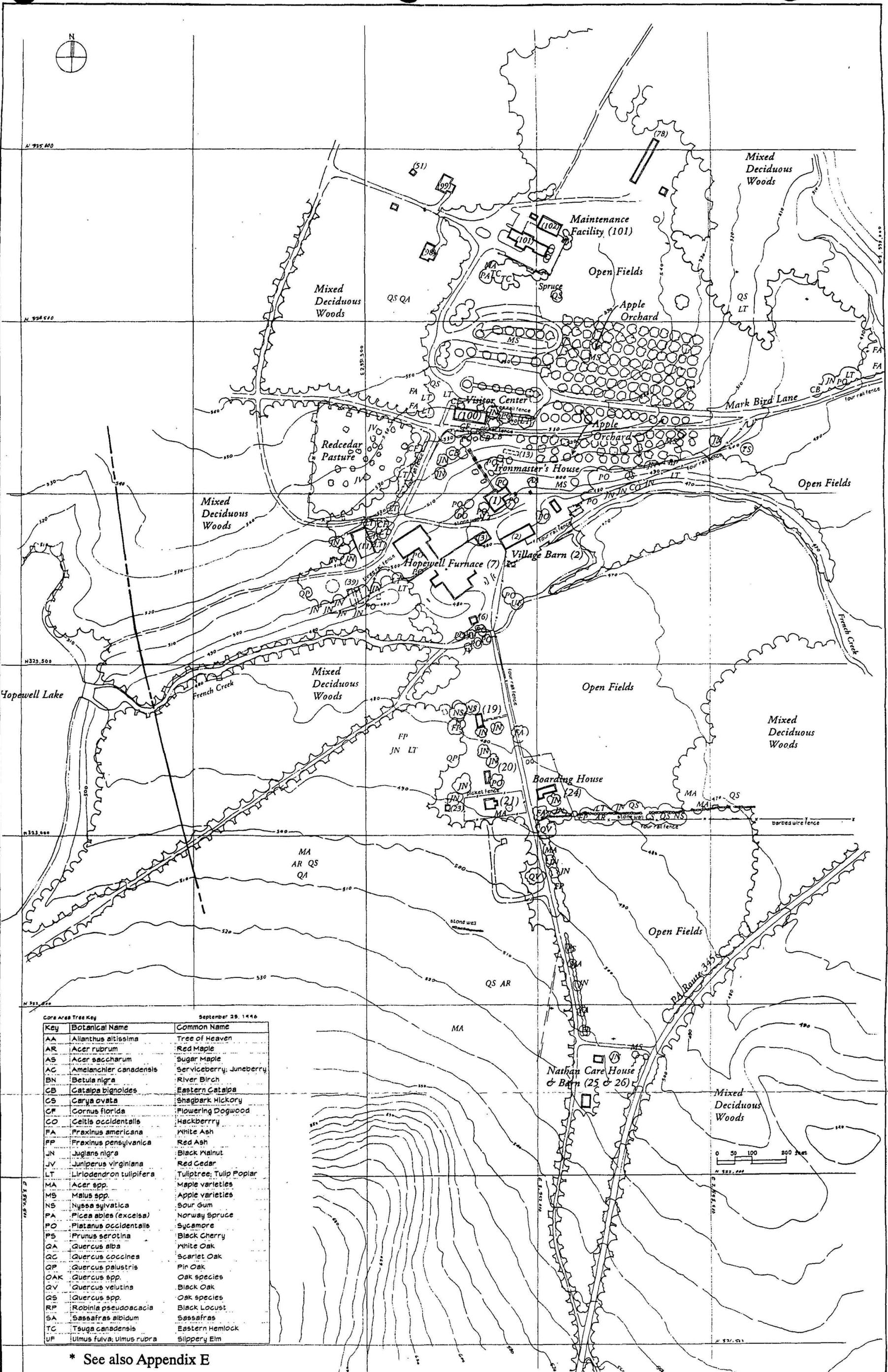
The various gardens maintained by the National Park Service near the Tenant Houses and Ironmaster's House in the core village are vestigial representations of these historic landscape features. The specimen trees near the Ironmaster's House and the Tenant Houses do, however, reflect the property's late-nineteenth century appearance, as evidenced by historic photographs. The present Ironmaster's House garden does not appear to be based upon any historical documentation and is a fraction of the size of any of the documented historic gardens (Figure 4.22a and 4.22b). Much of this garden is presently given over to turf; however documentary evidence and the oral recollections of Harker Long and Mary Krewson suggest that, at least since the mid-nineteenth century, this was an intensively cultivated and well-maintained formal garden, with herbs, vegetables, flowers, berry bushes, and ornamental shrubs. The overgrown boxwood and other garden shrubs near the Ironmaster's House currently convey a naturalistic appearance more common to twentieth century gardens and are not indicative of nineteenth century gardening practices.

The present vegetable gardens near the Tenant Houses are planted with heirloom varieties. They appear, however, too small to support the needs of a tenant family. The size of the historic Tenant House gardens is not known, but it is assumed that they were large enough to provide most of the fresh vegetables consumed by the residents of the house. The village store may have offered a supplemental source for fruits and vegetables, but there appears little need to purchase such goods if they could be provided through the labor of oneself and one's family. In addition to their small size the Tenant House gardens are inappropriately fenced. The extant fencing is designed to keep deer at bay, not approximate historic fencing.

Deer browsing represents a significant management problem at Hopewell Furnace National Historic Site. The small size of the extant gardens, the nature of their fencing, and the absence of row crops in the site's agricultural fields are all partially attributable to the deer population,

---

<sup>41</sup> Charles H. Stearns, Project Forester, USDI NPS, "Revised Type Mapping Report," French Creek Project, Birdsboro, PA, July, 1939 (original made in the summer of 1936 by student technicians). This report coincides with the 1936 Forest Type Map.



Core Area Tree Key September 28, 1946

Key	Botanical Name	Common Name
AA	<i>Allianthus altissima</i>	Tree of Heaven
AR	<i>Acer rubrum</i>	Red Maple
AS	<i>Acer saccharum</i>	Sugar Maple
AC	<i>Amelanchier canadensis</i>	Serviceberry; Juneberry
BN	<i>Betula nigra</i>	River Birch
CB	<i>Catalpa bignoides</i>	Eastern Catalpa
CS	<i>Carya ovata</i>	Shagbark Hickory
CF	<i>Cornus florida</i>	Flowering Dogwood
CO	<i>Celtis occidentalis</i>	Hackberry
FA	<i>Fraxinus americana</i>	White Ash
FP	<i>Fraxinus pensylvanica</i>	Red Ash
JN	<i>Juglans nigra</i>	Black Walnut
JV	<i>Juniperus virginiana</i>	Red Cedar
LT	<i>Liriodendron tulipifera</i>	Tuliptree; Tulip Poplar
MA	<i>Acer spp.</i>	Maple varieties
MS	<i>Malus spp.</i>	Apple varieties
NS	<i>Nyssa sylvatica</i>	Sour Gum
PA	<i>Picea abies (excelsa)</i>	Norway Spruce
PO	<i>Platanus occidentalis</i>	Sycamore
PS	<i>Prunus serotina</i>	Black Cherry
QA	<i>Quercus alba</i>	White Oak
QC	<i>Quercus coccinea</i>	Scarlet Oak
QP	<i>Quercus palustris</i>	Pin Oak
OAK	<i>Quercus spp.</i>	Oak species
QV	<i>Quercus velutina</i>	Black Oak
QS	<i>Quercus spp.</i>	Oak species
RP	<i>Robinia pseudoacacia</i>	Black Locust
SA	<i>Sassafras albidum</i>	Sassafras
TC	<i>Tsuga canadensis</i>	Eastern Hemlock
UF	<i>Ulmus fulva; Ulmus rubra</i>	Slippery Elm

\* See also Appendix E

Figure 4.21. Hopewell Furnace Core Area Vegetation, 1995.



Figure 4.22a (top) and 4.22b (bottom). View east to the garden terraces, steps, Greenhouse, and Ironmaster's House in 1936 and 1995. Top photo HOFU archive, bottom photo Menke & Menke.

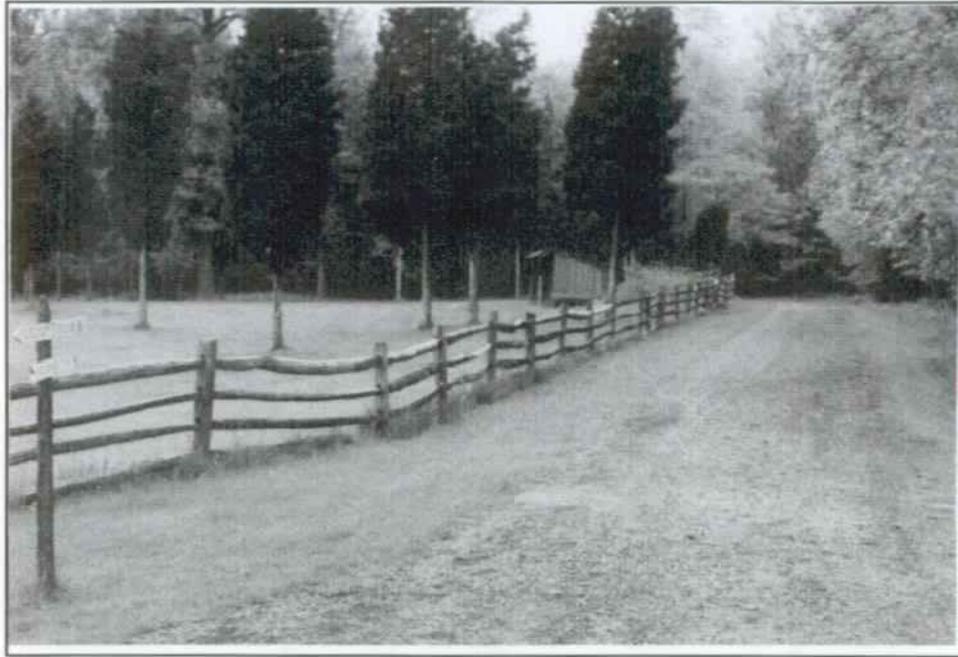


Figure 4.23. The Cedar Pasture looking west, 1990. All other vegetation has been removed either by deer or by the National Park Service. The pasture is fenced and contains a small outbuilding. Menke & Menke photo.

which routinely consumes vegetables and crops that are not adequately protected against their incursions.

In the Cedar Pasture, located near the Anthracite Furnace ruins, deciduous trees among the red cedars were removed, possibly in the 1950s. The red cedars, listed as “scattered young cedars” in 1938, evidence a deer browsing line, indicating that deer have penetrated the area (Figure 4.23).

The current location of the orchard, on both sides of the Visitor Entrance road, approximates the location of the historic orchard on the hillside above French Creek in close proximity to the Ironmaster’s House. The older trees are found to the south, with the newer, circa 1960, grove to the north, spreading beyond the visitor parking area eastward. The resource is maintained as a historic orchard, with managed turf beneath. Documentary evidence notes that clover was planted within the orchard during the mid-nineteenth century. It is unclear whether the white painted lower trunks reflect historic practice. The existing orchards contain over twenty-five varieties of apples.<sup>42</sup>

The village meadow (Field 6), is retained as a fenced pasture. This appears to reflect its historic function. PA Route 345 forms the present east boundary of the meadow. The location of the meadow’s east boundary prior to the construction of PA Route 345 in the 1930s is unknown. Farm animals (sheep, horses and cattle) graze in the meadow; and deer also frequent the area, particularly during hunting season in the adjacent State Game Lands.

---

<sup>42</sup> Location and type are mapped on the 1991 “Apple Orchard Plan.” Twenty-five distinct types are noted, including Baldwin, Delicious, Jonathan, Greening, Macintosh, Northern Spy, Rome, Summer Rambo, and York.

PA Route 345 and portions of the later Mark Bird Lane, pass across several agricultural fields, subdividing these features into parcels considerably smaller than those extant prior to the construction of the roads. This is particularly true of the fields adjacent to the Church farm. In addition, the roads separate these fields from the farmstead, making it much more difficult for visitors to recognize this property as a farm. Isolated from its fields, located at the present main entry to the site, and maintained as a staff residence rather than as a working farm, the Church House presently offers visitors the mistaken impression that it functioned as a historic estate gatehouse.

Maintenance and management considerations play an important role in Hopewell's cultural landscape. Extant agricultural fields are retained as open spaces and, in an effort to keep successional forest from reclaiming these tracts, receive more intensive regular maintenance than the site's woodlands. The fields are described in the 1992 Field Maintenance Plan in terms of "advantages and disadvantages in terms of maintenance costs, historical accuracy, utility and public perceptions."<sup>43</sup> Differentiated vegetation in the open spaces include meadow pasture, perennial forage crops, turf, rough grass, tall grass cover, and fields under agricultural special use permits.

Hopewell Furnace's permit farmers have occasionally tried to grow row crops in the site's former agricultural fields; however, hay is presently the dominant field cover. The absence of row crops, such as corn, wheat, and oats, are partly a result of maintenance priorities at the site and partly a result of deer browsing. The size of the local deer population, and the prohibition on hunting within the site, makes special use permits with local farmers interested in raising row crops in these fields very unlikely. Deer browsing greatly reduces crop yields, preventing farmers from earning an adequate return on their investment. Consequently, hay is the predominant crop grown in the site's fields, since it is not as subject to loss from browsing deer.

The small amount of agricultural enterprise at Hopewell has resulted in a reduction in the amount of open, agricultural space at the site. In several locations fields that are not maintained by the National Park Service have reverted to successional woods. The northern sector of the site has been woodland since the early twentieth century, while the central and southern portions are a mixture of open fields and successional forest occupying former agricultural fields (Figure 4.24). South of the Nathan Care House and Barn, an independent farm throughout the second half of the nineteenth century, is a stand of birch and maple, indicating open fields that have reverted to successional wooded stands in the twentieth century. The loss of these fields creates a false impression that the Nathan Care House and Barn are simply additional tenant buildings located at the south end of the village road, rather than an independent farmstead with close economic and social ties to the furnace.

At least six separate fields in the Thomas Lloyd tract have reverted to forested stands, lending the property the appearance of an isolated house and field surrounded by woods, rather than that of a productive farmstead set in the midst of cultivated agricultural fields.<sup>44</sup> All the

---

<sup>43</sup> Roger Stone, et. al. "Hopewell Furnace NHS Field Maintenance Plan," May 1992. On file at Hopewell Furnace National Historic Site

<sup>44</sup> See the 1883, 1938 and 1995 base maps accompanying this report for a graphic representation of the landscape evolution. Other than the aerial photographs in the HOFU archive, little information is available with regard to the eighteenth and nineteenth century character of the fields and forests adjacent to the core village. This report has interpolated available evidence to predict how the landscape might have appeared in these periods. It is hoped that further research may uncover information pertaining to the adjacent farms, especially the Nathan Care, Thomas and Harrison Lloyd farms, and the Brison and Woodlot parcels.

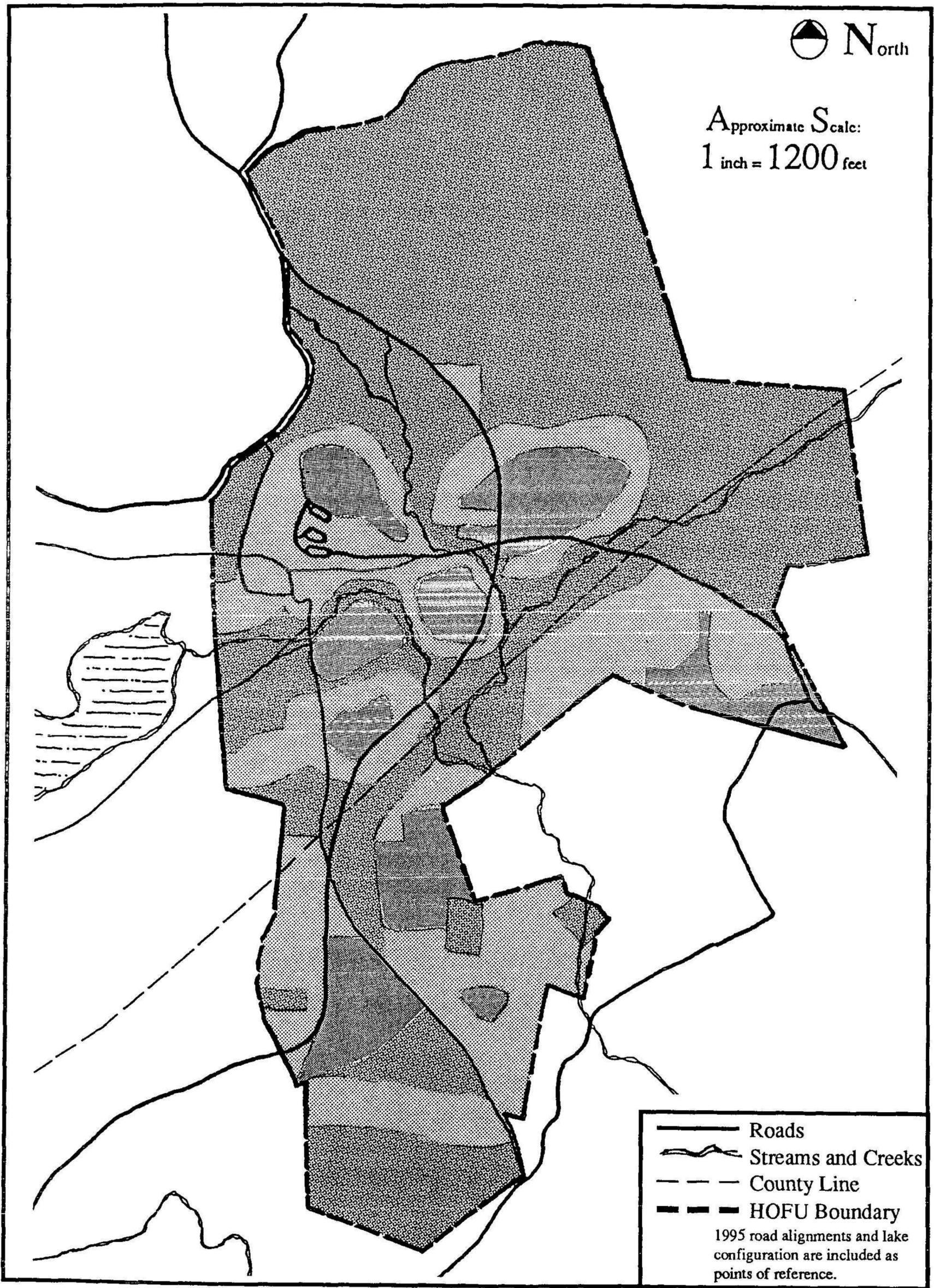


Figure 4.24. Transitional Woodlands, 20th Century.

buildings at the Harrison Lloyd farm have been razed, eliminating a critical part of the farm's cultural landscape. These farm fields are generally planted with hay. The surrounding woodlands are noticeably encroaching upon these fields, further removing them from their historic relationship to the former farmstead. Historic photographs of the area show the farm sited among a collection of no fewer than ten cultivated fields, with additional areas of woodlot.

The incursion of woodlands into former agricultural fields represents a major change in Hopewell's cultural landscape. Field boundaries are less defined, with many of the divisions between individual fields and between fields and roads, streams, and other boundary demarcations obscured with overgrown vegetation. Invasive plant species have entered portions of the site, particularly along stone walls and climbing mature trees at field edges. These species include barberry, bittersweet, honeysuckle, poison ivy, rugosa rose, and others (see also Appendix E).

The National Park Service manages the site's woodlands as a natural and recreational area, maintaining the trail system constructed during the previous period by the CCC. At present, three-quarters of the site is forested, with open fields primarily in the southern portion of the site. Vegetation within Hopewell's wooded stands includes many successional species that became established during the National Park Service's management of the site. These have been extensively catalogued by other researchers, notably Russell and Vanderwerff, and include red maples (*Acer rubrum*), tuliptrees (*Liriodendron tulipifera*) and sweet birch (*Betula lenta*). Understory species include witch hazel (*Hamamelis virginiana*), serviceberry (*Amelanchier arborea*), sassafras (*Sassafras albidum*), and flowering dogwood (*Cornus florida*). Shrubs include black huckleberry (*Gaylussacia baccata*), azaleas (*Rhododendron spp.*), viburnums (*Viburnum spp.*) and blueberries (*Vaccinium spp.*). Herbaceous plantings include bedstraws (*Galium spp.*), hay-scented fern (*Dennstaedtia punctilobula*), jack-in-the-pulpit (*Arisaema triphyllum*), wild sarsaparilla (*Aralia nudicaulis*), wood-sorrel (*Oxalis spp.*), hog-peanut (*Amphicarpa bracteata*) and cinquefoils (*Potentilla spp.*). In addition, the open areas within the woods, especially the locations of former charcoal hearths, are host to grasses and mosses.<sup>45</sup>

Hopewell's landscape has been substantially altered by recent deer browsing. Herds have recently grown larger than the landscape can support, with the result that the deer are increasing the number of species they regularly consume. In recent years, vast areas have been cleared to the browsing height of deer. This cleared out the understory from wooded areas, and made growing field crops, such as corn, wheat, rye, oats, and buckwheat nearly impossible. It is not unusual to see deer browsing the fields and forests on any given day. Fences less than ten feet high have been frequently crossed by deer. The deer problem is the most serious obstacle at present to the planting of gardens and historically appropriate field crops, such as corn.

### *Vegetation Summary*

Extant gardens at Hopewell are too small to adequately convey the extent of this agricultural activity throughout the period of the furnace's operation. The location of the Ironmaster's House garden is well documented, as is the appearance of the garden in the late-nineteenth century. The present garden plantings in this location do not reflect the garden's appearance at any time in its past. The existence of tenant house gardens is documented in furnace records. The location of these gardens is not known. It is assumed that they were large enough to

---

<sup>45</sup> A full listing of plants found on the Hopewell Furnace site is included in Russell, "Vegetative Study," 1987 and Vanderwerff, "The Vascular Flora of Hopewell Furnace National Historic Site," 1994.

supply the needs of the Tenant House residents, in which case the present gardens appear to be too small. Additional vegetable gardens, located near the Charcoal Kilns and the Village Barn, are indicated in the documentary record. Neither of these gardens are extant and their approximate sites are not interpreted. Garden fencing does not reflect historic fencing at Hopewell.

The present orchard appears to be in approximately the same location as the historic orchard. However, the presence of the visitor parking area within portions of the orchard creates confusion as to whether the orchard represents a historic landscape feature or a contemporary design element.

Agricultural fields have been subdivided by non-historic roads. This is particularly apparent in the vicinity of the Church House, which is separated from its fields by PA Route 345 and Mark Bird Lane. The site's fields lack a diversity of historic crops, although the village meadow retains its historic function. The lack of row crops, partly a concession to the browsing habits of the site's deer herd, makes it difficult for visitors to visualize the scope and extent of agricultural activities at Hopewell during the eighteenth and nineteenth centuries.

The minimal level of agricultural activity, combined with site maintenance priorities, has resulted in the reforestation of significant portions of the site's former agricultural fields. This is particularly evident at the southern end of the site, in the vicinity of the former Nathan Care and Harrison Lloyd Farms. In areas that are maintained as open space, woodlands have developed along the edges of fields, obscuring historic boundary demarcations and reducing the size of the fields. At present the Hopewell site is probably more forested than at any time in the past 150 years.

The forests themselves have undergone significant change at Hopewell. The remnant wooded stands contain trees dating to the late-nineteenth century. In general they are far more mature than during the period of the furnace's operations, when timber tracts were cut for conversion into charcoal every twenty-five to thirty years. The woods are also comprised of different species than during the furnace's operation. Oak and maple are now the dominant species, replacing the chestnut and hickory woods of the eighteenth and nineteenth centuries. American chestnut (*Castanea dentata*) is virtually absent from the woods, largely as a result of blight. Other factors affecting the woodlands include fire, deer browsing, and lack of forest management.

Deer browsing represents a significant problem at Hopewell Furnace. The deer problem is one of the most serious obstacles to the planting of appropriately sized gardens and historically accurate field crops.

#### Clusters, Buildings and Structures

The focal point of Hopewell National Historic Site is the core village, which consists of three distinct clusters of buildings: the furnace cluster, which contains buildings and structures directly associated with iron making; the Ironmaster's House cluster which includes the Ironmaster's House and its associated outbuildings; and the tenant housing cluster consisting of three Tenant Houses, the Boarding House, and their associated outbuildings. Two other building clusters are located just outside the core village. The Nathan Care cluster, a nineteenth century farmstead, is located south of the village on the Birdsboro-Warwick Road. The John Church cluster is located near the intersection of Mark Bird Lane and PA Route 345. It is also a nineteenth century farm complex. Immediately north of the village is a National Park Service cluster, consisting of visitor services buildings, maintenance facilities, and staff quarters.

Outside the core village are a number of clusters associated with outlying farmsteads, such as the Thomas Lloyd and Harrison Lloyd farm clusters, ruins of buildings associated with the furnace, the Woodlot and Brison houses, an institutional cluster at Bethesda Church, and a CCC-related cluster at the Baptism Creek Picnic Area, now known as the Environmental Study Area.

*1770-1800: Settlement and Development*

Few buildings and structures survive from the earliest period of the site's history. Portions of the Ironmaster's House date from the 1770s, although the building was remodeled and enlarged on several occasions. The furnace stack and the East Head Race also date from the 1770s, although the stack was substantially rehabilitated during the 1930s and the head race has been repaired and rehabilitated on several occasions. Bethesda Church was erected in 1782, and is perhaps the most intact building surviving at the site from this period (Figure 4.25).



Figure 4.25. Bethesda Church Cluster 1995. The cluster includes Bethesda Baptist Church (79), Bethesda Carriage Shed (80), Privy (81), stone walls with wooden caps (79A) and cemetery gravestones (79B). Menke & Menke photo.

Several support structures extant at the site may date from this period. It is impossible to determine whether the blacksmith shop and the office and store described in the furnace records are the same buildings presently extant, but the appearance of the extant buildings suggests that they likely date from the eighteenth century. Portions of the Village Barn, which was almost entirely rebuilt in the 1960s, also likely date to this period.

Tenant houses certainly existed at the site during this period, but documentary evidence suggests that the extant buildings date from the nineteenth century. Early tenant housing may have consisted of log cabins or other temporary buildings.

Several farmsteads in the outlying areas of the site appear to date from the eighteenth century. Elements of both the Thomas Lloyd and Harrison Lloyd farmsteads are apparently eighteenth century. Both clusters consisted of supporting farm buildings grouped around the farmhouse and surrounded by open fields and forested land. At the Thomas Lloyd complex, historic aerial photographs and archeological reports indicate several barn structures, one of which is extant, a springhouse, and stone walls and other earthworks demarcating fields. On the Harrison Lloyd farm, the house was demolished in the 1960s, one freestanding wall remains of what is presumed to have been a large barn, while several other foundations appear to be a blacksmith shop (foundation and partial fireplace remnants) and several other outbuildings of undetermined function.<sup>46</sup>

### *1800-1845: Growth and Prosperity*

Many of the extant buildings and structures at the site date from this period and are representative of the furnace's greatest period of prosperity. Elements of the West Head Race and the associated wheel pit date from this period, although both resources have been heavily rehabilitated, and in some locations reconstructed, by the National Park Service.

The east wing of the Ironmaster's House dates from 1826, and the south addition from 1828. Outbuildings in the vicinity of the Ironmaster's House date from this period, including the Springhouse (1816) and the Bake Ovens (1823).

South of French Creek Tenant Houses No. 1 and 2 date from this period, as does the Boarding House. The permanence of their construction reflects the prosperity enjoyed by the furnace during this period. The first village school house, also located south of French Creek, but no longer extant, was built in the 1830s.

Outside the core village the John Church House and Barn, located near the intersection of Mark Bird Lane and PA Route 345, date from this period. A number of tenant houses, located along the 1809 Road (Joanna Road) and north of Hopewell Lake, were erected during this period, but no longer survive.

### *1846-1883: Decline*

Extant buildings from this period include Tenant House No. 3 and the Nathan Care House and Barn, both built during the third quarter of the nineteenth century. Tenant House No. 4, located south of Tenant House No. 3, and a new schoolhouse built in the 1870s a half-mile west of the earlier school, do not survive. Portions of the Coal House appear to date from the 1880s, when this building was rebuilt. During this period the Ironmaster's House assumed its present configuration. The heart of the village during this period probably resembled the 1936 drawing of Lafayette Houck (Figure 4.26).

---

<sup>46</sup> These structures are visible on early twentieth century photographs, including circa 1920s, 1937, and 1951 aerial photographs.

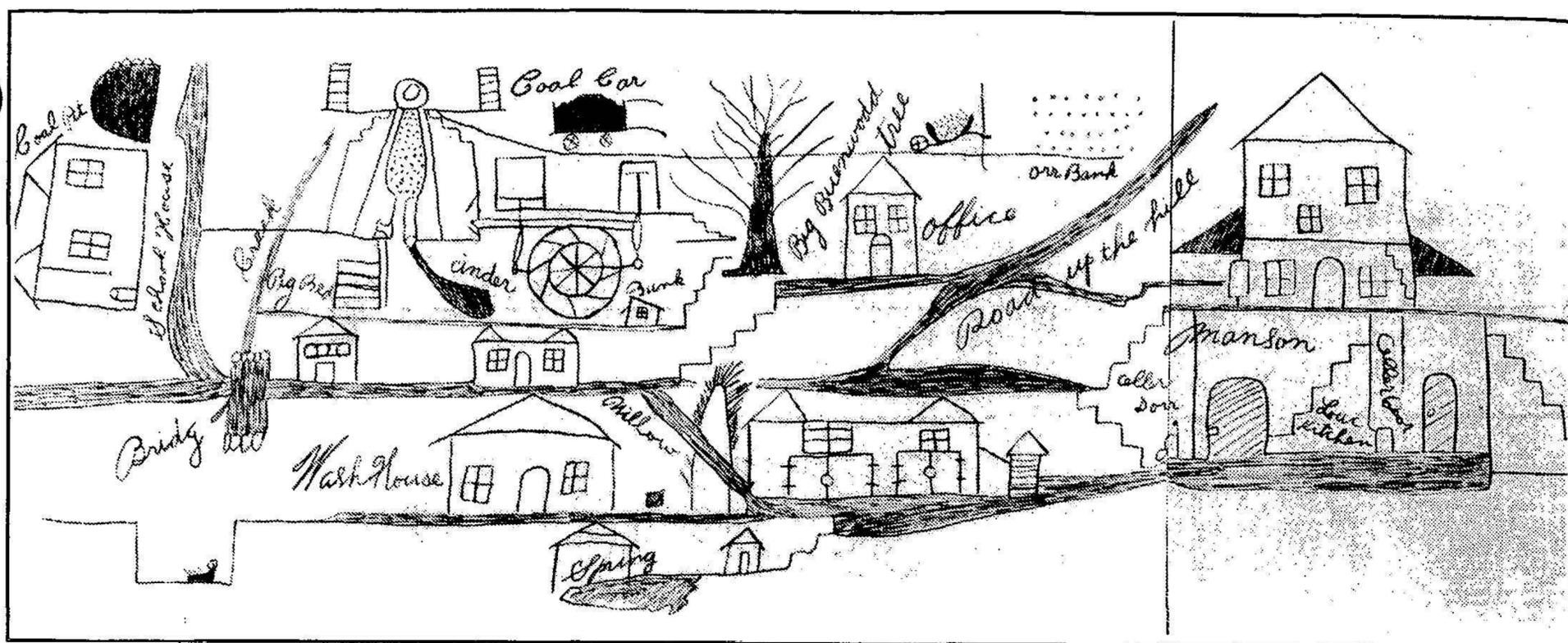


Figure 4.26. 1936 recollections of Lafayette Houck, Master Collier at Hopewell Furnace. Although charmingly naive, this plan drawing is a precise representation of Hopewell Furnace's working landscape from the worker's perspective. Note the furnace, with inclined plane to transport materials from the ore bank to the furnace stack by wheelbarrow and coal car. The water wheel is connected to double bellows. Also shown are the pig bed and cinder outflows where furnace product and waste flowed onto the furnace floor.

The upper floors of the Ironmaster's House are dwarfed by the lower (basement) portions, which would have been more familiar to workers. Other important site buildings include the School House (with Charcoal Hearth beyond), the Wash House, Blacksmith Shop, Carpenter (Wheelwright) Shop, Office, Springhouse and Village Barn (with attached wagon shed and corn crib).

Landscape elements depicted include roads, walls, and steps, a rough timber bridge over French Creek, and the big buttonwood (*Platanus occidentalis*) and willow (*Salix spp.*) trees at the site's core. The willow is depicted as cut to the trunk to encourage flexible branches, which were presumably woven into the willow baskets. Sketches on file in HOFU archive.

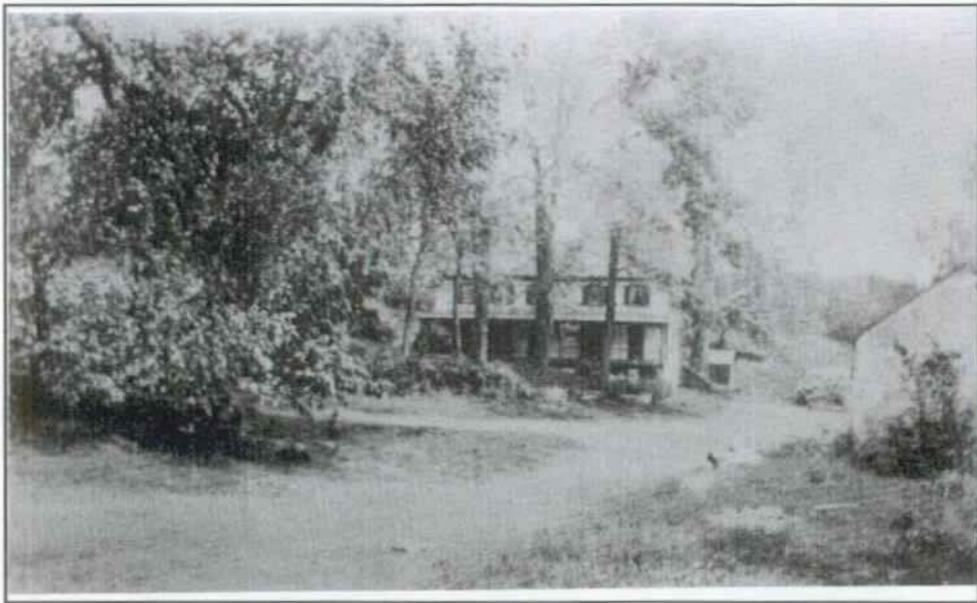
An 1879 insurance map indicates the presence of a second barn in the core village during this period. It is depicted as a large (40-foot by 70-1/2-foot) building located along the north side of Reading-Valley Forge Road east of the Ironmaster's House (see Archeological Sites).<sup>47</sup>

### 1883-1935: Shutdown and Survival

Few extant buildings and structures date from this period. The cessation of operations at the furnace resulted in the abandonment of many of the site's industrial buildings, which then rapidly deteriorated into a ruinous state, as evidenced by historic photographs. Indeed, historic photographs taken in the 1930s, at the end of this period, record a deteriorated site, with buildings in disrepair. Several buildings burned or were otherwise destroyed during this period, including the Cast House and Tenant House No. 4.

Little new construction occurred during this period. Much of this construction was associated with the use of the property as a summer home (Figures 4.27a and 4.27b) and the effort to develop a working dairy farm on the tract. Large additions transformed the Village Barn into a dairy barn, while a series of chicken coops were erected near the former site of Tenant House No. 4. Tenant House No. 4 reportedly burned in 1893.

<sup>47</sup> Insurance Company of North America, "Survey of the Property of Edward S. Buckley and Maria L. Clingan," 1879.



Figures 4.27a (top) and 4.27b (bottom). Ironmaster's House as a summer residence, in the early twentieth century. The same view in 1995 reveals a more manicured landscape with less vegetation. Small-scale elements in the 1995 view include fencing, a bench, and a barrel. The Ironmaster's House, Office & Store, and wall are seen in both views. Top photo HOFU archive, bottom photo Menke & Menke.

*1935-1938: The Civilian Conservation Corps*

The arrival of the CCC inaugurated a massive building program at the site. CCC Camp SP-7 consisted of a cluster of buildings north of the core village. Barracks, mess halls, recreation halls, and various support structures, were all arranged around an open parade ground in accordance with military site planning precepts. CCC construction activities included stabilization and rehabilitation of the furnace stack, rehabilitation of the tail race, construction of the bypass road, and completion of trails, picnic areas, and other recreational facilities. Only three buildings constructed by the CCC in this area are extant: the Pump House (Building 51), and two maintenance structures Buildings 66 and 67 (Figure 4.28). The later two buildings date from the end of the CCC's tenure at Hopewell (1941).



Figure 4.28. Two of three buildings extant from the vicinity of CCC SP-17 Camp (on the left and right), 1995. The center building is of much more recent construction. Menke & Menke photo.

The Baptism Creek Picnic Area (Environmental Study Area) is an example of the rustic style of architecture and naturalistic site planning characteristic of CCC activities (Figure 4.29). By 1940, a parking area for over 100 vehicles had been completed, curving gently north from Hopewell Road (Reading-Valley forge Road). The picnic area included 130 tables and benches, two latrines, four drinking fountains, two water hydrants, two springhouses, a shelter/concession building, two vehicular bridges, nine foot bridges, and trails, in addition to

Figure 4.29. Circa 1940 proposed design for Baptism Creek Picnic Area.

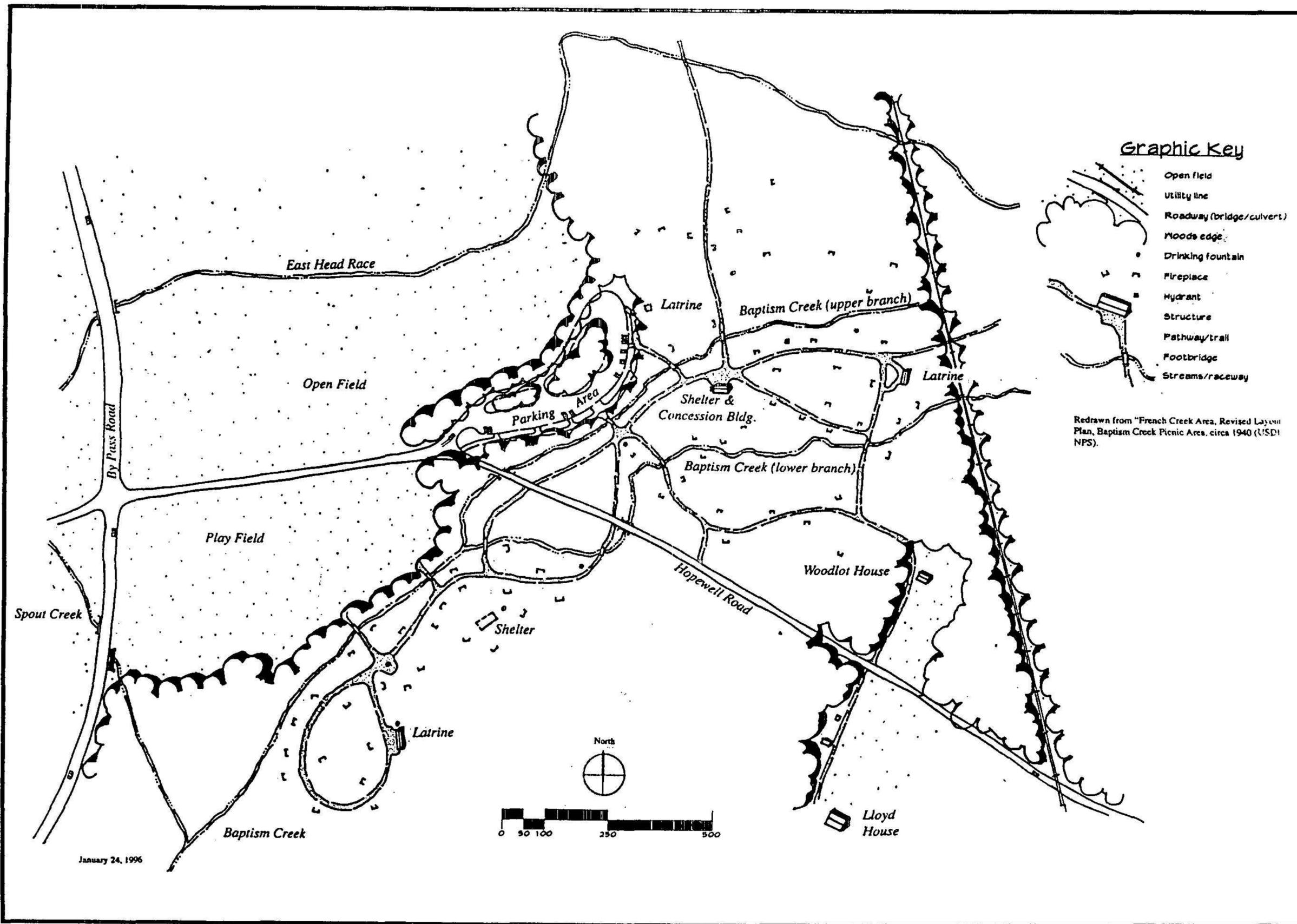




Figure 4.30. CCC Picnic Shelter in the Environmental Study Area near Baptism Creek, 1994. Menke & Menke photo.

the parking area.<sup>48</sup> Open fields were utilized for play fields, and trails wound through portions of the surrounding woods, which incorporated some trees growing since the Civil War.<sup>49</sup>

The main structure, the 1936 picnic shelter, has been determined eligible for inclusion on the National Register of Historic Places (Figure 4.30). Other extant elements associated with the picnic area include fireplaces, rustic bridges, drinking fountains, springhouses, and latrine ruins.

Miscellaneous CCC improvements included culverts at the Church House driveway and beneath Mark Bird Lane. Several concrete culverts with stone walls pass beneath PA Route 345. One carries French Creek under the roadway, while others carry Spout Run and runoff from area springs.

#### *1938-Present: The National Park Service*

The National Park Service has engaged in significant construction efforts at Hopewell Furnace National Historic Site. Many of the key buildings in the core village are reconstructions, based upon extensive documentary and physical evidence, constructed during the 1950s and 1960s. These include the Cast House (Figure 4.31), Cooling Shed, Bridge House, Charcoal House

<sup>48</sup> National Park Service, U. S. Department of the Interior, Pennsylvania Department of Forests and Natural Areas, cooperating, "French Creek Area, Revised Layout Plan, Baptism Creek Picnic Area," paper print, ca. 1940.

<sup>49</sup> Ibid. The age of these woods was determined from forester analysis and review of National Park Service, "Forest Type Map, French Creek Project," September 11, 1936. The latter depicts woods in the proposed picnic area dating from 61-80 years in age, implying that some trees had been growing since at least 1875, and possibly as early as 1856. Arborist Bill Graham of the Morris Arboretum took core samples from some older trees in 1995, and initial analysis indicates ages of 100-110 years and older.

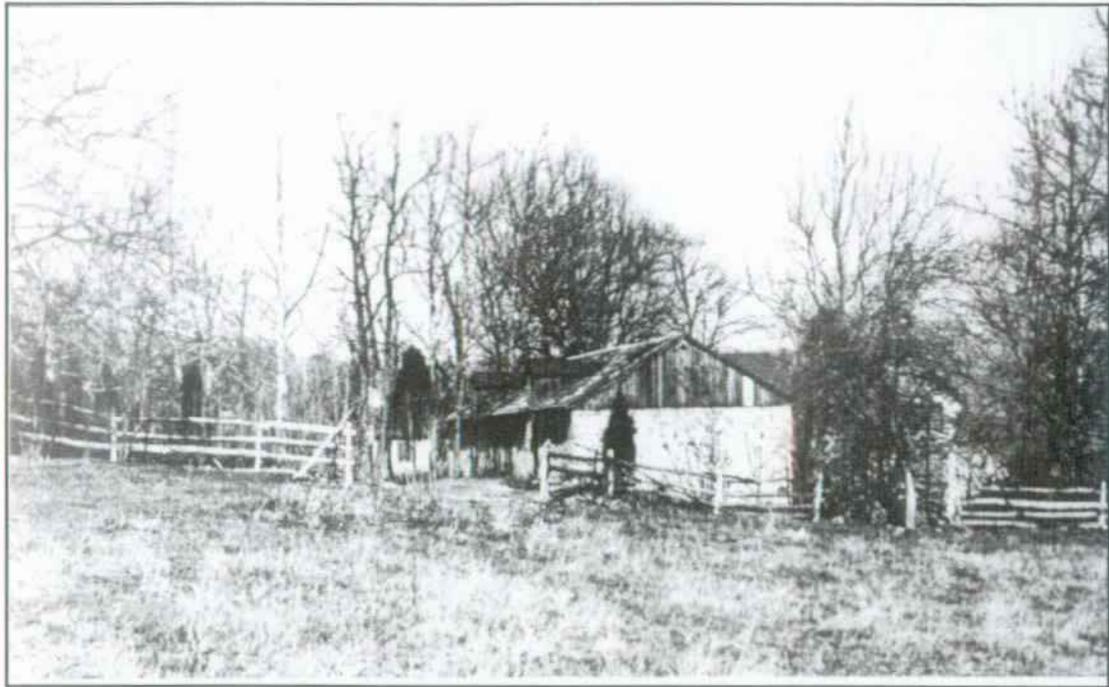
(Figure 4.32a and 4.32b), and Village Barn. None of these key buildings are historic structures, although the quality and accuracy of the reconstructions appears to be excellent. Additionally, the Blacksmith Shop was rebuilt following a fire in the 1980s (see Appendix C).

Other buildings and structures that existed during the nineteenth century, such as the Carpenter's Shop, were not reconstructed, which results in a landscape slightly emptier or less densely built than that which existed during the furnace's operation. In addition, the buildings today present too highly maintained, or "clean" appearance, with soot-free whitewash and carefully tended grounds. This inappropriately reinforces an image of the furnace as an extension of a pastoral landscape associated with a gentleman's estate, rather than as an active industrial site, complete with the dirt and noise that this entailed. Nevertheless, with its impressive collection of historic and reconstructed buildings and structures, the furnace cluster is a remarkably intact resource of exceptional interpretive power.



Figure 4.31. 1995 view of the reconstructed furnace complex. Menke & Menke photo.

The Ironmaster's House is appropriately furnished as a late-nineteenth century residence, openly acknowledging the additions and alterations to the original eighteenth century building. Important to the setting and function of the Ironmaster's House are the associated outbuildings that supported its pivotal role in the furnace operation. These include the bake ovens, springhouse, smoke house, garden terraces, and greenhouse ruins. The National Park Service has rehabilitated or preserved most of these structures. A reconstructed hog pen and chicken coop lie east and south of the springhouse. Other outbuildings and structures are no longer extant, including a tool house, privy, and an ice house with a summer house above.



Figures 4.32a (top) and 4.32b (bottom). Charcoal House from the west in 1920 and in 1995. Note that the dormers in the 1920s view were deleted in the restoration and the shed portion and Bridge House were reconstructed. Top photo HOFU archive, bottom photo Menke & Menke.

In the 1960s, the Tenant Houses were rehabilitated (Figures 4.33a and 4.33b). No effort was made to reconstruct missing outbuildings and other structures. The absence of these elements prevents a fuller interpretation of the lives of the furnace workers. These buildings appear today as residential structures surrounded by lawns and managed by a single caretaker.

Outside the immediate village core are two historic building clusters with peripheral associations to the furnace. Although not open to the public, these clusters include buildings dating from the furnace's period of operation. At the John Church cluster, near the intersection of Mark Bird Lane and PA Route 345, the National Park Service constructed an addition to the house and a garage in 1941. This work was associated with conversion of the building into a staff residence. Other previously described construction projects have isolated this building from its historic fields. It presently appears as a gate house, rather than as a farmstead. This appearance is enhanced by the gate and stable located south of the house and adjacent to the visitor entrance road. Similarly the Nathan Care cluster, located immediately south of the core village, is isolated from its historic agricultural fields. It was modernized as a staff residence in 1948.

The Thomas Lloyd complex is presently the most intact and representative of the outlying farmsteads. It is used as a staff residence and is not open to the public. At the Harrison Lloyd farm, the house and barn were demolished in 1964, one freestanding wall remains of what is presumed to have been a large barn structure, while other foundations are associated with a blacksmith shop (foundation and partial fireplace remnants) and several other outbuildings of undetermined function.<sup>50</sup>

The 1936 CCC picnic shelter was determined eligible for inclusion in the National Register of Historic Places in 1995. Its cedar roof has recently been replaced. Other remnant elements of the CCC picnic area include fireplaces, rustic bridges, drinking fountains and springhouses. The CCC activities at the ESA site are not currently part of the interpretive program.

A new cluster of buildings and site elements were erected, beginning in 1959, as part of Mission 66 efforts. Located, for the most part, north of the core village, this cluster includes the Visitor Center, parking area, and an expanded maintenance complex (Figures 4.34 and 4.35).<sup>51</sup> This area has continued to evolve, as evidenced by the addition of the Bally Building in the 1990s.

### *Clusters, Buildings and Structures Summary*

The basic clusters of buildings and structures at Hopewell Furnace National Historic Site have changed little over the past two hundred years. The essential organization of Furnace, Ironmaster's House, worker housing, and outlying building clusters survives remarkably intact. Within these clusters, however, there are significant examples of buildings reconstructed during the mid-twentieth century. These buildings, including such major

---

<sup>50</sup> These structures are visible on early-twentieth century photographs, including circa 1920s, 1937 and 1951 photographs.

<sup>51</sup> The National Park Service cluster focus on the Visitor Center, the center of on-site interpretive activities, and the maintenance buildings. On-site residential needs are met by both circa 1950s quarters and historic buildings rehabilitated for this use. A number of interpretive, maintenance, and staff support structures were built during this period, primarily north of the core village. Mission 66 buildings include staff quarters, the Visitor Center, and maintenance buildings. Recently the Bally Building was added for curatorial storage. Existing buildings are listed by name and number in Appendix A, as well as on the existing conditions map.



Figures 4.33a and 4.33b. Two views of Tenant House No. 3. Top, "View of Tenant House and Privy Looking West, 1936." Bottom, similar view in May 1995. A small grain silo, privy and a shed addition to the outbuildings are no longer extant, but the porch has been restored, a picket fence added, and the trees have grown. Top photo HOFU archive, bottom photo Menke & Menke.

structures as the Cast House, Charcoal House, Village Barn, and Blacksmith Shop, are *not* historic. Nevertheless, the quality of the reconstructions appears high.

This work has resulted in a core village that never existed at any one time in the past. At present a ca. 1840 furnace complex co-exists with a ca. 1879 Ironmaster's House, an 1853 anthracite furnace, and a ca. 1815 barn. Different buildings are associated with various periods of significance, complicating interpretation. Nevertheless, this situation emphasizes the multi-faceted history of the property and argues against efforts to freeze this dynamic site at one point in time.

It is clear that, while their precise numbers and locations cannot be determined, there were many smaller-scale buildings at the site, such as tenant houses and farm outbuildings, that are no longer extant. The absence of these buildings results in a site that is less cluttered and more pristine than at any point in its past. The lack of documentary evidence regarding these buildings suggests that archeological investigations may offer the best chance for determining their location and some hints as to their appearance.

Buildings and farmsteads outside the core village are not adequately protected or interpreted. Several former farm houses are used as staff quarters. Little effort is made to interpret these buildings. Likewise, the ruins of buildings and structures in the woods, such as the Brison and Woodlot Houses, are not included in interpretive programs. Indeed, these resources are not being maintained or stabilized and may be considered threatened by this neglect.

The site's few remaining CCC period buildings and structures, most notably those associated with the former Baptism Creek Picnic Area, are not currently interpreted. National Park Service support facilities are appropriately and sensitively located within the historic landscape.

### Archeological Sites

#### *1770-1800: Settlement and Development*

Previous archeological investigations at Hopewell Furnace National Historic Site have focused upon features and resources associated with the iron furnace. No pre-1770s artifacts or features are noted in these studies. It is possible, however, that future archeological investigations may reveal evidence of pre-1770s European settlement and activities, or of pre-contact Native American occupation of the site.

Most potential archeological sites from this period cannot be precisely located. Possible sites include remnant portions of the Reading Valley Forge Road. This road, paved in 1930's, was partially destroyed during construction of the present entrance road. Nevertheless, traces of the eighteenth century alignment may survive as subsurface features. Other roads might be located and investigated using archeological methods. The precise location of wells, privies, possible log tenant houses, vegetable gardens, and outbuildings from this period are not known. Archeological investigations of such features would likely reveal significant information pertaining to the earliest years of iron production at the furnace, but locating such resources would entail extensive testing.

Ruins located in outlying areas represent a high potential for archeological deposits, and can be readily located. At the Harrison Lloyd farm, which was established during this period, above-ground remains include two sets of stone walls and a well site. Archeological investigations could reveal information pertaining to the eighteenth century occupation of this farm and its continued occupation through the nineteenth century. Investigations might also be conducted at



Figure 4.34. Visitor Center, 1995. One of the buildings associated with Mission 66 construction efforts. Menke & Menke photo.



Figure 4.35. Quarters 99, 1995. One of the buildings associated with Mission 66 construction efforts. Menke & Menke photo.

charcoal pits and huts mapped in the late 1980s. The dates of these resources are unknown (see Figure 4.36).<sup>52</sup>

### *1800-1845: Growth and Prosperity*

There are primary archeological resources in the core village dating from this period whose locations are well established. These include the Carpenter's Shop; ruins within the Ironmaster's grounds, including the gardener's tool house, privy, ice house, smoke house, and greenhouse, as well as the terraced gardens themselves (Figure 4.37); and the School House. The Carpenter's Shop, which dates from the 1820-1844 period, was in ruins by the late-nineteenth century and was razed ca. 1900. The 1830s Ironmaster's House gardens and associated outbuildings and structures were in ruins when the federal government acquired the site in the 1930s. However, it is likely that they fell into disrepair well before that time, as Mary Krewson specifically mentions the Greenhouse ruins in her recollections. The School House dates from 1836 and was abandoned after construction of a new school house in the 1870s. The remains of the School House are barely visible today (Figure 4.38). Both the Greenhouse and School House presently are identified by National Park Service signage.

Potential archeological resources known to have existed during this period, based upon documentary evidence, but whose precise location is unknown, include the various Tenant House gardens and outbuildings. Near the furnace, a cupola existed as early as 1816. Its location remains unknown, despite several previous investigations. Archeological testing could locate this resource and reveal significant information regarding production at the furnace during this period.

As the furnace prospered the number of workers and tenants in the village grew, and the number of tenant houses increased. The precise location of these buildings is not known, although tenant houses existed along the Jones Mine Road (1772 Road) and north of Hopewell Lake. Additionally, the Nathan Care Log House and its associated features (privy, vegetable garden, and possible sheds) occupied an area south of the Boarding House during this period.

Determination of the number and location of these tenant houses could provide valuable additional data on the furnace work force's built environment and their living patterns.

A number of outlying farms and building sites date from this period. As noted previously, the Harrison Lloyd farm site includes ruins and features that may date to as early as the late-eighteenth century. Since the site remained occupied and active throughout this period, archeological investigations have the potential to reveal significant information pertaining to nineteenth century activities and practices at this location. Among the remains are the house foundations, an apparent blacksmith shop with a fireplace, several barn walls and foundations (Figure 4.39), and an open well. The trace of a possible former lane leading to the farmstead can be identified by parallel rows of trees forming an alley (Figure 4.40).

Other outlying ruins include those associated with the Woodlot House (Figure 4.41) and Brison House. The Woodlot House site includes a possible privy or well pit. The ruins at both sites, located in wooded areas, were stabilized in the 1970s-1980s. Nevertheless, they are continuing to deteriorate. The stabilization of the above-ground ruins did not protect potential archeological resources at either location. Like the Woodlot and Brison ruins, the

---

<sup>52</sup>This plan is based on the interpretation of a number of sources held by HOFU including archeological reports by Edward Heite.

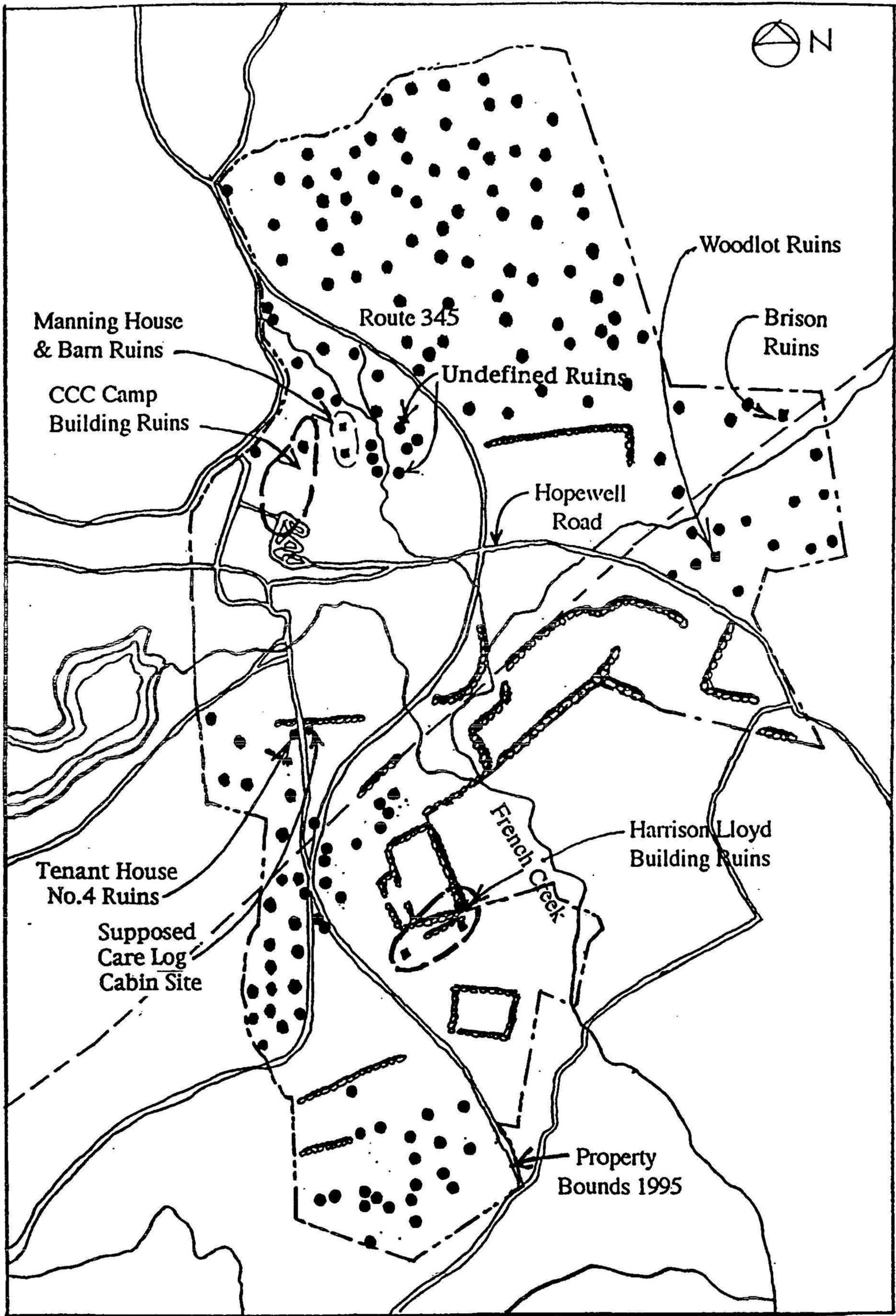


Figure 4.36. Archeological Sites & Stone walls.

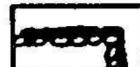
-  Charcoal Pits/  
Huts
-  Known Building  
Sites/Ruins
-  Stone Walls



Figure 4.37. Greenhouse Ruins, 1995. Menke & Menke photo.



Figure 4.38. School House Ruins, 1995. Menke & Menke photo.



Figure 4.39. Harrison Lloyd Farm; ruins of former barn, 1995. The end wall of one of several buildings visible in historic aerial photographs. Other archeological resources in the area include the house and blacksmith shop (72C) ruins, stone walls (73), a well, and several bank barn ruins. Menke & Menke photo.

Manning house and barn ruins occupy a wooded section north of the NPS maintenance complex. As with all archeological sites located in the woods, these are difficult to identify due to encroaching vegetation.

The present site boundaries exclude most of the woodlands associated with the furnace from this period. Consequently, the majority of the charcoal hearths and colliers' huts associated with the furnace would have been located off the present site in these woodlands, which now comprise French Creek State Park. A 1936 Forest Type Study and the current Orienteering Map confirm this conclusion. Nevertheless, a number of hearths and huts, of unknown dates, have been identified within the present site boundaries. Mikan and Abrams "located 105 previously unidentified charcoal hearths and the remains of 13 collier's huts in wooded portions of the site."<sup>53</sup> These hearths and huts represent significant archeological resources. They are intimately associated with the iron-making operation, having been used to produce the charcoal that fueled the furnace.

Additional archeological resources that date from this period include fence lines within the core village and the outlying areas. In many instance these resources would leave only an ephemeral trace, possibly posthole molds. Their identification might provide a fuller picture of land divisions and uses at Hopewell. Likewise, archeology may prove able to locate and identify traces of the charcoal roads that ran between the furnace and the clusters of charcoal hearths in the woodlands. These rough, temporary roads are not indicated on historic maps. Archeology may prove the only means to conclusively identify their locations and routes.

---

<sup>53</sup> Mikan and Abrams, 1995, I. These are shown on text figures in the report (Figures 2-5) and reproduced at different scales and keyed to an overall plan (Figure 1).



Figure 4.40. Possible Harrison Lloyd farm lane with an alley of trees, 1995. Menke & Menke photo.



Figure 4.41. Woodlot House ruins in enveloping vegetation, 1995. Menke & Menke photo.

### *1846-1883: Decline*

In the core village the locations of several archeological sites from this period are known. The Charcoal Kiln ruins, constructed ca. 1849 were later converted to a residence.<sup>54</sup> They are clearly evident as foundation ruins. The nearby Anthracite Furnace was constructed in 1853 and used until circa 1857. The Ore Roaster, built in 1882, was covered by the 1932 realignment of the Birdsboro-Warwick Road. Site rehabilitation subsequently exposed the Ore Roaster's foundation.

Just south of the Village Barn, stone walls for a barn-related structure are evident. These are presumably from a stable depicted on an 1879 fire insurance map. Tenant House No. 4, constructed as a store and residence on the west side Birdsboro-Warwick Road in 1869, burned in 1891. The ruins were stabilized in the 1970s-1980s, but are not part of the village tour. With charcoaling continuing throughout this period, the establishment and relocation of hearths and huts would most likely have continued.

An 1879 fire insurance map, unknown prior to work on the present study, depicts a large barn on the north side of Reading-Valley Forge Road, east of the Ironmaster's House (see Figure 4.42). Measuring approximately 40 feet by 70-1/2 feet, this major structure is not mentioned in furnace records. The barn was destroyed prior to federal acquisition of the site. Archeological investigations may be able to locate the remains of this building and provide information regarding its function.<sup>55</sup>

### *1883-1935: Shutdown and Survival*

In the core village, several structures, including a silo and wagon shed, were located adjacent to the Village Barn. These structures were probably associated with the dairy operation established during this period.

In the woodland areas, charcoaling continued throughout this period, albeit on a smaller scale than during the furnace's operation. It is not known where charcoal hearths from this period were located.

### *1935-1938: The Civilian Conservation Corps*

The location of CCC Camp SP-7, in the meadow north of the maintenance complex, is well documented. Numerous chicken coops and other small farm structures located near the Ironmaster's House and south of Tenant House No. 3, none of which are extant, also dated from this period. In the Baptism Creek area, some of the trails developed by the CCC have become traces and CCC-constructed fireplaces are presently in ruins.

### *1938-Present: The National Park Service*

Because the National Park Service's tenancy is relatively recent, few potential archeological sites date from this period. A 1948 Quonset hut and a large shed, perhaps erected at about the same date, are evident in period photographs south of Tenant House No. 3.

---

<sup>54</sup> Apple, "Documentation," II-99.

<sup>55</sup> Insurance Company of North America, "Survey of the Property of Edward S. Buckley and Maria L. Clingan," 1879.

Adapted from an 1879 Insurance Company of America insurance site sketch that accompanied a set of insurance policies issued to Edward S. Buckley and Maria T. Clingan. This rough drawing has been modified for purposes of this report (shadows added to buildings and descriptive text) to show existing and missing site features. Note in particular the large barn, stable, and Spout Run Reservoir with piping. None of these features survive at the Hopewell Furnace. (Not to scale; however the general relationships are accurate. North is up.)

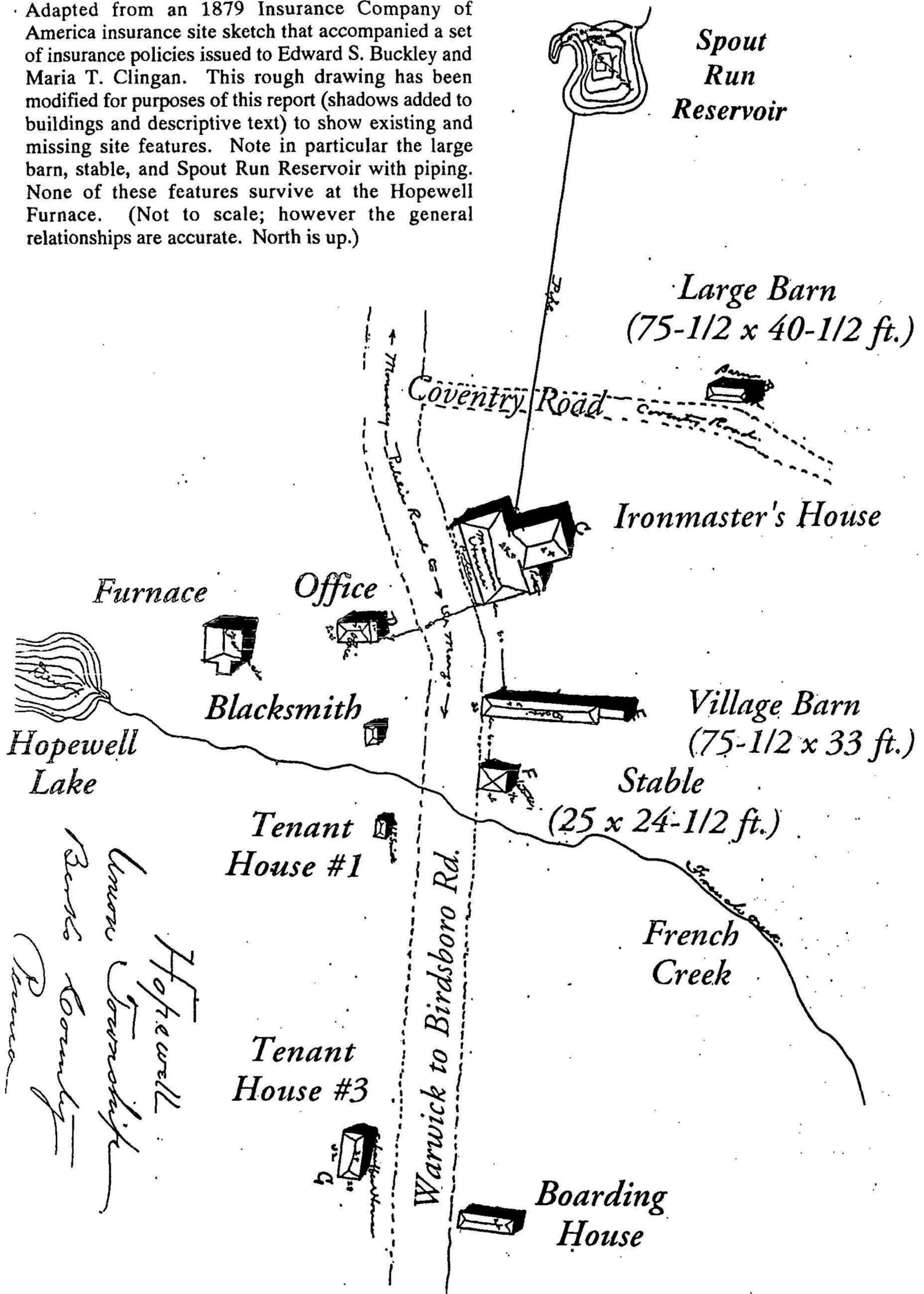


Figure 4.42. Insurance Company sketch of Hopewell Village, 1879

## *Archeological Sites Summary*

The lack of conclusive documentary evidence regarding the location of many known features at Hopewell Furnace creates an opportunity for archeologists to make significant contributions to our understanding of the site. The highly successful investigations conducted by the National Park Service in association with the rehabilitation and reconstruction of specific buildings confirms this conclusion. The present plan of the Cast House is almost entirely based upon archeological evidence.

The furnace records clearly indicate the presence of numerous buildings and structures, such as tenant houses, that are no longer extant, but the records do not provide accurate locational data for these resources. Archeological surveys and investigations might provide firm evidence as to the number and location of non-extant buildings within the core village and in outlying areas of the site. This information would not only identify significant cultural resources worthy of preservation, but would also furnish new data to enrich interpretive and educational programs. Our understanding of the pre-twentieth century history of Hopewell Furnace would be greatly enhanced.

The outlying areas of the site also contain important archeological resources. The locations of outlying house and farm sites are well documented, but archeological investigations can determine the boundaries of these resources and provide a fuller understanding of the scope and extent of these operations.

Charcoal hearths and colliers' huts have been located in recent archeological surveys. More intensive investigations of a sample of these resources may provide information on changes in charcoaling methods over time.

The most significant, and extensive, twentieth century archeological site at Hopewell Furnace is the former site of CCC Camp SP-7. An archeological survey of this area would determine the nature and extent of subsurface resources. Since the camp consisted of temporary buildings designed to be removed or destroyed upon the closure of the camp, it is possible that no significant building remains survive.

### Small-Scale Elements

#### *1770-1800: Settlement and Development*

From the earliest days of settlement at Hopewell outbuildings existed in locations where people worked and lived. A privy would have been located near each house, whether a log tenant house or the Ironmaster's House. These simple wood buildings would be relocated occasionally, when the pits beneath them filled. A privy was probably also placed near the furnace for use by the workers. It is possible that during this period the landscape evidenced other small outbuildings, such as barns or chicken coops. These may have been temporary in nature or constructed from found or left over building materials. It is known that a cider press existed at the site, since it was repaired in 1804.

Slag piles would have existed in the area immediately surrounding the furnace from the earliest days of operation. These piles obviously became larger the longer the furnace operated. It appears that slag was used from an early period to fill low marshy areas of the site. Ultimately the slag piles altered the course of French Creek. Although it is likely that the area west of the furnace was initially utilized as a dumping ground, the dimensions of the slag piles are not known for any given time period. It is also probable that piles of iron ore and limestone stood

adjacent to the charcoal house (which may have been a temporary shelter during the early years of furnace operation).

Without documentation, it is not possible to determine the numerous small scale elements present in the early years of settlement at Hopewell. Simple wood hitching posts would have been required at the Office & Store and the Ironmaster's House. Cords of wood for heating and cooking would have been stacked near all residences, while farm implements, such as wheelbarrows or hoes might have been left near vegetable gardens or stored within sheds. The furnace and blacksmith shop may have also had piles of rejected products or implements left outside.

Just as the village residences had outbuildings, the farmsteads adjacent to the furnace property also had privies, barns, and other small structures. For example, by 1798, Thomas Lloyd had erected a barn and constructed a stone springhouse near his residence (Figure 4.43). Nearby, at Bethesda Church, small-scale elements included gravestones in the cemetery (Figure 4.44) and a carriage house erected soon after the church's construction in 1782.



Figure 4.43. Thomas Lloyd House, Barn, and Springhouse, 1995. Menke & Menke photo.

#### *1800-1845: Growth and Prosperity*

The increased number of outbuildings, tools, equipment, and other small scale site elements present during this period reflected the growth and prosperity of the furnace. All buildings continued to have privies, which were replaced or relocated as necessary. Temporary or poorly constructed outbuildings dating from the earliest years may have been replaced with more permanent or larger barns, chicken coops, corn cribs, or sheds. New barns and outbuildings were likely built when new house construction occurred. A water pump may have been installed at the Boarding House during this period.



Figure 4.44. Gravestones at Bethesda Church cemetery, 1995. Menke & Menke photo.

Boardwalks and footbridges likely existed in the low marshy areas of the village from the first period of settlement. Tenant Houses No. 1 and No. 2, constructed during this period, had wood walks leading to the Birdsboro-Warwick Road, with footbridges over the ditch that ran along the west side of the road. These bridges may have simply been wood planks.

The grounds surrounding the Ironmaster's House contained numerous outbuildings and garden features constructed during this period. The residence's privy dated from the earliest period of occupation, while a Springhouse provided water to the Ironmaster's House by 1816. Bake ovens appeared by 1823 and a smokehouse by 1828, while the Greenhouse was probably constructed in 1829. Soon thereafter, sets of stone stairs and garden terraces were linked by walkways to the house; and the 1834 ice house, a gardener's tool house, and other ancillary outbuildings were completed.

Existing independent farms within the Hopewell area, such as the Thomas Lloyd farm, expanded operations during this period, resulting in the construction of new and replacement outbuildings. For example, the Harrison Lloyd farmstead had numerous outbuildings probably constructed soon after the house in the early 1800s. These included a blacksmith shop, which may date from this period. Other residences likely constructed during this period included the Woodlot and Brison Houses. It is assumed that all of these residences had a complement of outbuildings.

Ongoing agricultural activities at Hopewell likely led to the acquisition of new and improved farm tools. Some implements or tools noted in furnace records during this period included a horse drawn rake (1819), a winnowing mill, a revolving rake, and an improved plow (1827).

As with the earlier period, the village landscape probably continued to incorporate many small site elements: wood piles, boardwalks, clothes drying on fence rails or drying racks, hitching

posts, wagons, wheelbarrows, and a host of other miscellaneous items. The slag piles all increased in size, and new piles were probably begun. Slag may have been used to surface roads and fill marshy areas. The documentary records are largely silent on this matter. Archeological investigations may be able to delineate the various uses of slag at the site.

With new construction came new site elements. A cupola was constructed in 1816, possibly west of the furnace near the West Head Race. The area around the Carpenter's Shop probably included periodic stacks of lumber and scrap piles. Wagon scales along the Birdsboro-Warwick Road, between the Village Barn and the Furnace, may have existed during this period. A bull ring, used to tie off cattle for slaughtering, is reported to have existed near the southwest corner of the Office & Store. Archeological investigations, however, failed to locate this feature. A bake oven was probably built in conjunction with the construction of the Boarding House.<sup>56</sup> Bee hives are reported to have stood in the Ironmaster's House new terraced gardens.

### *1846-1883: Decline*

With the decline in furnace and village activity came a corresponding decline in the condition of previously erected outbuildings and small-scale site elements. After completion of a new school house outside the core village, the old school on the 1809 Road was abandoned. Its privy likely also fell into disrepair and vanished, as did other structures or outbuildings that were no longer used. However, if an outbuilding remained in use it was likely replaced or repaired. For example, a new smokehouse was built ca. 1867 on the Ironmaster's House grounds. When the Ironmaster's House received indoor plumbing (an upstairs toilet was added in the 1870s), the double privy on the hillside was likely retained for use by servants.

Although tenant houses, particularly any log buildings, probably began to disappear during this period, a number of new structures appeared in the village. A barn was constructed behind Tenant House No. 3 in the 1860s. The Charcoal Kiln, built circa 1849, was converted for use as a residence before 1870, probably with a privy and a nearby fenced vegetable garden. Tenant House No. 4, also known as the Boone house and store, was built in 1869. This dwelling also likely had a privy, fenced garden, and perhaps other outbuildings. After the house burned in 1893 any associated outbuildings or site elements probably fell into disrepair and disappeared.

With iron making and farming continuing throughout this period, the landscape would have continued to contain many of the previously described industrial and farm implements and machines. Records indicate the introduction of a threshing machine at the site in 1849. The Houck drawing of Hopewell includes: representations of wheelbarrows with ore; boxes for limestone; a large cart for cinders; tools to cull the furnace (pull hook and ringer); a tool to make the pig bed; a clay box; a clock; a water bucket; and a coal or charcoal car. Houck also indicates that a wagon house and corn crib were located near the village barn.

### *1883-1935: Shutdown and Survival*

After the furnace ceased operations, it is likely that the abandonment and disappearance of small barns, corn cribs, chicken coops, privies, fenced vegetable gardens, and other small-scale elements associated with abandoned Tenant Houses and other buildings accelerated. The Nathan Care Log House and its associated outbuildings were removed ca. 1900 so that the site could be used for agriculture. It is important to note, however, that ca. 1935 maps and

---

<sup>56</sup> Apple, "Documentation," II-147.

photographs indicate the continued presence of a number of small-scale elements, including a hitching post at the foot of the Ironmaster's House south stairs, privies of probable twentieth century origin and location at each Tenant House and the Boarding House, a boardwalk, but no footbridge, at Tenant House No. 3, and a well with a hand pump of indeterminate age at the Boarding House (Figure 4.45).

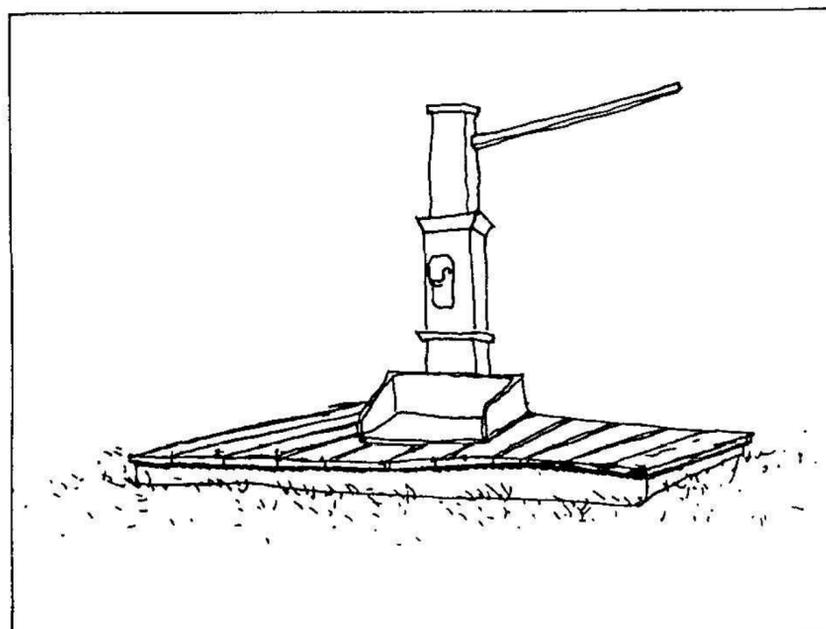


Figure 4.45. Water pump adjacent to Boarding House, ca. 1935. Drawn from May 1995 photograph of ca. 1935 photo filed in HOFU archive.

Within the furnace complex, any remaining ore or pig iron was removed and sold during this period. Furnace related equipment, tools, wagons, and other gear with a market value were probably disposed of early in the shutdown period, while the expansive slag piles that remained after decades of operation may have been partially used in the 1932 realignment of the Birdsboro-Warwick Road. Slag piles were noted west, southwest, and east, across the road from the furnace, on 1930s survey maps. Another small pile was located in the woods north of the 1809 Road.

Various site elements from previous periods were noted on 1930s plans. Within the Ironmaster's House grounds, the ice house, terrace steps, privy, greenhouse, terrace walls, and gardener's tool shed survived into this period only as ruins. Plans indicate the continued existence of the Springhouse and Bake Ovens, but the Smoke House apparently did not survive into this period. In the furnace area, the scales survived east of the realigned Birdsboro-Warwick Road. Plans indicate a well near the ruins of Tenant House No. 4.

The use of the Ironmaster's House as a summer house, and the development of the property as a dairy farm, introduced new small-scale landscape elements. The Ironmaster's House grounds continued to be maintained. In 1941 Mary Krewson remembered many small scale site elements in this area, including a rustic lattice garden seat covered with ivy, trumpet creeper vines on arbors, and grapes on an arbor.<sup>57</sup> Other elements may have been introduced into the landscape in the Tenant House area during this period, such as a grape arbor at the rear of Tenant House No. 2 (Figure 4.46) and the trellis structures at Tenant House No. 3 (Figure 4.47).

---

<sup>57</sup> This and other information regarding the mansion area gardens are based upon on a drawing by Dennis C. Kurjack, titled "Statistical Data Base Plan for Restoration of Mansion Gardens." On file at HOFU archive.

Figure 4.46. Grape Arbor seen in ca. 1935 photographs behind Tenant House No. 2. Drawn from 1995 photos of a ca. 1935 photo filed in HOFU archive.

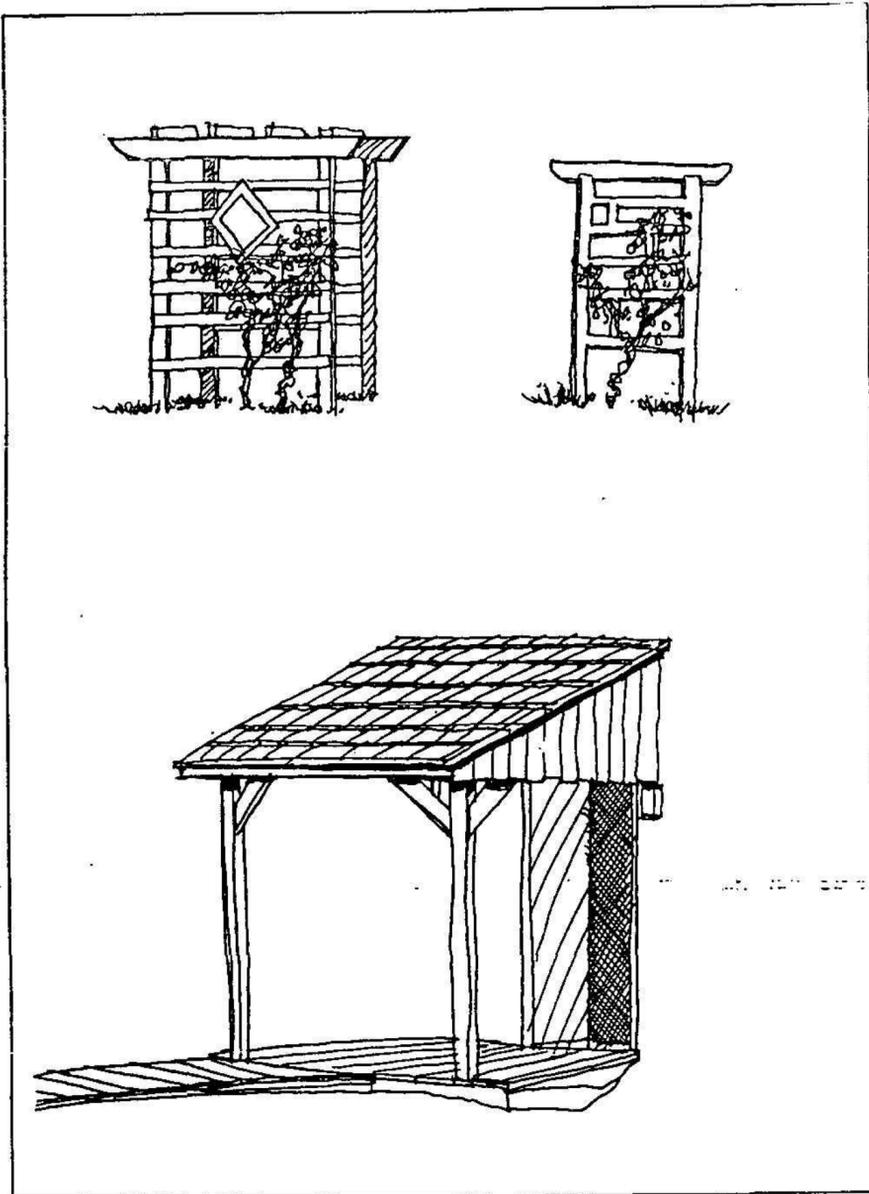
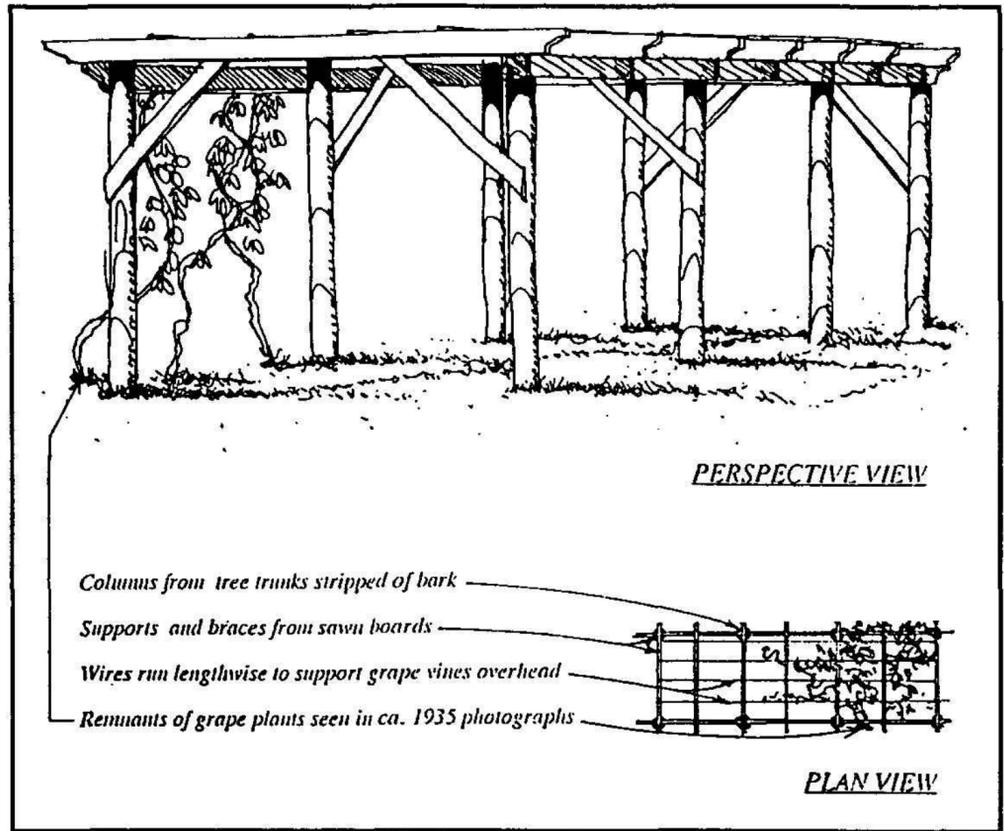


Figure 4.47. Three small scale site elements from the Tenant House area. Top, trellis/arbor and trellis seen in ca. 1935-1940 photographs adjacent to Tenant House No. 3. Bottom, wood walkway leading to a wood porch at Tenant House No. 1. Drawn from 1995 photos of historic photos filed in HOFU archive.

The dairy operation also produced new site elements. A concrete watering trough was constructed in the barn yard and a silo was built at the southeast corner of the Village Barn. A wagon shed, measuring approximately 20 feet by 30 feet, was constructed southwest of the barn. Other small outbuildings, such as a chicken house, a hog shed, and other sheds may have been located near the Ironmaster's House or the Village Barn, but these remain undocumented. In the 1930s, only the foundations remained from the nineteenth century stable located slightly southeast of the barn in the yard area.

Other minor landscape elements appeared and disappeared during this period. At the turn of the century, and clearly shown in village photographs dating from 1914, telephone poles lined the east side of Birdsboro-Warwick Road. A grape arbor is evident in photographs dating from the 1930s behind Tenant House No. 2.

#### *1935-1938: The Civilian Conservation Corps*

When the federal government acquired the property in the 1930s, numerous outbuildings and site elements were in deteriorated or ruinous condition. Plans and existing condition photographs from this period provide some of the best documentation of small-scale site elements (Figure 4.48).



Figure 4.48. Ironmaster's terrace garden steps in ruins, 1936. HOFU archive photo.

The CCC was responsible for the construction of several outbuildings within the core village. An approximately 10-foot square corn crib was erected just west of the Bake Ovens. A 10-foot by 40-foot chicken house and a small hog pen were built south of the Springhouse. A new corn crib was constructed on the site of the earlier wagon shed, southwest of the barn, and a temporary plank walk was used to reach the lower barn level. A privy just south of the Charcoal House may also date from this period. A temporary CCC blacksmith shop, measuring about 40 feet by 20 feet, was located just west of the Charcoal House by 1935. The blacksmith shop was indeed temporary, as a "truck road" is shown across its location on a 1937-1938 plan. On the other hand, a few features in the barnyard area were probably extant when the CCC began work at the site, including a concrete watering trough located at the base of the former stable walls.

Eight chicken houses, varying in size from 20 feet by 80 feet to 10-foot square are noted on 1937-1938 survey drawings as of "recent" origin. These were located south of Tenant House No. 3 and to the rear of the ruins of Tenant House No. 4. Another small scale element that may have been relocated by the CCC were the telephone poles along the Birdsboro-Warwick Road. The new line came from the west, along the 1809 Road, then passed north through the woods from 400 to 800 feet west of the old alignment.

Even though the CCC was responsible for numerous changes in the small-scale elements within the core village, the primary focus of their construction activity was in the vicinity of the camp area known as SP-7. Constructed north of the village, the camp included a number of small outbuildings including; two latrines, a barber shop, a pump house, garages, and a flagpole. Other site elements that reflected the work and life of the camp may have included drying lines near the bath house, and buses, trucks, and other vehicles used to transport workers to the job site.

The CCC constructed the Baptism Creek Picnic Area northeast of PA Route 345 and Hopewell Road. Within this site, numerous small scale features were built near the 1936 Picnic Shelter. These included stone fireplaces, drinking fountains, pumps, footbridges, picnic tables, and latrines (Figure 4.49 and 4.50). Along the outlying trails CCC crews stripped the bark from logs and laid them at right angles to the trails to form steps or to divert water from the paths. Rustic steps are included on some outlying trails, such as along the Lenape Trail.

#### *1938-Present: The National Park Service*

During the 1940s a number of outbuildings at the site were photographed. South of Tenant House No. 3, near the former site of a series of chicken coops, it appears that a Quonset hut with a cupola was erected ca. 1948. In another photograph, a silo is visible, probably to the west of the Quonset hut. Another outbuilding visible in photographs, but not depicted on plans, is a shed in front of the barn associated with Tenant House No. 3. A smaller shed may be seen just south of Tenant House No. 1.<sup>58</sup> The origins of these sheds is unknown. At Tenant House No. 3, a pergola gate, a small arbor structure, and possibly a mailbox on a post were located in the front yard, reflecting the continued residential use of this building. All the small-scale structures, privies, and outbuildings visible in these photographs have been removed, possibly in conjunction with the 1960s rehabilitation of the Tenant Houses. The two surviving small-scale elements in the Tenant House area, the Boarding House pump and the barn east of Tenant House No. 3, were rehabilitated during this period. Recently, the National Park Service erected a pole shed structure north of the former site of Tenant House No. 4.

---

<sup>58</sup> Untitled Photograph No. 2210, HOFU archive photo.

The National Park Service has restored or reconstructed several of Hopewell's outbuildings and site features. The Bake Ovens, Springhouse, and Bethesda Church carriage shed were restored in 1955. The Ironmaster's House garden steps and terrace walls have been partially rehabilitated. The Smoke House was reconstructed. Slag piles that had been previously removed or reduced in size were reconstructed ca. 1957 with slag from another furnace site. At present the slag piles are partially covered with vegetation, making them difficult to identify for the casual visitor.



Figure 4.49. Rustic Bridge at the Baptism Creek Picnic Area, north of Hopewell Road. The stone footing dates from ca. 1940, however, the wood bridge is more recent. Menke & Menke photo, 1995.

The National Park Service removed many outbuildings and small-scale elements because of their condition or lack of clear associations with the period of interpretation. These included corn cribs, privies, silos, chicken houses, and wagon scales (Figure 4.51). Documentary evidence is inadequate to evaluate the accuracy of location or appearance of the chicken house and hog pen presently located south of the Springhouse.

Outside the core village, barns dating from earlier periods are extant at the Church, Nathan Care, and Thomas Lloyd farmsteads. However, the use of these clusters as staff residences has necessarily introduced modern site elements into these settings; such as cars, mailboxes, and garages.

Some outlying structures in the Hopewell landscape disappeared or were restored during this period. The Harrison Lloyd house and its outbuildings were demolished in 1964. The Bethesda Church Carriage Shed was restored in 1955, while the church's privy was extensively repaired in 1971.<sup>59</sup> Nearby, in the Baptism Creek Picnic area, some CCC era site elements are in deteriorated condition and require maintenance or rehabilitation. The CCC

<sup>59</sup> Jacox, *National Register Nomination*, 7:8.

Picnic Shelter (No. 122) received a new roof in 1995. Throughout the outlying areas there are a few signs, such as those at Bethesda Church and the East Head Race near Baptism Creek, that identify historic site elements. However, most areas lack interpretive visitor information or facilities that connect site elements to the history of the property.



Figure 4.50. Drinking fountain and fireplace site elements dating from ca. 1940 at the Baptism Creek Picnic Area north of Hopewell Road. Menke & Menke photo, 1995.

The National Park Service erected a number of small scale elements to serve interpretive or functional purposes. Before construction of the Visitor Center, in 1959, a visitor shelter was located at the site. This shelter was relocated to a spot near the School House ruin, and was removed entirely in 1972. The NPS has placed signs throughout the core village to orient and guide visitors, beginning with an informational kiosk at the visitor parking area and continuing with interpretive signage throughout the industrial and village portions of the site. These are usually associated with site features, such as the anthracite furnace ruins. A reconstructed charcoal pit west of the anthracite furnace, represents the only interpretive element at Hopewell Furnace associated with the historic charcoaling process. The reconstruction is conveniently located for the visitor, but is in a historically inappropriate setting.

A number of site furnishings and elements reflect the National Park Service's need to supply visitor services and facilities. Functional site elements include picnic tables near the parking lot, wood benches, drinking fountains, trash receptacles, a metal bike rack, a flagpole, and directional and regulatory signage. Steps of exposed aggregate are located near the Visitor Center. Within the interpreted area paths are concrete, cinders, or slag. Site lighting is unobtrusive.

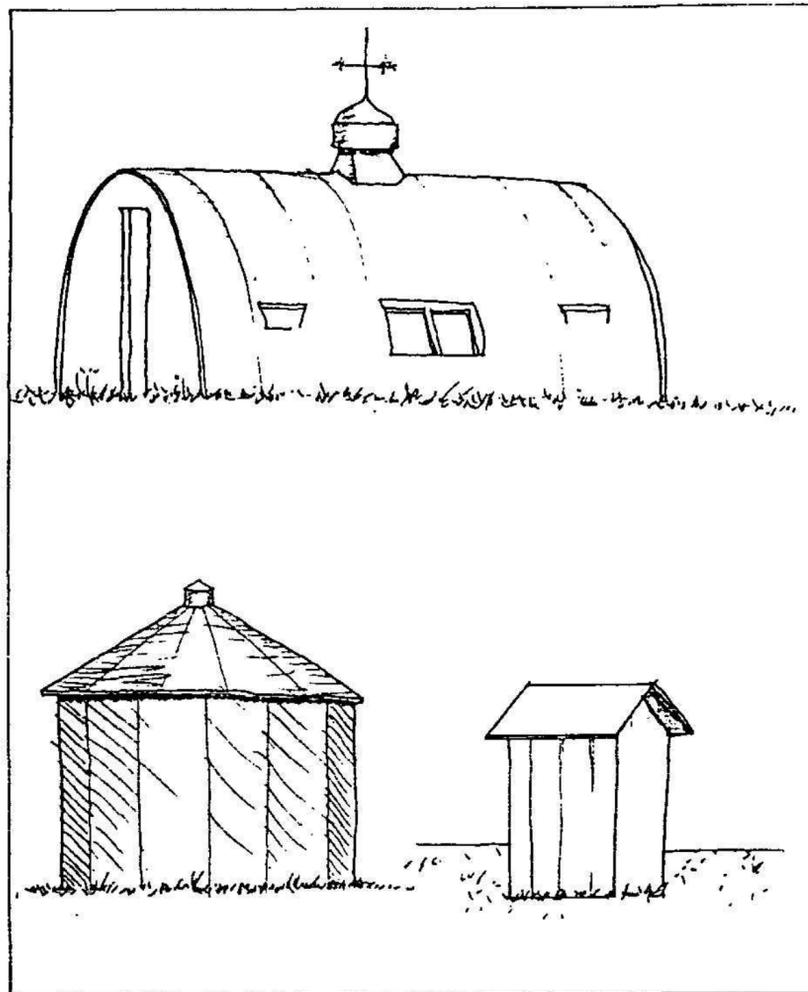
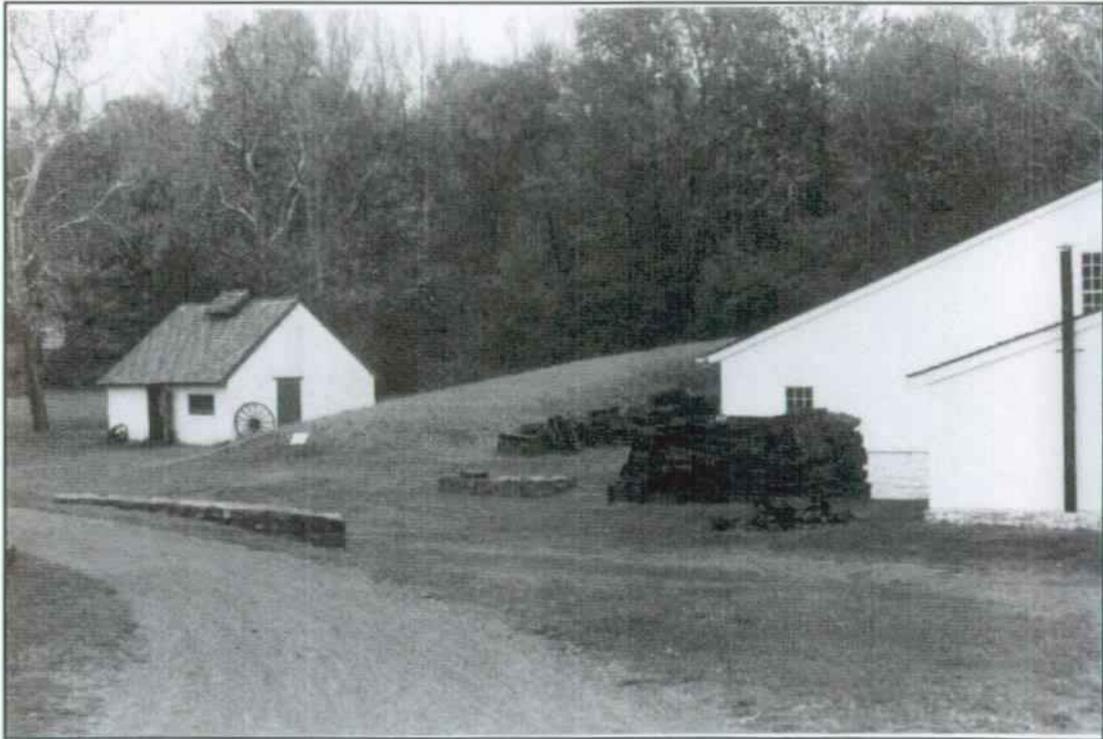


Figure 4.51. Three outbuildings in the Tenant House area, ca. 1935. Above, Quonset hut near Tenant House No. 3; below left, silo near Tenant House No. 3; below right, outhouse behind Tenant House No. 2. Drawn from historic photos filed in HOFU archive.

Within the core village, the National Park Service has attempted to introduce some small-scale site elements as interpretive displays. These include empty hog and chicken pens; piles of wood, iron ore, and limestone; wheel barrows, a wagon wheel, and some rejected iron castings (Figures 4.52 and 4.53). Despite these displays, the core village does not resemble a dynamic, vibrant community where people lived and worked. Many site elements are missing or represented by a single example. Hitching posts and other elements relating to the use of horses and other animals are missing. Likewise, the lack of outbuildings, privies, rain barrels, clothes lines, fenced gardens, and other elements associated with life and work at the furnace is apparent.



Figures 4.52 & 4.53. Top, East Head Race sign near Baptism Creek, 1995. Bottom, stacks of iron, grass-covered slag piles, molding frames, and a wagon wheel near the furnace, 1995. Menke & Menke photos.

Without these small-scale elements; the core village resembles a picturesque, pastoral estate, rather than a vital industrial and agricultural village. Hopewell Village would have been a cluttered, active, dirty landscape; today it is clean; almost sterile. In the adjacent farmsteads and outlying woodlands, the uncluttered landscape mirrors its current rural use.

### *Small-Scale Elements Summary*

Few small-scale site elements are extant from any period in the furnace's history. The general lack of privies, outbuildings, and the general paraphernalia of everyday life contributes greatly to the present overly pastoral, picturesque quality of the site. Reintroducing small-scale elements into the landscape will aid in the interpretation of the site as a living, dynamic community. However, it must be realized that the lack of historical evidence regarding the location and appearance of many small-scale elements necessitates that they be treated as interpretive exhibits, rather than as historic artifacts.

Small-scale site elements include outbuildings, sheds, privies, arbors, rain barrels, clothes lines, fenced gardens and the host of other items that enabled people to live and work at Hopewell Furnace. The few displays presently extant are not sufficient to convey the extent of residential and industrial activity at the site. The present appearance of the slag piles, partially obscured by grass and vegetation, is indicative of the site. During the period of the furnace's operation these were active industrial waste dumps. To permit vegetation to veil these features creates a landscape feature that never existed.

## **EVALUATION OF SIGNIFICANCE AND INTEGRITY**

### Statement of Significance

Hopewell Furnace National Historic Site is significant under National Register of Historic Places criteria A, B, C, and D, as defined in 36 CFR 60.4. Hopewell Furnace National Historic Site is associated with "events that have made a significant contribution to the broad patterns of our history."<sup>60</sup> These events include the American Revolution; the rise of Pennsylvania's charcoal iron industry, a significant example of early industrial enterprise closely associated with the onset of the Industrial Revolution in the United States; the agricultural development of the Pennsylvania Piedmont, one of the nation's richest agricultural areas; and the evolution of the federal government's role in the preservation of the nation's historic resources and the provision of recreational areas for its citizens.

Hopewell Furnace has significant associations with the history of the American Revolution. The furnace's original owner, Mark Bird, produced cannon, shot, and shell for the Continental Army and served as a colonel in the Berks County militia. Before the start of hostilities, Bird was a member of local Committees of Observation and Correspondence.

Hopewell's associations with the charcoal iron industry extend over more than a century of time, from the establishment of the furnace in the 1770s until the cessation of smelting operations in 1883. This is the primary period of significance for the property. Starting in the early Colonial period, and continuing through the mid-nineteenth century, charcoal iron furnaces produced virtually all of Pennsylvania's and most of the nation's supply of iron. The process used to produce iron changed little over a period of nearly one hundred years, until the late-1830s. After this date other methods of iron production became increasingly important.

---

<sup>60</sup> 36 CFR 60.4(a)

Cold-blast charcoal furnaces continued to operate until the last quarter of the nineteenth century, but their numbers dwindled after 1850.

Hopewell Furnace National Historic Site is nationally significant for its long history as a charcoal-fueled ironworks. Hopewell survived longer than many of Pennsylvania's charcoal furnaces. While not the oldest, largest, or longest operating iron furnace in Pennsylvania, Hopewell is representative of the eighteenth and nineteenth century charcoal furnaces that provided colonial America and the new republic with much of its supply of iron. Consequently, Hopewell Furnace National Historic Site has national significance as an industrial site representative of a technology and process important in the economic development of the United States and as a rare example of the industrial villages that surrounded the often isolated and remote iron furnaces.

In addition to its industrial activities, Hopewell Furnace included a considerable agricultural operation. The Hopewell Furnace property included agricultural fields, pastures, orchards, and vegetable gardens. These provided foodstuffs for the owners, workers, and animals who resided in the village and reduced the need to purchase food from outside sources. The agricultural operations engaged in at Hopewell are typical of those engaged in by local farmers. Consequently, Hopewell Furnace National Historic Site may be considered locally significant for its associations with local farming practices, and as an example of the efforts of iron furnace operators to achieve agricultural self-sufficiency.

As the National Park Service's first unit focused upon the industrial history of the nation, Hopewell is nationally significant to the history of the historic preservation movement in the United States, and as an early example of the National Park Service's efforts to interpret and display the industrial and social history of the United States. Hopewell Furnace is locally significant for its associations with the Civilian Conservation Corps CCC, a major New Deal employment program. The CCC stabilized the furnace stack, cleaned the water wheel pit, recorded historic buildings, and conducted the first archeological investigations at the site. The CCC also developed roads, hiking and bridle trails, and constructed a picnic area in the vicinity of Baptism Creek. This work was conducted as part of the larger effort to develop the entire furnace property as the French Creek Recreation Demonstration Area (RDA). The RDA consisted of group camps, picnic areas, lakeside beach areas, and other developments intended to provide recreational opportunities for urban residents. Hopewell Furnace was an integral part of the French Creek RDA and, as such, is associated with this important federal effort to develop recreational facilities for the public.

Hopewell Furnace National Historic Site is associated with "the lives of persons significant in our past."<sup>61</sup> As noted above, the furnace's original owner, Mark Bird, produced cannon, shot, and shell for the Continental Army and served as a colonel in the Berks County militia. Bird also served as a member of local Committees of Observation and Correspondence. Subsequent owners of the furnace, including various members of the Buckley and Brooke families, were locally significant because of their ownership of a major industrial enterprise that provided employment to a considerable number of local residents.

Hopewell Furnace National Historic Site embodies "the distinctive characteristics of a type, period, or method of construction."<sup>62</sup> A number of extant buildings and structures date from the late-eighteenth and early-nineteenth century and embody the distinctive characteristics of

---

<sup>61</sup> 36 CFR 60.4(b)

<sup>62</sup> 36 CFR 60.4.

local vernacular style construction. It is important to note, however, that major buildings at the site, including the Cast House and Barn, are reconstructions, not historic buildings.

Hopewell Furnace National Historic Site has "yielded, [and] may be likely to yield, information important in prehistory or history."<sup>63</sup> Archeological investigations dating back to the 1930s have yielded significant information about the methods and practices of charcoal iron furnaces. Additional archeological investigations have the potential to produce significant information pertaining to the lifestyles of industrial workers and owners at an iron plantation. Much of the information that archeological investigations at Hopewell Furnace may provide is not available through research in documentary source materials.

#### Evaluation of Site Integrity

The National Register of Historic Places criteria for evaluation state that, in addition to the quality of significance, a resource must possess "integrity of location, design, setting, materials, workmanship, feeling, and association."<sup>64</sup> Hopewell Furnace National Historic Site retains a considerable degree of integrity in terms of the broad patterns that define its cultural landscape. However, examination of the detailed components of the landscape reveals a significantly diminished level of integrity. The appearance of the site differs considerably from its appearance during the mid-nineteenth century. The property is more wooded. The forested stands are older than during the period of the furnace's operation. Reforestation has obscured former agricultural fields and masked boundaries. Boundary demarcations, such as fences, are almost entirely modern. Many buildings and structures are missing, and several major buildings are reconstructions that lack historic integrity. Nevertheless, a holistic approach to the site is called for, given the size of the property, its numerous periods of significance, and the variety of activities that shaped the landscape over the past two hundred years. While various individual components of the resource lack integrity, as a totality the site retains integrity as a resource with a long history of industrial activity, a period of decline and abandonment, and a major effort to reconstruct and interpret colonial and early national period iron making.

The complexity of the site's history makes it difficult to assess integrity for any particular period. Evaluating integrity based upon a single historic period of significance represents an artificial effort to freeze time and deny the entire history of the resource. Indeed, the only quality of integrity that exists for every historic period is that of location. The location of the resource has remained the same throughout all periods of significance. For each individual period of significance qualities of design, setting, materials, workmanship, feeling, and association have been lost. Buildings have been demolished and constructed, roads have been introduced and paved, fields have given way to woods (and vice-versa), and the use of the site has changed dramatically. Despite these changes to the landscape, a careful examination of the cultural landscape characteristics defined in "National Register Bulletin 30: Guidelines for Evaluating and Documenting Rural Historic Landscapes," indicates that Hopewell Furnace National Historic Site retains a considerable degree of integrity, when evaluated as a resource with a long and dynamic history that incorporates landscape change.<sup>65</sup>

The land uses and activities at the site have obviously changed over the past two hundred years. Iron is no longer produced, many houses are no longer occupied, some fields are no longer planted, and woods are no longer logged. Nevertheless, the patterns of spatial

---

<sup>63</sup> 36 CFR 60.4(d)

<sup>64</sup> 36 CFR 60.4

<sup>65</sup> McClelland, et al., *National Register Bulletin 30, 3*.

organization and responses to natural features that resulted from these activities are clearly evident in the present landscape. The noise, heat, and dirt associated with iron making are gone, but the industrial core of the site is plainly evident. The furnace complex, with its cast house, charcoal house, charging bridge, wheel house and waterwheel, blacksmith shop, ore banks, and other elements appears visually distinct from the remainder of the site. Likewise, while most of the residences are no longer occupied, these areas of the site clearly reflect their residential use, with houses, gardens, barns, and other elements. The Ironmaster's House remains distinct from the remainder of the site behind its low garden wall and fences, while French Creek separates the residential village from the industrial core. The agricultural areas within the site also remain clearly defined and discernible in the pattern and location of streams, pastures, fields, fences and walls, barnyards and other elements. While the surrounding forests no longer display evidence of the massive wood cutting operations historically required to maintain the furnace's fuel supply, and while the chestnuts and hickories that historically comprised the woods have been replaced by maples and oaks, the hillsides remain forested and undeveloped, providing strikingly similar views from the village core of the nineteenth century.

Circulation patterns within the site remain largely identical to those established by 1825, when the last of the principal historic roads in the area was formally established. The only major change to the historic circulation pattern is the present PA Route 345, which loops around the village to the east and was constructed by the Civilian Conservation Corps (CCC) in the late 1930s. The principal access road to the Visitor Center is also non-historic, but roughly approximates the path of a historic road, while a series of minor service roads, largely located north of the Visitor Center, are essentially not visible to site visitors.

Boundary demarcations exist on two basic levels. Separations between field and forest constitute a basic, and highly visible, form of boundary demarcation. This distinction between furnace property and the property of surrounding landowners remains visible, although partially obscured by the reforestation of some agricultural lands, at the eastern and southern portions of the site. The removal of fences and the incorporation of separate tracts into a single parcel under common management also obscures historic boundaries. Boundary fences have been destroyed in several locations, particularly at the south end of the village core, where the CCC removed several stone walls that marked the limits of the furnace property. While remnant sections of stone walls date from the period of significance, most of the wood fencing within the property is of recent vintage and cannot be considered historic. Nevertheless, the demarcations between furnace property and the property of surrounding landowners remains roughly discernible, although these historic boundary distinctions are often overlooked by visitors.

As noted earlier, the basic composition of the woods surrounding the village core has changed from a chestnut-hickory forest to a maple-oak forest. Field investigations suggest that the site is significantly more wooded at present than it was during the heyday of furnace operations. The proportion of woods to fields has changed dramatically; several historic agricultural fields have become reforested since the 1930s, changing the vegetation in specific areas of the site. Additionally, fields historically planted with row crops are presently planted in hay. Remnants of the eighteenth and nineteenth century pattern of woodlands, agricultural fields, and pastures are evident, but the integrity of this landscape characteristic has been compromised. Within the core village a number of historic specimen trees and plantings survive. The basic pattern of vegetation, the mix of fields and forests, retains some degree of integrity, despite the encroachment of forests into fields and alterations to the specific composition of the vegetation. However, these patterns are threatened, as woods continue to advance into abandoned fields, obscuring boundaries and masking the agricultural aspects of the landscape.

The extant buildings, structures, and objects within the site retain a high degree of integrity. The National Park Service has maintained most of the historic buildings that were extant when it acquired the site in the 1930s, and has worked to accurately reconstruct significant elements of the site's built environment, most notably the Cast House. Many buildings and structures that existed during the nineteenth century are clearly missing from the site, which results in a landscape notably emptier or less occupied in appearance than existed during the primary period of interpretation. The National Park Service has wisely restricted new construction. Most large-scale new construction is located north of the Ironmaster's House. The Visitor Center is the non-historic building nearest the concentration of historic resources.

The cluster arrangement of the site retains a high degree of integrity. The core village remains clearly divided into an industrial area surrounding the furnace, residential areas focused upon the Ironmaster's House and garden and the Tenant Houses lining the village street, and agricultural areas associated with the barn and meadow.

In sum, Hopewell Furnace National Historic Site retains some integrity as a cultural landscape. The site's highest degree of integrity is associated with the broad patterns of the landscape, such as patterns of spatial organization, cluster arrangement, and land uses and activities. In many instances the detailed components of the landscape lack integrity. Nevertheless, given the long evolutionary history of the site, the basic patterns of Hopewell Furnace's significant cultural landscape remain discernible and may be interpreted for the public.

#### Contributing and Non-Contributing Resources

The significance and integrity of Hopewell Furnace National Historic Site are linked to the entire history of the site; however the period of the furnace's operation is clearly the primary period of significance. It is important to recognize that the site has evolved over more than two hundred years, and that it includes significant resources from all of its periods of significance. The role of the CCC should not be ignored, and the Baptism Creek Picnic Area should be recognized as a significant resource, not an intrusion into the landscape of the charcoal furnace. Nevertheless, the principal measure of significance and integrity must be with the furnace and its period of operation.

There are, however, a number of specific features that may be considered non-contributing elements of the cultural landscape. These include the Visitor Center and its associated parking lots, and the living quarters and maintenance buildings located north of the Visitor Center. Most of these buildings were constructed in the 1950s and 1960s under the auspices of Mission 66. Mission 66 had important impacts upon the historic resources within the village core; most notably the reconstruction of the Cast House, the realignment of Birdsboro-Warwick Road near the Office & Store, and the remarkable amount of historic and archeological research this work engendered. However, the buildings and structures constructed during Mission 66 that fulfill support and service functions cannot be considered to contribute to the site's cultural landscape.

The remainder of the resources at the site, the wooded hills, the fields and pastures, the roads and creeks, the sites of charcoal huts and hearths in the woods, and the buildings, structures, and objects within the village core and at outlying locations, all are contributing elements of Hopewell's cultural landscape.

### Recommendations for Further Research

It is clear that more tenant houses were associated with Hopewell Furnace than are presently extant or known. Archeological investigations along the 1809 Road might reveal the site of three houses supposedly located in this area. Likewise, additional archeological investigations within the village core, particularly in the area between Tenant House No. 1 and French Creek, might reveal additional house locations.

Nearly thirty years have elapsed since the last systematic and comprehensive examination of the original furnace records. A major reexamination of the records, collating the findings of previous researchers and comparing those findings to the original documents, might provide valuable new insights into the built environment and landscape. Likewise, there is a considerable need for documentary research and field investigations within French Creek State Park. Hopewell Furnace National Historic Site comprises only a small portion of the original furnace tract, most of which is now located within French Creek State Park. Documentary research and field investigations, possibly including archeological excavations, could provide heretofore unknown information about the role that this large tract of land played in the operation of the furnace. Were there houses and buildings located on this land? Where were they and what purpose did they serve? Where were charcoal hearths and colliers huts located? What do the spatial arrangements of these resources reveal about the charcoal process and the patterns of land use during the furnace period? Clearly, there remains much to be learned at Hopewell Furnace National Historic Site.

**5.0 TREATMENT  
ALTERNATIVES**



## 5.0 TREATMENT ALTERNATIVES AND RECOMMENDATIONS

Selection of a treatment for a cultural landscape determines the type and scope of work for each project, i.e., the extent of repair and replacement to historic features and materials. The type and scope of work, in turn, determines how the entire property will exist in time in relation to the user, viewer, or visitor. Decisions made at this step will determine how the history of the property will be perceived.

Although the treatments are interrelated, one primary treatment is usually selected for a property. The *Secretary of the Interior's Standards for Historic Preservation Projects* guide the treatment of historic properties and include four general types of treatment:

- preservation
- rehabilitation
- restoration
- reconstruction

Each of these treatments is different in type and degree of intervention, and in the goals planned for interpreting the cultural landscape. The key to choosing and implementing an appropriate overall strategy is understanding the significance, integrity, historic character, and character-defining features of the property before specific treatments are proposed. Careful selection and application of the right treatment can ensure that cultural landscapes are preserved as a physical record of history.

### PRESERVATION

Preservation calls for retaining, protecting, stabilizing, and maintaining the materials, features, and spaces that characterize a property. It places a high premium upon the retention of *all* historic fabric through conservation, maintenance, and repair. Under this treatment alternative the replacement of historic materials is to be as limited as possible. This "retain and repair" approach acknowledges a property's history in the broadest sense, including its growth, loss, and change over time. The purpose of this treatment is the retention of the property's existing form and materials, allowing interpretation of the evolution of the entire cultural landscape.

This treatment includes ongoing and cyclical maintenance activities, such as pruning or mowing, masonry cleaning and re-pointing, resurfacing paths or roads with appropriate materials, and removing volunteer or invasive plant material. In addition to ongoing maintenance projects, preservation may include the repair of existing historic materials and features, but does not allow for substantial replacement of vanished features.

- Preserve the historic character (continuum of the property's history).
- Stabilize, consolidate, and conserve existing historic materials.
- Replace minimum amount of fabric necessary and in kind (match materials).

It may be necessary to undertake initial or temporary measures of protection or stabilization for individual features before implementation of comprehensive treatment work. Protective measures guard the existing condition of a property, or its features, by preventing further deterioration, loss, or attack, or by shielding it from danger or injury. In landscapes, protection may include fencing or closing an area of the landscape to secure the habitat of a

rare or endangered species, as well as other actions required to prevent continued damage from human or natural causes such as vandalism, weather, and fire.

Stabilization secures the strength of a structurally unsafe, damaged, or deteriorated property or feature while retaining the essential form as it presently exists. This procedure is often used for buildings or landscape structures that are threatened with structural failure due to severe deterioration or damage. Stabilization may also be applied to individual trees that require cabling or staking due to structural weaknesses in the trunk or limbs resulting from pests, storm damage, or age. For entire cultural landscapes, stabilization may involve reinforcing earthen, water, or vegetative features after natural disasters such as earthquakes, hurricanes, or flooding.

A preservation treatment at Hopewell Furnace National Historic Site might include maintaining existing character-defining features by active preservation maintenance, fencing historic fields and garden areas to protect them from foraging animals, mowing fields at historically appropriate intervals, and replanting annual vegetation, on an appropriate maintenance schedule, with suitable plant materials. It would also entail recognition that the property has evolved to its present appearance over a period of more than two hundred years of occupation and use. All extant historic resources, including buildings, structures, and landscape features, would be recognized for the role that they played in the evolution of the Hopewell landscape.

## REHABILITATION

The goal of rehabilitation is also to retain the historic character of a property, while allowing for alterations and additions that are necessary for contemporary use. Rehabilitation emphasizes the retention and repair of historic materials, but more latitude is provided for replacement because it is assumed that the property is more deteriorated prior to work. Both preservation and rehabilitation focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character. Rehabilitation allows for improvements to a property that make possible an efficient contemporary use, while preserving those portions or features of the property that are significant to its historical or cultural values. The principals that apply to preservation also apply to rehabilitation; the entire history of the landscape is retained for interpretation.

In cultural landscapes, rehabilitation is a common treatment since it allows for changes necessary to satisfy present-day demands. For example, when a formerly private property is adapted for public use, it may require the addition of new features such as parking, visitor centers, and other public facilities. These new additions must be carefully designed and located so that the historic character of the property is retained, and the new design is compatible with and distinguishable from the historic features.

- Preserve the historic character (continuum of property's history).
- Do not make changes that falsify the historical development.
- Repair deteriorated features. Replace severely deteriorated features in kind.
- New additions and alterations should not destroy historic materials or character.
- New work should be differentiated from the old, yet compatible with it.

Rehabilitation treatments at Hopewell Furnace National Historic Site might include maintaining character-defining features through active preservation maintenance,

rehabilitating the east head race to historic period specifications in the vicinity of the mansion garden, rehabilitating fireplaces in the former CCC picnic area, repairing drainage ditches along historic roadways, repairing stone walls or fencing in kind, and clearing open fields that are evolving into second growth woodland. In essence a treatment based upon rehabilitation would preserve the historic character of the property while permitting limited intervention in order to augment and improve interpretive potentials throughout the property.

## **RESTORATION**

Restoration differs from preservation and rehabilitation. It focuses on the retention of materials from the most significant time in a property's history, while permitting removal of materials from other periods. This treatment is used to illustrate a narrow period in the landscape's history, not the whole history of the landscape's evolution. As a result, materials or features that relate to later or earlier periods of significance may be removed or substantially altered. Accordingly, restoration is a treatment that should only be considered when a specific time period is so significant in a landscape's history that it justifies removal or alteration of features or materials that would ordinarily be retained.

Although restoration may include substantial repairs to existing historic features, the overall goal is to depict the property as it appeared during its period of greatest significance. Since restoration may also require the replacement of missing features from an earlier period, substantial and thoroughly accurate documentation is a necessity. If the quality of the available documentation is not sufficient for the formulation of accurate, informed decisions about the construction of the property's features, then a restoration treatment approach should not be taken. Regardless, speculation and conjecture should be avoided.

Restoration may require replacing major features that have vanished from the cultural landscape over time, such as outbuildings, as well as vegetation features and plantings lost due to disease, age, or changes in landscape maintenance practices. It may include the removal of overgrown vegetation that obscures a historic feature such as a view or vista, or the replacement of hedges and screen plantings necessary to direct views as they existed historically. For restoration, like other treatments, the construction of features that were designed, but never built, is not considered appropriate.

- Remove features from other periods, but document them first.
- Stabilize, consolidate, and conserve features from the restoration period.
- Replace severely deteriorated features from the restoration period with matching features.
- Replace missing features from the restoration period based on documentation and physical evidence. Do not make changes that mix periods and falsify history.
- Do not execute a design that was never built.

Restoration treatments at Hopewell Furnace National Historic Site might include replanting the mansion garden, restoring the greenhouse and other garden outbuildings, removing trees and shrubs along roadways that did not exist historically, removing buildings dating outside the site's period of significance, such as the anthracite furnace, removing additions to the Ironmaster's Mansion that date from outside the selected period of significance, and widening charcoal paths that are currently trails.

## RECONSTRUCTION

Reconstruction establishes limited opportunities to re-create a non-surviving site, landscape, building, structure, or object in all new materials. Substantial documentation is required in order to avoid conjecture and to accurately replicate the materials, features, and details of the historic period. Reconstructions should only be undertaken when compelling historical evidence is found, and when no other similar extant property exists, since the reconstruction simulates a historic landscape using new construction. Archeological evidence alone may not be sufficient to generate an accurate reconstruction because it may not provide sufficient information about the materials or details of the landscape. Again, designs that were never undertaken historically should not be newly constructed.

Reconstruction may require the replication of the organization or arrangement of the landscape as a whole, as well as of the individual features and materials that comprised the landscape during the period depicted by the reconstruction. This includes construction of landscape structures such as outbuildings, walls, and fences, and other features such as paths and plantings. Careful planning should consider the age and arrangement of vegetation, allowing for growth and maintenance to continue an appearance that replicates the reconstruction period. It may also require the removal of other features that were built after the specific historic period depicted in the reconstruction. This may be the case in landscapes that have a very long period of significance, or in cases where the property has undergone substantial changes over time.

- Do not reconstruct vanished portions of a property unless the reconstruction is essential to the public understanding.
- Reconstruct based on documentary and physical evidence.
- Precede reconstruction with thorough archeological investigation.
- Preserve any remaining historic features.
- Re-create the appearance of the property as a contemporary re-creation.
- Do not execute a design that was never built.

Reconstruction treatments at Hopewell Furnace National Historic Site might include reconstructing the wheelwright shop, archeological investigations to locate and determine the appearance of non-extant tenant houses, and the subsequent reconstruction of those houses, and reconstruction of one or several charcoal hearths in known historic locations.

\* \* \*

Many factors influence what type of treatment work is undertaken. These include the physical condition and historical significance of the property, as well as educational or programmatic objectives, maintenance considerations, contemporary or future needs, and funding.

The implementation of physical work is undertaken once an overall treatment objective has been selected. This may require a detailed evaluation of the condition of individual spaces, features, and materials necessary to determine individual treatment needs and potentials. The result of this analysis will lead to a comprehensive plan for retention, repair, or updating of the landscape, including design and construction specifications.

Ongoing maintenance and management are necessary regardless of the treatment objective. Due to the dynamic nature of plant material, a plan for ongoing maintenance should address periodic replacement of diseased, deteriorated, dying, or over-scaled vegetation. Thus, any

plan for preserving a historic landscape should include a developed maintenance and management component that addresses both cyclical and long-term maintenance needs.

## **RECOMMENDED TREATMENT STRATEGY**

Hopewell Furnace National Historic Site is a complex property with a long and varied history and several periods of significance. *Preservation* is the general treatment strategy recommended for the property. Preservation recognizes the long and significant history of the site, acknowledging the site's evolution as a cultural landscape over a period of more than two hundred years. The program of conservation, maintenance, and repair, dictated by a preservation strategy will assure the retention of all historic fabric.

For interpretive purposes it is recommended that selected historic features at Hopewell Furnace National Historic Site be rehabilitated. This recommendation is in keeping with the overall strategy of preservation, since both preservation and rehabilitation focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character. Rehabilitation would be limited to extant historic features, such as the East Head Race, in which a combination of archival and archeological research affords an opportunity to accurately and faithfully rehabilitate the feature.

The complexity of the site effectively eliminates restoration or reconstruction as viable overall treatment strategies. Selection of either of these treatments would necessitate demolition or removal of significant resources for no other reason than that they are not associated with the selected period of significance. Restoration or reconstruction would effectively ignore the long and significant history of the site in favor of a "snapshot" of the property at a particular period.



**6.0 TREATMENT  
RECOMMENDATIONS**



## 6.0 TREATMENT RECOMMENDATIONS

### INTRODUCTION

Hopewell Furnace National Historic Site is a large, complex cultural landscape with a long, rich history. Recognition of the fact that the site has numerous periods of significance, not all associated with the production of iron, and that individual resources at the site may be associated with more than one of these periods of significance can lead to a greater appreciation of the dynamic character of the present cultural landscape and its reflection of over two hundred years of activity at the site.

This report documents the significance of the site, during five periods, from ca. 1770 to ca. 1945. This long history includes the establishment of a charcoal iron furnace in the eighteenth century, the furnace's struggling existence in the first quarter of the nineteenth century, and its eventual achievement of economic and technological success in the second quarter of the century. This span of time, encompassing some seventy-five years and two periods of significance, forms the basis for current management and interpretive practices at Hopewell Furnace National Historic Site. The century of history that unfolded at the site following the cessation of molding in 1844 is under-represented in the site's interpretive program and not well reflected in management policies. This century included the slow decline of iron making at the furnace, which ceased operations in 1883, the significant economic and social dislocations that followed the closure of the furnace, and the dramatic impacts of two federal agencies, the Civilian Conservation Corps (CCC) and the National Park Service, upon the site beginning in the 1930s.

The site's historical significance encompasses all of these periods. Resources from all of these periods are extant, and many individual resources are associated with all or several of the periods of significance. Management and interpretive policies should reflect the site's long dynamic history and recognize the complexity of the landscape and the layering of historical land uses across the site that occurred over time. Nevertheless, the site's mission is the preservation and interpretation of Hopewell as a representative eighteenth and nineteenth century iron-making community. The site's primary significance is as an iron-making community and its primary period of significance encompasses the period in which iron was produced at the furnace. While recognizing that the site includes significant resources dating from outside the primary period of significance, the focus of preservation and interpretive activities must be upon the primary period. This focus on the primary period of significance shapes the establishment of priorities for treatment recommendations.

This chapter is divided into four sections that address issues specifically connected to the management of Hopewell's cultural landscape. The sections address the park's landscape management zones, treatment recommendations (both general and specific), interpretation, and phasing of the recommendations.

*These recommendations must be coordinated with Hopewell's Statement for Management and Long Range Interpretive Plan. Any recommendation that diverges from the above mentioned management documents requires a revision to those documents prior to implementing the recommendation.*

## LANDSCAPE MANAGEMENT ZONES

The National Park Service currently delineates four different management zones: the Historic Zone, the Natural Zone, the Park Development Zone and the Special Use Zone (see Figure 6.1). The Historic Zone encompasses approximately 347 acres including the core village and its adjacent fields, Bethesda Church, Harrison Lloyd farm, and the Thomas Lloyd farm. The Natural Zone, approximately 471 acres, includes much of the remainder of the site, including the former Baptism Creek Picnic Area, woodlands, and former agricultural fields. The Park Development Zone, twenty-seven acres, includes the Visitor Center, parking areas, staff residences, maintenance complex and other support facilities located north of the core village, as well as portions of the replanted historic orchard. The Special Use Zone is a three-acre corridor of land located in the northeastern portion of the site and used as an electric power line right-of-way. It should be noted that these zones are not geographically contiguous and, according to the Statement for Management, are arbitrary in configuration.

These zones reflect current Park Service Management concerns and policies more than the historic patterns of land use and activity at the site, or the various periods of historic significance. As a result, the four current management zones somewhat obscure the site's complexity and long history.

It is proposed to redefine the four management zones at Hopewell Furnace National Historic Site in order to better reflect the site's long history and complex land use patterns (see Figure 6.2), and to recognize current land use limitations. The proposed management zones are more closely linked to the previously defined historic land use patterns and emphasize the connection between the site's history, its interpretation as a National Park Service unit, its day-to-day management, and stewardship land use options. The Park's Statement for Management must be revised to reflect the reorganization of management zones prior to their implementation into routine management activities.

The proposed management zones are designated the Core Village, Agricultural, Woodland, and the Park Support Zones. The Core Village Zone encompasses most of the site's extant historic buildings and interpreted areas. It is bounded on the north by the roadway below the Visitor Center, on the west by the site boundary with French Creek State Park, on the south by the historic property boundary immediately south of the Boarding House, and on the east by the fence line that forms the west edge of the Village Meadow.

The Core Village Zone encompasses the furnace and its associated outbuildings, including the Blacksmith Shop, Office-Store, Charcoal House, Anthracite Furnace, and Charcoal Kilns; the Ironmaster's House and its gardens and outbuildings; the Tenant Houses, Boarding House, and their associated outbuildings; and the Village Barn, its barnyard, and associated structures. Each of these clusters of buildings and structures served a distinct historical function. Nevertheless, from a landscape management perspective, they may be treated as a single management zone. Management goals within this zone should be oriented towards the preservation and maintenance of those extant landscape elements that either contribute to the historic character of the site or are important to interpreting the site's cultural landscape.

The Agricultural Zone includes the Village Meadow and lands associated with four historic farms. Near the core village, the Agricultural Zone encompasses the open land south of French Creek and east of the Birdsboro-Warwick Road. Under existing management practices this land, known as the Village Meadow, is considered part of the Historical Zone. Although the Village Meadow is physically proximate to the core village it is

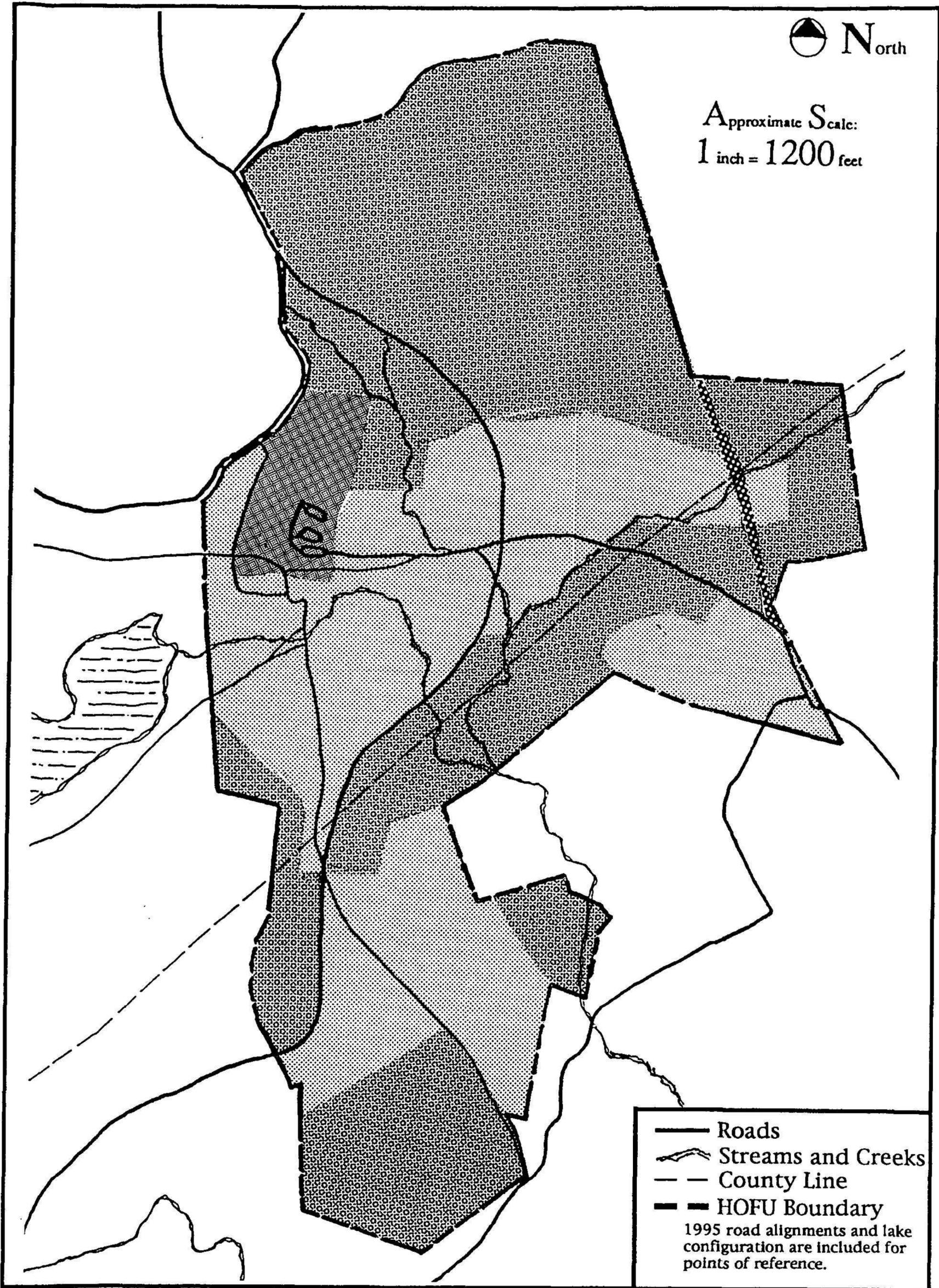


Figure 6.1. Existing Management Zones, 1994.

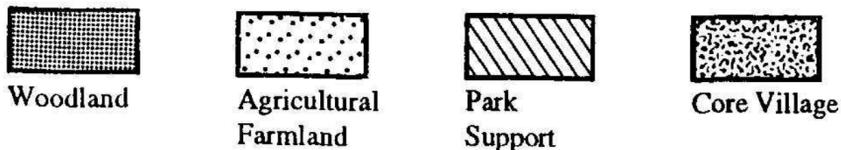
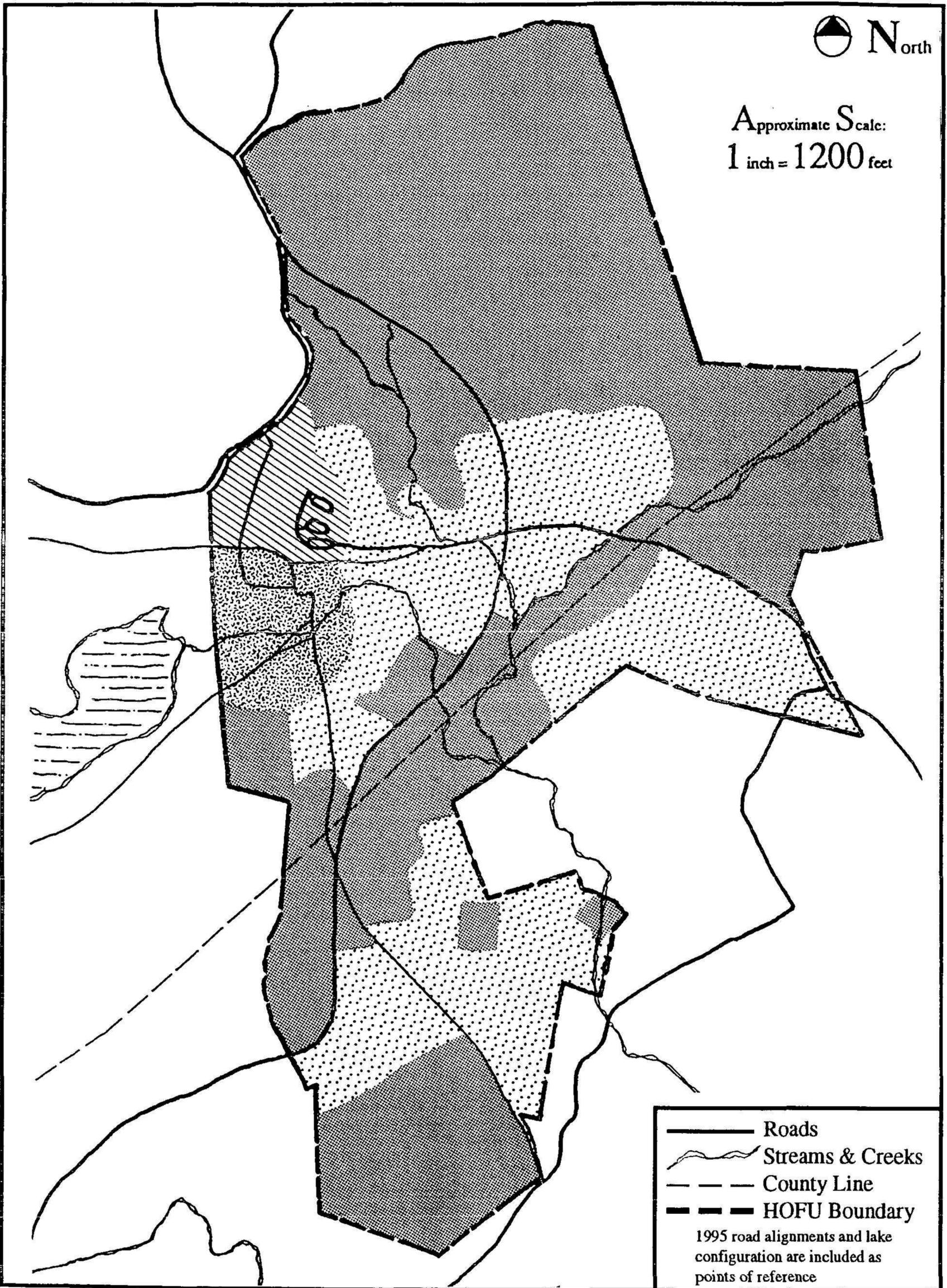


Figure 6.2 Proposed Management Zones.

agricultural land that may be managed in the same fashion as the other agricultural land at the site.

Three of the four farms within the Agricultural Zone, the Thomas Lloyd Farm, the Harrison Lloyd Farm, and the Nathan Care Farm, were independently owned and did not become part of the furnace property until the first quarter of the twentieth century. The Church Farm, located near the intersection of Mark Bird Lane and PA Route 345, and the Village Meadow were owned by the furnace throughout the site's history.

Management goals within the Agricultural Zone should, as at present, stress the preservation and retention of the extant fields and meadows. The Hopewell site is considerably more wooded at present than during the period of the furnace's operation. This is a result of the lack of logging, the encroachment of woodlands into abandoned agricultural fields, and the growth of trees and other vegetation along stone walls and other field boundaries. The continued integrity of the site's cultural landscape depends, to a considerable extent, upon preserving and maintaining the existing fields and meadows. Additional loss of open space will reduce the integrity of the landscape and hamper efforts to interpret Hopewell Furnace as a cultural landscape. Management of the Agricultural Zone should not, however, seek to impose a unified appearance upon the entire zone. Rather it should acknowledge that this zone encompasses property historically owned and controlled by both the furnace and a number of independent farms. Each of these farms had its own patterns of land use and activity. This variation within the zone should be incorporated into the overarching goal of preserving and maintaining the extant patterns of fields, meadows, and woodlands.

This management zone also includes the cluster of buildings and structures associated with Bethesda Church. Management goals at Bethesda Church should seek to preserve the historic character of the buildings and structures.

The proposed Woodland Management Zone encompasses those portions of the site retained as woodlands throughout the period of the furnace's operation and some current woodlands that were formerly open fields, such as the wetlands component. During that period, these areas provided the charcoal used to fuel the furnaces (both Hopewell and Warwick Furnace woodlands lands are represented). After the cessation of operations at the furnace these areas continued to supply wood products for sale on the open market. After federal acquisition of the site they were valued chiefly as a natural area suitable for recreational activities such as hiking. It is important to note that the woodlands located in the southern portion of the site did not become part of the furnace property until the twentieth century, and that most of the woodlands owned and used by the furnace for charcoal production are not included within the present boundaries of Hopewell Furnace National Historic Site, but are part of French Creek State Park.

Management goals for this zone should include protection of archeological resources, such as charcoal hearths and huts, preservation of extant trails, and development of an interpretive policy that will help clarify the former connections between these areas and the core village. Three isolated house sites are located within the Woodland Management Zone. Management policy at the Manning, Brison, and Woodlot houses should be directed towards the stabilization, preservation, and protection of the extant building ruins. Also located within the Woodland Management Zone are the buildings and structures associated with the CCC's Baptism Creek Picnic Area. Management goals at the Baptism Creek Picnic Area should include preservation of buildings, structures, site elements, and landscape features associated with the CCC-designed picnic area. Preservation of these elements, combined with development of an interpretive program that highlights the role of the CCC, can reintegrate this area into the history of the site. The implementation of CCC

resource interpretation into the Park's interpretive plan requires a revision to the Long Range Interpretive Plan.

The Park Support Management Zone corresponds to the present Development Zone. It includes the Visitor Center, visitor parking areas, staff residences, and maintenance facilities located north of the core village. Included within this area are the replanted historic orchard and the site of CCC Camp SP-7. The presence of these resources illustrates the layering of resources from various periods of significance within a restricted geographic area; a common occurrence at Hopewell Furnace. Management priorities in this area should include the preservation of historic resources and the provision of facilities and services required for park operations, maintenance, and visitor services.

The boundaries of the proposed management zones should be perceived as somewhat porous. Each zone incorporates elements from various periods of historic significance. Land use patterns overlap zone boundaries, as is evidenced by the replanted historic orchard within the Park Support Zone and the East Head Race within the Agricultural Zone. The boundaries of the zones defined in this report should be viewed as dynamic, rather than static, and may be redefined in the future in order to accommodate specific management and use requirements or reflect new historic documentation and evidence.

## GENERAL TREATMENT GUIDELINES

The following section describes general treatment guidelines and provides an overall philosophy towards preserving the broad patterns of Hopewell's cultural landscape. Specific treatment recommendations aimed at preserving individual features and elements are found in the next section of this chapter.

The recommended treatment strategy for Hopewell Furnace National Historic Site, as developed in Chapter 5.0, is preservation. This strategy acknowledges the long and significant history of the site and its evolution as a cultural landscape over a period of more than two hundred years. Preservation, with its emphasis on protection, stabilization, cyclical maintenance, repair, and limited rehabilitation of character defining landscape features, will assure the retention of historic fabric from all of Hopewell's periods of historical significance.

Because of Hopewell's long and multi-layered history, landscape elements from all of the property's periods of significance contribute to the character of the site. This is evident in Appendix B, in which elements identified as non-contributing are almost exclusively associated with the National Park Service's tenancy at the site, the most recent period of its history. Non-contributing elements identified in Appendix B include roads and trails constructed by the National Park Service to facilitate visitors and maintenance, maintenance buildings and structures, reconstructed historic buildings, and most on-site small scale landscape elements used to augment and support interpretive efforts. While non-contributing, many of these landscape elements, particularly the reconstructed historic buildings, are critical to the interpretation of the site.

Preservation represents a conservative approach to the Hopewell landscape. The emphasis upon protection, maintenance, and repair should reduce the possibility that a significant or contributing landscape element will be lost through neglect, deterioration, construction, or maintenance policies that subsequent historical findings reveal as misguided. This plan's treatment policy recognizes that elements from a host of historic periods contribute to Hopewell's cultural landscape. Preserving the present landscape assures that all of these periods will continue to be represented within the landscape.

While this recommendation will, in general, maintain the *status quo*, it should not be taken as preventing or prohibiting change. There are numerous opportunities for change at Hopewell, both in the management and interpretation of the landscape, that will serve the goal of preserving all the historic and significant elements of the landscape. Most of these opportunities are associated with specific components of the landscape, such as circulation routes, boundary demarcations, clusters of buildings, etc., rather than with the broad patterns of the landscape within which these component elements are located.

The broad patterns of Hopewell's landscape retain the highest degree of integrity. These include the basic spatial organization of the property, the number and location of building clusters, the general division of the property into discrete use or activity zones, and the patterns of circulation. At the detailed level of specific buildings, fence lines, and garden plots the integrity is less intact. This fact makes preservation of Hopewell's broad landscape patterns of paramount importance. If these broad patterns are lost or deteriorate the integrity of the entire site will be significantly diminished.

In order to fully support the preservation, use, and interpretation of Hopewell's 848 acres, treatment guidelines recommend the reallocation of maintenance resources. Generally, this entails reallocating a portion of staff effort from the core village to outlying areas where archeological and historic resources should be more fully protected and interpreted. A similar reallocation of maintenance resources should occur within the core village. For example, buildings should be white washed less often and slag piles should be weeded more frequently.

Whereas much of the landscape is currently treated uniformly, as either a pastoral estate or as a natural area, the landscape treatments should reflect the diversity and historic uses of the site. Throughout the site, a variety of appropriate landscape interpretive and maintenance treatments should portray the independent, productive role of tenant and farm sites. For example, managing a long stretch of lawn in the village as individual parcels related to specific tenant houses. Adding exterior furnishings and crops can also significantly strengthen the appropriate interpretive message.

The following paragraphs describe general treatment goals and guidelines intended to preserve the broad patterns of Hopewell's landscape. They are grouped by landscape characteristics described and analyzed in Chapter 4.0

#### Patterns of Spatial Organization

As noted in Chapter 4.0, the spatial organization of the Hopewell Furnace property closely reflects the patterns of land use that characterized the property throughout its history. Significant shifts in the patterns of spatial organization are closely associated with major changes in the ownership and use of the property.

The present management organization of the property reflects National Park Service goals and objectives. The historic core village is the primary focus of preservation and interpretation efforts. The Park Service support area encompasses maintenance and primary visitor orientation activities. The outlying portions of the site are considered natural areas largely devoted to recreational activities. This organization, while much simpler than during earlier periods of the furnace's history, nevertheless permits the earlier patterns of spatial organization to be discerned and understood by the visitor.



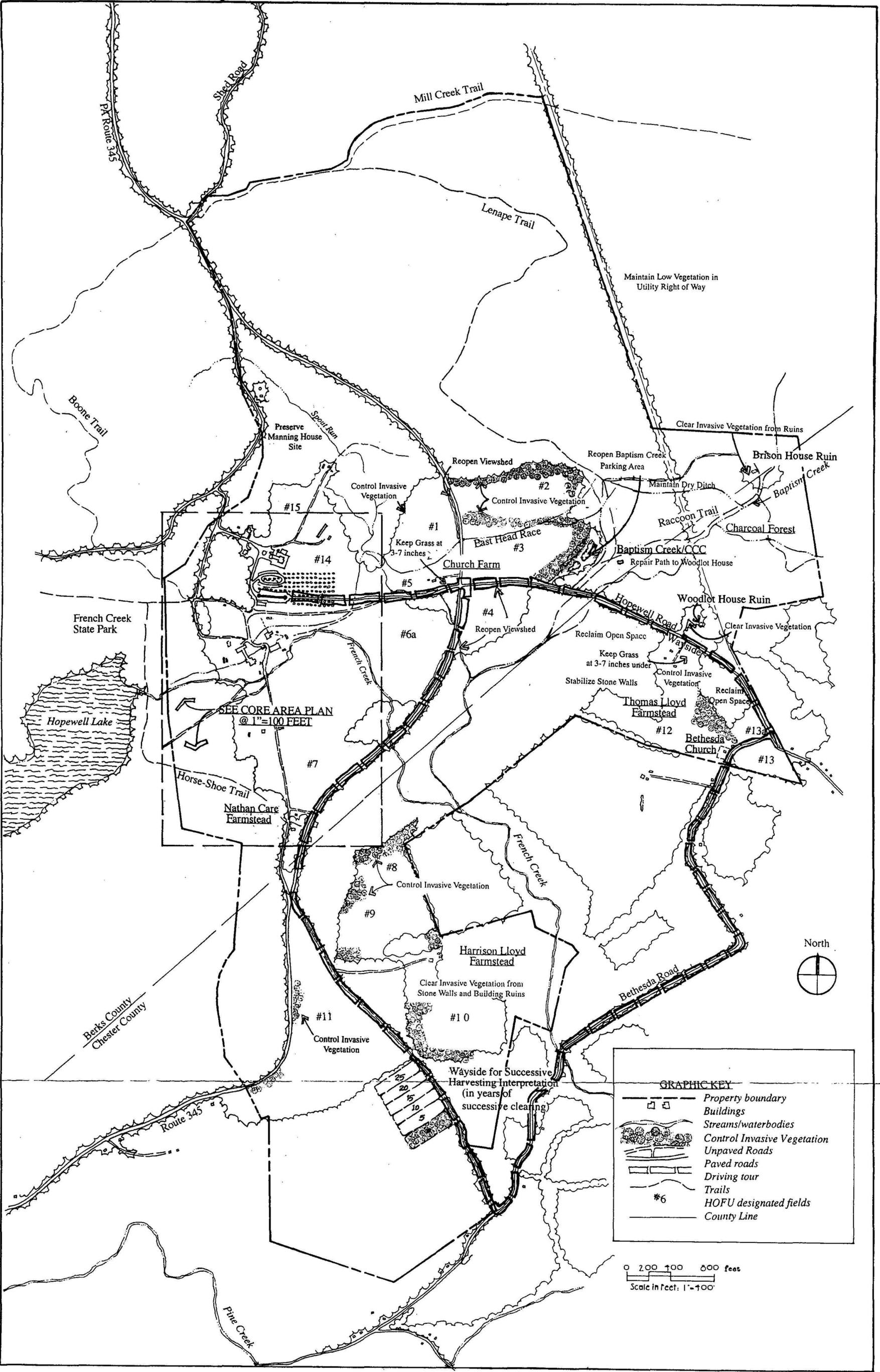


Figure 6.3. Hopewell Furnace Treatment Recommendations.

Accordingly, the present patterns of spatial organization should be retained and preserved. The goal should concentrate on keeping wooded areas wooded, maintaining fields and pastures as open space, continuing to maintain support activities in their present location, and preserving the core village as the focus of preservation and interpretation efforts. The Secretary of the Interior's *Guidelines for the Treatment of Cultural Landscapes* does allow the reclaiming of open space from woody plant intrusion in order to maintain the cultural landscape. No attempt should be made to reclaim an area of land without basing the activity on documentary evidence. Such areas should also be evaluated in order to determine if they have acquired significance in their own right. Reclaiming selective areas would contribute to a clearer understanding of the cultural landscape; however, a wholesale restructuring of the extant patterns of spatial organization would be cost prohibitive and would not achieve the goal of preservation.

## Circulation

### *Roads*

The basic circulation network presently visible at Hopewell was in place by ca. 1815. The principal roads associated with this network remain clearly evident, with the possible exception of the portion of the 1757 Reading–Valley Forge Road between the Warwick–Birdsboro Road and PA Route 345.<sup>1</sup> The circulation network is a critical component of the site's cultural landscape. Until the late 1930s Hopewell occupied a position at the intersection of several important roads that brought the world, with its attendant clamor and change, past its doors. When the Civilian Conservation Corps constructed the bypass road around the core village, PA Route 345, they effectively marooned the former industrial village on the sidelines of history. Hopewell Furnace ceased *moving in time*, as every living community moves, and became what it remains today: *a place out of time*.

Preservation of the extant road network is critical to the accurate portrayal of Hopewell as a vibrant crossroads community, with extensive links and connections to the surrounding farms, villages, and towns, rather than as an isolated industrial outpost in the woods. The Warwick–Birdsboro and Reading–Valley Forge Roads were principal links between the village and surrounding towns, while the two Jones Mine Roads connected the village to one of the principal iron mines used by the furnace. The National Park Service removed twentieth century paving materials from roads in the core village and returned the Warwick–Birdsboro Road to its historic alignment in the 1950s. The core village roads presently function as pedestrian paths for visitors. These roads retain a high degree of integrity in terms of their alignment and general appearance. It is critical that they remain unobstructed and unpaved in order to support the primary period of interpretation. Dating from the 1930s, a secondary period of significance, PA Route 345 bypass is important because it transformed the core village from a public crossroads to an end destination reserved for pedestrian visitors.

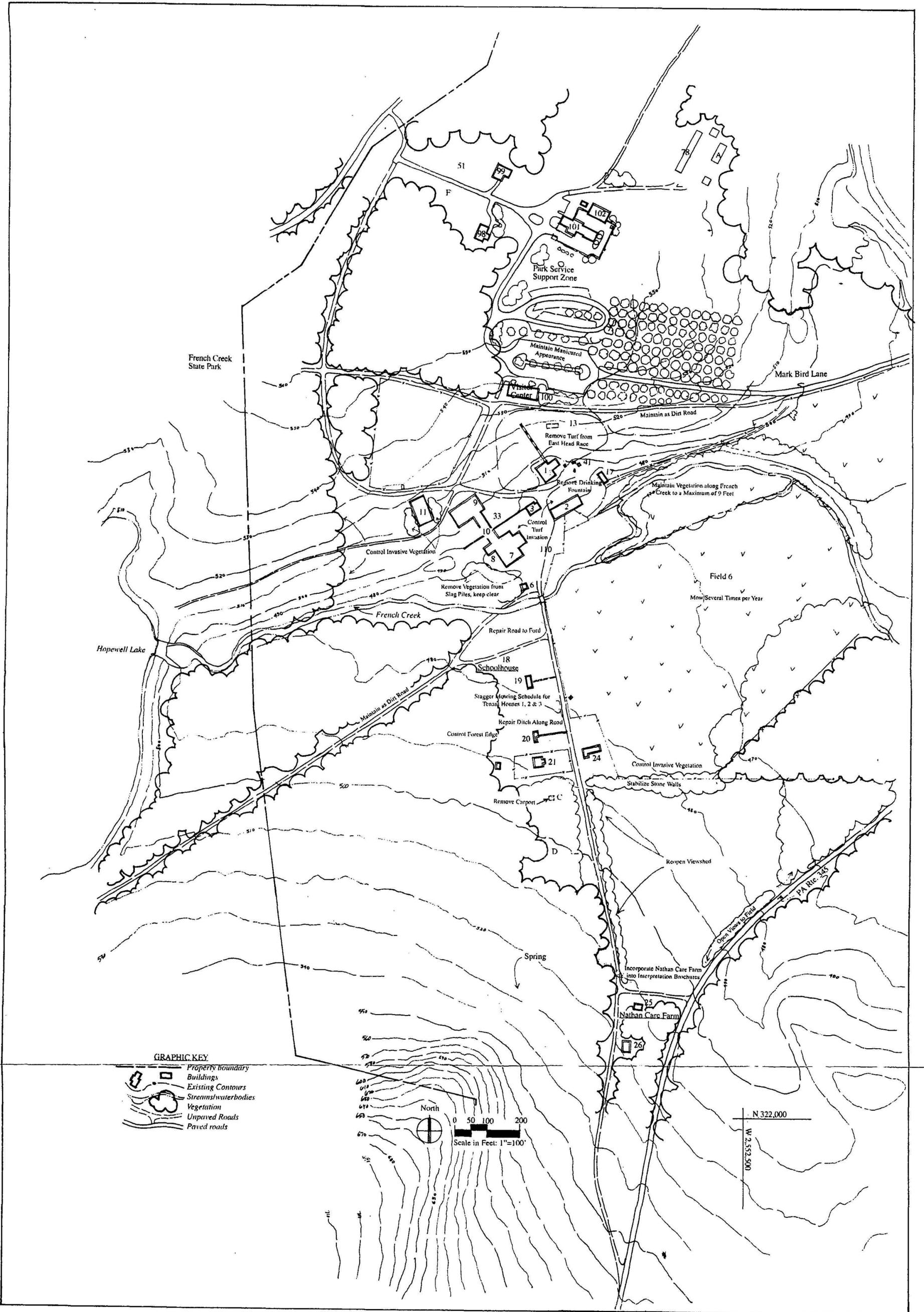
### *Trails*

The trail system represents a significant resource that provides visitor access to those wooded area of the site that provided the charcoal used to fuel the iron furnace. Trails that currently exist within the boundaries of the site were largely constructed by the CCC in the 1930s. While they are not directly associated with the site's primary period of significance and do not, for the most part, represent modifications or improvements to earlier charcoal trails, they are considered contributing site elements and should be retained and maintained.

---

<sup>1</sup>This segment was partially obliterated by construction of the present park entry road in the late-1950s.

Figure 6.4. Hopewell Furnace Treatment Recommendations, Core Area.



Care should be taken not to expose abandoned farmsteads and other former residential sites located in the woods, such as the Woodlot, Brison, Manning, and Harrison Lloyd sites, to visitors. Additionally, they should probably not be identified in brochures or on interpretive panels at this time. These constitute fragile archeological resources that must be protected and stabilized before they are made readily accessible to the public.

### *Pedestrian Paths*

The pedestrian paths within the core village are largely confined to the area of the Ironmaster's House gardens and the Tenant Houses. Other pedestrian paths currently used within the core village are, in reality, former roadways that are no longer used for vehicular traffic. The steep stone steps west of the Office & Store are a reconstruction of a historic element that was demolished in the early 1930s as a result of road construction within the village. The pedestrian paths around both the Ironmaster's House and the Tenant Houses occupy historically appropriate locations, but were extensively repaired and rehabilitated by the National Park Service. This work included new foot bridges, steps, and crushed stone paving material. The bridges and steps, while non-historic, reflect documented historic elements, as in the case of the furnace bank steps. In general, these paths and their attendant foot bridges, steps, and paving materials are considered non-contributing landscape elements; however, they contribute to the interpretation of the village and the life and work of its former residents. Moreover, they are located with a considerable degree of historical accuracy and should be retained and maintained.

The site's steep slopes and stairs separating the upper and lower portion of the site hampers efforts to provide handicap accessibility to the site. While handicap accessibility must be improved, any solution to the problem must protect the topography and related character defining features.

### Boundaries

Boundaries at Hopewell Furnace separate land uses and designate former and current property limits. They consist of walls, fences, roads, and vegetation. The present boundaries of Hopewell Furnace National Historic Site do not reflect the boundaries of the furnace property at any point in its history prior to the National Park Service's acquisition of the tract. The site boundaries are, therefore, of little significance to the preservation and interpretation of the landscape. Of more significance are the internal boundaries that separate former fields, land parcels, and uses. These demarcations should be retained and preserved.

### *Roadways*

Roads served as important boundaries from the earlier periods of the site's history. As noted previously, the extant road network was largely in place by 1815 and constitutes a critically significant landscape element at Hopewell. The PA Route 345 By-pass, however, forms a modern boundary by cutting through land historically used as a farm field. Efforts should strive towards retaining and preserving the historic road network found at Hopewell while lessening the visual impact of PA Route 345 on the surrounding landscape.

### *Fencing*

No wood fencing survives from the period of the furnace's operation. All the extant wood fencing at the site was constructed by the National Park Service and is considered a non-contributing landscape element. Post-and-rail fencing, such as that presently extant within the core village, was clearly used to enclose fields and delineate the edges of roads during the period of the furnace's operation. With the exception of the fencing along modern roadways, such as a portion of the park entry road and PA Route 345, the majority of fencing appears to be in historically appropriate locations.

Generally, the existing fencing is important to the interpretation of the site and should be retained. New fencing may be selectively introduced to the core village to assist with the interpretation of the site. Any new fencing intended to augment interpretation of the site must be carefully considered and implemented only where it is critical to interpretation. Any new fencing should resemble known historical fence types used at Hopewell. It is important to note that new fence lines have the potential to effect archeological resources. No new fencing should be installed without careful consideration of the possible effect of such work upon subsurface archeological resources. In general this would entail Phase I archeological investigations intended to determine whether subsurface resources survive within the given project area.

The potential archeological consequences associated with the construction of new fences mitigates against such work. Any desire to reconstruct historic fencing must be evaluated in terms of the financial costs and the potential archeological and interpretive consequences.

### *Walls*

Stone walls and field boundaries that delineated individual agricultural fields and property lines survive only as remnants, as do the remains of the East Head Race. Many of these boundary demarcations were demolished by the CCC, while others deteriorated following the abandonment of the fields. Most of those that survive are obscured by vegetation that grew up alongside the walls and has not been removed as part of an ongoing maintenance plan.

Because Hopewell's stone walls are important in delineating boundaries and reflecting historic patterns of land use, they should be retained. Invasive vegetation that obscures and possibly threatens the preservation of these boundary demarcations should be removed. Mowing and weeding along these resources should not attempt to provide a manicured suburban look to the boundary between the walls and the surrounding vegetation. Rather, this treatment should simply seek to remove visual obstructions from alongside the wall. This action maintains the goal of preserving the resource and enables visitors to discern the walls from roads, trails, and paths.

### *Vegetation*

Vegetation serves as a boundary element in many locations at Hopewell. In some instances vegetation can obscure or damage a boundary element, while in others it is a boundary element. Reforestation along former field edges, property boundaries, and roadways has created boundaries that are not as clearly defined as in previous periods. In other instances, particularly within the core village, National Park Service maintenance standards have produced vegetation boundaries that are far more distinct than would have existed in previous periods. Existing forest and field vegetation boundaries and vegetation alongside roads should be retained and preserved where they help define historic character and functional boundaries.

Care should be taken to not over maintain these boundaries. It is unlikely that the furnace operators or area farmers mowed their fence lines or roadsides so as to provide a neat and tidy appearance. Grazing animals, farming activities, and routine fence and road maintenance probably represented the only controls to vegetation along these boundary demarcations. Consequently, a slightly unkempt appearance, with vegetation as much as one to two feet in height, probably represents an accurate reflection of the historic appearance of these boundaries.

In those locations where vegetation has grown inappropriately, such as along the obscured stone field walls described above, it should be removed to help stabilize, repair, and

preserve these historic boundary elements. This particularly applies to volunteer and invasive trees as well as exotic invasive plants.

### Vegetation

Vegetation at Hopewell consists of forests, agricultural fields and pastures, orchards and specimen trees, and gardens. As a landscape element, the vegetation at Hopewell is considerably changed from its appearance during most of the site's history. The forests, originally dominated by chestnut and hickory, presently consist largely of oak and maple. Historical evidence suggests that the present forests are comprised of much older trees than during the period of the furnace's operation, when cyclical cutting for charcoal production occurred every twenty-five to thirty years. Agricultural fields are no longer in full production and have been reduced in size by reforestation. The orchard, while apparently located in close proximity to its historic site, incorporates a parking lot. Vegetable and ornamental gardens are almost entirely absent from the present site. Individual specimen trees in the core village area appear to closely reflect those trees extant at the turn of the twentieth century.

The existing patterns and most types of vegetation have existed at the site for more than fifty years and reflect the federal ownership and stewardship of the site. Returning Hopewell to its mid-nineteenth century appearance, in terms of vegetation is both physically and financially impossible. The chestnut/hickory woods cannot be returned and charcoal production cannot be resumed on an industrial scale. The agricultural fields cannot be returned to their full and varied levels of production. The physical and financial obstacles associated with fully restoring and maintaining the orchard and the various gardens are tremendous. Even if funding sources are obtained, the appearance of these landscape elements would have to be accurately determined prior to beginning restoration activities. Moreover, the present levels of deer infestation within Hopewell Furnace National Historic Site restricts further expansion of vegetation related activities. Therefore, despite the changes that have occurred in Hopewell's vegetation, it is recommended that the existing vegetation be largely retained and preserved.

Exotic invasive vegetation at Hopewell can pose potential threats to both the cultural landscape and the forest in general. Approximately 115 exotic plants have been identified growing at Hopewell Furnace (see Appendix E). These are largely located in and around agricultural fields, former home sites, and along the border of forest and field. In addition to exotic species, any plant (even native species) found in the wrong place or behaving in a manner inconsistent with historical or approved management guidelines could be considered invasive and removed. Park managers should consult with National Park Service Guideline No. 77, *Natural Resources Management*, "Prevention of Exotic Species Invasions" prior to developing a systematic control program.

### *Forests*

Over the past century the size and composition of Hopewell's forests have changed; however, the existing forests are an essential element of Hopewell's cultural landscape. The forested areas of the site should be retained and efforts should be made to prohibit the expansion of the existing forest edge. The development of a deer management plan is essential to the preservation of forest succession and understory.

### *Agricultural Fields and Meadows*

The existing agricultural fields and meadows are an essential element of Hopewell's cultural landscape. Over the past century the acreage consisting of fields and meadows has declined as a result of the cessation of active farming and the reforestation of field margins. Because of this loss, it is critical that the extant open spaces be preserved and maintained as

open space. Fields and pastures should not be allowed to return to forest. Efforts should be made to retain and preserve the boundaries of these elements.

Preserving and maintaining the agricultural aspects of the landscape is important to the interpretation of the site, which was bordered by independent farms throughout the eighteenth and nineteenth centuries. Removing selected vegetation alongside PA Route 345, where the road passes through former agricultural fields can help the visitor understand the historic agricultural character of the landscape. Rather than traveling along a road that passes through a tunnel of vegetation, the visitor could experience open views similar to those of the nineteenth century, and more readily see the fields and views beyond.

Additionally, some effort should be made to convey the agricultural character of some fields in close proximity to the core village through the planting of row crops. This may take the form of a small interpretive exhibit, but returning an entire field or fields to row crops would significantly enhance the historic appearance of the landscape. Documentary evidence indicates that wheat and corn were the most commonly grown crops. Deer incursions will take a significant toll on these crops, if no effort is made to control the existing herd, but if the crops are viewed strictly as an interpretive device these losses may not matter. Development and implementation of a deer management program might enable local farmers to enter into lease arrangements that will provide a satisfactory market return while keeping row crops in some fields.

#### *Gardens*

The core village included a number of gardens during the period of the furnace's operation. These landscape elements are almost entirely absent from the present landscape. Communal vegetable gardens are noted in the documentary record, although their precise size and location are difficult to determine. It is assumed, based upon circumstantial evidence and a careful reading of the documentary records, that most if not all tenant houses had a fenced vegetable garden. Additionally, after circa 1830 a large terraced garden fronted the Ironmaster's House. Only some of the structural components of this garden, such as outbuilding ruins, terraces, and paths, survive.

The surviving elements of the Ironmaster's House garden should be retained and preserved. The absence of documentary evidence precludes any attempt, at this time, to restore or rehabilitate this landscape element. However, landscape archeology might provide significant evidence regarding the layout of the garden's beds and paths, and the location and types of flowers and vegetables grown in the past. Evidence of this nature is essential before any effort is made to rehabilitate this significant landscape element. Extant structural features, such as the perimeter walls, garden terracing, and East Head Race, should be retained and stabilized or repaired where possible. These features provide definition to the garden.

The communal and Tenant House gardens are wholly absent from the present landscape with the exception of small interpretive gardens established by the National Park Service. Any ground disturbing activity within the vicinity of the Tenant Houses or the presumed locations of the communal gardens should be subject to archeological testing. If the boundaries of these gardens can be determined they should be indicated through fencing or some other device in order to enable visitors to visualize the size and location of these elements. The current lack of physical and documentary evidence describing the historic gardens prohibits a full restoration of these gardens at this date. It is not recommended that new gardens be introduced as interpretive exhibits. However, a patch of plowed earth could convey a sense of a garden. Obviously, such a treatment must consider possible

affects to archeological resources as well as concerns regarding the potential for soil erosion.

#### *Orchards and Specimen Trees*

Orchards and individual specimen trees exist within the core village. Although of recent origin, the present orchard should be retained and maintained as an important interpretive device. The extant specimen trees largely date from circa 1900 and should be retained and preserved. A management plan addressing the maintenance and preservation of the orchard and specimen trees should be developed.

#### *Grass and Lawns*

Lawns are not a historic landscape element at Hopewell, and reflect National Park Service maintenance standards and practices. Nevertheless, existing lawns and grass should not be removed. However, less frequent mowing would improve their appearance as a historic landscape element. Similarly, the removal of weeds and grass from the extant slag piles would significantly improve their appearance as historic landscape elements. It is not necessary to totally remove all vegetation from the slag piles, but these elements (especially those near the Cast House) should not resemble grassy hummocks.

#### Clusters, Buildings and Structures

The extant clusters of buildings and structures at Hopewell Furnace have changed little over the past two hundred years. The essential spatial organization of the site, with furnace, Ironmaster's House, tenant housing, and outlying building clusters is remarkably intact. Within the basic clusters, however, are numerous reconstructed buildings. These include such major buildings as the Cast House, Charcoal House, Village Barn, and Blacksmith Shop. These non-historic buildings, while considered non-contributing landscape elements, are critical to the interpretation of the site.

The reconstructed buildings have contributed to a core village that reflects no precise point in time. A circa 1840 furnace complex co-exists with a circa 1879 Ironmaster's House, the ruins of a circa 1853 anthracite furnace, and a barn reconstructed to a circa 1829-1842 appearance. This situation complicates the preservation and interpretation of the property, while simultaneously emphasizing the multi-faceted history of the site and its various periods of significance.

All existing building clusters, and all individual buildings and structures, should be retained and preserved. Historic buildings should be maintained in accordance with the *Secretary of Interior's Standards and Guidelines for Rehabilitation*, as should the significant reconstructions. It should be noted that buildings in the core village would benefit from less rigorous aesthetic maintenance. Weathered finishes can dramatically help convey the sense of Hopewell as a "real" industrial village, rather than a perfectly maintained museum piece. Clearly, every effort should be made to assure that maintenance and preservation matters protect the resources from deterioration and damage. Other non-contributing buildings, which are concentrated in the Park Support Management Zone, should be maintained as appropriate in accordance with National Park Service maintenance guidelines. Every effort should be made to locate any proposed new construction within the Park Support Management Zone, away from the core village.

Contributing buildings currently occupied as staff quarters should remain in this use. However, efforts should be made to locate visually inappropriate site elements associated with the use of these buildings as quarters, such as barbecues, playground equipment, automobiles, and other vehicles, out of the sight of visitors.

## Archeological Sites

Archeological sites, both known and unknown, are a critical part of the Hopewell landscape. Archeology represents a significant, and largely untapped, resource regarding the appearance of Hopewell Furnace prior to circa 1850. The location and size of non-extant tenant houses, vegetable gardens, and a host of other significant landscape elements is not apparent in the documentary record. Archeological investigations can provide a wealth of information on both the appearance of the site and the lives of its residents.

Consequently, every effort should be made to assure that all known and unknown archeological sites are preserved and protected. The completion of an Archeological Overview and Assessment for the entire site would greatly aid in decision making regarding landscape treatments. All activities requiring archeological involvement prior to the completion of such a plan should be handled on a case-by-case basis. Any ground disturbing activity should be reviewed by a qualified archeologist and field investigations should be undertaken to identify, evaluate, and protect any subsurface resources that may be affected by such activities. Archeological sites should not be identified to the general public unless the sites are adequately protected.

## Small-Scale Elements

Few small-scale site elements survive from any period prior to the federal government's acquisition of Hopewell Furnace. Existing small-scale elements are largely non-contributing landscape elements used to augment and enhance the interpretive program. All extant outbuildings and other small-scale site elements should be maintained and preserved. Small-scale elements known to have existed, such as hitching posts, privies, clothes lines, arbors, and rain barrels, might be introduced as interpretive exhibits. Care should be taken to avoid reconstructing an imagined nineteenth century landscape, but simply to convey, in a general or schematic sense, some flavor of the site. A sense of the site's small-scale landscape elements can be incorporated into the interpretive program at the Visitor Center, through the use of written materials, historic photographs, and exhibits.

## **Handicapped Accessibility**

Handicapped accessibility into the core village is hampered by the site's features, including the steep slopes and stairs separating the upper and lower portions of the village. Individual resources, such as the Tenant Houses, Ironmaster's House, gardens, and trails provide additional accessibility problems. The majority of extant features and resources within the core village, whether contributing or not, are significant to the site's interpretation.

Providing full accessibility to all aspects of the site without altering, obscuring or destroying character-defining features will always be difficult. The goal of providing accessibility to historic resources as stated in *Preserving the Past and Making It Accessible for People with Disabilities* is to provide the highest level of access with the lowest level of impact on the integrity of resource. In order to accomplish this it is in the park's best interest to have a building evaluation or "audit" performed on the core village in order to identify accessibility problems, deficiencies, and potential solutions. If certain site features are unable to be made physically accessible because it would significantly compromise the feature's integrity, then some alternative method of accessibility, such as audio-visual materials, may be used.

Interim solutions should be handled on a case by case basis and could include providing assisted access to the core village via a Park Service operated vehicle or providing one or

two handicapped parking spaces within the core village, possibly in the screened area near Tenant House 3. An electrically powered wheelchair or cart with the capability of managing the dirt roads and grass-covered areas might be provided for use in the core village. At a minimum, the visitor center must be fully accessible to disabled persons and provide audio-visual programs that include all aspects of the site not currently accessible to the handicapped. Resources outside the core village could be made accessible through the implementation of a driving tour keyed to a brochure.

## **SPECIFIC TREATMENT RECOMMENDATIONS**

The following discussion of specific treatment recommendations is organized by management zone and then by landscape element. An overview for each landscape element is provided and is followed by goals for the preservation of that element and recommendations for achieving those goals. These treatment recommendations expand on the guidelines presented in the previous section of this chapter. A summary of treatment recommendations and phasing plans are in Tables 6.1-6.4 at the end of this chapter. The treatment recommendations concentrate specifically on Hopewell's cultural landscape and implementation of some these recommendations may prove difficult because of other park priorities or current staffing levels. Park managers should work towards achieving the goals outlined for each landscape element. This may be accomplished by fully implementing a specific recommendation or by phasing work with the intention of attaining the goal in the future.

### **Core Village Management Zone**

The core village is the heart of Hopewell Furnace National Historic Site and is the primary focus of interpretive programs by the National Park Service. The Core Village Management Zone contains the greatest concentration of historic buildings and structures at Hopewell. It includes the Furnace, Ironmaster's House, Tenant Houses, and Village Barn among others. As the center of activity (historically and presently) the core village is often the only part of Hopewell Furnace National Historic Site experienced by visitors. A summary of treatment recommendations for the Core Village Management Zone are found in Table 6.1.

#### *Patterns of Spatial Organization*

The present spatial organization within the Core Village Management Zone closely reflects the patterns of land use that characterized the core village throughout its history. In spite of the loss of some individual features, the core village's overall spatial organization remains substantially intact. The Core Village Management Zone contains three distinct land use components. It contains the Iron Furnace Component with its associated outbuildings, including the Cast House, Blacksmith Shop, Office & Store, Charcoal House, Anthracite Furnace, and Charcoal Kilns. It also contains the Ironmaster's Component and includes the Ironmaster's House, Village Barn, gardens and outbuildings. Lastly, the Core Village Management Zone contains a Residential Component that includes the Boarding House and three tenant houses with associated land and outbuildings.

The most effective way to preserve the historic pattern of spatial organization within the core village is to maintain the existing relationships between land use components, natural features, and landscape characteristics. The topography of the core village historically contributed to Hopewell's pattern of spatial organization. This is evident in the positioning of the furnace against the hillside, the location of the Ironmaster's House on the hill above the furnace, and the location of the Tenant Houses and meadow on the flat land below the hill.

Physical activity within the core village no longer relates to this area's historic spatial organization; therefore, existing landscape characteristics are essential in defining the historical patterns of spatial organization and should be retained. The existing road network within the core village tied the various components together and formed the foundation for the pattern of spatial organization (see *Circulation*). The stone retaining wall, garden area, and specimen trees in front of the Ironmaster's House helped define this area as a separate entity and physically separated the ironmaster's component from the industrial component. Likewise, the existing location of French Creek separated the furnace component from the tenant houses, while fencing along Birdsboro-Warwick Road defined the agricultural zone east of the tenant houses. The forested area behind the tenant houses continues to provide a border between open and closed space.

#### Goals:

The primary goal should be the retention of existing landscape characteristics that are essential to defining the historical patterns of spatial organization. Natural features within the core village, such as French Creek and the site's overall landform, should be preserved. Views into, and from, the core village form part of the spatial organization and should be preserved. The introduction of modern elements into this management zone should be kept to a minimum.

#### Recommendations:

- Continue maintenance activities that foster the preservation of existing landscape characteristics.
- Focus preservation efforts toward preventing deterioration of the topography through proper drainage, erosion control, and soil management. Routine maintenance activities should include cleaning drainage ditches. This should include removing accumulated silt and debris from ditches to its original swale elevations. Additionally, all woody vegetation (if any) should be removed from drainage ditches.
- Avoid introducing modern elements into the Core Village Management Zone; however, if they are introduced into this zone they should be screened from view. Vegetative screening should be naturally occurring vegetation such as a dense hedgerow that, when mature, will be no taller than the object being screened. Neither the modern intrusion nor the screening should be allowed to diminish the character of the landscape.
- Preserve the edge of woodland by controlling any encroachment of trees into open spaces. This may be accomplished through annual mowing of field edges. Vegetation located along the forest edge determined to be exotic invasive vegetation should be removed. Consider use of an herbicide to reduce the amount of labor required to remove this vegetation. This, and the use of all pesticides, should include consultation with the National Park Service's Integrated Pest Management Coordinator.
- Maintain and reclaim vistas and view sheds as needed through selective thinning, especially along Birdsboro-Warwick Road in the vicinity of Field No. 7. Preserve older trees along field edges when they contribute to the cultural landscape.

### *Circulation*

The circulation network is a critical component of Hopewell's cultural landscape. Preservation of this system is essential for the accurate portrayal of Hopewell as an active community, with extensive connections to the surrounding farms, villages, and towns. The portion of Hopewell's historic road system located within the core village remains clearly evident. Principal roads located within the core village are the Birdsboro-Warwick Road (including the 1804 and 1825 portions as well as the bridge over French Creek), a private road to Hopewell Dam (part of Boone Trail), and Reading-Valley Forge Road. These roads retain a high degree of integrity in terms of their alignment and general appearance. The roads within the Core Village Management Zone presently function primarily as pedestrian paths for visitors.

Pedestrian paths within the core village are important landscape components and make important contributions to the interpretation of the site. These paths are largely confined to the area around the Ironmaster's House gardens and the Tenant Houses. Pedestrian paths located in the vicinity of the Ironmaster's House include the path, bridges, and steps within the garden area, the path from the house to the road, and the path leading from the Ironmaster's House to the Spring House. The paths at the Ironmaster's House and at the Tenant Houses occupy historically appropriate locations, but were extensively repaired, rehabilitated, and reconstructed by the Civilian Conservation Corps (CCC) and the National Park Service. Similarly, the steps near the Office & Store are a reconstruction. In general these paths are considered non-contributing landscape elements; however, they are all important features within Hopewell's cultural landscape and are critical to understanding the site's cultural landscape.

#### Goals:

Roads and paths located within the core village should be retained and maintained. Likewise, features such as fences, ditches, and vegetation that have historically helped define the boundaries of roads within the core village should be retained and maintained unless new documentary or physical evidence contradicting their present location or construction materials is revealed.

#### Recommendations:

- Historic roads within the core village should remain unpaved and standard maintenance activities should be directed toward prohibiting grass or other vegetative growth from encroaching into the roadway. This type of deterioration is most evident along the portion of the 1809 Road leading to the ford at French Creek. The encroachment of turf and stilt grass currently threatens this landscape feature. A limited use of an herbicide, such as Roundup® (short term) or Triox® (long term), may be applied to affected areas. Accord® is an EPA acceptable herbicide for use in wetland areas; however, this, and all use of pesticides, must include consultation with the National Park Service's Integrated Pest Management Coordinator when determining an NPS acceptable pesticide. Using mechanical means, such as shallow rototilling, to remove turf should be limited to previously disturbed areas, and should not extend below previously disturbed levels.
- Continued maintenance and repair of roads should use historically appropriate materials such as dirt, slag or other compatible material. Care should be taken during repair and maintenance work not to significantly alter the road's elevation or profile, unless such changes can be historically documented.

- The repair of deteriorated portions of paths and steps should be done in kind or with compatible substitute materials.

#### *Boundary Demarcation*

Boundaries within the core village separate former fields, land parcels, and uses. They consist of walls, fences, roads, vegetation, and natural features. All extant wood fencing located within the core village was constructed by the National Park Service and is considered a non-contributing landscape feature; however, the existing fencing provides a vital component for interpretation of the site. The location of some existing fencing approximates historic fence locations. Photographic evidence shows the use of post-and-rail fencing during the early twentieth century on both sides of Birdsboro-Warwick Road south of French Creek. Documentary evidence suggests that fencing existed along this road during earlier time periods as well. Presently post-and-rail fencing exists along the east side of Birdsboro-Warwick Road; between the Charcoal House and Office & Store; west of the Furnace, along the West Head Race; in the vicinity of the Village Barn; and east of Birdsboro-Warwick Road, between French Creek and the Village Barn. Three-, four-, and five-rail post-and-rail fencing was commonly used at Hopewell.

Analysis of typical nineteenth-century regional farming practices suggests that residences, like those comprising Hopewell's Tenant Houses, would have had some type of garden fencing. Presently Tenant House No. 3 contains picket fencing (installed by the National Park Service) outlining its presumed yard. The other tenant houses presently contain historically inappropriate fencing marking small gardens. The picket fences located southeast of the Spring House and at the north edge of the Ironmaster's House garden are National Park Service installations and are considered non-contributing features; however, this fencing is important in understanding the site's cultural landscape.

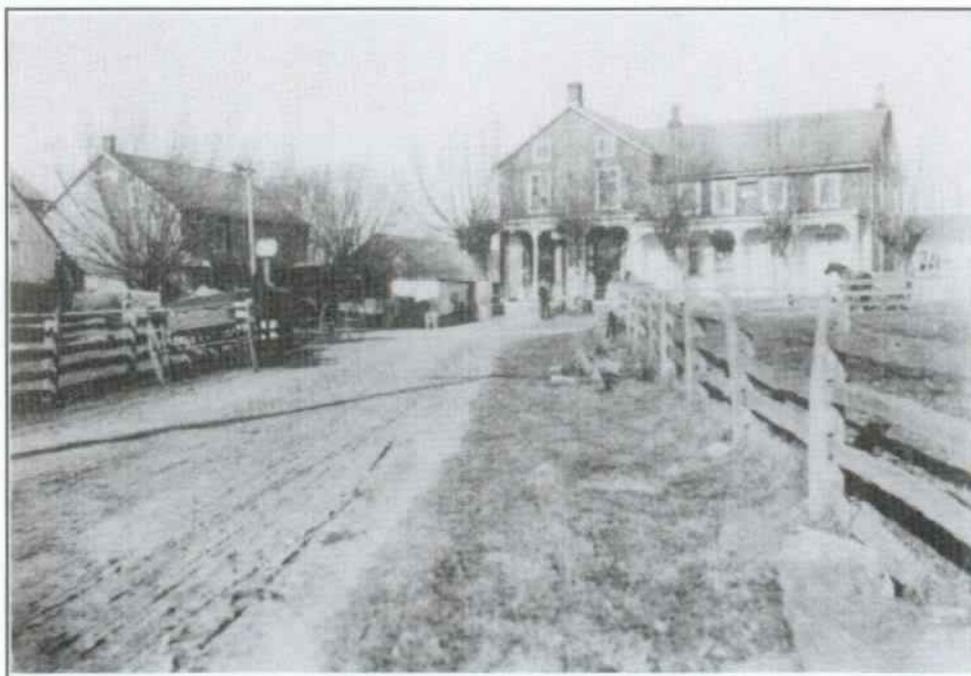


Figure 6.5. View of a neighboring crossroads community showing an example of dirt roads, pollarded trees, post-and-rail fencing, and rough-grazed grass between the road and fence. N.d. Photo reproduced from Fegley *Farming, Always Farming* (Birdsboro, Penn.: The Pennsylvania German Society, 1987). Use of photo courtesy of the Schwenkfelder Library.

Walls within the core village defined boundaries between component areas, such as the Ironmaster's House and the Industrial area. They also delineated former parcel boundaries like that between the Boarding House and the Nathan Care property. A remnant of a stone wall is located south of Tenant House No. 3 and a stone wall located south of the Boarding House presently exists as a ruin. The stone retaining wall located between the Furnace and the Office & Store is a National Park Service reconstruction. While this feature is not historic, it represents a documented historic feature and contributes to the understanding of Hopewell's cultural landscape. Stone walls located within the core village contribute to the spatial organization of the site and help define other landscape features.



Figure 6.6. A regional example of a nineteenth century road with an adjacent ditch and boardwalk crossing. N.d. Photo reproduced from Fegley *Farming, Always Farming* (Birdsboro, Penn.: The Pennsylvania German Society, 1987). Use of photo courtesy of Schwenkfelder Library.

In some instances vegetation serves as a boundary element within Hopewell's core village. This is most evident west of the Tenant Houses, where the open space behind the tenant houses abuts the forest edge. Historically, rough grass roadside boundaries would have been more common within the core village. Grass and weeds growing along the roadside would probably not have been as closely cropped as at present.

#### Goals:

Boundary demarcations including walls, fences, and vegetation that separate former fields, land parcels, and uses are important in understanding Hopewell's cultural landscape and should be retained and maintained. Preservation efforts should focus on halting further deterioration as well as stabilizing and repairing existing boundaries. Preservation and maintenance efforts should focus on not over-maintaining existing borders and should deter the creation of false historical borders comprised of overgrown vegetation.

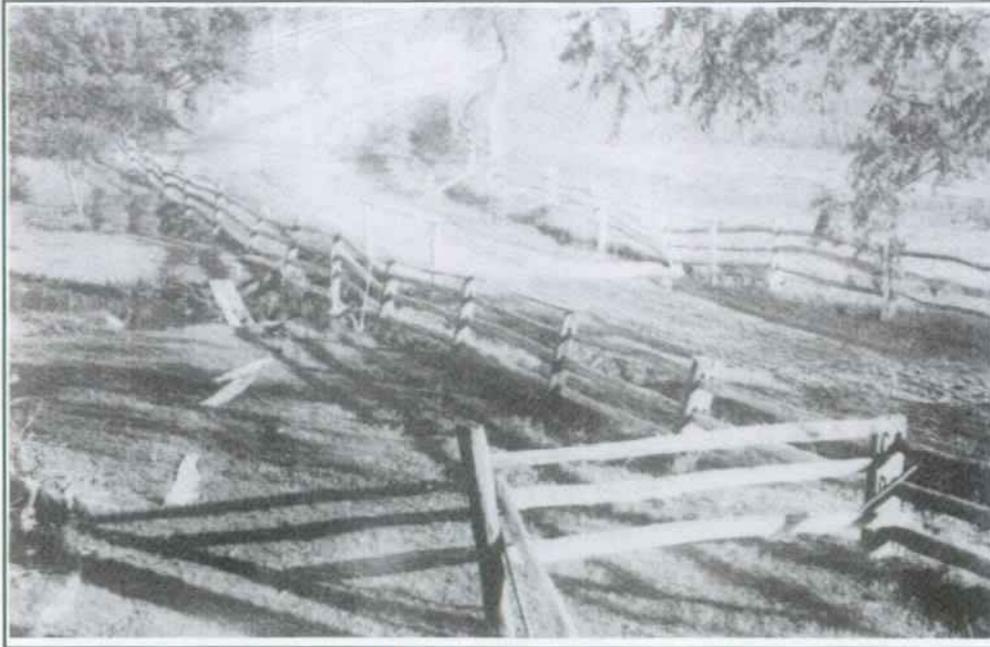


Figure 6.7. A regional example of a dirt road with adjacent post-and-rail fencing. N.d. Photo reproduced from Fegley *Farming, Always Farming* (Birdsboro, Penn.: The Pennsylvania German Society, 1987). Use of photo courtesy of the Schwenkfelder Library.

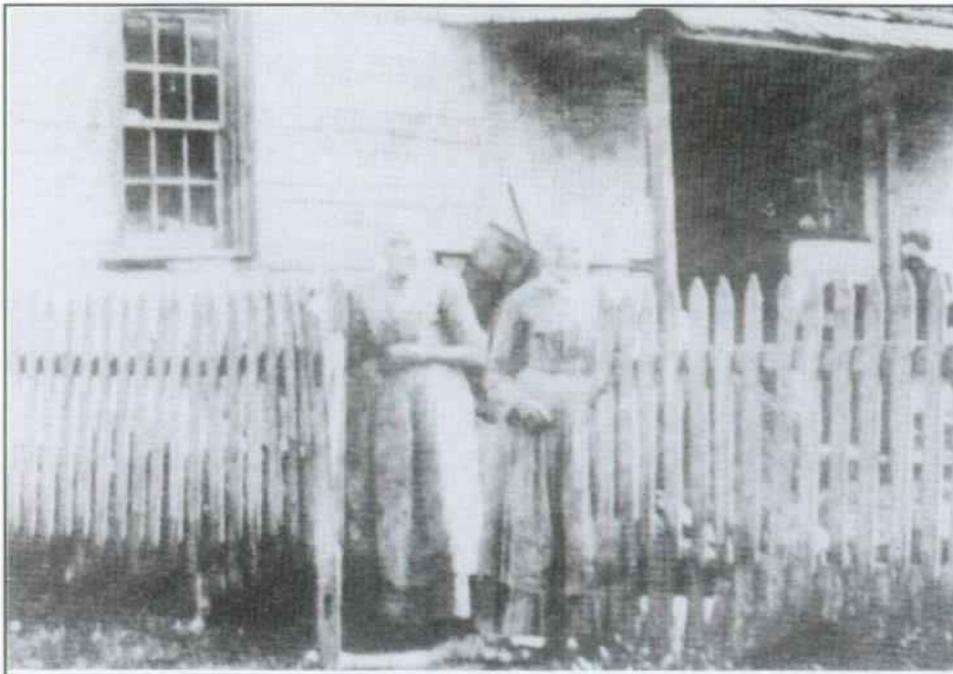


Figure 6.8. View of picket fencing at the Mohn Home. Circa 1900. N.d. Photo reproduced from Fegley *Farming, Always Farming* (Birdsboro, Penn.: The Pennsylvania German Society, 1987). Use of photo courtesy of the Schwenkfelder Library.

## Recommendations:

### *Fences*

- Repair or replacement of existing post-and-rail fencing within the Core Village should be done with three-, four-, or five-rail wood fencing. Installation of new fencing or relocating existing fencing is not recommended without additional archeological or documentary evidence.<sup>2</sup>
- Use of electronic fencing, like that currently used in the Cedar Pasture, should only be used if it is a necessary management tool. Place electronic fencing as unobtrusively as possible inside of post-and-rail fencing.
- Replace historically inappropriate fencing, such as at Tenant House No. 1, with historically appropriate fencing wherever possible.
- Repair or replacement of existing picket fencing should be in kind, unless additional historical evidence supports a change in type or location.
- Restrict the use of tall fencing to keep deer out of garden areas to after visiting hours.

### *Walls and Stone Rows*

- Remove invasive vegetation threatening a wall's structural stability. If vegetation cannot be removed at its roots then it should be cut to the ground and an appropriate herbicide applied to its trunks and roots to deter reestablishment. Care should be taken not to further disturb the stability of the wall during the removal of vegetation.
- Scrub and other visual obstructions should be removed from along walls. Regular maintenance activities should be scheduled so that adjacent grasses are kept to a height of six to twelve inches.
- Focus on preserving existing wall remnants; however, missing portions of wall may be rebuilt if the rebuilt portions are based upon the existing prototype and uses compatible materials. Attempts should only be made to replace those portions of wall that are known to have existed. Reconstruction of wall sections without sufficient documentary or physical evidence is not recommended. Only qualified contractors should repair/reconstruct walls and they must follow the Secretary of Interior Standards and Guidelines.
- Continue to preserve the wall at the edge of the Ironmaster's House garden, which is presently in good condition.
- Implement a less rigorous schedule of whitewashing the wall between the Office & Store and the Furnace. This would convey a more historic impression of this feature without jeopardizing its preservation.

### *Vegetation*

- Preserve the edge of woodland west of the Tenant Houses by controlling any encroachment of trees into this open space. This may be accomplished through

---

<sup>2</sup> The remains of a slag pile east of Birdsboro-Warwick Road and north of French Creek would suggest that a fence did not always exist in this location; however, historical documentation does not provide for a more suitable location for the fencing. This fencing is currently needed for the Park's livestock management and should be retained.

annual mowing of the area. Vegetation located along the forest edge determined to be exotic should be removed. Use of an herbicide such as Pronone® could reduce the amount of labor required to remove this exotic vegetation; however, all pesticides must be determined NPS acceptable prior to their use.

- Do not over-maintain existing vegetative borders along the core village roads. Incorporate a less rigorous mowing schedule. A mowing schedule of not more than once per month during the growing season should be adopted for these areas.

### *Vegetation*

Vegetation within Hopewell's core village consists of specimen trees, gardens, border forest, orchard, and grass areas. Vegetation, as a landscape element, has changed considerably in the core village from its appearance during most of the site's history. Vegetable and ornamental gardens are almost entirely absent from the present site and adjacent agricultural fields are no longer in production of row crops. Moreover, the present core village landscape imparts a much more manicured and uniform appearance. Despite changes in the composition of Hopewell's vegetation, it remains important to the understanding of Hopewell's cultural landscape. The existing patterns and types of vegetation have, for the most part, existed at the site for more than fifty-years and reflect federal custodial care and ownership. Moreover, the lack of documentary evidence and the restrictive costs associated with restoring and replacing numerous vegetative elements restricts other treatment alternatives.

The core village contained a number of vegetable and flower gardens during the furnace's period of operation. These landscape elements are largely absent from Hopewell's present-day landscape. This absence is most evident in the vicinity of the Tenant Houses and the Ironmaster's House. The majority of area surrounding the Tenant Houses presently consists of turf with two small areas fenced for gardens. The lawns that presently border the Tenant Houses do not represent a historic landscape element at Hopewell Furnace.

### Goals:

Preservation efforts should focus on controlling existing vegetation through ongoing maintenance activities. Identify and control the more aggressive invasive exotic plants, especially in open areas, along French Creek, and at forest edges.

### Recommendations:

- Cut back invasive vegetation from around walls and fences. Try to keep adjacent grass to a height of six to twelve inches. Invasive woody vegetation should be removed either by hand or through mechanical means such as the use of string trimmers, brushcutters, or grubbers. If woody vegetation cannot be removed by the root then it should be cut to the ground.
- Maintain the division between open space and woodlands west of the tenant houses by removing invasive saplings through annual mowing of turf adjacent to the woods. Vegetation located along the forest edge determined to be exotic should be removed. Use of an herbicide could reduce the amount of labor required to remove this exotic vegetation.
- Remove larger woody vegetation and the more aggressive exotic invasive vegetation from along French Creek. Vegetation bordering French Creek through Fields 6a and 6b should generally be kept to a maximum height of nine feet.

- Remove invasive trees at the west edge of the large slag pile, and adopt a more aggressive schedule of removing grass and weeds from the slag piles. The last activity might include a careful use of organic pesticides, controlled burning, or manual weeding. Accord® herbicide is EPA registered and acceptable for use in or near wetland areas. This, and all use of pesticides, should include consultation with the National Park Service's Integrated Pest Management Coordinator.
- Discourage further advancement of turf into historically dirt covered areas. These areas include the ground immediately in front of the doors to the Village Barn (on the north facade) and extending to the roadway, the area immediately east of the furnace complex and extending to the roadway, and the wagon turn-around near the Charcoal House. The limited use of an herbicide, such as Roundup® (short term) or Triox® (long term) could possibly control this type of unwanted vegetation. Placing additional gravel in appropriate areas may also control this type of vegetation.



Figure 6.9. A regional example of a creek with adjacent meadow and grazing cows. Circa 1900. Photo reproduced from Fegley *Farming, Always Farming* (Birdsboro, Penn.: The Pennsylvania German Society, 1987). Use of photo courtesy of the Schwenkfelder Library.

- Protect specimen trees from disease and continue their protection from lightning strikes. Develop a preservation maintenance plan for all specimen trees. Maintenance activities should include pruning dead wood and removing dying trees. It is recommended to first consult relevant publications, such as the following written by Dr. Alex J. Shigo: *Tree Anatomy* (1994), *A New Tree Biology* (1996), *A New Tree Biology Dictionary* (1996), or *100 Tree Myths* (1993). Consultation with a certified arborist is also recommended. While there are no specific trees warranting clonal replacement, all dead or extensively deteriorated specimen trees should be replaced in kind. If the exact historic species

has been lost or is unavailable, substitute species may be used as long as they convey the same growth habit, form, foliage, and bloom characteristics as the historic tree.

- Promote the vegetative health of individual plants and the environment as a whole through good maintenance practices. The occasional reevaluation of the condition of vegetative features should be incorporated into maintenance activities in order to refine maintenance practices and adjust the frequency of maintenance activities. Vegetative health conditions should be evaluated yearly, while general plant conditions should be evaluated no less than every five years.
- Introducing new gardens to the Tenant Houses in the core village is not recommended. It is not recommended that existing lawns and grass be removed. Mowing schedules for lawns and other grass-covered areas should be adjusted by lengthening the intervals between mowings. Staggering the mowing schedule of adjacent parcels could also distinguish individual parcels and present a less uniform appearance to the area as a whole. Turf should generally be kept to a height of three to seven inches.
- The absence of conclusive documentary evidence precludes any attempt, at this date, to substantially restore or rehabilitate the Ironmaster's House Garden. Landscape archeology could provide sufficient evidence regarding the layout and size of garden beds and paths. Soil analysis that includes seed, pollen, and phytolith analysis may determine plant types historically grown in the garden.<sup>3</sup> Evidence of this nature is essential prior to making any effort to rehabilitate, restore, or reconstruct this significant landscape element.
- Retain extant features, such as perimeter walls, terrace walls, the East Head Race, and the greenhouse ruins.
- Reevaluate previously stabilized elements no less than every other year to determine if additional treatment is necessary.
- All ground disturbing activities must take into consideration the potential archeological resources that may be affected by such activities.

#### *Clusters, Buildings, and Structures*

The core village contains the most concentrated collection of buildings and structures within Hopewell Furnace National Historic Site. While a number of these buildings are historic, the core village also contains a number of reconstructed buildings and structures. These include the Cast House, Charcoal House, Village Barn, Birdsboro-Warwick Road Bridge, and Blacksmith Shop. These non-historic buildings and structures, while considered non-contributing landscape elements, are essential to the site's interpretation.

#### Goals:

All existing building clusters, and all individual buildings and structures within the core village, should be retained and maintained.

---

<sup>3</sup>William M. Kelso and Rachel Most (eds), *Earth Patterns: Essays in Landscape Archaeology* (Charlottesville: University Press of Virginia, 1990), 38.

### Recommendations:

- Historic buildings must be maintained in accordance with the *Secretary of Interior's Standards and Guidelines for Rehabilitation*, as should all significant reconstructed buildings.
- Repairs to deteriorated parts of buildings and structures should be in kind. Repairs should not attempt to return a particular building to an earlier appearance, but acknowledge the building's full history.
- It is not recommended that non-extant buildings or structures, such as the Carpenter Shop, be reconstructed.
- Remove carport from Tenant House Number 3.
- Include annual maintenance inspections to evaluate building condition. Priority should be given to structural deficiencies and repairs that affect deteriorated character-defining features. Work of a more cosmetic nature should be given a lower priority. This will help focus available resources on structural concerns, and provide a desired less kept appearance to the buildings.



Figure 6.10. Nineteenth century view of a cluster of farm buildings with an adjacent dirt lane, chickens, post-and-rail fencing, and small-scale features. N.d. Photo reproduced from Fegley *Farming, Always Farming* (Birdsboro, Penn.: The Pennsylvania German Society, 1987). Use of photo courtesy of the Schwenkfelder Library.

### *Archeological Sites*

Archeological Sites, both known and unidentified, represent a significant source of information regarding the historic appearance of the core village. This is particularly true for the period before 1850, for which there is little site-specific documentary evidence. Ruins located in the core village include the Anthracite Furnace, the School House, the Kiln

House, Ironmaster's House Greenhouse, and the Ore Roaster. Below ground resources known or believed to exist in the core village include Tenant House No. 4, the Ironmaster's Garden Privy and Tool House, tenant house privies, and the Carpenter Shop.

The potential exists for substantial archeological discoveries within the core village. Landscape archeology can help determine the location of gardens, fence lines, paths, walls, or other landscape features. Landscape archeology could also provide valuable information regarding historic plant types.

#### Goals:

Known archeological sites and ruins should be protected, and stabilized where needed. An archeological overview, inventory, and assessment should be completed for the Core Village Management Zone.

#### Recommendations:

- A qualified archeologist should review all ground disturbing activities and evaluate the potential of known sites and unidentified sites.
- Control activities that may disturb or destroy potential archeological remains. Additionally, archeological resources should be protected, within reason, from natural forces that may cause degradation of the site over time. This approach can include such activities as diverting water runoff from a known archeological site. Above ground archeological ruins should be stabilized (if needed) to help prevent deterioration of the resource.
- Reevaluate the condition of previously stabilized ruins no less than once every two years.
- Remove invasive vegetation that threatens archeological sites. Invasive vegetation can cause serious damage to archeological ruins. Removal of invasive vegetation should be done carefully so that the activity does not destroy archeological features. Vegetation within a known archeological site should be cut to the ground. A limited use of an herbicide applied to trunks and root systems may help keep vegetation from sprouting.
- The potential effects of ground disturbing activities on archeological resources should be considered for known sites and unidentified sites prior to the commencement of activities.

#### *Small-Scale Elements*

Few small-scale elements survive within the core village from any period prior to the federal government's acquisition of Hopewell Furnace National Historic Site. Some of the existing small-scale elements represent elements that existed historically at Hopewell, such as the boardwalk at Tenant House No. 1 and the water pump near the Boarding House. Others elements provide modern conveniences for visitors, such as drinking fountains, trash receptacles, and benches. Other modern small-scale elements guide visitors, such as wayside signage; or compliment interpretive programs, such as the placement of tools near the furnace. Most of these features are considered non-contributing to Hopewell's cultural landscape; however, many are important to the site's interpretive programs and add to the overall understanding of the site.

Examples of small-scale elements exhibited around the furnace component of the core village include charcoal baskets, ore cars, hand tools in the bridge house, piles of ore and limestone near the charcoal house, and pig iron at the cast house. Other small-scale elements that would typically be found at a site such as Hopewell include water pumps, clothes lines, privies, arbors, hitching posts, piles of wood, and farm implements, among many others. Some of these have been placed within the core village; however, many more likely existed during the period of furnace operation. Most small-scale elements are impermanent in nature, and because of their commonness were typically not mentioned in any detail within the documentary record. Therefore, the quantity of small-scale elements is not known nor are the actual designs or placements.



Figure 6.11. A regional example of a spring house with adjacent small-scale features. Circa 1900. Photo reproduced from Fegley *Farming, Always Farming* (Birdsboro, Penn.: The Pennsylvania German Society, 1987). Use of photo courtesy of the Schwenkfelder Library.

#### Goals:

Small-scale elements reflecting those that historically would have been found within the core village should be retained and preserved. Small-scale elements should be better represented in the Core Village Management Zone.

#### Recommendations:

- Repair ditch in front of Tenant Houses by no longer diverting water away from the existing depression. Monitor this area once water is allowed to naturally return to the ditch in order to ensure that no subsequent damage is done to the site. Give consideration to the potential effects of water flowing from the ditch through to French Creek.

- Preservation of the site does allow for some additional small-scale features; however, care should be taken not to create an completely imagined nineteenth century landscape through the introduction of countless undocumented small-scale features. The choice of small-scale elements should be based on historical documentation and such sources as Stuart Wells' Hopewell Historic Scene Report and historic photographs of Hopewell, area farms, or other iron furnaces.
- Modern features, with modern or contemporary designs, should be kept out of the core village or screened from view.
- Remove the water fountain (located near the barn) from the core village.
- Modern elements designed to blend with the historic character of the core village, such as trash cans and benches, should have limited placement in this management zone.



Figure 6.12. View of a blacksmith shop with associated small-scale elements. N.d. Photo reproduced from Fegley *Farming, Always Farming* (Birdsboro, Penn.: The Pennsylvania German Society, 1987). Use of photo courtesy of the Schwenkfelder Library.

### **Agricultural Management Zone**

The Agricultural Management Zone includes the Village Meadow, Bethesda Church, and lands associated with four historic farms. Three of the four farms located within the Agricultural Zone were independently owned and did not become part of the furnace property until the first quarter of the twentieth century. These farms are the Nathan Care Farm, located immediately south of the core village; the Thomas Lloyd Farm, located east of PA Route 345 near Bethesda Church; and the Harrison Lloyd Farm, located east of PA Route 345 south of the Nathan Care property. The Church Farm, located immediately north of the intersection of PA Route 345 and Mark Bird Lane, and the Village Meadow were owned by the furnace throughout the site's history. Management goals for the

Agricultural Management Zone should continue to stress the retention of extant fields and meadows. A summary of Treatment Recommendations for the Agricultural Management Zone are found in Table 6.2.

#### *Patterns of Spatial Organization*

Patterns of spatial organization within the Agricultural Management Zone are likely less defined than during the furnace's period of operation. A large number of former fields have been encroached upon by successional woods and exotic invasive plants, altering the relationship between open and closed space. This is most evident with lands associated with Thomas Lloyd and Harrison Lloyd; however, the Church and Nathan Care farms have also been affected by the shrinkage of agricultural fields. The loss of some walls and fences, as well as the limited selection of crops within individual farms, has altered the composition of these farmsteads. The construction of PA Route 345 By-pass during the 1930s created a false division of farm fields at Hopewell.

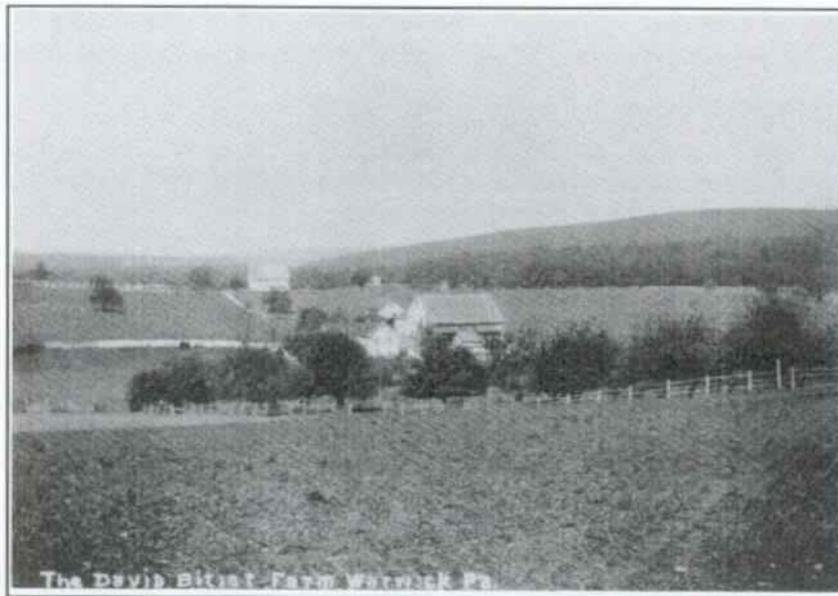


Figure 6.13. View of David Bitler Farm, Warwick, Pa. Showing agricultural fields, field divisions, and orchard. N.d. Octavius Bull photograph taken between 1900-1907. On file at the Chester County Historical Society, Photo No. CCHS 1812.

#### Goals:

Preservation efforts should focus on controlling the encroachment of woods into farm fields and better represent the relationship between open fields and woodland. Efforts to reestablish internal field boundaries should focus on exposing extant walls and stabilizing wall remnants.

#### Recommendations:

- Control voluntary woody vegetation from encroaching into farm fields. An annual or biennial cutting of field edges should be sufficient to control the encroaching woods. Vegetation located along the forest edge determined to be

exotic invasive vegetation should be removed. Use of an herbicide could reduce the amount of labor required to remove this vegetation.

- Control the loss of stone walls through their stabilization. This may require the removal of invasive vegetation from the walls. Care must be taken during the removal of vegetation to prevent additional destruction to the wall.
- Expose field stonewalls that are likely to be seen by the visiting public, but are visually obstructed by vegetation (see Heite "Report of Archaeological Surveys on 198 Acres at Hopewell Furnace NHS," 1989 for some examples).
- Give low priority to reconstructing internal field boundaries.
- Remove trees and brush that have established themselves as a border alongside PA Route 345 to strengthen the visual division of the fields. If removal of such vegetation creates the potential for subsequent erosion then sodding or seeding should be employed.
- Maintain low edge along PA Route 345 by mowing once or twice a year.
- Consider reclaiming open space from woody plant intrusion, especially west and southeast of the Thomas Lloyd House. The Secretary of the Interior's *Guidelines for the Treatment of Cultural Landscapes* allows for the reclaiming of open space. Use aerial photographs and archeological investigations to help define the area to be reclaimed. Reclaiming open fields might be accomplished by mechanical means or possibly through prescribed burning.

#### *Circulation*

Preservation of the circulation network is essential for the accurate portrayal of Hopewell as a vibrant community connected to surrounding farms, villages, and towns. The portions of Reading-Valley Forge Road and Birdsboro-Warwick Road that are located within the Agricultural Management Zone generally retain their historic alignments. Access roads leading from the main roadways into specific farmsteads should also be preserved. These include the Harrison Lloyd farm lane and the Thomas Lloyd farm lane. The Thomas Lloyd farm lane is in good condition; however, the Harrison Lloyd farm lane is in poor condition and is overrun by volunteer trees and invasive vegetation.

#### Goals:

Preservation efforts should focus on maintaining the circulation network by preventing the encroachment of grass and volunteer trees into their alignments.

#### Recommendations:

- Volunteer trees and invasive vegetation should be removed from the Harrison Lloyd farm lane. Preservation efforts should, at a minimum, include removing the volunteer trees from its alignment. If it is not possible to remove these trees from the roots then the trees should be cut to the ground and an herbicide, such as Accord® or Pathway®, RTU applied to road alignment to deter future growth. All pesticides, however, must be determined NPS acceptable prior to their use
- Unpaved roads should remain unpaved. Maintenance and repair of these roads and lanes should use historically appropriate materials such as dirt, slag, or

compatible material. It is not recommended to replace asphalt-paved roads with dirt roads.

### *Boundary Demarcation*

Boundaries within the Agricultural Management Zone separate fields, land parcels, and uses. They consist of walls, fences, vegetation, roadways and specifically the East Head Race. These features are important components within Hopewell's cultural landscape and contribute to the spatial organization of the site.

Stone walls are found at Bethesda Church, at the Church Farm, along Birdsboro-Warwick Road near the Nathan Care property, as part of the East Head Race, and within the former fields associated with both the Thomas and Harrison Lloyd properties.

No wood fencing, within the Agricultural Management Zone, survives from the furnace's period of operation. The existing wood fencing is considered a non-contributing landscape feature; however, it provides an essential component to understanding the site's cultural landscape and should be retained. This includes the fences enclosing the Village Meadow, along Mark Bird Lane, along PA Route 345, and in the vicinity of Bethesda Church. The construction of the PA Route 345 By-pass created a non-historic division of fields west of the core village. Trees and other forms of vegetation have begun to line the edges of PA Route 345, accentuating these non-historic field divisions.

### Goals:

Preservation efforts should focus on those boundaries that are visually accessible to the public, such as at the East Head Race (both east and west of PA Route 345), at the Church Farm, at Bethesda Church, and the walls near the Nathan Care property. A visual continuity should be maintained among fields divided by PA Route 345.

### Recommendations:

- Manage encroaching invasive vegetation that can lead to deterioration of stone walls. This is needed along the East Head Race, east of PA Route 345, where the wall's integrity is threatened by encroaching vegetation. Employ the use of hand-held trimmers and brushcutters to clear wall areas. Limited use of an herbicide may deter future growth. Adjacent vegetation should be kept to a height of six to twelve inches. In the case of the stone wall associated with the Nathan Care property, efforts should focus on preserving the existing wall. Missing portions of this wall can be rebuilt if those portions are known to have existed historically and their appearance is based on existing prototypes. Compatible materials must be used for repairs and reconstructions. At a minimum, the walls located within the former boundaries of lands associated with Thomas Lloyd and Harrison Lloyd should be stabilized by removing invasive vegetation threatening the wall's integrity.
- The repair or replacement of post-and-rail fences should be done with three-, four-, or five-rail post-and-rail fencing. The installation of additional fencing is not recommended unless archeological or documentary evidence can provide for its precise placement. Adjacent grasses should be kept to a height of six to twelve inches.
- Maintenance efforts should concentrate on limiting and reducing the growth of trees and scrub along PA Route 345 so that these divisions may be de-emphasized and a visual continuity maintained for historic fields divided by the roadway. If

removal of trees or brush in this area creates the potential for future erosion then sodding or seeding the area should be considered.

- Bury utility wires currently running through woods near Thomas Lloyd Farm in order to eliminate a non-historic boundary/land division.
- Bury utility wires currently running north of the Nathan Care House.

### *Vegetation*

The most important aspect of the Agricultural Management Zone is the relationship between open space and woodland. Additionally, it is important for the agricultural fields to convey a sense of their past agricultural use. Optimally, most of the fields comprising the Agricultural Management Zone would be planted with a range of crops historically grown on these farms. Many factors, however, prohibit fulfillment of this ideal. These include lack of documentary evidence placing specific crops in specific fields, prohibitive costs of operating such farms, and the devastation caused to row crops by the region's white-tailed deer population.

#### Goals:

The most important treatment activity within the Agricultural Management Zone is the maintenance of the relationship between open space and woodland. Efforts should concentrate on preventing the further loss of agricultural fields to successional forests. It is also important that the existing fields convey a sense of their agricultural past to visitors.

#### Recommendations:

- Cut back invasive vegetation from around fences and walls, as well as along roadways, where that vegetation presents a false division of fields. Use the most appropriate means to cut back vegetation without causing damage to historic features, such as stone walls or fences. In these instances it is better to use a hand-held trimmer or brushcutter. Use of an herbicide on the stumps of removed woody vegetation may help deter its reestablishment.
- Till selective fields that are visually accessible to the public, without planting crops. This could help convey the sense of agricultural usage without jeopardizing the preservation of the site. Tilling fields without planting, however, could lead to soil erosion. In areas where this is likely to result (such as a sloped area), work should include stabilization with vegetation or naturally occurring mulch. If this is not possible then only choose field locations that will not lead to soil erosion.
- Plant hay in agricultural fields when planting row crops or tilling without planting are not options. If row crops are planted it is best to use varieties that were known to have existed at Hopewell.
- Mow fields left to grass once a year.
- Mow Fields 6a and 6b several times per year so that they exhibit the semblance of a nineteenth century grazing pasture.

- Balance the needs of the park and the user when managing turf areas around houses used as residences (Nathan Care House, Church House, and Thomas Lloyd House).
- Keep turf areas most visible to the visiting public less manicured and to a height of three to seven inches. Those areas less visible to the public could be cut shorter.

### *Clusters, Buildings, and Structures*

The Agricultural Management Zone contains concentrations of buildings and structures at the former Church Farm, Nathan Care property, Thomas Lloyd property, and Bethesda Church. Historic clusters include the church, carriage house, and privy at Bethesda Church; the house, spring house, and wagon shed at the Thomas Lloyd property; the house and barn at the Church Farm; and the house and barn at the Nathan Care property.

#### Goals:

All existing historic building clusters, and all individual historic buildings and structures within the Agricultural Management Zone, should be retained and maintained.

#### Recommendations:

- Work to historic buildings must follow the *Secretary of the Interior's Standards and Guidelines for Rehabilitation*. Repairs should respect the resource's complete history and not attempt to return a particular resource to an earlier appearance. Reconstructing missing buildings or structures within the Agricultural Management Zone is not recommended.
- Maintenance activities at these buildings should include annual inspections to evaluate building condition. Priority should be given to structural repairs and repairs directed at halting deterioration. Lower priority should be given to cosmetic repairs.

### *Archeological Sites*

The greatest concentration of above ground ruins within the Agricultural Management Zone are located in the vicinity of the former Harrison Lloyd property. These include the ruins of the Harrison Lloyd House, Barn, Blacksmith Shop, outbuildings, and well. The best way to preserve archeological resources is to control activities that may disturb or destroy known and unidentified archeological remains. Additionally, archeological resources should be protected, to a reasonable extent, from natural forces that cause degradation of the site over time.

#### Goals:

All known archeological sites should be protected. A proactive plan to locate additional archeological sites should be investigated. Invasive vegetation can cause serious damage to archeological ruins. The effects of invasive vegetation on archeological sites should be considered. Additionally, the potential effects of ground disturbing activities on known and unidentified archeological resources should be considered prior to commencement of the activity. A qualified archeologist should review such activities and evaluate the archeological potential of the site.

### Recommendations:

- Consult a qualified archeologist for all maintenance activities to ensure that a proper approach is taken.
- Stabilize above ground archeological ruins to help prevent any further deterioration of the resource. Previously stabilized ruins should be reevaluated a minimum of once every two years.
- Use ongoing maintenance activities to remove invasive vegetation that threatens archeological sites unless the specific vegetation supports the historic structure or stabilizes it against erosion. Removal of invasive vegetation should be done carefully so that the activity does not destroy archeological features. Vegetation within a known archeological site should be cut to the ground. A limited use of an herbicide, such as Accord®, Roundup®, or Triox®, applied to trunks and root systems may help keep vegetation from sprouting. All herbicides must be NPS approved prior to their use.

### *Small-scale Elements*

Few small-scale elements survive in the Agricultural Management Zone from any period prior to the federal government's acquisition of Hopewell Furnace National Historic Site. Small-scale features are most likely found near building clusters.

### Goals:

Efforts should be made to maintain those elements that reflect historic features; however, care should be taken not to create an imagined nineteenth century landscape through the introduction of too many undocumented small-scale elements.

### Recommendations:

- Preservation of the site does allow for the addition of some small-scale features for interpretative purposes. The choice of small-scale elements should be based on historical documentation and such sources as the farm data section of this report, Stuart Wells' "Hopewell Historic Scene Report," as well as historic photographs of Hopewell and area farms.
- Keep modern features to a minimum and place where they will create the least amount of visual impact for park visitors. Native, naturally occurring vegetative screening may be used to conceal modern features that cannot be placed out of view; however, the plants when mature should be no taller than the item they are concealing. Additionally, no screening should cause a impact on the cultural landscape greater than the modern feature it is trying to conceal.

## **Woodland Management Zone**

The Woodland Management Zone includes areas that have remained wooded throughout the period of the furnace's operation as well as woodlands that were once fields. This zone comprises the majority of Hopewell's land. The primary management goal for the Woodland Management Zone should be preventing further forest expansion into agricultural land, and promoting a healthy forest by protecting the understory through deer management. A summary of Treatment Recommendations for the Woodland Management Zone are found in Table 6.3.

### *Patterns of Spatial Organization*

The overall spatial organization of the site has changed from that of the furnace's period of operation. Throughout the period of the furnace's operation the associated woodlands would have exhibited a less uniform appearance than at present. At any given point in time the forest would have displayed various stages of growth as a result of the cyclical cutting of trees for charcoal production. Additionally, certain forested areas have expanded into historically non-forested areas. There is little distinction of spatial organization within the Woodland Management Zone. The majority of the area is simply forested. Exceptions include the Brison, Woodlot, and Manning house sites. Encroaching vegetation into these sites threatens former spatial distinctions. The CCC's involvement at Hopewell Furnace during the twentieth century introduced minor land use and spatial organization changes within some of the forested areas. The development of a picnic area with adjacent parking lot near Baptism Creek and the construction of hiking trails are two examples of these changes within the Woodland Management Zone.

#### Goals:

Preservation activities within the Woodland Management Zone should include maintaining or lessening the existing edges of forested land. The relationship of open space to woodlands should generally be preserved. Efforts should be made to control future encroachment of volunteer trees and invasive vegetation into adjacent open fields and former house sites.

#### Recommendations:

- Control encroachment of forests into open space. Annual or biennial cutting of field edges should control the expansion of woodlands into fields. Vegetation located along the forest edge determined to be exotic invasive vegetation should be removed. Use of an herbicide such as Pronone® could reduce the amount of labor required to remove this vegetation. All pesticides, however, must be determined NPS acceptable prior to their use
- Consider reclaiming open space from woody plant intrusion, especially north of the Thomas Lloyd House and south of field No. 4. *The Secretary of the Interior's Guidelines for the Treatment of Cultural Landscapes* allows for the reclaiming of open space. Use aerial photographs and archeological investigations to determine the area to be reclaimed. Reclaiming open fields might be accomplished by mechanical means or possibly through prescribed burning.

### *Circulation*

Resources comprising the Woodland Management Zone's circulation system include through roads, hiking trails, traces of former charcoal roads, and abandoned access roads. PA Route 345 is the major through road in the park. The northern and southern portions of this road generally follow historic road alignments, while the central portion was constructed by the CCC during the late 1930s as a by-pass road around the core village.

#### Goals:

The park should advocate the retention of historic alignments of state or county roads that pass through the park if alterations are proposed to these roads. Similarly, the park should preserve the alignment of the Reading-Valley Forge Road east of the PA Route 345 By-Pass. The Lenape and Horse-Shoe Trails should be retained and maintained as should the Harrison Lloyd farm lane. The

Horse-Shoe Trail and the Harrison Lloyd Road share part of the same alignment. The current trail system should be retained.

Recommendations:

- Follow the *Secretary of Interior's Standards and Guidelines for Rehabilitation* for work proposed on CCC-era bridges and culverts.
- Clear saplings and brush from within the roadbed of the Harrison Lloyd farm lane. If it is not possible to completely remove these trees then the trees should be cut to the ground and an herbicide, possibly Accord® or Pathway® RTU, applied within the road alignment to deter future growth. Leaf-mulch and other debris should also be cleared from road traces if its presence poses a significant threat to the preservation of the road trace.
- Repair path from Baptism Creek Picnic Shelter to Woodlot House.
- Use historically appropriate materials such as dirt, slag, or compatible material if repairs are made to historic roads. Care should be used during repair work not to significantly alter the road's elevation or profile.

*Boundary Demarcation*

The forest edge forms boundaries between the forest and agricultural fields. These boundaries have, over time, extended into fields. This is evident in the vicinity of the former Harrison Lloyd property and near fields 5 and 14. Other boundaries include the remnants of walls. These can be found near the Manning House site and just north of the Baptism Creek Picnic Shelter.

Goals:

Preservation efforts should focus on maintaining the forest edge and controlling the expansion of woodlands into adjacent farm fields or into former tenant house sites. Efforts should also control invasive vegetation around walls and where it forms artificial boundaries. Any fence or wall reflecting a former boundary should be retained.

Recommendations:

- Remove invasive vegetation threatening the structural stability of walls as part of stabilization plans. Employ the use of hand-held trimmers and brushcutters to clear wall areas. Limited use of an herbicide may deter future vegetative growth along walls.
- Remove invasive vegetation that visually obscures walls that are routinely seen by visitors. Walls that are not routinely seen by visitors should be stabilized, but it is not necessary to clear vegetation that only obscures a view to these features.
- Remove scrub to prevent artificial borders along roadways.

*Vegetation*

As a landscape element, the vegetation within Hopewell's Woodland Management Zone has changed considerably from the time of the furnace's operation. The woodlands,

originally dominated by chestnut and hickory, presently consist largely of maple and oak. Historical evidence suggests that the present forests are comprised of much older trees than existed during the furnace's period of operation, when cyclical cutting for charcoal production occurred every twenty-five to thirty years. Additionally, the forests have spread into former agricultural fields, increasing the total area of woodlands. Consequently, the Woodland Management Zone is more wooded and more mature than during the period of the furnace's operation. This composition of the forest will most likely continue because the chestnut and hickory woods cannot be returned to the site and charcoal production will not be resumed on an industrial scale.

Moreover, the overpopulation of deer within Hopewell's woods and in the surrounding area threatens the preservation of forest type and understory as well as restricts how other parts of the park are used and interpreted. The extensive browse lines, worn trails, and clear views caused by the deer creates a false impression and is not representative of the site's historical appearance. In addition Hopewell's woods are more susceptible to aggressive invasive species.

#### Goals:

The existing forests should be preserved and the overall relationship between open space and forests maintained. Efforts should focus on controlling the encroachment of volunteer trees into adjacent fields. Additionally, efforts should be made to promote a healthy forest by protecting the understory through a deer management plan.

#### Recommendations:

- Implement a deer management plan to ensure the preservation of forest type and understory within Hopewell's woods. The plan should address how to control the current deer population. Any plan should be coordinated with those of adjacent parks and game lands because any actions taken, or not taken, on these adjoining lands will impact Hopewell's deer population. The goals of the deer management plan should be to contribute to the regeneration of understory plants, promote the natural succession of young woods into mature forests, provide for a fuller plant and wildlife component, and allow for a fuller use and interpretation of gardens and agricultural fields. Any management action such as this deer management plan should follow the National Park Service's Natural Resource Management Guidelines, NPS-77.
- Mow field edges at least once a year to ensure that woods do not encroach into these open areas. Vegetation located along the forest edge determined to be exotic invasive vegetation should be removed. Use of an herbicide, possibly Pronone®, could reduce the amount of labor required to remove this vegetation.
- Control exotic invasive species or pest infestations of more than five acres of existing forested stands. Solicit the advise of a certified forester, arborist, or state forester.

#### *Clusters, Buildings, and Structures*

Baptism Creek Picnic Shelter and Spring House as well as a number of vehicular and pedestrian bridges are the only clusters, buildings, and structures within the Woodland Management Zone. The extension of the East Head Race, north of the picnic shelter, should be preserved. This feature presently exists as a dry ditch.

### Goals:

CCC related buildings and structures located within the Woodland Management Zone should be retained and preserved. More fully include CCC-era buildings and structures in interpretive programs.

### Recommendations:

- Maintain historic buildings and structures in accordance with the *Secretary of Interior's Standards and Guidelines for Rehabilitation*. Repairs to deteriorated portions of buildings and structures should be in kind.
- Retain as much of the East Head Race's (dry ditch east of field No. 3) overall profile so that it is not lost through natural deterioration. Efforts should include removing accumulated silt and debris to the original swale. Remove woody vegetative plants with a string trimmer or grubbing tool. Use an herbicide as needed to control future growth of invasive vegetation.
- Incorporate CCC-era buildings and structures into the Long Range Interpretive Plan.

### *Archeological Sites*

Known archeological sites located within the Woodland Management Zone include two house ruins, a house site, numerous charcoal hearths and collier hut sites, and road traces.

### Goals:

All known archeological sites should be protected. An active plan to locate additional archeological sites should be investigated. The potential effects of ground disturbing activities on known and unidentified archeological resources should be considered prior to commencement of the activity. A qualified archeologist should review such activities and evaluate the archeological potential of the site.

### Recommendations:

- Consult a qualified archeologist prior to working on archeological sites or initiating ground disturbing activities.
- Reevaluate the condition of the Brison and Woodlot House ruins a minimum of once every two years. Schedule stabilization work if needed.
- Remove volunteer trees and invasive woody vegetation from the immediate area of ruins unless the specific vegetation supports the historic structure or stabilizes it against erosion. Removal of invasive vegetation might include cutting the vegetation to the ground and applying an appropriate herbicide, possibly Accord®, Roundup®, or Triox®. All pesticides, however, must be determined NPS acceptable prior to their use.
- Restrict new ground disturbing activities in the vicinity of the Manning House site as a means of protecting potential archeological resources.
- Protect the remains of Hopewell's charcoal hearths and collier huts. These are most often disturbed through human activity and/or natural forces. Human

disturbance of these sites can be controlled through limiting human activity in the vicinity of known sites. Natural forces provide potential long term threats to these sites. A biennial evaluation of these sites could identify potential threats.

- Archeological sites within the Woodland Management Zone should not be identified to the general public unless the sites are adequately protected.

#### *Small-scale Elements*

Few small-scale elements remain within the Woodland Management Zone. Most of the small-scale features are located in the vicinity of Baptism Creek Picnic Area and consist primarily of modern trash receptacles and picnic tables. Additionally, some drinking fountains and fireplaces constructed by the CCC remain.

#### Goals:

Retain and maintain extant small-scale features located within the Woodland Management Zone.

#### Recommendations:

- Retained and stabilize CCC era drinking fountains and fireplaces if necessary.
- Incorporate interpretation of CCC-era small-scale features into Long Range Interpretive Plan.

### **Park Support Management Zone**

The Park Support Management Zone is located directly north of the Core Village Management Zone. It contains the Visitor Center, visitor center parking area, staff residences, and maintenance facilities. Additionally, it contains part of a replanted apple orchard and open fields. A summary of Treatment Recommendations for the Park Support Zone are found in Table 6.4.

#### *Patterns of Spatial Organization*

The present spatial organization of the Park Support Management Zone reflects the pattern of land use that has characterized this area since the late 1950s. It includes two distinct sub-components. A visitor-focused component is located directly north of the core village and contains the Visitor Center, replanted apple orchard, and the visitor parking lot. A Park Service component, oriented at the maintenance of the park, is located north of the visitor parking area. This component contains staff residences and maintenance facilities.

This zone contained agricultural lands and woodlands until the Civilian Conservation Corps established a camp in this area during the 1930s. The present patterns of spatial organization are, for the most part, not reflective of historical patterns of spatial organization for this area.

#### Goals:

The woodlands, open fields, and apple orchard located within this zone are reflective of historic land uses and as such should be retained and preserved.

Recommendations:

- Keep areas within the Park Support Management Zone well-kept and orderly to help differentiate this zone from the slightly rougher look desired for the historic zones. These non-historic areas require less stringent adherence to preservation guidelines.
- Consider potential impacts of all future treatments and activities, both physical and visual., Consider the effects they may have on the surrounding landscape and the historic buildings located within the Park Support Management Zone.

*Circulation*

The present circulation network in the Park Support Management Zone includes both historic and non-historic roads. Historic roads include portions of the Reading-Valley Forge Road and the 1804 Road.

Goals:

Extant portions of historic roads should be retained and maintained.

Recommendations:

- Continue maintenance and repair of historic roads utilizing historically appropriate materials such as dirt, slag, or other compatible material. Care should be taken during repair work not to significantly alter the road's elevation or profile, unless such changes can be historically documented. The current road widths should be preserved through maintenance activities that controls encroaching grasses into the roadway. Encroaching vegetation can be controlled with routine mowing, mechanical means, and the limited use of an appropriate herbicide, possibly Roundup® (short term) or Triox® (long term).

*Boundary Demarcation*

Boundary demarcations within the Park Support Management Zone separate open space from woodlands, delineate the southern limits of the Park Support area, and outline roadways. The Reading-Valley Forge Road, the picket fence along the Ironmaster's House garden, and the post-and-rail fence enclosing the cedar pasture delineate the border between the core village and the Park Support Management Zone. These fences are National Park Service installations and are considered non-contributing landscape features; however, these features provide an important component to site interpretation.

Goals:

Retain and maintain existing boundary demarcations.

Recommendations:

- Repair or replace fences that represent historic fences in kind. Installation of new fencing or relocating existing fences is not recommended without additional archeological or documentary evidence that more precisely locates or describes individual fences. Moreover, no new fencing should be installed without careful consideration of the possible effects such work can have on potential archeological resources.

- Control the encroachment of forests into open fields within the adjacent Agricultural Management Zone. Annual or biennial cutting of field edges should control the expansion of woodlands into fields.

### *Vegetation*

Vegetation within the Park Support Management Zone consists of woodland, individual trees and shrubs, turf, grass, and an apple orchard. The orchard was planted by the National Park Service; however, it represents an orchard thought to date from the late-eighteenth century and replanted during the nineteenth century. Encroaching woodlands are affecting the relationship between open and closed areas within the Park Support Management Zone. The encroachment of woods is most apparent in Fields 14 and 15.

### Goals:

Preservation activities should focus on retaining vegetative features that reflect those historically found in this area. This includes the apple orchard, woodlands, and the fields located north of the orchard. Treatment activities should concentrate on controlling the encroachment of woodlands into open fields. Distinguish the Park Support Management Zone from neighboring zones through maintenance activities.

### Recommendations:

- Provide a more manicured look to lawns and grass-covered areas in this area to help distinguish this zone from neighboring historic zones.
- Control encroachment of forests into open space. Annual or biennial cutting of field edges should control the expansion of woodlands into fields. Use of an herbicide, such as Pronone® Power pellet, along adjacent hedgerows could reduce labor.
- Replace individual trees in the orchard as they deteriorate. Historic species are usually available only in small sizes or as scion wood to be grafted onto root stock. Scion wood of historic varieties is available from the Worcester County Historical Society.<sup>4</sup> If varieties specific to Hopewell are not available or present significant management difficulties, they should be replaced with varieties that convey the same characteristics as the historic varieties. Additionally, the existing orchard stock could be replenished by cutting and grafting existing stock onto new root stock.

### *Clusters, Buildings, and Structures*

The Park Support Management Zone contains buildings dating from the period of Civilian Conservation Corps (CCC) activity at the site, Mission 66 building programs, and more recent utilitarian constructions. The CCC buildings that remain in the Park Support Management Zone include Buildings No. 51, 66, and 67. These buildings contribute to Hopewell's cultural landscape.

### Goals:

Retain and maintain extant CCC related buildings, structures, and clusters.

---

<sup>4</sup>Worcester County Historical Society, Tower Hill Botanic Garden, P.O. Box 598, Boylston, MA 01505-0598.

### Recommendations:

- Revise the current Statement for Management and Long Range Interpretive plan to reflect CCC-era buildings and structures as contributing features of Hopewell's cultural landscape.
- Maintenance activities should include annual inspections of historic buildings to evaluate its condition. Maintenance and repair of these buildings should follow Secretary of Interior Standards and Guidelines for Rehabilitation. Repairs to deteriorated parts of buildings should be in kind.
- The remaining buildings located in the Park Support Zone are considered non-contributing features of Hopewell's cultural landscape. There are no specific treatment recommendations for these buildings, however, any undertaking involving these buildings should take into account the potential affect of that undertaking on the character of the surrounding landscape. Conduct a reevaluation of significance for these buildings after they reach fifty years of age.

### *Archeological Sites*

Archeological Sites within the Park Support Management Zone can represent a significant source of information regarding charcoaling at Hopewell, as well as later CCC activities. Previous archeological investigations located a number of charcoal hearths in this area. The potential exists for the discovery of additional charcoal hearths, colliers huts, and road traces. The potential also exists for the discovery of CCC related resources including road traces and artifacts.

### Goals:

Protect known as well as unidentified archeological sites within the Park Support Management Zone.

### Recommendations:

- Consult a qualified archeologist prior to initiating ground disturbing activities.
- The best way to preserve archeological sites is to control activities that may disturb or destroy potential archeological remains. The potential effects of ground disturbing activities on archeological resources should be considered prior to the commencement of the activity. A qualified archeologist should review such activities and evaluate the potential of the site.

### *Small-scale Features*

Small-scale features located within the Park Support Management Zone relate predominantly to modern activities. These include small stacks of building materials, trash containers, picnic benches, and newspaper/mail receptacles.

### Goals:

Control the placement of new small-scale features so that they do not detract from the historical components of the cultural landscape.

Recommendations:

- Any new small-scale elements introduced to this area should have contemporary designs, but also take into account their potential effects on the character of the surrounding landscape.

## INTERPRETATION

The physical features of Hopewell Furnace National Historic Sites are the foundation from which the history of the site is presented to visitors. Each object, resource, feature, and activity adds (or should add) to the story and ultimately to the visitor's understanding of the site. These physical components, however, cannot tell the entire story. Personal interpretation supplements the telling of the story and is needed to explain individual personalities, processes, changes over time, as well as continuity within the site. Interpretation provides the connections between the resource and the visitor.

Moreover, the *Secretary of the Interior's Standards for the Treatment of Historic Properties* prohibits the repair, restoration, or reconstruction of features without sufficient documentary evidence. While restoration or reconstruction of certain features may not be a viable option at Hopewell due to a lack of documentary evidence, the introduction of an interpretive exhibit or feature will often be able to add clarity to the story. Care must be taken, however, not to create a false image of the site through interpretation.

Certain physical features convey their part of the story better than others. In some instances the connections are not obvious or sometimes a particular component of a feature is missing, and therefore, unable to fully contribute to the story. The use of various interpretive techniques, however, can enhance a visitor's understanding of features and the role they historically played. These techniques, while enhancing the story, must not compromise the preservation of the site.

The following sections discuss ways in which interpretation can convey certain ideas or concepts of Hopewell's cultural landscape to the public. The first part provides an overview of Hopewell's Interpretive Program. The second part makes recommendations regarding overall interpretation and access to the park. The last part of this section makes specific recommendations and is organized by proposed management zone. These recommendations must be coordinated with Hopewell's Long Range Interpretive Plan (LRIP). Any recommendation that diverges from the LRIP requires revision of that document prior to the recommendation's implementation.

### Overview

In Chapter 4.0, Analysis and Evaluation, a detailed discussion of the evolution of the road system at Hopewell Furnace concluded that the site, once an active crossroads community, now appears as a museum destination at the end of an entrance road. This statement is resoundingly true, and provides a key to understanding visitors' first strong impressions of the site. Interpretation at the furnace can focus on Hopewell Furnace as an active crossroads community, but it cannot (and should not) obliterate or invalidate Hopewell Furnace as a museum destination at the end of an entrance road.

Hopewell Furnace stood, for most of its history, at the intersection of several roads that brought the world, with all its attendant clamor and change, past its doors. When the Civilian Conservation Corps constructed the by-pass road around the core village, PA Route 345, they effectively marooned the old industrial village on the sidelines of American culture. At that point, Hopewell Furnace stopped *moving in time*, as every living community moves, and became what it remains today: *a place out of time*.

This quality of being *out of time* is what makes Hopewell so intensely appealing to visitors; this is what gives it the power to communicate, to educate, and to interpret the past.

Hopewell is dramatically different from the familiar places down the road (it is dramatically different, too, from other furnace towns that survive in the nearby French Creek region). But it is important to remember that Hopewell is no more a community of the 1820s, or of the 1950s, than it is of the present day. Hopewell is neither "in" nor "of" any historical era.

Underpinning the interpretive program at Hopewell are two parallel stories: 1) The process of making iron using charcoal cold-blast furnace technology; and 2) The people who made the iron and lived in the village surrounding the furnace. The lives of selected Hopewell residents illustrate the region's transition from an agrarian to an industrial economy. On-site interpretation is focused on the decades of the 1820s through the 1840s, Hopewell's era of highest productivity and greatest prosperity.<sup>5</sup>

From the establishment of Hopewell Village as a historic site in the 1930s, through the bicentennial era of the 1970s, interpreters envisioned a "living history museum" setting in which restored buildings and costumed interpreters would create for visitors an illusion of having stepped back in time; to a Hopewell alive and functioning as an early industrial community. The focus era shifted from the period of Mark Bird's ownership in the late-eighteenth century to the peak production years of the 1820s through the 1840s; and iron-industry themes took precedence over village life, but the interpretive strategy remained approximately the same. The goal was to have "the village speak for itself." In the late 1970s, it became apparent that resources would never be sufficient to develop a full "living history" presentation at Hopewell, and supporting media were planned and implemented.

*Key interpretive strategies currently utilized at Hopewell:*

- Orientation programs at the Visitor Center set context and provide a transition between the modern world and the experience found at Hopewell. Current offerings include a ranger's welcome and introduction, and a 11-minute slide show.
- Eight historic buildings (some original, some reconstructed or restored), are furnished and interpreted with audio programs to tell selected stories, most of which relate to the 1830s. The sites or remains of other historic structures are marked and interpreted.
- Costumed interpreters, representing selected historic characters, guide tours or demonstrate work related to iron making, farming, or housekeeping. On occasion, costumed interpreters enact dramatic vignettes. (Most costumed interpretation is done during the summer months.)
- Uniformed rangers welcome visitors, give programs, and occasionally guide tours.
- Wayside exhibit panels identify sites and explain industrial processes.
- Trails (primarily uninterpreted) link the core village to outlying sites, French Creek State Park, and a regional trail system.

Other interpretive operations include the sale of publications, the viewing of video programs, the presentation of educational programs for school groups, and a variety of special events.

---

<sup>5</sup>"Long Range Interpretive Plan: Hopewell Furnace National Historic Site" (1993). On file at Hopewell Furnace National Historic Site.

The Long Range Interpretive Plan (LRIP) notes that visitors spend a relatively short time at Hopewell Furnace, averaging approximately ninety minutes per visit. According to the LRIP this means that the message the site delivers must be nearly immediate. A primary goal of the park's presentation is to suggest to visitors, through sensory images, that Hopewell is "about another time and a different way of life," offering "the sounds, smells, and visual images that place Hopewell into its rural nineteenth-century industrial community complex."

Visitors must not only sense the past at Hopewell, they must come to understand some of its more technical processes and some of its subtle cultural transitions. While the rural landscape and interpreted historic buildings are strongly evocative of the past, supporting media are needed to communicate more detailed information and present a more complete understanding of the site.

The fact that the core village represents twentieth-century National Park Service landscape maintenance standards, rather than those of a nineteenth-century industrial community, is recognized as an obstacle to achieving interpretive goals. Visitors are intended to feel as though "the historic residents are out of sight, but might reappear at any moment." Although the bustle, noise, dirt -- and safety hazards -- of a nineteenth-century iron plantation can not be duplicated, neither is the present bucolic appearance desired. Overall, the LRIP and this report recommend that the landscape appear less manicured, the buildings less precisely maintained, the rooms less pristine, than as at present. Many small improvements are suggested: slag piles weeded, carriage collection removed from the barn hayloft, handbills pasted on building walls. These and other changes can greatly enhance a visitor's understanding of Hopewell's cultural landscape.

On-site interpretation provided by audio programs and wayside exhibit panels is acknowledged to be less evocative of period ambiance than interpreters would like it to be. In addition, the audio programs present maintenance problems. A self-guided audio tour of Hopewell Furnace is cautiously recommended. Such a program would utilize period voices and sounds, and could replace the recorded programs currently offered at some village sites. Due to funding priorities and logistical difficulties, production by a concessionaire was recommended. If a program of this nature is pursued it should be coordinated with resources identified in the Hopewell Furnace Adjacent Land Study.

The interpretation of residential spaces does not fully represent the social structure at Hopewell Furnace. The LRIP suggests that the Ironmaster's House and the Tenant Houses could be furnished and interpreted to better illustrate cultural and social distinctions and interactions.

The Long-Range Interpretive Plan notes that important pieces of the Hopewell story are currently missing from site interpretation. These include the sources of the raw materials used to make iron (iron ore and limestone) and Bethesda Church, which served the Hopewell community throughout its existence. Other pieces of the site's history are absent from current interpretive programs, including the late-nineteenth century period of "shutdown and survival," and the period of CCC/NPS restoration and park development. The site's true appearance and character presents a challenge for interpretation.

Chapters 3.0 and 4.0 of this report describe the evolution of the landscape at Hopewell from its settlement era through the present. Examining the available resources, the report indicates that the story of Hopewell's physical past, including first-person recollections that go back to the 1860s, began to be collected in the 1930s. Information about earlier periods relies on tradition, scholarship, and archeological investigation. The furnace community

evolved significantly between the end of the focus period in the 1840s, and the time of earliest first-hand accounts, in the 1860s.

What this means is that we have access to a "window" on Hopewell Furnace that opened onto the past in the 1930s. The backward view from that window stretches clearly through the Civil War era, and includes the furnace in its final phase of operation. Prior to that time, the view is more distant, neither so clear nor so detailed.

Some important features at Hopewell Furnace distinguish the physical organization of today's National Historic Site from the furnace community of the focus period featured in the interpretive program. These "anachronisms" are essential to Hopewell's historic significance, and should be incorporated into the interpretive plan. Visitors will see them, and a failure to acknowledge the authentic characteristics of the site as they presently exist will detract from the overall quality of the visitor's experience. These features include:

- The appearance of the surrounding landscape, which is in general more wooded than in the nineteenth century; and when farmed, displays fewer crops and supports fewer animals.
- The drier appearance of land around the furnace and tenant houses. The presence of mown-grass "yards" at the tenant houses.
- The 1870s appearance of the Ironmaster's House, indicated by the deep, shady porches front and side, the overhanging water-closet extension, and interior molding and trim. The absence of early outbuildings, including the privy.
- The absence of the Carpenter's Shop and Cupola from the furnace complex, and the presence of the remnant Anthracite Furnace.
- The absence of tenant houses, schoolhouse, outbuildings, ancillary structures, and gardens.
- The absence of traffic and activity that would have characterized the furnace and its crossroads community throughout the focus period.
- The presence of twentieth-century indicators, including planes in the sky, denim clothing on visitors, and the signage and curatorial devices in and around historic structures.

The site's interpretive potential can be enhanced through maintenance, repair, and preservation. For example, sufficient information does not currently exist to fully restore the Tenant Houses' gardens or yard areas; however, changing the mowing schedule to show the separateness of the properties will help interpretation of the resource.

Preservation, as a treatment alternative, allows for limited replacement of missing site features, if those features are known to have existed at the site. The addition of small-scale features, such as clothes lines, rain barrels, or privies, could augment the interpretive program. Care must be taken, however, not to recreate a completely imagined landscape. These features should be distinguished within the interpretive program as non-historic features. Any preservation work should be, to the maximum extent possible, reversible and removable.

## Overall Interpretive Recommendations

### *Use the Visitor Center to augment the site's physical characteristics*

Programs and exhibitory in the Visitor Center should continue to augment the site's physical characteristics and present those aspects of the site that are missing, not fully conveyed or not easily understood through the site's physical features. This could include audiovisual programs that suggest the noise and bustle, traffic and language of Hopewell Furnace's nineteenth-century business activity. Visitor Center presentations should be firmly anchored in the present, and should present the full story of the site including how it was recognized in the 1930s as a special place, due to its history as a relatively intact iron-furnace community, and was carefully isolated at that time from the flow and change of the modern world.

### *Use Trails/Old Roads to Link Hopewell Furnace NHS with French Creek State Park*

The road network played a crucial role in Hopewell's History; however, many of these roads are currently underused or left as trails, and may not fully convey their past use or importance. Linking French Creek State Park and Hopewell Furnace NHS through some of these trails could increase exposure of trails (as well as the rest of the site) to visitors. A recent summer survey cited in the Long-Range Interpretive Plan indicates that some 40 percent of Hopewell's visitors also visit French Creek State Park. A trail-head wayside in French Creek State Park may be designed to attract park visitors to walk over to the furnace. Hiking and/or visitor brochures that focus on Hopewell could be left at the trail head or with French Creek's visitor information center.

### *Develop Interpretive Linkage with the French Creek Charcoal Iron Belt and the Schuylkill River Heritage Corridor*

Long before Hopewell Furnace was transformed into a museum during the 1930s, it was one of numerous charcoal-fueled iron furnace villages along the French Creek Valley between Phoenixville and Reading. After anthracite superseded charcoal as the dominant fuel for making iron, furnace sites along the river and railroad supplanted the old woodland furnaces as the iron producing centers of the region. The history of iron-making in America is hidden in a dozen and more sites on and near the Route 23 corridor and Hopewell Furnace is an important part of this history. The Schuylkill River Heritage Corridor recognizes the French Creek Valley as an important component, and a major gateway/reception center is planned for a former iron foundry building in Phoenixville. Hopewell Furnace could be another anchor, and could form the interpretive linchpin for the charcoal iron story:

Hopewell Furnace might offer a map/guide outlining a driving tour that takes visitors through its neighboring farms, villages, and other furnace communities. This tour could emphasize the connections between Hopewell and area farms, iron mines, canal landings, and market towns. Because the area road network remains remarkably similar to that which existed during the mid-nineteenth century, visitors may actually follow the historic routes (see Adjacent Land study for potential sites). The added regional context would compliment Hopewell Furnace and provide a broader understanding of its role within the region.

## Interpretive Recommendations by Proposed Management Zone

### *Core Village Management Zone*

A visitor's understanding of Hopewell's Core Village cultural landscape can be significantly improved through interpretive activities.

- Increase interpretation of garden areas.

A sense of the missing gardens, especially at the Tenant Houses, might be conveyed to visitors through the use of fenced areas or by tilling suspected garden areas, but not necessarily planting those areas. Activities such as these require serious consideration of the effects of the activity on potential archeological sites.

If plantings are included as part of the interpretive display they should be historically appropriate varieties.

- The incursion of white-tail deer may require special solutions in garden areas; however, these activities need to weigh the benefits of the solutions to their potential intrusive effects on the cultural landscape.

- Introduce more small-scale features to the Core Village.

The general dearth of small-scale elements within the Core Village contribute to the museum-like quality of the site. The introduction of known small-scale elements such as privies, hitching posts, clothes lines, arbors, rain barrels, and miscellaneous tools could provide a fuller picture of the once vibrant and active industrial site.

An important concern, however, is not to construct a completely imagined nineteenth century landscape through the introduction of small-scale elements. The goal is to convey a better sense of, and richer flavor of, the site.

- Extend the interpretation of the Tenant House area south to include the Nathan Care Farm.

More prominently incorporate the Nathan Care Farm into existing interpretive materials, such as Park brochures, to lessen this feature's isolation within the larger cultural landscape.

Maps should encourage pedestrians to walk to the farm house, and interpretation en route should explain the interdependent role of farms around the furnace.

While perhaps not feasible at the present time, an interior display using historic photographs could be exhibited within one of the tenant houses to supplement existing interpretive programs and illustrate nineteenth century regional farming and gardening practices. Such a display would show what Hopewell's gardens and farms may have been like during the nineteenth century.

The use of exterior interpretive panels must consider their impact on the cultural landscape and should not be too obvious or intrusive within the landscape.

- Review the wagon collection located in the Village Barn for appropriateness.

The collection should be removed from the barn loft and stored elsewhere.

Consideration might be given to putting hay in the loft, and furnishing the barn with appropriate tools and implements.

### *Agricultural Management Zone*

The physical remnants of the Agricultural Management Zone's cultural landscape are not sufficient to convey the zone's historic usage or its connection to Hopewell Furnace. By concentrating this zone's interpretive efforts on explaining the agricultural nature of the zone and by tying the resources located in this zone back to the core village, visitors will better understand its role within Hopewell's larger picture. These efforts should include the outlying farms such as the Church, Thomas Lloyd, and Harrison Lloyd farms as well as Bethesda Church.

- Establish a driving tour of the Agricultural Management Zone.

Key the driving tour to a labeled map or through the construction of selected waysides. Use of selected waysides would require additional parking and may adversely impact the landscape. Care should be taken to sensitively incorporate any new waysides. This type of driving tour could also be coordinated with an Adjacent Lands driving tour.

Coordinate Visitor Center interpretive programs and the driving tour with the waysides explaining the roles that each of the agricultural resources had within the larger Hopewell Furnace community.

Any additional interpretive activities at these sites need to consider their potential effects on the resources. This may be most evident at the Harrison Lloyd Farm where current inaccessibility, the ruinous condition of the site, and the remaining fragile archeological resources warrants less active participation by visitors.

### *Woodland Management Zone*

The significant role that the forests played in the operation of the furnace cannot be conveyed without additional interpretive activities. The forests and the role it played could be emphasized through brochures, and interpretive walking and driving tour exhibits (in conjunction with the Agricultural Management Zone driving tour). This interpretive program can incorporate a range of themes, such as charcoaling and CCC recreational development, and exhibits, such as sequential one-acre harvesting.

- Link hiking trails to historic sites.

Interpretation efforts within the Charcoal Management Zone should include linking hiking trails to historic sites. Brochures for hikers and walkers could explain the significance of the woodlands to the history of the furnace and detail the role played by the CCC in developing the recreational facilities at Hopewell and adjacent French Creek State Park.

A self-guided tour brochure or interpretive signs placed along the trails could provide information on the charcoaling process, the practice of cyclically cutting and regenerating the woods, the CCC's role in the development of the site, natural history, and a variety of other topics. Abandoned farmsteads and other former residential sites located in the woods, such as the Woodlot, Brison, Manning, and Harrison Lloyd sites, should probably not be identified in brochures or on interpretive panels at this time. These sites contain fragile archeological resources that must be protected and stabilized before they are made readily accessible to the public.

Other activities could include cutting select one-acre tracts in order to demonstrate the number of trees needed to fuel the furnace on a daily basis. Six such tracts, cut

over five year time spans, could then provide examples of regenerating forests over different periods. The first tract would be cut again after twenty-five years. Part of the cutting might be used as a demonstration project that shows historic cutting techniques. These tracts could be keyed to the driving tour map. If this activity is pursued care must be taken not to disturb potential archeological sites that may be located in the woods.

*Park Service Support Zone*

The Park Service Support Zone has always been distinct from those furnace areas presented to the public as historic.

- The orchard, however, represents a historic feature and needs to be explained as such.
- CCC-era resources should be incorporated into the Long Range Interpretive Plan.

**Table 6.1 Summary of Treatment Recommendations and Phasing Schedule**  
**CORE VILLAGE MANAGEMENT ZONE**

Landscape Characteristics	PHASE I Implement in 1 to 3 years	PHASE II Implement in 3 to 5 years	PHASE III Implement in 5 or more years
Spatial Organization Page 180-181	<ul style="list-style-type: none"> <li>• clean drainage ditches</li> <li>• control erosion</li> </ul>	<ul style="list-style-type: none"> <li>• maintain and reclaim vistas and view sheds</li> </ul>	
Circulation Pages 181-182	<ul style="list-style-type: none"> <li>• continue maintenance of roads</li> <li>• prohibit grass from invading historic road alignments</li> </ul>	<ul style="list-style-type: none"> <li>• repair 1809 road at French Creek ford</li> </ul>	
Boundary Demarcation Page 182-187	<ul style="list-style-type: none"> <li>• remove invasive vegetation from walls</li> <li>• clear vegetation obscuring walls and fences</li> <li>• maintain vegetation to 6-12 inches adjacent to walls and fences</li> <li>• control forest edge west of Tenant Houses</li> </ul>	<ul style="list-style-type: none"> <li>• maintain historically appropriate fencing</li> <li>• replace inappropriate fencing with historically appropriate styles</li> </ul>	
Vegetation Pages 187-189	<ul style="list-style-type: none"> <li>• remove invasive vegetation from walls and fences</li> <li>• maintain division between open and wooded areas</li> <li>• remove larger woody invasive vegetation from along French Creek</li> <li>• remove vegetation from slag piles and vicinity</li> <li>• revise mowing schedules, especially at Tenant Houses</li> <li>• mow grass along roadways not more than once per month</li> <li>• develop deer management plan</li> <li>• prune dead wood as necessary</li> </ul>		<ul style="list-style-type: none"> <li>• implement deer management plan</li> </ul>
Clusters, Buildings, and Structures Page 189-190	<ul style="list-style-type: none"> <li>• conduct annual building inspections</li> <li>• follow Secretary of Interior Standards for Rehabilitation</li> </ul>		<ul style="list-style-type: none"> <li>• remove carport from Tenant House No. 3</li> </ul>
Archeological Sites Page 190-191	<ul style="list-style-type: none"> <li>• control vegetation that could damage archeological resources</li> <li>• control activities that could damage archeological sites</li> <li>• request funding for archeological overview</li> </ul>	<ul style="list-style-type: none"> <li>• begin implementation of archeological inventory and evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• conduct archeological investigations in garden areas</li> </ul>
Small-scale Features Page 192	<ul style="list-style-type: none"> <li>• keep modern features to a minimum</li> </ul>	<ul style="list-style-type: none"> <li>• repair ditch in front of Tenant Houses</li> <li>• remove drinking fountain from near barn</li> </ul>	<ul style="list-style-type: none"> <li>• continue adding appropriate small-scale features to Core Village</li> </ul>
Interpretation Page 212-213		<ul style="list-style-type: none"> <li>• add small-scale features as interpretation</li> <li>• relocate wagon collection</li> </ul>	<ul style="list-style-type: none"> <li>• incorporate Nathan Care Farm more prominently into interpretative brochures</li> <li>• link waysides/brochures within French Creek</li> <li>• expand farming interpretation</li> </ul>

**Table 6.2 Summary of Treatment Recommendations and Phasing Schedule  
AGRICULTURAL MANAGEMENT ZONE**

<b>LANDSCAPE CHARACTERISTIC</b>	<b>PHASE I Implement in 1 to 3 years</b>	<b>PHASE II Implement in 3 to 5 years</b>	<b>PHASE III Implement in 5 or more years</b>
<b>Spatial Organization</b> Page 193-195	<ul style="list-style-type: none"> <li>control relationship between open and wooded areas</li> </ul>	<ul style="list-style-type: none"> <li>expose stone walls that could be visible to the public</li> <li>Thin trees and shrubs acting as border along PA Route 345</li> </ul>	<ul style="list-style-type: none"> <li>reclaim open space near Thomas Lloyd Farm</li> </ul>
<b>Circulation</b> Pages 195	<ul style="list-style-type: none"> <li>continue maintenance of roads</li> </ul>	<ul style="list-style-type: none"> <li>remove invasive vegetation on Harrison Lloyd farm lane</li> </ul>	
<b>Boundary Demarcation</b> Page 195-196	<ul style="list-style-type: none"> <li>maintain 6-12 inch height for vegetation adjacent to fences</li> </ul>	<ul style="list-style-type: none"> <li>remove invasive vegetation from stone walls</li> <li>reduce growth of trees along PA Route 345</li> <li>reopen views around fields #3 and #4 by thinning vegetation</li> </ul>	<ul style="list-style-type: none"> <li>bury utility wires near Thomas Lloyd property</li> <li>bury utility wires north of the Nathan Care House</li> </ul>
<b>Vegetation</b> Pages 196-197	<ul style="list-style-type: none"> <li>revise mowing schedule, keep turf at 3-7 inches where visible to public</li> <li>mow fields left to grass once a year</li> <li>cut fields 6a and 6b several times a year</li> <li>begin development of a deer management plan</li> <li>cutback vegetation from fences and walls</li> </ul>		<ul style="list-style-type: none"> <li>reintroduce row crops into agricultural fields</li> <li>implement deer management plan</li> </ul>
<b>Clusters, Buildings, and Structures</b> Page 197-198	<ul style="list-style-type: none"> <li>conduct annual building inspections</li> <li>follow Secretary of Interior Standards</li> </ul>		
<b>Archeological Sites</b> Page 198	<ul style="list-style-type: none"> <li>reevaluate condition of known sites</li> <li>plan for an archeological inventory and evaluation</li> </ul>	<ul style="list-style-type: none"> <li>remove invasive vegetation from house ruins</li> <li>stabilize Harrison Lloyd House ruins</li> <li>begin implementation of archeological inventory and evaluation</li> </ul>	
<b>Small-scale Features</b> Page 199	<ul style="list-style-type: none"> <li>keep modern features to a minimum, screen from view</li> </ul>		<ul style="list-style-type: none"> <li>add appropriate small-scale features within this zone</li> </ul>
<b>Interpretation</b> Page 213			<ul style="list-style-type: none"> <li>establish driving tour keyed to maps</li> </ul>

**Table 6.3 Summary of Treatment Recommendations and Phasing Schedule**

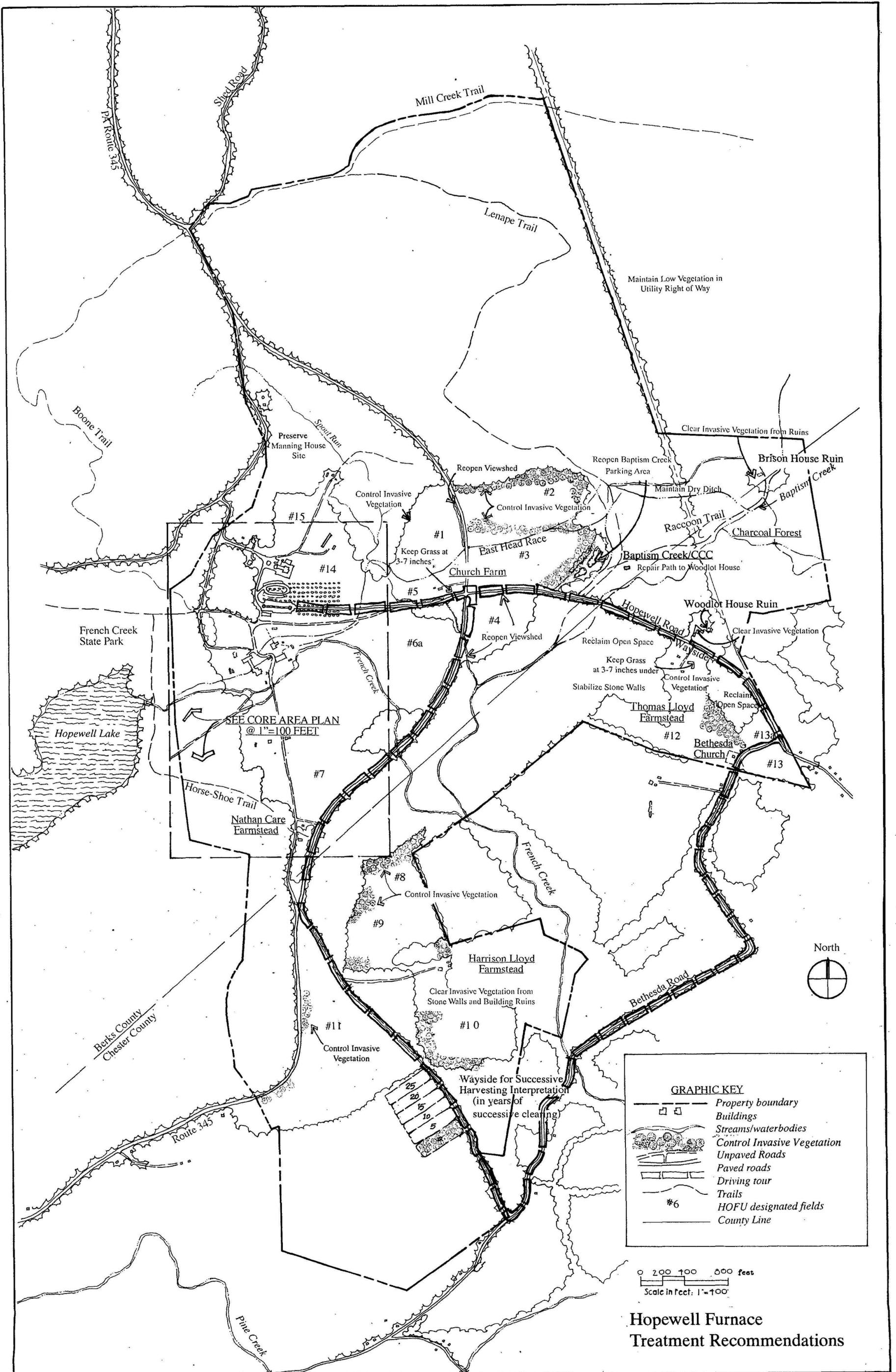
**WOODLAND MANAGEMENT ZONE**

LANDSCAPE CHARACTERISTIC	PHASE I Implement in 1 to 3 years	PHASE II Implement in 3 to 5 years	PHASE III Implement in 5 or more years
Spatial Organization Page 199-200	<ul style="list-style-type: none"> <li>control encroachment of woods into open spaces</li> </ul>		<ul style="list-style-type: none"> <li>reclaim open space near Thomas Lloyd property.</li> <li>reopen Baptism Creek Parking area</li> </ul>
Circulation Pages 200-201	<ul style="list-style-type: none"> <li>continue road maintenance</li> <li>follow Secretary of Interior Standards for work to CCC era bridges and culverts</li> </ul>	<ul style="list-style-type: none"> <li>remove invasive vegetation from Harrison Lloyd farm lane</li> </ul>	<ul style="list-style-type: none"> <li>repair path from Baptism Creek Picnic Shelter to Woodlot House</li> </ul>
Boundary Demarcation Page 201	<ul style="list-style-type: none"> <li>control scrub along roadways</li> </ul>	<ul style="list-style-type: none"> <li>remove invasive vegetation from along stone walls that are visible to the public</li> </ul>	
Vegetation Pages 201-202	<ul style="list-style-type: none"> <li>control the encroachment of woods into fields</li> <li>begin development of a deer management plan</li> </ul>		<ul style="list-style-type: none"> <li>implement deer management plan</li> <li>remove exotic invasive vegetation</li> </ul>
Clusters, Buildings, and Structures Page 202-203	<ul style="list-style-type: none"> <li>conduct annual building inspections</li> <li>follow Secretary of Interior Standards</li> </ul>	<ul style="list-style-type: none"> <li>clear and stabilize East Head Race (dry ditch)</li> </ul>	
Archeological Sites Page 203	<ul style="list-style-type: none"> <li>protect archeological sites</li> <li>begin planning an archeological inventory and evaluation</li> <li>remove invasive vegetation from Brison and Woodlot ruins</li> </ul>	<ul style="list-style-type: none"> <li>implement archeological inventory and evaluation</li> <li>evaluate Manning House site -stabilize as needed</li> </ul>	
Small-scale Features Page 203-204		<ul style="list-style-type: none"> <li>repair and stabilize CCC era fireplaces, footbridges, and water fountains</li> </ul>	
Interpretation Page 212-214	<ul style="list-style-type: none"> <li>incorporate CCC era features into LRIP</li> </ul>	<ul style="list-style-type: none"> <li>link hiking trails to historic resources</li> </ul>	<ul style="list-style-type: none"> <li>establish driving tour keyed to maps</li> <li>link Hopewell to Schuylkill River Heritage Corridor</li> <li>establish charcoal forest demonstration area</li> </ul>

**Table 6.4 Summary of Treatment Recommendations and Phasing Schedule  
PARK SUPPORT MANAGEMENT ZONE**

<b>LANDSCAPE CHARACTERISTIC</b>	<b>PHASE I Implement in 1 to 3 years</b>	<b>PHASE II Implement in 3 to 5 years</b>	<b>PHASE III Implement in 5 or more years</b>
Spatial Organization Page 204	<ul style="list-style-type: none"> <li>• maintain relationship between open and wooded areas</li> </ul>		
Circulation Pages 204-205	<ul style="list-style-type: none"> <li>• continue maintenance of historic roads</li> </ul>		
Boundary Demarcation Page 205	<ul style="list-style-type: none"> <li>• repair fences as needed</li> <li>• control the encroachment of woods into open spaces</li> </ul>		
Vegetation Pages 205-206	<ul style="list-style-type: none"> <li>• continue manicured appearance of turf</li> <li>• maintain relationship between fields and wooded areas</li> <li>• replace dead or deteriorated tree in orchard</li> </ul>		
Clusters, Buildings, and Structures Page 206	<ul style="list-style-type: none"> <li>• conduct annual building inspections</li> </ul>		<ul style="list-style-type: none"> <li>• evaluate the significance of resources that recently attained 50 years of age</li> </ul>
Archeological Sites Page 207	<ul style="list-style-type: none"> <li>• protect archeological resources</li> <li>• begin planning an archeological inventory and evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• implement archeological inventory and evaluation</li> </ul>	
Small-scale Features Page 207	<ul style="list-style-type: none"> <li>• new small-scale features should be contemporary in design</li> </ul>		
Interpretation Page 214	<ul style="list-style-type: none"> <li>• incorporate CCC-era resources into LRIP</li> </ul>		





SEE CORE AREA PLAN @ 1"=100 FEET

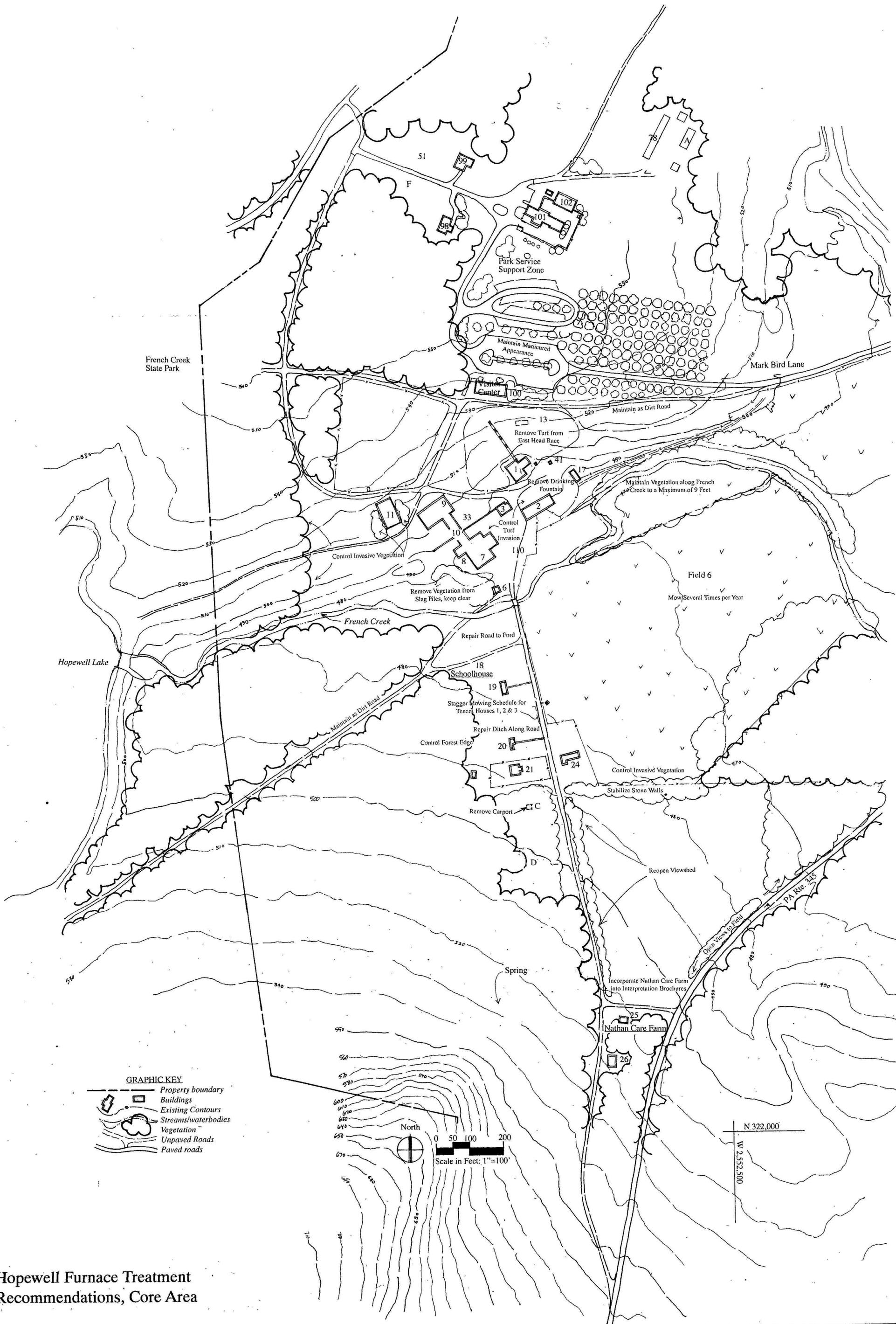
**GRAPHIC KEY**

	Property boundary
	Buildings
	Streams/waterbodies
	Control Invasive Vegetation
	Unpaved Roads
	Paved roads
	Driving tour
	Trails
	HOFU designated fields
	County Line

0 200 400 800 feet  
Scale in Feet: 1"=100'

**Hopewell Furnace  
Treatment Recommendations**





**Hopewell Furnace Treatment Recommendations, Core Area**

**7.0 BIBLIOGRAPHY**

## 7.0 BIBLIOGRAPHY

- Aerial Photographs. Various aerial photographs of Hopewell Furnace and French Creek State Park areas dating from 1986. On file at Hopewell Furnace National Historic Site.
- American Automobile Association. *Map of New Jersey and Pennsylvania*. Princeton, N.J.: Mark E. Gibson, 1989.
- Apple, Russell A. "Documentation for the Historical Base Maps: 1830-1840," June 1956. Typescript on file at Hopewell Furnace National Historic Site.
- Appleman, Roy Edgar. "Map of Hopewell Village & Ruins," December 31, 1935. On file at Hopewell Furnace National Historic Site.
- . "Restoration Map of Hopewell Village, 1785-1800," prepared 1936. On file at Hopewell Furnace National Historic Site.
- Baker, Michael Jr., Civil Engineer & Surveyor, "Property Line Map, Hopewell Village National Historic Site, Birdsboro, PA," April 1, 1946, with survey to reset #14-18, 1992. Drawing number NHS-HV 9384, Hopewell Furnace National Historic Site.
- Bianchini, Francesco and Francesco Corbetta. *The Complete book of Fruits and Vegetables*. New York: Crown Publishers, Inc., 1973.
- Bining, Arthur C. *Pennsylvania Iron Manufacture in the Eighteenth Century*. Harrisburg, Penn.: Pennsylvania Historical Commission, 1938.
- Birnbaum, Charles A., ed. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. Washington D.C.: U.S. Department of the Interior, 1996.
- Breou's Official Series of Farm Maps, Chester County, Pennsylvania*. Philadelphia: W. H. Kirk & Co., 1883.
- Bridgens, Henry F. and A. R. Witmer. *Atlas of Chester County, Pennsylvania*. Lancaster Co., Penn.: A. R. Witmer, 1873.
- Brooke, Cornelia. *Forges and Furnaces in the Province of Pennsylvania*. Philadelphia: Pennsylvania Society of Colonial Dames in America III, 1914.
- Center for Coastal and Environmental Studies. "Vegetative Species," 1987. Cartography Laboratory, Rutgers University. On file at Hopewell Furnace National Historic Site.
- Chester County Historical Society. "Hopewell National Park - Warwick Township Lands." Vertical file. On file at the Chester County Historical Society, West Chester, Pennsylvania.
- Cook, Derrick M. "Statement for Management, Hopewell Furnace National Historic Site," October 1993. On File at Hopewell Furnace National Historic Site.

- Crownover, Donald A. *Iron Stoves Manufacturing and Marketing, Hopewell Furnace Pennsylvania*. Washington, D.C.: National Park Service, 1970.
- Davis, Anthony F., Gregory J. Edinger, Sarah B. Andersen, Anthony M. Wilkinson, and Jill R. Belfornti, "A Natural Areas Inventory of Berks County, Pennsylvania," 1991. Pennsylvania Science Office of The Nature Conservancy, Middletown, PA, for the Berks County Planning Commission, Reading, PA.
- Davis, F. A. *Historical Atlas of Berks County Pennsylvania*. Reading, Penn.: A. M. Davis, Reading Publishing House, 1876.
- Dechant, William H. & Son. "Hopewell Furnace Lands and Contiguous or Adjacent Tracts, Property of A. Louise C. Brooke At Hopewell Penna." August 1915, rev. to January 1931. Map on file at Hopewell Furnace National Historic Site.
- Eggert, Gerald G. *The Iron Industry in Pennsylvania*. Pennsylvania Historical Studies No. 25. Harrisburg, Penn.: The Pennsylvania Historical Associations, 1994.
- Elms, W. B., "Hopewell Furnace NHS, Tree Species and Locations," April 1973. On file at Hopewell Furnace National Historic Site.
- Engineering & Planning Associates, Inc. "Park Improvements," n.d. The General State Authority, Harrisburg, PA. On file at Hopewell Furnace National Historic Site.
- . "Plan-Sanitary and Water Piping, Water and Sanitary System, French Creek State Park, Union Twp., Berks & Chester Counties, Pennsylvania," n.d. The General State Authority, Harrisburg, PA, Drawing P-6. On file at Hopewell Furnace National Historic Site.
- Fagan, L. *Map of Berks County, Pennsylvania*. Philadelphia: Henry F. Bridgens, 1860.
- Fegley, Winslow H. *Farming, Always Farming*. Birdsboro, Penn.: The Pennsylvania German Society, 1987.
- Fischer, David H. *Albion's Seed: Four British Folkways in America* New York: Oxford University Press, 1989.
- Glass, James A. *The Beginnings of a New National Historic Preservation Program, 1957 to 1969*. Nashville, Tenn.: American Association for State and Local History, 1990.
- Graham, A. William, Jr. "Forest Age Documentation and Other Forest Management Issues at Hopewell Furnace NHS," April 1996.
- Hartzog Lader Richards and White. "Upper Reaches of French Creek," January, 1991. Plans prepared for the French and Pickering Creeks Conservation Trust, Coventryville, PA, On file at Hopewell Furnace National Historic Site.
- "The Harvard Forest Models," Cornwall, N.Y.: Cornwall Press, 1941.
- Heite, Edward F., "Report of Archaeological Surveys in Two Tracts at Hopewell Furnace National Historic Site," Berks and Chester Counties, PA., May 1988. On file at Hopewell Furnace National Historic Site.

- \_\_\_\_\_. "Report of Archaeological Surveys on 198 Acres at Hopewell Furnace National Historic Site," Berks and Chester Counties, PA., May 1989. On file at Hopewell Furnace National Historic Site.
- "Hopewell & French Creek Area, W. Detail." Aerial Photo 9-15-37-1-15. On file at Hopewell Furnace National Historic Site.
- "Hopewell & French Creek Area, West Detail." Aerial Photo 4-23-51. On file at Hopewell Furnace National Historic Site.
- "Hopewell & French Creek Area, Detail, AHJ 7MM7 757623 CFL209.80." Aerial Photo 9-24-71. On file at Hopewell Furnace National Historic Site.
- Hopewell Furnace National Historic Site. Historic Structures Reports. Reports on file at Hopewell Furnace National Historic Site.
- \_\_\_\_\_. Building Maintenance Records. Building records on file at Hopewell Furnace National Historic Site.
- \_\_\_\_\_. Photographic Archive. Historic photographs on file at Hopewell Furnace National Historic Site.
- Houck, Lafayette, "Studies of the Old Hopewell Furnace and Village," December 1936. Sketch on file at Hopewell Furnace National Historic Site.
- Insurance Company of North America. "Survey of the Property of Edward S. Buckley and Maria L. Clingan." Five insurance policies dated July 19, 1879. Policies on file at CIGNA Archives, Philadelphia, Pennsylvania.
- Jacox, Diann L. and Joseph Lee Boyle. "Hopewell Furnace." *National Register of Historic Places Nomination*, 1985. On file with the Pennsylvania Historical and Museum Commission, Bureau of Historic Preservation, Harrisburg, Pennsylvania.
- Kelso, William and Rachel Most, eds. *Earth Patterns: Essays in Landscape Archaeology*. Charlottesville: University Press of Virginia, 1990.
- Kurjack, Dennis C. *Hopewell Village National Historic Site*. National Park Service Historical Handbook Series No. 8. Washington, D.C.: National Park Service, 1954, reprint 1961.
- \_\_\_\_\_. "Statistical Data Base Plan for Restoration of Mansion Gardens." Drawing number NHS-HV-3001. On file at Hopewell Furnace National Historic Site.
- Landis Valley Museum. *1991 Heirloom Seed Catalogue*. Lancaster, Penn.: Landis Valley Museum, 1991.
- Lewis, W. David and Walter Hugins. *Hopewell Furnace National Historic Site*. Handbook 124. Washington, D.C.: Division of Publications, National Park Service, 1983.
- Lightfoot, Thomas. "A Map or General Plan of the Several Tracts Belonging to the Warwick Co., Messieurs Rutter & Potts...Situat in the Townships of East Nantmeal & Coventry in Chester County & the Township of Union in Berks County," 1787. On file at the Chester County Historical Society.

*Map of the Clingan & Buckley Hopewell Furnace Lands at Hopewell, PA.* Surveyed by Kendall Bro's, November and December 1875. Map on file at Hopewell Furnace National Historic Site.

McClelland, Linda Flint et al. "Guidelines for Evaluating and Documenting Rural Historic Landscapes." *National Register Bulletin 30*. Washington, D.C.: U.S. Department of the Interior National Park Service, Interagency Resources Division.

Mikan, Carl J., David A. Orwig, and Marc D. Abrams. "Age, Structure, and Successional Dynamics of a Pre-settlement-origin Chestnut Oak Forest in the Pennsylvania Piedmont." University Park, Penn.: School of Forest Resources, Forest Resources Laboratory, Pennsylvania State University, circa 1992.

Mikan, Carl J. and Abrams, Marc D. "Vegetation, Edaphic and Historical Analysis of Charcoal Hearths at Hopewell Furnace National Historic Site, Pennsylvania," February 1994. University Park, Penn.: School of Forest Resources, Pennsylvania State University.

Morris, Richard B., ed. *American Encyclopedia of American History*. New York: Harper & Brothers, 1953.

Muhlenberg, Nick, et al., "French Creek Watershed Study," Regional Planning Studio 502, University of Pennsylvania, Philadelphia, Penn., Spring 1987. On file at Hopewell Furnace National Historic Site.

National Park Service. "Development Plan - Residence, Utility & Village Areas, Part of Master Plan, Hopewell Village National Historic Site," December 1956. On file at Hopewell Furnace National Historic Site.

\_\_\_\_\_. "Base Map - Hopewell Village National Historic Site," 1937. On file at Hopewell Furnace National Historic Site.

\_\_\_\_\_. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. Washington, D.C.: Technical Preservation Services Branch, National Park Service, 1996.

\_\_\_\_\_. "Historic Vegetative Map," June 6, 1956, rev. November 1961. Part of Master Plan Hopewell Village National Historic Site. On file at Hopewell Furnace National Historic Site.

\_\_\_\_\_. "Historical Survey French Creek," NE Area, circa 1930's, four sheets; B-64-67. On file at Hopewell Furnace National Historic Site.

\_\_\_\_\_. "General Development Plan Part of the Master Plan, Hopewell Village National Historic Site," February 1956, rev. On file at Hopewell Furnace National Historic Site.

\_\_\_\_\_. "Hopewell Furnace National Historic Site Apple Orchard Plan," revised December 1991. On file at Hopewell Furnace National Historic Site.

\_\_\_\_\_. "Hopewell Furnace National Historic Site, Pennsylvania," GPO 1989-242-342/80029. On file at Hopewell Furnace National Historic Site.

- . "French Creek Area, Revised Layout Plan, Baptism Creek Picnic Area," circa 1940. On file at Hopewell Furnace National Historic Site.
- . "Topography Hopewell Village Recreational Demonstration Project, French Creek - Key to Buildings at CCC Camp SP-7," July 1937, rev. March 1938. On file at Hopewell Furnace National Historic Site.
- "Old Hopewell Village French Creek Recreation Demonstration Project, Berks County, PA," June 1937. On file at Hopewell Furnace National Historic Site.
- Paige, John C. *The Civilian Conservation Corps and the National Park Service, 1933-1942: An Administrative History*. Washington, D.C.: National Park Service, 1985.
- Pendleton, Philip E. *Oley Valley Heritage, The Colonial Years: 1700-1775* Birdsboro, Penn: The Pennsylvania German Society, 1994.
- Pennsylvania Gazette*, Philadelphia, 1786 and 1788.
- Regional Planning Federation of the Philadelphia Tri-State District. "Honey Brook Quadrangle - N.E.," n.d. On file at Hopewell Furnace National Historic Site.
- Richards, Henry M. *Map of Berks County*, 1820. On file at the Historical Society of Pennsylvania, Philadelphia, Pennsylvania.
- Rothman, Hal. *Preserving Different Past: The American National Monuments*. Chicago: University of Illinois Press, 1989.
- Rupp, Daniel L. *History of the Counties of Berks and Lebanon*. Lancaster, Penn.: G. Hills, 1844. Reprint. Spartanburg, S.C.: The Reprint Company, 1984.
- Russell, Emily W. B. "Vegetation Study Hopewell Furnace National Historic Site," March 1987. Center For Coastal and Environmental Studies, Rutgers University, New Brunswick, NJ.
- Sharpe, William E., and C. William Neff. "Hopewell Furnace National Historic Site Water Resource Management Plan," Final Report, November 1993. Environmental Resources Research Institute, Penn State, University Park, Penn.
- Stone, Roger et. al. "Hopewell Furnace NHS Field Maintenance Plan," May 1992. On file at Hopewell Furnace National Historic Site.
- Storm, Gerald L., Walter M. Tzilkowski, Todd W. Bowersox, and Stephen E. Fairweather. "Plant Community Development in Historic Forest Stands at Hopewell Furnace National Historic Site," July 1994. USDI NPS Mid-Atlantic Region Technical Report NPS/MARHOFU/NRTR - 94/062. On file at Hopewell Furnace National Historic Site.
- Stearns, Charles H. "Revised Type Mapping Report," French Creek Project, Birdsboro, Penn. July 1939. On file at Hopewell Furnace National Historic Site.
- Thomas & Newswanger. "Hopewell Furnace Historic Structures Report and Engineering Study," June 1987. 2 Vols. On file at Hopewell Furnace National Historic Site.

U.S. Bureau of the Census. Manuscript Population Schedule, Sixth Census (1850) of the United States, Union Township, Berks County, Pennsylvania. Microfilm M432 Roll 754.

USDI NPS Division of Construction--Eastern Division. "Plan of Mansion Gardens, Ironmaster's House," NHS-HV, August 1, 1956. On file at Hopewell Furnace National Historic Site.

Vanderwerff, William D., "The Vascular Flora of Hopewell Furnace National Historic Site," October, 1994. On file at Hopewell Furnace National Historic Site.

Walker, Joseph E. Hopewell Village: *The Dynamics of a Nineteenth Century Iron-Making Community*. Philadelphia: University of Pennsylvania Press, 1966.

Wells, Stuart W. "Hopewell Furnace Historic Scene Report," draft 1994. Typescript on file at Hopewell Furnace National Historic Site.

Whealy, Kent. *An Inventory of Seed Catalogs Listing All Non-Hybrid Seeds Still Available in the United States and Canada*. Decorah, Iowa: Seed Saver Publications, 1988.

**APPENDIX A**



## APPENDIX A: HOPEWELL FURNACE BUILDING NUMBERS

The table on the following pages provides designated building and structure numbers for three periods at Hopewell Furnace National Historic Site. The "NPS #" column shows the current National Park Service identification numbers while the "ca. 1956" and the "ca. 1935" columns show the assigned building numbers for those respective time periods. The list was compiled from Hopewell Furnace National Historic Site's List of Classified Structures and other official building lists held by the park. Appendix A is intended to show the changes in building numbers at Hopewell Furnace over time. Additionally, the information in this appendix may be used when determining the current number designation for buildings identified in documentary records by an obsolete numbering system. See Appendix G for buildings and structures that are keyed to the period Base Maps.

APPENDIX A: HOPEWELL FURNACE BUILDING NUMBERS

NPS #	ca. 1956	ca. 1935	Category	Name
001	1	16	Building	IRONMASTER'S HOUSE
002	2	8	Building	VILLAGE BARN
003	3	42	Building	OFFICE & STORE
004	--	--	Boundary Demarcation	CEDAR PASTURE FENCE
006	6	48	Building	BLACKSMITH SHOP
007	7	4	Building	FURNACE {Complex}
008	8	1	Building	WHEEL HOUSE {Part of Furnace}
008	--	--	Structure	FURNACE BANK & RETAINING WALL
009	9	40/13	Building	CHARCOAL HOUSE
010	10	19	Building	BRIDGE HOUSE
011	11	57	Archeological Site	ANTHRACITE FURNACE
013	13	56	Archeological Site	IRONMASTER'S GREENHOUSE RUIN
016	16	26	Building	IRONMASTER'S BAKE OVENS
017	17	38	Building	IRONMASTER'S SPRING HOUSE
018	18	--	Archeological Site	SCHOOL HOUSE RUIN
019	19	28	Building	TENANT HOUSE NO. 1
001A	--	--	Boundary Demarcation	IRONMASTER'S YARD WALL
001B	--	--	Boundary Demarcation	IRONMASTER'S GARDEN FENCE
001C	--	--	Boundary Demarcation	IRONMASTER'S KITCHEN YARD WALL
020	20	33	Building	TENANT HOUSE NO. 2
021	21	36	Building	QUARTERS-TENANT HOUSE NO. 3
021A	--	--	Boundary Demarcation	TENANT HOUSE NO. 3 FENCE
023	23	35	Building	TENANT HOUSE BARN
024	24	23	Building	BOARDING HOUSE
024A	--	60	Sm. Scale Element	BOARDING HOUSE PUMP AND WELL COVER
025	--	--	Building	NATHAN CARE HOUSE
025A	--	--	Boundary Demarcation	NATHAN CARE FIELD STONE WALL
025B	--	--	Boundary Demarcation	NATHAN CARE BOUNDARY STONE WALL
026	--	--	Building	NATHAN CARE BARN
027	--	--	Building	QUARTERS-ALEX CHURCH HOUSE
027A	--	--	Structure	JOHN CHURCH RETAINING WALL AND STEP
027B	--	--	Structure	JOHN CHURCH DRIVEWAY CULVERT
028	--	--	Building	ALEX CHURCH BARN

APPENDIX A: HOPEWELL FURNACE BUILDING NUMBERS

NPS #	ca. 1956	ca. 1935	Category	Name
029	--	--	Structure	MARK BIRD LANE CULVERT
032	--	--	Structure	EAST HEAD RACE
032A	--	--	Structure	EAST HEAD RACE RETAINING WALL
033	33	20	Building	CASTING HOUSE
034	34	--	Archeological Site	ORE ROASTER RUIN
035	35	24	Archeological Site	WHEELWRIGHT SHOP RUIN
039	--	--	Archeological Site	CHARCOAL KILNS RUIN
041	41	5	Building	SMOKE HOUSE
051	--	--	Building	PUMP HOUSE
055	--	--	Archeological Site	BRISON HOUSE RUIN
066	--	--	Building	WAREHOUSE-SERVICE
067	--	--	Building	OIL HOUSE SERVICE
070	--	--	Building	GARAGE-REAR OF CHURCH HOUSE
071	--	--	Building	THOMAS LLOYD HOUSE
071A	--	--	Building	THOMAS LLOYD WAGON SHED
071B	--	--	Circulation	THOMAS LLOYD FARM LANE
071C	--	--	Boundary Demarcation	THOMAS LLOYD STONE WALLS
072A	--	--	Building {One Wall}	HARRISON LLOYD HOUSE BARN
072B	--	--	Archeological Site	HARRISON LLOYD HOUSE RUINS
072C	--	--	Archeological Site	HARRISON LLOYD BLACKSMITH SHOP RUIN
073	--	--	Boundary Demarcation	HARRISON LLOYD STONE WALLS
076	--	--	Archeological Site	WOODLOT HOUSE RUIN
078	--	--	Building	QUONSET HUT
079	--	--	Building	BETHESDA BAPTIST CHURCH
079A	--	--	Boundary Demarcation	BETHESDA BAPTIST CHURCH STONE WALLS
079B	--	--	Sm. Scale Element	BETHESDA CHURCH CEMETERY GRAVESTO
080	--	--	Building	BETHESDA BAPTIST CHURCH CARRIAGE SH
081	--	--	Building	BETHESDA BAPTIST CHURCH PRIVY
083	--	--	Archeological Site	MULE STABLE RUIN
087	--	--	Building	THOMAS LLOYD SPRING HOUSE
088	--	--	Building	CCC SPRING HOUSES
098	--	--	Building	QUARTERS
099	--	--	Building	QUARTERS



**APPENDIX B**



### Contributing/Non-Contributing Resources

Landscape Features	Significance	Contributes to Site Interpretation *
<b>Topography and Drainage</b>		
French Creek	C	
Baptism Creek	C	
Spout Run	C	
Sloped areas north of French Creek	C	
Flat land south of French Creek	C	
<b>Patterns of Spacial Organization</b>		
Village Core, open vs. closed space	C	
John Church property, open vs. closed space	C	
Thomas Lloyd property, open vs. closed space	C	
Harrison Lloyd property, open vs. closed space	C	
Nathan Care property, open vs. closed space	C	
Brison House property, open vs. closed space	NC	
Woodlot House property, open vs. closed space	NC	
Manning House property, open vs. closed space	NC	
<b>Circulation</b>		
1757 Road, Reading-Valley Forge Road (116)	C	
1772 Road (114)	C	
1804 Road (114)	C	
1825 Road (118)	C	
1809 Road (119)	C	
Private Road to Dam (112)	C	
Private Charcoal House Turn-Around (113)	C	
Meadowbank Road	C	
Thomas Lloyd Farm Lane (71B)	C	
Harrison Lloyd Road (Laural Road)	C	
Hearth Road Trace (121)	C	
Hiking trail - Boone Trail	C	
Hiking trail - Lenape Trail	C	
Hiking trail - Mill Creek Trail	C	
Hiking trail - Raccoon Trail	C	
Hiking trail - Buzzard Trail	C	
Hiking trail - Horse-Shoe Trail	NC	
Entrance Road (Mark Bird Lane)	NC	
Road to maintenance buildings	NC	
Road to Quarter 98 and 99	NC	
Visitor Parking Area	NC	
Baptism Creek Picnic Area parking	C	
Ford in French Creek	C	

**Contributing/Non-Contributing Resources**

Landscape Features	Significance	Interpretation *
<b>Vegetation</b>		
Meadow south of French Creek	C	
Woodland north of Maintenance buildings	C	
Fields north and east of John Church House	C	
Orchard	NC	C
Harrison Lloyd fields	C	
Thomas Lloyd fields	C	
Woodlands east of PA 345 and north of Baptism Creek	C	
Woodlands west and south of tenant houses	NC	
Tenant House No. 2 garden	NC	
Cedar pasture	C	
Core Area specimen trees	C	
<b>Clusters, Buildings, and Structures</b>		
Ironmaster's Mansion (1)	C	
Ironmaster's Bake Ovens (16)	C	
Ironmaster's Springhouse (17)	C	
Barn (2)	NC	C
Office & Store (3)	C	
Furnace (7)	C	
Wheelhouse (8)	NC	C
Charcoal House (9)	C	
Bridge House (10)	NC	C
Cast House (33)	NC	C
Furnace Bank and Retaining Wall H (8)	NC	C
Blacksmith Shop (6)	C	
Smoke House (41)	C	
Tenant House No. 1 (19)	C	
Tenant House No. 2 (20)	C	
Tenant House No. 3 (21)	C	
Tenant House No. 3 Barn (23)	C	
Pole Shed south of Tenant House No. 3	NC	
Boarding House (24)	C	
Nathan Care House (25)	C	
Nathan Care Barn (26)	C	
John Church House (27)	C	
John Church Barn (28)	C	
John Church Garage (70)	NC	
John Church Driveway Culvert (27B)	C	
Thomas Lloyd House (71)	C	
Thomas Lloyd Wagon Shed (71A)	C	
Thomas Lloyd Spring House (87)	C	
Quonset Hut (78)	NC	
Bethesda Baptist Church (79)	C	
Bethesda Baptist Church Carriage Shed (80)	C	

**Contributing/Non-Contributing Resources**

Landscape Features	Significance	Interpretation *
Bethesda Baptist Church Privy (81)	C	
Quarters (98)	NC	
Quarters (99)	NC	
Visitor Center (100)	NC	
Maintenance Building (101)	NC	
Bally Building (102)	NC	
Service Warehouse (66)	C	
Oil House (67)	C	
Pump House (51)	C	
YCC Storage Building (104)	NC	
Butler Building (103)	NC	
Baptism Creek Picnic Shelter (122)	C	
East Head Race (32)	C	
West Head Race (111)	NC	C
Tail Race (110)	C	
French Creek Bridge (115B)	NC	C
Birdsboro-Warwick Road Bridge (115A)	C	
Mark Bird Lane Culvert (29)	C	
CCC Spring Houses (88)	C	
CCC Vehicular Bridge	C	
CCC Vehicular Bridge	C	
Reservoir	NC	
Utility Building - northeast edge of site at powerline	NC	
<b>Archeological Sites</b>		
Mansion garden	C	
Ironmaster's Greenhouse ruins (13)	C	
Gardener's Tool House ruins	C	
Ice / Summer House ruins	C	
Charcoal Hearths	C	
Brison House ruins (55)	C	
Woodlot House ruins (76)	C	
Harrison Lloyd House ruins (72B)	C	
Harrison Lloyd Barn ruins (72A)	C	
Harrison Lloyd Blacksmith Shop ruin (72C)	C	
Harrison Lloyd Well ruins	C	
Anthracite Furnace ruin (11)	C	
Mule Stable ruin (83)	C	
Manning House ruins	C	
Wheelwright shop ruin (35)	C	
Ore Roaster ruin (34)	C	
Brick Kiln ruin (39)	C	
SchoolHouse ruin (18)	C	

### Contributing/Non-Contributing Resources

Landscape Features	Significance	Interpretation *
<b>Small-scale Elements</b>		
Tenant House Boardwalk	NC	C
East Head Race Stone Retaining Wall (32A)	C	
Ironmaster's Mansion Stone Wall (1A)	C	
Ironmaster's Mansion Garden Fence (1B)	NC	
Ironmaster's Kitchen Yard Wall (1C)	C	
Ironmaster's Garden Walk Trellis	NC	
Foot Bridges in Mansion garden	NC	
Chicken House near Springhouse	NC	
Hog Pen near Springhouse	NC	
Woodpiles and Sled near Charcoal Hearth	NC	
Cannon, Wagon Wheel, Iron Stacks near Furnace	NC	
Slag Pile (between Cast House and Blacksmith Shop)	NC	C
Watering Trough	NC	
Boarding House Pump and Well Cover (24A)	NC	
Nathan Care Stone Walls (25A)	C	
Nathan Care Boundary Stone Wall (25B)	C	
Cedar Pasture Fence (4)	NC	
Village Meadow Fence	NC	C
Harrison Lloyd Stone Walls (73)	C	
Thomas Lloyd Stone Walls (71C)	C	
Bethesda Baptist Church Stone Wall (79A)	C	
Baptism Creek Fireplaces	C	
Bethesda Baptist Church Gravestones (79B)	C	
CCC Foot Bridge	C	
CCC Foot Bridge	C	
Interpretive Signs	NC	
Ironmaster's Garden Steps	NC	
Meadowbank Road fencing	NC	C
NPS trash cans	NC	
Flagpole at Visitor Center	NC	
NPS Drinking Fountains	NC	
NPS Wood Benches	NC	
NPS Picnic Tables	NC	
Telephone Poles	NC	
Fencing along PA 345 at John Church House	NC	

**APPENDIX C**



## APPENDIX C. HOPEWELL CHRONOLOGY

- 1757: road opened from Reading to Coventry Forge  
c. 1770: Hopewell Mine opened  
1771: Furnace erected (date in cast arch)  
1772: road built connecting Jones Mine to Schuylkill River at Monocacy (north of Hopewell Village on "Brushy" Hill)  
1772: Ironmaster's House extant by this date  
c. 1773: Cast House constructed  
1774: Bird acquires Jones Good Luck Mine  
c 1775: Blacksmith Shop constructed  
1779: Bird taxed for 16 horses, 21 cows, and 46 sheep -- barn  
1782: Bethesda Church built by Thomas Lloyd  
1784: Bird appeals for tax reduction, as furnace has not run for some time  
1784: earliest mention of Store in records  
1784: Blacksmith Shop mentioned in records  
1786: flood  
1786: Bird offered property at public sale - 4,000 acres of land, 5,000 cords of wood, 800 loads of ore  
1788: sheriff's sale in April - 5,163 acres to Cadwallader Morris & James Old (includes 250-tree apple orchard)  
1791: Morris' brother Benj. Morris becomes sole owner of Hopewell Furnace  
1793: James Old bought property for \$37,000 and resold to James Wilson (Wilson also owned Birdsboro Forge at this date)  
1796: sheriff's sale of 4,000 acres to Old  
1798: Direct Tax lists Lloyd House  
1798: East Head Race clearly extant by this date (6,100 feet from Baptism Creek)  
1800: sheriff's sale of Hopewell Furnace to Benj. Morris;  
1800: Morris sold furnace property to Danl. Buckley and brother-in-laws Thomas & Matthew Brooke  
Buckley & Brooke made extensive alterations to Furnace: rebuilt hearth walls, reoriented water wheel east-west, built new West Head Race; constructed new Coal House - log and timber (Charcoal House)  
1803: Buckley & Brooke had log house constructed at unknown location (possible tenant house)  
1804: public road from Birdsboro to Hopewell opened  
1805: stamping mill erected  
1806: built stone tenant house (156 perches of stone) - west section of Boarding House ? (Bldg. 24)  
1806: built north end of Springhouse (79.5 perches of stone)  
1807: dam burst three times this year  
1808-1816: Furnace out of blast - law suits against furnace; at least three houses extant at mines  
1809: road to Jones Mine opened (used ford near Blacksmith Shop)  
1814: David Lloyd acquires 19+acres (Bldg. 71?)  
1815: road to Warwick opened (Warwick Mine to Hopewell)  
c. 1816: new Cast House erected  
1816: reorganized as Daniel Buckley & Co.  
1816: Bird died in North Carolina

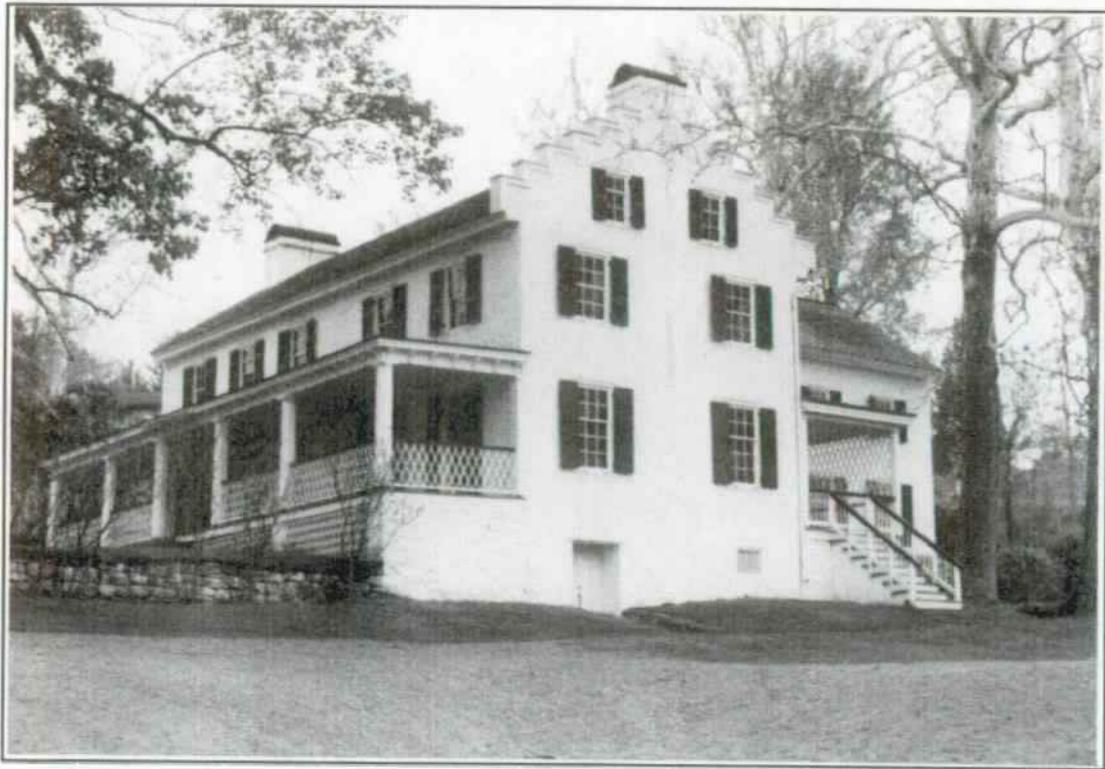
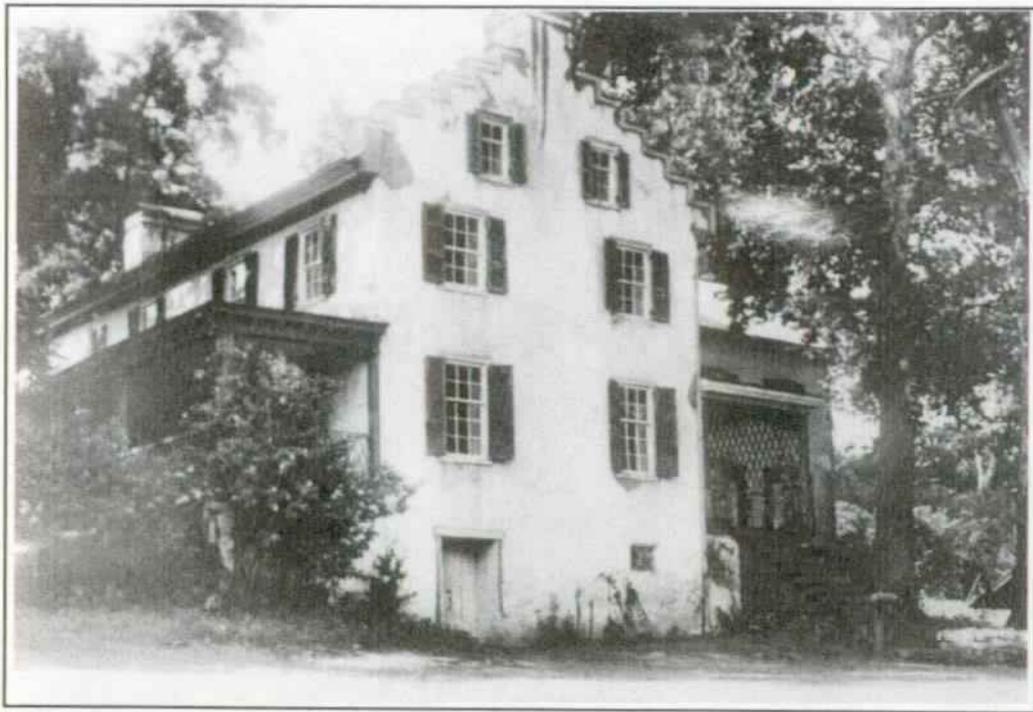
- 1816: preparing to restart Furnace after long hiatus; over \$8,000 worth of repairs made
- 1816: water pipe existed from Spring House to Mansion
- 1816-1817: cupola constructed
- 1817: alterations to Barn???
- 1818: Wheel House erected (designated as "new")
- 1819: eight regular miners employed at Hopewell Mine
- 1820: Lloyd Tract (Tract 18) willed to Thomas Lloyd (3rd gen.) - possible house additions
- 1820: David Lloyd inherits 64+ acres from father Thomas (2nd gen.)
- 1823: one bake oven built (near Ironmaster's House?)
- 1825: road officially established from Furnace to 1750s Road; obliterated in 1930s and reconstructed in 1950s
- 1826: built tenant house with excavated cellar (Church House?)
- 1826-1827: the furnace made door frames and other items for New State Penitentiary (Eastern State?)
- 1827: formal organization of Baptist congregation at Bethesda Church
- c. 1827: supposed date for enlargement of Cast House
- c. 1828: Smokehouse built (records - new or repairs?)
- 1828: major masonry repairs to Furnace; possible removal of south shed and construction of new shed
- 1828: first mention of scales (wagon) in records
- c 1829: Greenhouse constructed (based on glass purchases)
- c. 1829-1842: 25-foot addition to east end of Barn
- 1829: 160 apple trees purchased
- 1830: possible east addition to Boarding House
- 1830-1838: furnace's most prosperous period
- 1831: reorganized as Clement Brooke & Co.
- 1832: payment for dressing vineyard
- 1832: stone steps put in garden
- 1832-1833: Garden Wall constructed (records)
- c. 1833: Garden Toolhouse built (Bldg. 14) - no hard evidence
- c. 1834: Ice House/Summer House constructed (earliest mention in records)
- 1834: 304 apple trees purchased
- 1835: wood hauled from old peach orchard
- 1836-1837: peak of casting production (720.5 tons)
- c. 1836: public school located at furnace - built at company expense (currently ruins)
- 1837: furnace owners taxed for 10 tenant houses in Union Township
- 1837: reported that furnace burned 6000 cords/year (4000 from furnace lands)
- 1838: Greenhouse constructed (based on presence of full-time gardener)
- 1840: furnace owners taxed for 11 tenant houses in Union Township
- c. 1841: gable end steps built on mansion for fire control
- 1843: furnace owners taxed for 11 tenant houses in Union Township
- 1844: stove casting halted at Furnace
- c. 1845-1854: Tenant House 3 (Building 21) built
- c. 1847: South Molding Room abandoned
- 1847: scales installed in Bridge House
- c. 1849: Brick Kiln House built (Bldg. 39) - currently ruins
- 1849: store purchases suggest underground mining by this date - oil cloth coats
- c. 1850s: Carriage Shed frame addition constructed to east end of Barn
- c. 1850: Care Log House extant

- 1852: furnace owners taxed for 12 tenant houses in Union Township
- 1853: Anthracite Furnace erected
- c. 1856-1857: Nathan Care House (Bldg. 25) built
- 1855: furnace owners taxed for 14 tenant houses in Union Township
- 1856: AME Mount Frisby Church constructed (3 miles from furnace)
- c. 1857: anthracite machinery moved to Monocacy
- 1857: payment for dressing vineyard
- 1858: oats sown in little orchard (other orchard labeled old)
- 1859: Hopewell listed as a post office
- c. 1859: Nathan Care Barn built
- 1860: three tenant houses depicted north of lake on map (possibly extant by c. 1825)
- 1862: date inscribed in plaster of Tenant Barn (Bldg. 23)
- 1864: furnace owners taxed for 10 tenant houses in Union Township
- 1867: furnace owners taxed for 10 single and 1 double tenant houses in Union Township
- c. 1867: no roof on North Molding Room
- 1867: Ironmaster's House porch extended to 20 feet
- 1869: extensive repairs to Furnace
- c. 1869: Tenant House 4 (Boone Store) built - frame duplex
- 1870s: tenant house burned
- c. 1870: new School built along Jones Mine Road (approx. one mile west of Hopewell)
- c. 1870: frame additions constructed to Barn
- 1870: bathroom installed in Mansion; 1st floor windows lengthened; porch extended
- 1873: furnace owners taxed for 10 tenant houses in Union Township
- 1874: Furnace out of blast
- c. 1875: Boone Store started in Tenant House No. 4
- c. 1876: latrine in mansion yard
- 1877: furnace owners taxed for 9 tenant houses in Union Township
- 1877-1878: Furnace out of blast
- 1878: Brick Kiln rented as residence to John Roberts
- 1879: Wheel House rebuilt with roof to Bridge House
- c. 1880: Charcoal House and north shed rebuilt
- c. 1881: boiler installed to provide auxiliary power to furnace
- 1882: Ore Roaster installed
- 1883: furnace owners taxed for 5 tenant houses in Union Township (Long recalled 14-15)
- 1883: Furnace's last blast finished on June 15
- 1891: Boone Store closed
- 1893: Boone Store burned
- c. 1895: Wheelwright Shop torn down
- fence posts and rails cut from woodland and sold in railroad car lots
- c. 1900: Care Log House demolished to use site as field
- 1915: Clingans ceased using Mansion as summer house (Harker Long lived in rear wing)
- 1920: Ironmaster's House Bridge at east facade built (formerly steps to summer house)
- 1922: grading on north side of Barn by Nathan Care, Jr.
- 1926: new Barn built incorporating some old stone walls
- 1932: 1804 Road realignment: wall broken, ore roaster infilled

1935: US Gov't purchased Hopewell property approx. 6000 acres  
 1935: two CCC camps located in area (about 400 men)  
 1935: CCC raised dam 8 feet (increased lake from 12 acres to 62 acres)  
 1935-1939: WPA restoration work  
 1938: CCC cleaned out tail race  
 1938: Hopewell Village NHS established  
 1939: Pennsylvania Route 345 loop road completed  
 1941: Furnace restoration by CCC complete  
 1941: addition constructed onto Church House (Bldg. 27)  
 1947: approx. 5000 acres deeded to state; US retained 848 acres  
 1950: Blacksmith Shop restored  
 1952: Waterwheel and blast machinery restored by NPS  
 1955: Birdsboro-Warwick Road through Hopewell Village closed to the public  
 1955-1958: steps west of Store restored  
 1957: Bridge House reconstructed  
 1958: considerable interior work on Ironmaster's House  
 1958: Bridge House reconstruction completed  
 1958-1959: Visitor Center, Upper Parking Lot, Maintenance Bldg., & Residences built  
 1959: Tenant Barn stabilized and re-roofed  
 1960: Parking Lot orchard planted  
 1961: Store restored  
 1961: Barn restored  
 1962: archeology discovers Cleaning Shed  
 1963-1964: Anthracite Furnace stabilized  
 1965: Cast House reconstruction completed  
 1965: Harrison Lloyd House (Bldg. 44) razed on January 14  
 1965: Spring House restored  
 1965: Charcoal House reconstructed/rehabbed  
 1965: Bethesda Cemetery Wall restored  
 1965: Grade lowered east and north of Blacksmith Shop  
 1973: Cedar Pasture cleared of all but cedars  
 1980: Blacksmith Shop burned  
 1981: Blacksmith Shop restored  
 1985: name changed to Hopewell Furnace National Historic Site

**APPENDIX D**





Ironmaster's House in 1936 (top) and 1995 (bottom). Top photo filed at HOFU Archives, bottom photo Menke & Menke.



(Top) Ca. 1890 photograph near Ironmaster's House showing photographer (possibly Octavius Bull) and assistant as well as stone wall with picket fencing located near edge of East Head Race. On file at HOFU archives. (Bottom) 1995 view of Ironmaster's Stone Wall. Menke & Menke photo.



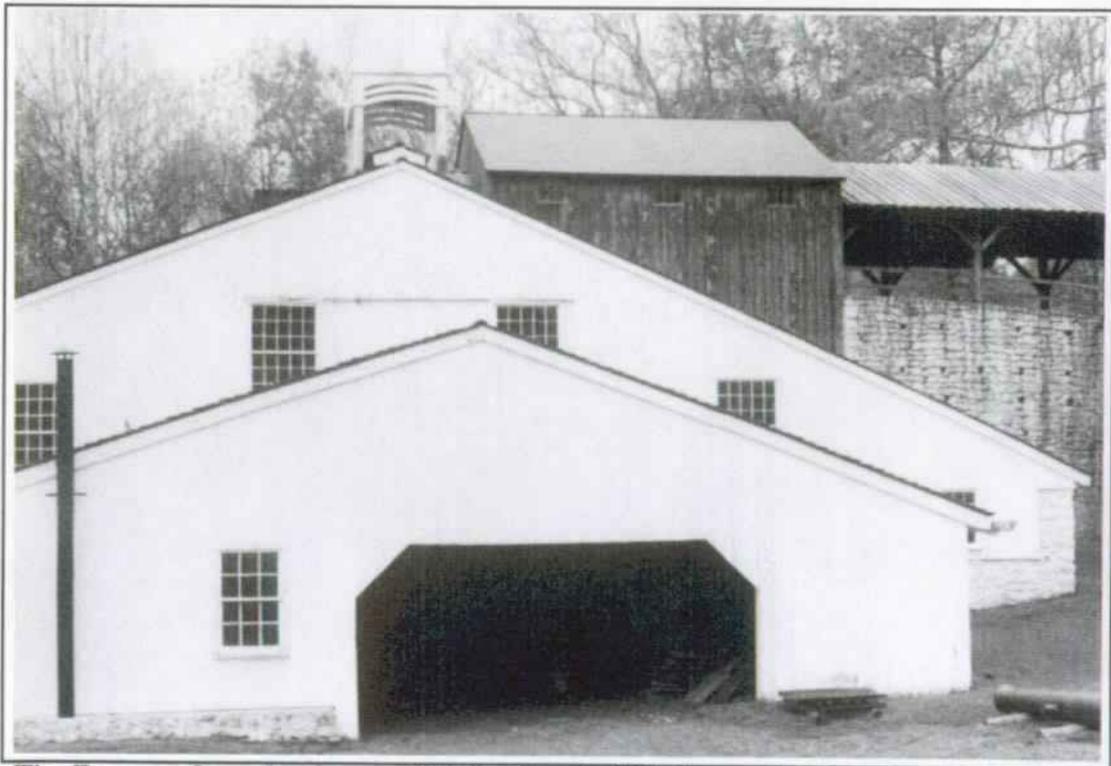
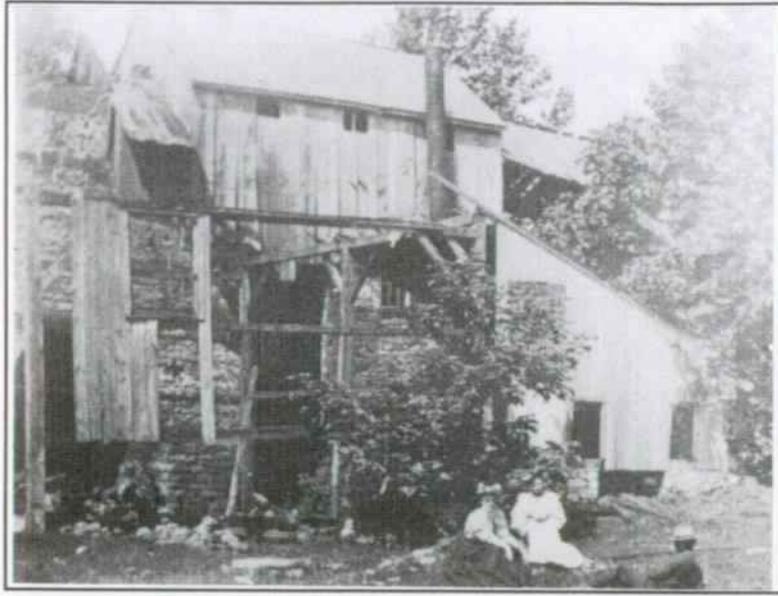
Terraces in Ironmaster's Garden in 1936 (top) and 1995 (bottom). Top photo on file in HOFU archives, bottom photo Menke & Menke



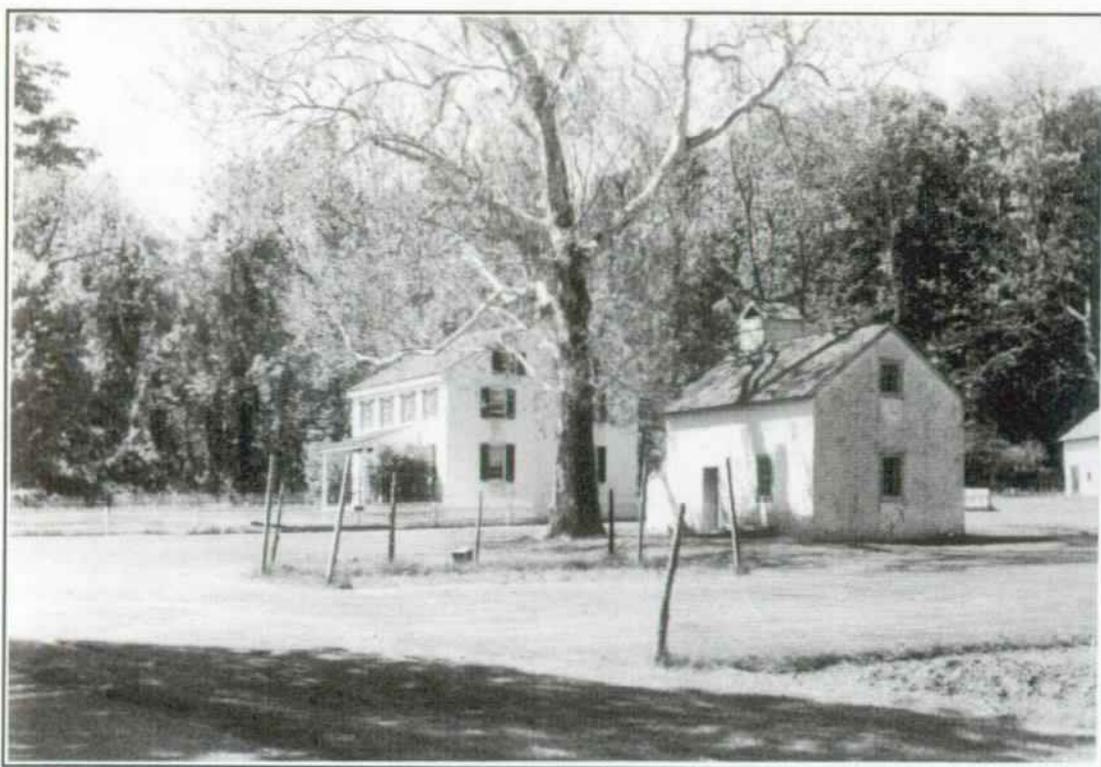
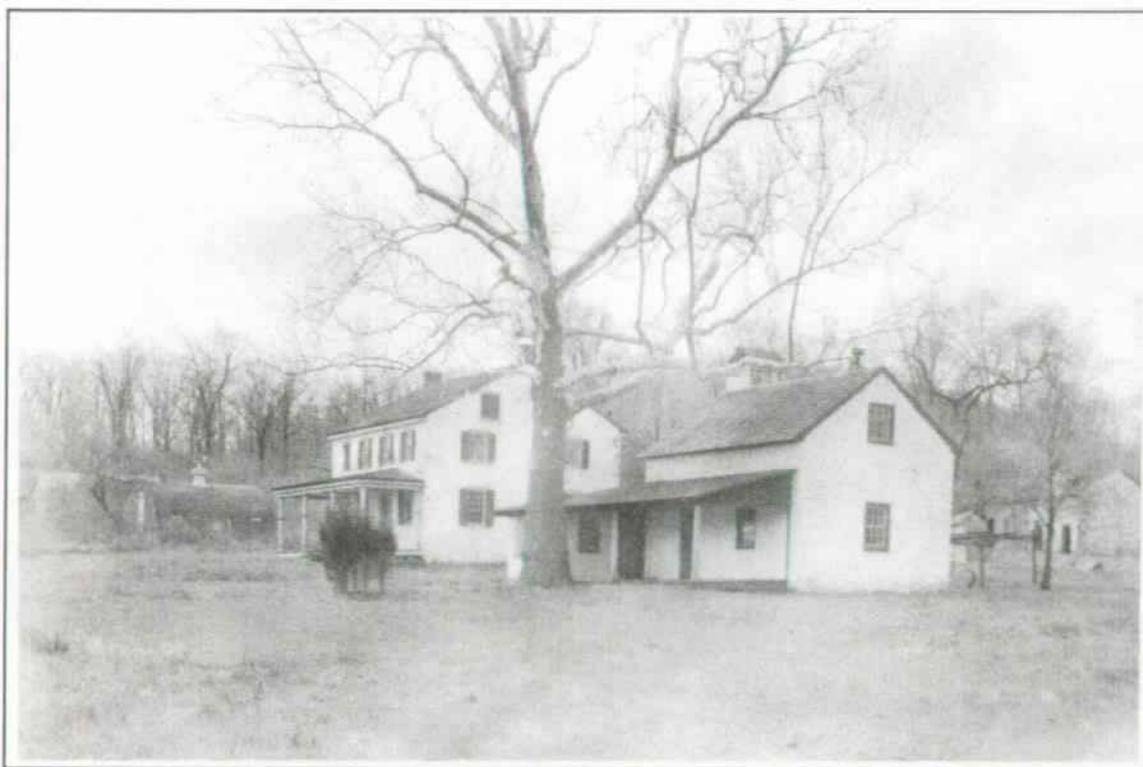
View of Office & Store, Ironmaster's House, and Barn in 1915 (top) and 1995 (bottom). Top photo on file in HOFU archives, bottom photo Menke & Menke.



French Creek Bridge and Blacksmith Shop in 1936 (top) and 1995 (bottom). Notice Furnace ruin in background of the 1936 photo and bridge modifications in the 1995 photo. Top photo on file in HOFU archives, bottom photo Menke & Menke.



The Furnace Complex in ca. 1896 (top) and 1995 (bottom). Top photo reproduced from Kurjack *Hopewell Village* (Washington, D.C.: National Park Service, 1954), bottom photo Menke & Menke.



Tenant Houses No. 2 and No. 3 in ca. 1940 (top) and 1995 (bottom). Site elements removed between these dates include porches, some outbuildings, arbors, and pergolas. Picket fencing and a small vegetable garden added in bottom photo. Top photo on file HOFU archives, bottom photo Menke & Menke.



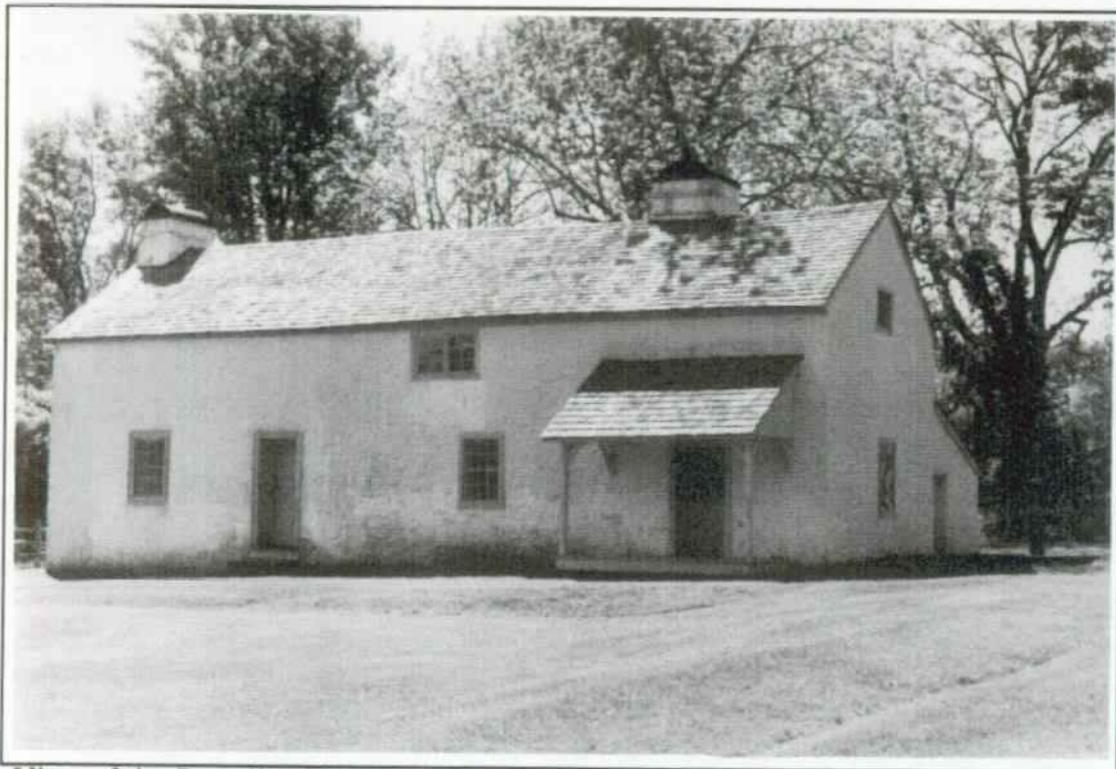
Tenant Houses No. 2 and No. 3 in 1936 (top) and 1995 (bottom) with Boarding House in center background. Note the removal of outbuildings, pergola, and possible apple tree as well as the addition of picket fencing in the 1995 photo. Top photo on file in HOFU archives, bottom photo Menke & Menke.



Tenant House No. 2 looking north in ca. 1935 (top) and 1995 (bottom). Pergola and addition no longer remain in 1995 photo. Top photo on file at HOFU archives, bottom photo Menke & Menke.



Tenant House No. 2, looking west in ca. 1936 (top) and 1995 (bottom). Top photo on file in HOFU archives, bottom photo Menke & Menke.



View of the Boarding House in 1935 (top) and 1995 (bottom). Top photo on file in HOFU archives, bottom photo Menke & Menke.



View of the Ironmaster's Spring House in ca. 1954 (top) and 1995 (bottom). Top photo reproduced from Kurjack *Hopewell Village* (Washington, D.C.: National Park Service, 1954), bottom photo Menke & Menke.

**APPENDIX E**

**Forest Age Documentation**  
**and**  
**Other Forest Management Issues at Hopewell Furnace NHS**

*Prepared for:*  
**Menke and Menke**  
**Landscape Architects & Planners**  
**6 Ogden Avenue**  
**Swarthmore, PA 19081-1213**

*In Support of:*  
**Menke & Menke's**  
**Cultural Landscape Report**  
**for**  
**Hopewell Furnace National Historic Site**

*Prepared by:*  
**A. William Graham, Jr.**  
**Arboricultural Consultant and Educator**  
**Morris Arboretum of the University of Pennsylvania**  
**9414 Meadowbrook Avenue**  
**Philadelphia, PA 19118**

**(215) 247-5777 extension 144**

**April 1996**

### **Summary:**

1. The forest stand ages in the Charles Stearns Report of 1936 is corroborated by my own increment core sampling and by other studies at Hopewell Furnace NHS.
2. Forest canopy types have changed on at least some sites since the Stearns study and are best characterized by the Russell study in 1987.
3. There are approximately 115 exotic plants growing at Hopewell Furnace NHS according to Russell and Schuyler in 1988. These are largely found in and around the current and old agricultural fields and home sites. Attempts to control the more aggressive invasive exotic plants should commence by a survey of the location and frequency of these plants. Once identified, a systematic control program can be designed and implemented.

### **Background and Resources:**

The forested areas currently owned and managed as the Hopewell Furnace NHS is a portion of charcoal forests and farmland owned by two different furnaces and adjoining privately owned farms during the period of furnace operation from about 1771 to 1883. The charcoal forests owned by Hopewell Furnace's proprietors included, in large part, the lands now under the jurisdiction of French Creek State Park. As a part of the interpretive resources for the currently held by Hopewell Furnace NHS, it is desired to understand both the historic composition and harvest patterns of the charcoal forest lands. In this context, I have been asked to confirm the age estimates and forest type characterizations given by other authors.

There are numerous detailed studies of the forests at Hopewell Furnace NHS. One of the earlier studies dates back to 1936, when student technicians under the direction of Charles H. Stearns mapped the forest cover types, forest ages, and forest fires (occurring between 1902 and 1938) of forests previously used for charcoal production by the Hopewell Furnace. This study included much of the land now part of French Creek State Park. Subsequent studies are of more recent origin and focus more specifically on current holdings of the National Historic Site. Of note are vegetation studies by Emily Russell in March of 1987 detailing, updating, and documenting the current forest cover types and other flora of the site. A subsequent study of the vegetation and location of charcoal hearths at Hopewell Furnace NHS was completed by Carl Mikan and Marc Abrams in 1994 and adds additional depth and information on forest type and age structure. Another study was initiated in 1994 by Gerald L. Storm, Walter M. Tzilkowski, Todd W. Bowersox, and Stephen E. Fairweather on the effects of large herbivores on the regeneration and stocking of Oak species in forest stands of the site. The documented permanent study plots provide further documentation of the forest types and size distribution although non-specific about forest age.

---

**Rediscovery of the Stearns Study Site Map:** Of significance in the current study by Menke and Menke is the rediscovery of the site map blueprint that mapped the forest types and forest fire boundaries referenced in the Stearns study of 1936. This information was not available to other researchers. Since this is such an key document for interpreting changes in the forest type and since it meticulously determined age of the forests within four 20 year periods, I was asked to check the validity of the information.

### **Assignment:**

1. Verify the accuracy of forest dating and forest type in *Revised Type Mapping Report* by Charles H. Stearns and student technicians originally made in summer of 1936.
2. Read and analyze previous forest studies and plans.
3. Make suggestions and recommendations on future forest management to include exotic invasive plants
4. Submit field data and core samples for inclusion in Hopewell Furnace NHS archives
5. Submit a report on all field work, analysis and recommendations

### **Materials and Methods:**

In this study, two site visits were made: the first on November 3, 1995, accompanied by Bill Menke; and the second on March 18, 1996, unaccompanied.

Two study methods were selected and employed in this study: 1) increment cores were taken within several forest areas from various forest species, and 2) a circular study plot was selected and sampled for both forest type and age, especially of Red Maple (*Acer rubrum*). It must be emphasized that this was not undertaken as a definitive study, but to spot check the validity of earlier studies, especially the Charles Stearns study concluded in 1936.

**Increment Core Sampling:** Twelve, 5 millimeter diameter, increment core samples were taken from 11 trees in widely scattered parts of the park as indicated on *Table 1*. The location of the many of the samples taken on November were determined by a hand-held Global Positioning System (GPS) operated by Bill Menke (see *Table 5*). Other samples were estimated by using a grid map system given to me by Roger Stone of the Hopewell Furnace NHS staff. This map is appended to this report as *Figure 2*. In a few instances, magnetic compass bearings to recognizable site features were taken and recorded.

Cores were taken to various depths and the tree's circumference was measured at 4.5 feet above the ground. Where possible, at least one half of the tree diameter was sampled. On my site visit of November 3, 1995, core sample depths were limited by the 16 inch length of the increment

borer. On my site visit of March 18, 1996, I used a 28 inch long increment borer. Time was limited on the project and re-sampling of large diameter trees with the longer increment borer was not possible. One sample per tree was taken except for one White Oak (*Quercus alba*). The increment cores were glued into a groove routed near the center of a one inch wide by four foot long white pine boards and labeled for the Hopewell Furnace NHS archive.

During my two site visits I encountered three tree blow downs that provided opportunities to count annual growth rings at various heights above the ground. No samples were taken of these trees. Cross sections of blow downs provide a very accurate and complete estimate of the tree's age and taking samples should be considered as a standard operating procedure when removing trees for whatever reason. Over time, this information could increase the accuracy of forest dating within the park. Ring counts of these un-sampled cross sections are include in *Table 1*.

Annual growth rings were counted to determine tree age. The ring porous oaks (*Quercus sp.*) and ash (*Fraxinus sp.*) were easy to count. The diffuse porous samples of American Sycamore (*Platanus occidentalis*) and Red Maple core samples were first stained by treating the cores with a solution of phloroglucinol in ethyl alcohol (1 gram in 100 milliliters) and then hydrochloric acid. This procedure turns the wood a pink color and makes the annual growth rings easier to distinguish. Even with this treatment, the American Sycamore annual growth rings were extremely difficult to count. One section of the Red Maple sample required a hand lens to aid in counting the extremely small growth increments.

*Table 1* makes a comparison of several age estimating methods. Unless the core sample passes directly through the center pith of the tree, the number of growth rings near the center must be estimated. Where the core passes very near the center of the tree the rings become slanted across the increment core or become arcs. In this case, there is a higher degree of certainty. In samples from very large diameter tree taken with the shorter (16 inch) increment borer, the age of the tree could not be accurately counted or estimated. On these samples and the others as well, I calculated the age of the tree by using a growth index determined by counting ten years of growth close to the center section of the core. The index was selected from a section as close to the center as possible without diagonally crossing growth ring lines. The index's length was divided by 10 to determine the growth increment per year. This growth index was then used to calculate the missing segment of the core sample by subtracting the core length from half the tree's diameter. *Table 1* also makes a comparison of the various estimates and calculated tree ages from analysis of these cores with Stearns' forest age estimates.

**Forest Type Sampling:** A 1/5 acre circular plot was analyzed by using a randomly selected Red Maple as the center point in a plot west of the village and approximately 65 feet south of French Creek (magnetic azimuth of 60 degrees to the Hopewell Furnace NHS visitor center and 280

---

degrees to the active spillway of Hopewell Lake Dam). A 10.5 inch increment core sample was taken from the south side at about 4.5 feet from the ground of this Red Maple and was used to determine growth rates and extrapolate the approximate forest age of other Red Maples in the stand. Each Red Maple on the sample plot was inventoried and measured at breast height. Other species in the sample plot were tallied without measuring. Two large Tulip Tree (*Liriodendron tulipifera*) were noted as dominant trees on the site. The larger Maples claimed crown dominance along with the Tulip Trees. The ground was moist and boggy at the time of sampling. *Table 2* details the measurements and inventory of the plot and estimated age of stand members.

### **Discussion and Analysis:**

**Accuracy of Forest Age Dating:** There appears to be close agreement between the forest age determined in this study and that of Stearns in 1936 and Mikan and Abrams in 1994. *Figure 1* is an adaption of a map used by Mikan and Abrams in their study of the site's charcoal hearths and has been labeled to indicate the comparisons between Stearns, Mikan et al, and Graham. There is close agreement between all three tree age studies.

Although beyond the scope of this study, it is possible that certain tree species may have been selectively spared in certain forested areas. For example, White Oak was used extensively in cooperage and as a building material. Barrels were used during this era both to store liquids as well as dry materials. Wooden barrels were used in a similar fashion as we use packing boxes today. This might explain why the three White Oaks which were age dated in the area south of French Creek and east of Route 345 varied in estimated age: 1872, 1920, and 1875. A word of caution is necessary, since the sample size is small.

It was noted incidentally to the coring study, that some boundary trees may be of substantial age such as White Oaks along the western boundary south of the lake where four trees very large diameter trees line up and have spreading (open-grown) crown architecture. Other sentinel or boundary trees surveyed include the White Ash (*Fraxinus americana*) and Black Oak (*Quercus velutina*) found in sections J11 and J12 North of Hopewell Road and East of Route 345.

**Accuracy of Forest Canopy Type Characterizations:** The forest canopy types in the Charles Stearns Report do not agree with the spot checking of some of the forest types I found on site.

These changes reflect changes in the forest canopy since 1936. According to the Society of American Foresters 1980 publication entitled *Forest Cover Types of the United States and Canada*, forest types must meet the following criteria:

1. The dominant cover must be of trees, in other words, tree crowns should cover at least 25 percent of the area.
2. The type must occupy a fairly large area in the aggregate, but not necessarily in continuous stands. Many types occur sporadically and merge into others over short distances.
3. Recognition of a forest cover type must be based entirely on biological considerations.

In particular, Gray Birch - Red Maple forest cover type indicated by Stearns to the west of Hopewell Village and south of French Creek have changed with Gray Birch (*Betula populifolia*) no longer found. Gray Birch is a disturbance tree species that colonizes disturbed sites such as where fire or logging has occurred. Red Maple may also colonize disturbed sites and may have been prominent on this site at the time of Stearns' assessment. The faster growing oak species may have out-grown the Red Maple and today has become a dominant canopy species necessitating a renaming of the forest cover type as Russell and others have indicated.

Forests are in a constant state of change and it can be expected that many of the forest types noted by Stearns may have changed and will change further over time. Many authors suggest that over time, Red Maple, in particular, and other shade tolerant forest trees may eventually become crown dominant species superseding Oak as the forest type on many sites (Lorimer, 1984). This has been suggested by Russell and others studying forests at Hopewell Furnace NHS.

The study plot used in this study (located south of French Creek and west of the Hopewell Village) clearly shows that Red Maple is the dominant tree and agrees with the site map forest type characterization from the Russell study in 1987. No Gray Birch were found any where near this site. Further to the west and to the south of my study plot, the forests are dominated by oak with a component of Red Maple. The age of the Red Maple in this Oak dominated stand was not assayed as part of this study, but might help unravel the discrepancy between the Stearns Report and that of subsequent authors.

*Table 3*, shows growth rates over several 10 year periods and one 26 year slow growing period. The growth rate chart shows a period of slowing growth for the period approximately 30 years followed by the 26 years of slow growth. Subsequent growth for the 40 years following the slow growth period show a study growth increase. The growth rates suggest various scenarios, but again the small sample size leads to more questions than definitive answers. It may be that a

---

young stand of vigorous, primarily Gray Birch and Red Maples colonized the one of the last charcoal harvests on this area. Increasingly, the Red Maple suffered from increasing competition. About 65 years ago, either a catastrophic disturbance occurred or fierce competition resulted in extremely slow growth. About 40 years ago, there was either a major release or the tree effectively recovered from the possible injury. Growth subsequently increased as the tree became more site dominant.

Although this very slow growth period remains a mystery due to the single sample size, it corresponds to the 1930 Mt. Pleasure forest fire reported in the Stearns report. The sample plot, however, is not within the burned area reported by Stearns.

*Table 2* shows several possible periods of stocking by Red Maple. These estimates are based on the growth rate of the core sampled Red Maple in the center of the sample plot. Six trees in the plot began growth from about 1853 to 1879 including the increment core sampled tree which started growth about 1879. A second period of stocking appears to have occurred representing five trees from about 1911 to 1928. A third period of Red Maple stocking occurred from about 1948 to 1960 representing about four trees. Taking into account the differences in growth rates between trees, this information suggests that the sampled tree and other larger diameter trees may have been established near the end of the furnace operation.

**Control of Invasive Exotic Plants:** Russell and Schuyler (1988) found approximately 115 exotic plants growing at the Hopewell Furnace site, mostly "concentrated near developed areas and the pasture, as well as near old house ruins and along roadsides" (see *Table 4*). My observation based on two days of casual observation, is that the most problematic exotic plants are found along forest edges and in old agricultural fields. A part of a systematic control program, the extent of the problem should be documented. Part of this documentation should include mapping the locations of exotic invasive species. Following this documentation process, a strategy for systematic mechanical and/or chemical control can be developed. Many of the exotic plants seem to be sunlight dependent species which will succumb, when tree competition for sunlight intensifies. Control is important along field edges and areas maintained as open land or crop land. Perhaps the most important control strategies are control of shade tolerant species which would have abundant habitat at Hopewell.

### **Forest Management Recommendations:**

1. Hopewell Furnace forests have been carefully studied and documented since 1936 and represent a wonderful resource for research on forest succession and other interactions such as White Tail Deer interactions that may be invaluable for application in other Eastern Hardwood Forest sites.

2. Within the scope of interpretation at Hopewell, controlled burning plots may be set up to study the long term effects of this management technique. Fire was documented in six locations within the park by Stearns (1936). Fire is likely to be a major factor in determining forest type as has been documented in many of the Hopewell forest studies. Another Treatment regime that would be compatible with the interpretive program at Hopewell would be systematic, periodic cutting. This could possibly be set up as relatively small demonstration plots and also be incorporated into long term forest studies.
3. Additional age dating of trees could be useful in identifying important resources to curate and interpret. A more definitive study and mapping of the witness trees and other monarch trees of the park and within the historic village may add dimension and interest to interpretative programs. Increment core dating has its limitations, especially with very large diameter trees where the cost of long increment bores and other physical aspects are involved. I strongly suggest that a policy of taking cross section samples from all trees that fall naturally or are removed intentionally from the site be implemented. This will, over time, capture an invaluable historic record of the age of the forests at Hopewell Furnace NHS.
4. As part of a systematic invasive exotic plant control program, the extent of the problem should be documented. Part of this documentation should include mapping the locations of exotic invasive species. Following this documentation process, a strategy for systematic mechanical and/or chemical control can be developed. Many of the exotic plants seem to be sunlight dependent species which will succumb, when tree competition for sunlight intensifies. Control is important along field edges and areas maintained as open land or crop land. Perhaps the most important control strategies are control of shade tolerant species which would have abundant habitat at Hopewell. *Table 4* is a compiled listing of exotic species found within the park boundaries that have potential to compete with native plants. It is a cross referenced of exotic plant species noted in the Russell study and a list of plants known to compete with native plants noted by Dr. Ann Rhoads, Director of Botany at the Morris Arboretum in her work on various publications on Pennsylvania's State flora.

## **Conclusions:**

- 1. Accuracy of Forest Age Dating:** The forest stand ages in the Charles Stearns Report of 1936 is corroborated by my own increment core sampling and other studies. The Stearns study seems to be a reliable age determination within the degree of accuracy of 20 years. More precise aging can be determined the oldest nearby tree sample in the Mikan and Abrams charcoal hearth study.
- 2. Accuracy of the Forest Type Characterization:** The forests have evolved since the Stearns study and may is no longer a valid characterization of the cover types. They are, however, interesting in that they document what had been there in 1936. The Russell Study in 1987 and other more recent characterizations are best used for interpreting the evolved forest. The Stearns study is no doubt invaluable in giving insight into the character of charcoal lands during the furnace's period of operation.

## **Bibliography:**

1. Eyre, F.H., editor, *Forest Cover Types of the United States and Canada*, Society of American Foresters, 1980.
2. Lorimer, Craig G., "Development of the Red Maple Understory in Northeastern Oak Forests," *Forest Science*, Vol. 30, No. 1, 1984, pp. 3 - 22.
3. Mikan, Carl J., Orwig and Abrams, Marc D. (School of Forest Resources - The Pennsylvania State University), "Vegetation, Edaphic, and Historical Analysis of Charcoal Hearths at Hopewell Furnace National Historic Site, Pennsylvania," February 1994.
4. Russell, Emily W.B., Center For Coastal and Environmental Studies, Rutgers University, New Brunswick, NJ, "Vegetation Study Hopewell Furnace National Historic Site," March 1987.
5. Russell, Emily W.B. and Schuyler, Alfred E., "Vegetation and Flora of Hopewell Furnace National Historic Site, Eastern Pennsylvania," *Bartonia* No. 54: 124-143, 1988.
6. Stearns, Charles H., formerly Project Forester, USDI NPS, "Revised Type Mapping Report," French Creek Project, Birdsboro, PA (original made in Summer of 1936 by student technicians), July, 1939. (with an accompanying blue print site map of forest cover types, age, and forest fire disturbances.)
7. Storm, Gerald L., Tzilkowski, Walter M., Bowersox, Todd W., Fairweather, Stephen E. (Pennsylvania State University), "Plant Community Development in Historic Forest Stands at Hopewell Furnace National Historic Site," USDI NPS Mid-Atlantic Region Technical Report NPS/MARHOFU/NRTR - 94/062, July 1994.

Table #1

### Tree Age Determination from Increment Core Samples Taken from Trees at Hopewell Furnace NHS

I.D. No.	Tree Species	Col- lection Date	Grid Tree Loc.	CBH (In.)	DBH (In.)	Length of Core In Ring Count (in In.)	Actual Tree Ring Count	10 Year Index Length (in.)	Cal.	Cal.	Est.	Est.	Stearns	Stearns	Notes:
									Tree Age	Year Tree Began	Tree Ring Count	Tree Year Began	Est. Year	Est. Forest Type	
1	Black Oak	3/18/96	H6	78	24.83	11.75	107	1.1875	113	1882	110	1885	1855-1895	SO-BO	
2	Black Oak	3/18/96	C/D13	61	19.42	8.63	63	1.5625	70	1925	71	1924	1916-1936	GB-RM	Section probably missing from bark end of sample
3	White Oak	3/18/96	C/D13	93	29.60	12.19	127	1.4375	145	1850	137	1858	1855-1895	SO-BO	Sect of the sample missing/Tree prob much older
4	Black Oak	3/18/96	D14	48	15.28	7.00	70	1.0000	76	1919	74	1921	1916-1936	GB-RM	Core sample not deep enough for exact age
5	Red Maple	3/18/96	D12	50	15.92	7.25	106	0.5625	119	1876	107	1888	1856-1875	WO	One section of 5/16 Inch grew in 26 years
6	White Ash	11/3/95	J11	128	40.74	13.19	88	1.9375	125	1870	88+	b. 1907	N/A		Core sample not deep enough for exact age
7	White Oak	11/3/95	F15	107	34.06	6.87	93	1.1875	179	1816	94	1901	1856-1875	WO	Very small hard to count rings the last 20 years
8	White Oak	11/3/95	F15	107	34.06	12.31	122	1.6875	150	1845	123	1872	1856-1875	WO	Very small hard to count rings the last 20 years
9	White Oak	11/3/95	F15	44	14.01	5.50	74	1.5000	84	1911	75	1920	not surveyed		
10	White Oak	11/3/95	F/G14	61	19.42	8.50	119	1.5000	127	1868	120	1875	1856-1875	WO	
11	Black Oak	11/3/95	KL11	89	28.33	12.31	97	1.8750	107	1888	102	1893	1856-1875	SO-BO	
X3	White Oak	11/3/95	K12				109				109	1886	1856-1875	SO-BO	Uprooted saw cut stump
12	Tulip Tree	11/3/95	K10	100	31.83	13.62	68	2.1250	79	1916	68+	b. 1927	1855-1895	SO-BO	Core sample not deep enough to determine age
13	Black Oak	11/3/95	J10/11	148	47.11	13.13	113	1.3750	189	1806	116	1879	Not Surveyed		
14	Sycamore	11/3/95	E11	159	50.61	15.00	110	1.7500	169	1826	110+	b. 1885	Not Surveyed		Very dif. to count/not deep enough for exact age
X1	Black Oak	3/18/96	H8	91	28.97	11.00	104	1.3750	129	1866			1855-1895	SO-BO	Ring count at cut end 24 feet from ground 22" dia.
X2	Black Gum	3/18/96	H8	54	17.19	8.6	111		111	1884			1855-1895	SO-BO	Ring count at cut end 3.5 ft. from ground

- Forest Age Documentation and Other Forest Management Issues at Hopewell Furnace NHS by A. William Graham, Jr. -

Table #2

Tree Inventory and Red Maple Age Distribution on a 1/5 Acre Sample Plot

Item No.	CBH Inches	DBH Inches	Cal. Age (Yrs.)	Year Tree Began
8	15	4.8	35	1960
7	15	4.8	35	1960
4	15	4.8	35	1960
3	20	6.4	47	1948
6	29	9.2	67	1928
12	32	10.2	74	1921
11	35	11.1	81	1914
5	35	11.1	81	1914
15	36	11.5	84	1911
14	50	15.9	116	1879
1	50	15.9	116	1879
13	52	16.6	121	1874
9	53	16.9	123	1872
10	54	17.2	126	1869
2	61	19.4	142	1853
	Averages	11.7	86	1909
<b>Other Species Represented in Plot with their Frequencies</b>				
Ostrya virginiana	11		<b>Note: In addition to Red Maple, two Liriodendron were the dominant crown trees in the plot</b>	
Comus florida	2			
Lindera benzoin	10			
Liriodendron tulipifera	4			
Nyssa sylvatica	3			
Viburnum prunifolium	6			
Carya tomentosa	2			

Table #3

Red Maple Growth Rate

"10 Yr. Increment	mm/10 yr.	mm/yr.						
1985-1995	30	3						
1975-1985	26	2.6						
1965-1975	26	2.6						
1955-1965	25	2.5						
*1929-1955*	8.75	0.337						
1919-1929	16.5	1.65						
1909-1919	17.5	1.75						
1899-1909	20	2						

Millimeters per "10" years

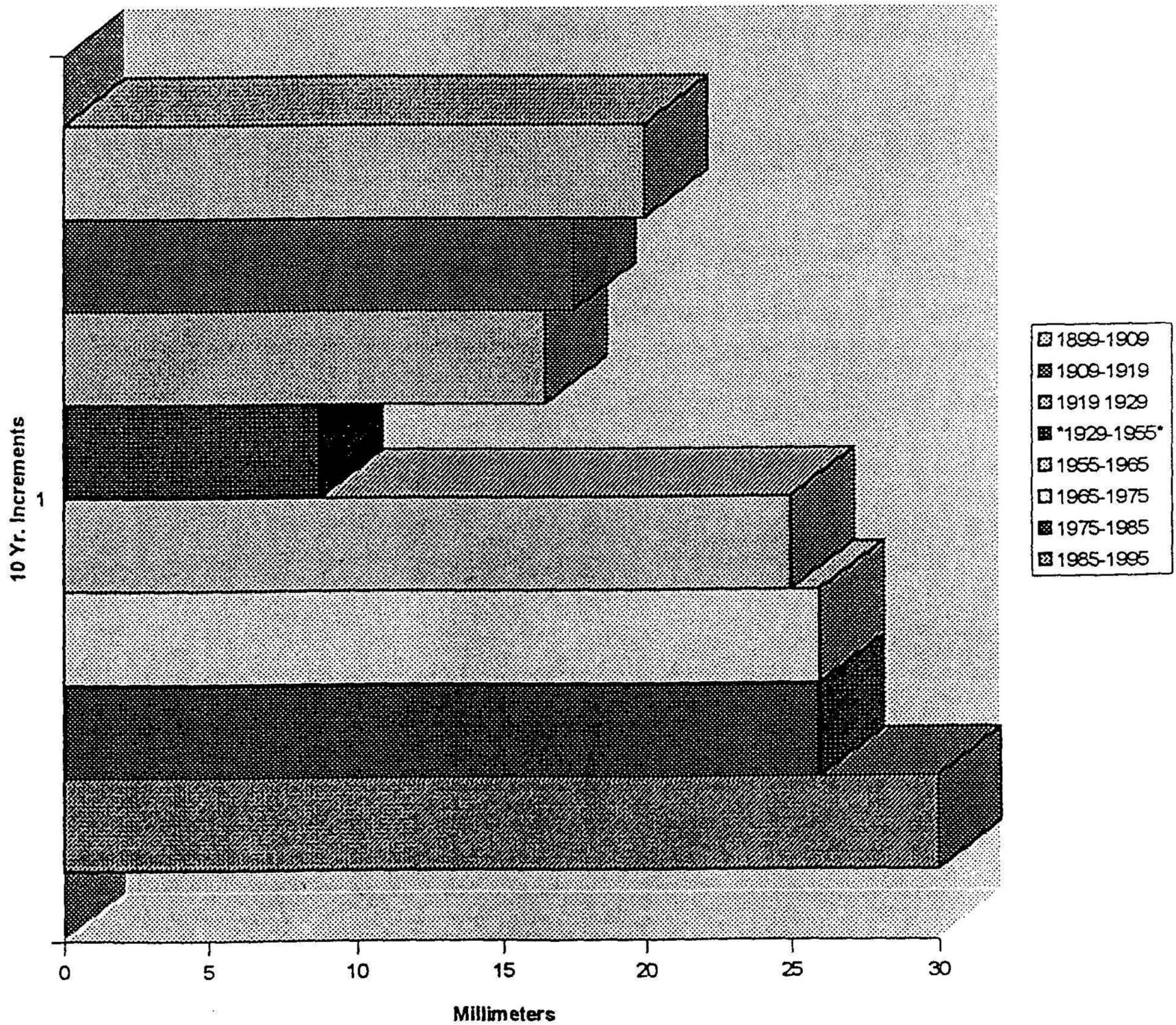


Table #4

## Exotic Invasive Plants of Hopewell Furnace NHS

Cross Reference from:					
<i>Selected Non-Native Species Which Have Had and Impact on Native Flora or Fauna in Pennsylvania</i>					
Compiled by Botany Department of the Morris Arboretum of the U. of PA,					
Dr. Ann Rhoads, Director					
and					
<i>The Vegetation Study: Hopewell Furnace National Historic Site</i>					
by Emily W.B. Russell and Center for Coastal and Environmental Studies, March, 1987.					
					Shade
Scientific Name:	Common Name:	Vegetation Type:	Russell List	Rhoads List	Tolerant
<i>Ailanthus altissima</i>	Tree-of-Heaven	Tree	X	X	N
<i>Alliaria officinalis</i>	Garlic Mustard	Herbaceous Biennial	X	X	Y
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	Herbaceous Perennial	X	X	N
<i>Berberis thunbergii</i>	Japanese barberry	Shrub	X	X	Y
<i>Broussonetia papyrifera</i>	Paper Mulberry	Deciduous Tree	X		?
<i>Campsis radicans</i>	Trumpet Vine	Vine	X		?
<i>Celastrus orbiculatus</i>	Oriental Bittersweet	Vine	X	X	Y-
<i>Chrysanthemum leucanthemum</i>	Oxeye Daisy	Herbaceous Perennial	X	X	N
<i>Dactylis glomerata</i>	Orchard Grass	Herbaceous Perennial	X	X	N
<i>Daucus carota</i>	Queens Anne's Lace	Herbaceous Biennial	X	X	N
<i>Eleagnus umbellata</i>	Autumn Olive	Deciduous Shrub	X	X	N
<i>Festuca elatior</i>	Tall Fescue	Herbaceous Perennial	X	X	?
<i>Glechoma hederacea</i>	Ground Ivy	Herbaceous Perennial	X	X	Y
<i>Hypericum perforatum</i>	Common St. Johnswort	Herbaceous Perennial	X		?
<i>Ligustrum obtusifolium</i>	Common Privet	Shrub	X	X	?
<i>Linaria vulgaris</i>	Butter-and-Eggs	Herbaceous Perennial	X	X	N
<i>Lonicera japonica</i>	Japanese Honeysuckle	Vine	X	X	Y-
<i>Lonicera morrowii</i>	Morrow's Honeysuckle	Shrub	X	X	Y-
<i>Microstegium viminium</i>	Stilt Grass	Herbaceous Annual	X	X	Y
<i>Morus alba</i>	White Mulberry	Deciduous Tree	X	X	N
<i>Potamogeton crispus</i>	Curly Pondweed	Herbaceous Perennial	X	X	?
<i>Prunus avium</i>	Sweet Cherry	Tree	X	X	N+
<i>Pyrus malus</i>	Apple	Tree	X		N
<i>Robinia pseudoacacia</i>	Black Locust	Tree	X		?
<i>Rosa multiflora</i>	Multiflora Rose	Shrub	X	X	Y-
<i>Rubus phoenicolasius</i>	Wineberry	Shrub	X	X	Y
<i>Symphoricarpos orbiculatus</i>	Indiancurrant Coralberry	Shrub	X		?

**Key to GPS (Geographical Positioning System) Locations  
for  
Increment Core Samples  
at  
Hopewell Furnace NHS**

<b>I.D. Number</b>	<b>Tree Species</b>	<b>Collection Date</b>	<b>Latitude</b>	<b>Longitude</b>
7 and 8	White Oak	11/3/95	40°12' 01.9" N	75° 46' 11.9" W
9	White Oak	11/3/95	40°12' 01.8" N	75° 46' 12.3" W
10	White Oak	11/3/95	40° 12' 06.4" N	75° 46' 13.0" W
11	Black Oak	11/3/95	40° 12' 25.5" N	75° 45' 41.7" W
12	Tulip Tree	11/3/95	40° 12' 38.9" N	75° 45' 49.5" W

\* All GPS readings taken by William Menke

\*\* GPS readings were taken for just these five increment core sample sites. I.D. No. corresponds to *Table #1*

Table #6

Tree Ages Adjacent to 38 Charcoal Hearths at Hopewell Furnace NHS

Adapted from Mikan and Abrams study of Charcoal Hearths February 1994 by A. William Graham, Morris Arboretum of the U. of PA						
	Oldest	Year			Oldest	Year
	Nearby	Growth			Nearby	Growth
Site	Tree	Began		Site	Tree	Began
F-41	112	1882		A-14	91	1903
F-42	113	1881		A-16	127	1867
F-43	113	1881		A-17	86	1908
F-44	113	1881		A-18	133	1861
F-45	111	1883		A-19	88	1906
F-52	110	1884		A-20	121	1873
F-51	114	1880		A-23	115	1879
F-56	115	1879		A-24	87	1907
<b>Ave. Age:</b>	<b>113</b>	<b>1881</b>		A-26	122	1872
				A-27	117	1877
G-60	126	1868		A-30	76	1918
G-67	136	1858		A-34	98	1896
G-78	131	1863		A-35	116	1878
G-91	131	1863		A-37	119	1875
G-96	123	1871		A-38	87	1907
G-98	130	1864		<b>Ave. Age:</b>	<b>106</b>	<b>1888</b>
G-99	140	1854				
G-124	130	1864		B-1	134	1860
G-129	111	1883		B-2	119	1875
G-132	116	1878		B-3	133	1861
<b>Ave. Age:</b>	<b>127</b>	<b>1867</b>		B-4	131	1863
				B-7	133	1861
				<b>Ave. Age:</b>	<b>130</b>	<b>1864</b>
<b>No. of Charcoal Sites =</b>			<b>38</b>			
A	15					
B	5					
F	8					
G	10					

*Forest Age Documentation and Other Forest Management Issues at Hopewell Furnace NHS*  
 by A. William Graham, Jr., Consulting Arborist for the Morris Arboretum of the U. of PA

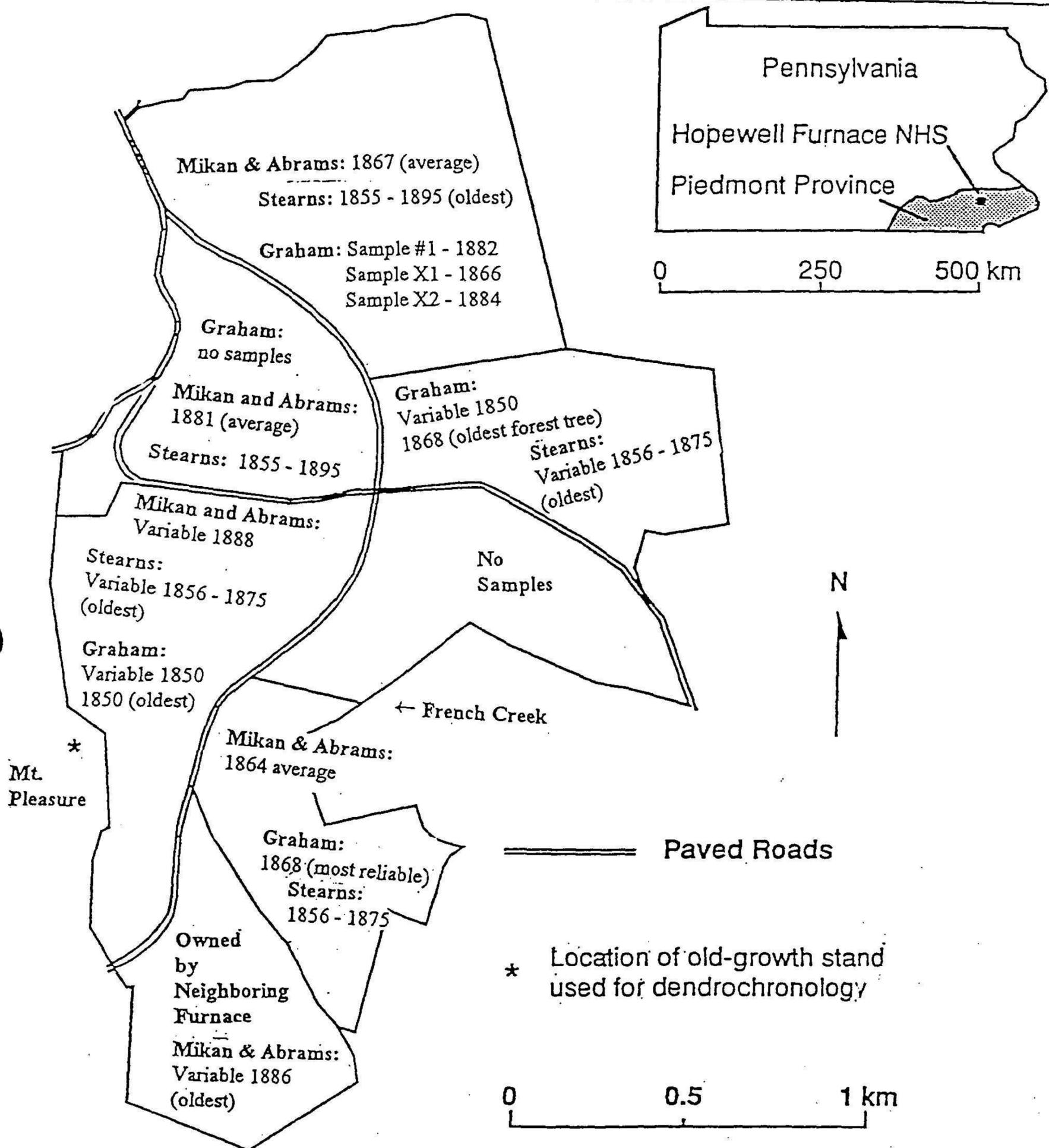


Figure #1. Map Comparing Forest Age by Different Site Investigators at Hopewell Furnace NHS



**APPENDIX F**



## HOPEWELL FARMING DATA

### Introduction

Much information regarding Hopewell's farming activity can be culled from Joseph Walker's *Hopewell Village* and Stuart Wells' "Historic Scene Report." Hopewell's farming character can also be inferred from texts on historic farming within the region and from maps, photographs, and other graphics representative of Hopewell and the region. The following information was compiled from these as well as other sources including personal interviews. Sources of information are cited parenthetically within the text and a list of references cited is located at the end of the text.

Fields were known to have been fenced with several types of fencing (including worm and five rail). These fields were predominantly filled with grain producing crops (barley, buckwheat, corn, oats, rye, and wheat) whose byproducts included hay (immature plants) and straw. {rather than the single purpose grasslike fields of today although Stuart Wells finds mention of Timothy used for hay, and Walker mentions clover being cut for hay in the orchard}. (Wells, 36). These products were used to the full extent possible, so that harvested rye (for example) provided grain for feed, stems for straw, as well as being refined into whiskey and sold at the store. Wood was cut not only from Hopewell forest lands, but from neighboring forested parcels as well. This appendix contains both general information on farming and crops as well as information that is specific to Hopewell Furnace.

### FARMING DATA

In **1798**, share-cropping occurred between Hopewell Furnace and Samuel Cox. Cox was required to clear a field, fence, plow and sow it at his expense. Two-thirds of the corn above the Furnace, and half below to go to Hopewell Furnace, and he could split the buckwheat or any other kind of summer grain (wheat, oats, rye?) equally with Hopewell Furnace. Winter grain was to be sowed by him. Cox could keep two-thirds of the shock (straw) a by-product of these winter and summer grains. (Walker, 122) He was permitted to mow the meadow to the "haves" {could mean that half the grain was processed into grain and straw and brought into the barn for winter feeding, while the rest was kept standing in the fields for livestock grazing as weather permitted}.

Ca. **1800**, usual grain crops wheat, corn, oats, buckwheat and rye (Walker, 124).

In **1803**, John Booker to Mattias Brooke, mentions that grain is threshed (separation of grain from straw portions of field crop). (Walker, 123).

In **1804**, Elishu Bard, performed numerous farming functions, including planting flax (May), (later (August) planted the same field with turnips for winter crop), fertilized the garden (May with dung presumed from barn){this garden presumably was a vegetable garden, although it could have included more formal beds as Bard was paid to do so by Hopewell owners}. Bard also cleared brush from the orchard, plowed potatoes in the garden (June), cut clover in the orchard, hauled his wheat to the barn (mid July), sowed buckwheat (late July), cross plowed the barn lot (a vegetable garden near the barn to convert from summer flax to winter turnips), sowed the barn lot and meadow ground with turnips (early August), hauled brush and wood from young orchard to Ironmaster's House, sowed oats (mid August), sowed clover in the young orchard (late August), delivered flour from Stichters to the Ironmaster's House (mid Sept.), repaired cider press, threshed grain (September), hauled corn from Bishops Mill (where processed) to Ironmaster's House (i.e. communal kitchen), hauled rails for fencing turnip ground (near barn),

laid worm for fence , hauled stone trunnels, killed red and black beef cattle, presumed threshing at Bishop's Mill, (paid in stoves?), hauled stoves to Reading and hauled flour and feed back (is this a barter payment for grain, or is it merely good use of wagon?), cleaned ditch (headrace?), hauled firewood to big house, killed hogs, hauled a load of feed and pork from Reading (buying off-site grain and meat?). (Walker, 123)

**1808**, important by-product of grain was straw. This was sold by the bundle at \$5. per 100 bundles (i.e. not grown as grass in fields). (Walker, 124)

In **1814**, Buckley & Brooke agreed to pay Matthew Foy \$65./year and provide him with a house. Foy agreed in return to do the farming and other work as required of him (Walker, 121-2). Analysis: Foy was providing farm produce to Hopewell Furnace for sale in the store and/or distribution among the employees. Other work may have included helping with Furnace operations when in full production, or it may have been helping work with fences, streams, races etc.

Outlying farms included the William Thomas farm, later rented by James Reperts, in East Nantmeal Township. (Walker, 121-2)

In **1829**, contract between Isaac Hayer and Hopewell Furnace, for 30 acres of summer and winter grain. The grain was taken to Birdsboro (for milling) with half the product returning to Brooke. Hayer was also required to repair fences and rails at his expense. The contract allowed Hayer to have a half-acre of potatoes, and a half-acre flax,. Brooke paid for lime and Hayer could find all the clover seed that was wanted. (Walker, 122)

In **1840** Union Twp., Berks County contained 303 horses, 976 cattle, 569 sheep and 688 swine. In percent of total livestock (2,536), these figures are: 12% horses, 39% cattle, 22% sheep and 27% swine. For field crops, there were (in bushels) 6,386 of wheat, 11,013 of rye, 14,839 of corn, 18,062 of oats and 598 of buckwheat. In terms of percent of the total of 30,898 bushels, this means that 13% wheat, 22% rye, 29% corn, 35% oats and 1% buckwheat was harvested. With some finessing, these percents could be applied to the ratio of livestock and field crops at Hopewell Furnace NHS. In addition, there were 8,375 bushels of potatoes and 1,719 tons of hay. The population of Union Twp. in 1840 was 1,298 (Rupp, 251).

In **1850**, there was a common pasture, open to outsiders {and presumably also used by villagers} (Timothy Parker paid \$1.50 for pasturing his herd for one night). (Walker, 130).

Ca. **1833** extrapolations of field products required per ton of furnace product delivered (includes area furnaces, not specifically Hopewell) (Walker, 120) from 1833. Report submitted to US House of Representatives on the cost of producing cast and bar iron. Note: although Walker does not take this further than to list as an interesting statistic, the below attempts to apply these formula to the Hopewell site at height of production (figuring 700 tons of iron):

14,000 bushels	Wheat and rye (average yield per acre = 35 bushels/acre± {oats}) (average yield per acre = 30 bushels/acre± {wheat}) {This would imply <u>467 acres of fields</u> at Hopewell devoted to wheat <u>or 400 acres of rye</u> }
39,900 lbs.	Pork (average weight ea. hog 250 lbs.) {This would imply <u>160 hogs</u> at Hopewell}
30,000 lbs.	Beef (average weight for cattle 1,200 lbs.) {This would imply <u>25 head of cattle</u> at Hopewell}
7,000 lbs.	Butter
1,400 bushels	Potatoes (200 bushels per acre in mid 20th century)

350 tons {This would imply 7 acres of fields of potatoes at Hopewell}  
Hay (grown in grazed or ungrazed fields).  
\$700. {weight would seem to vary considerably with amount of dryness!}  
Fruits & Vegetables  
\$1,000. {see discussion of orchards, below}.  
Depreciation of value of horses (horse at Hopewell typically  
purchased for \$100., unless for stud or special purpose).

plus trading of goods for services

{notable absence of mention of corn, sheep and chickens, typical on farms at this time; however, this does not mean that they weren't there!}

### SITE ELEMENTS

Bull ring where steers were butchered was near the Furnace. Twenty steers typically butchered in autumn (Houck recollections; Walker, 130).

Privies in historic core are seen in Bull and Stokes photographs (Wells, 33). {thought to be almost always in rear yards, this area subsequently regraded in historic core}. Woodlot house ruin has open hole in rear – may be privy pit.

Grape arbor behind Tenant House No. 2; Stuart Wells thinks this was located to screen the outhouse (Wells, 33).

### **FENCES**

Pigs kept out due to rooting instinct; cows also caused major damage to fields from grazing and hoof/trail damage. Typical 18th & 19th century, animals roamed free, fields were fenced, although cows were held liable for damage (to outlying fields?), see below. Germans-Americans were more likely to have housed animals in winter than other American farmers.

**1798:** Fence required to enclose new field (Walker, 122).

In **1800**, a farmer paid to use the meadow (presumed to be for grazing livestock he owned). (Walker, 122). This would imply that the meadow was fenced.

In **1804**, Elishu Bard, performed numerous farming functions, including fencing turnip ground near barn, placing worm fence with stone trunnels (Walker, 123).

**1805-1853** Rails and fence posts cut (Walker, 132).

**1826** Corn damaged by cattle, corn farmer reimbursed by cattle owner (apparent need to keep animals in enclosures!). (Walker, 132).

Farm reminiscences by Harker Long; quarter-acre area west of barnyard with whitewashed picket fence, half-acre plot by brick kiln (also fenced?).

In 1829, contract between Isaac Hayer and Hopewell Furnace included repair of fences and rails at his expense (Walker, 122).

Post and rail ca. 1830's (3-, 4- and 5-rail fences bought by Hopewell Furnace); picket fence mostly after 1850 (Wells, 24). Fencing made from chestnut and cedar wood as well as what was readily available (Wells, 25).

Stuart Wells in his Historic Scene Report thinks the Furnace exhibited a greater diversity in fencing than presently exists. He suggests three rail fencing near the tenant houses (ref. ca. 1835 sketch). (Wells, 25). He also mentions 4- and 5-rail fences typical for enclosing stock as well as other animals in fields (horses and mules in with pigs, hogs and sheep). Nevertheless, he is OK with picket fence around duplex tenant house (Wells, 26). Large number of palings prepared in 1817 and 1827 for Brooke family {may have been those seen later in 1890's photographs as lining the east head Race}. (Wells, 27 fn. 61). Picket fences used for smaller animals (chickens and other fowl as well as rabbits and pigs {known to have run of historic core}). (Wells, 28). Stake and rider fencing noted by Stuart Wells as being used in outlying non-permanent locations, such as regenerating woodlots (Wells, 31). This was done to protect regenerating chestnut and other sprouting stumps from browsing by cattle, deer and other animals.

## TOOLS / MACHINES

Various tools and machines that might be required on a large working farm included many of those cited below by Walker.

**1819:** horse drawn rake (Walker, 124).

**1820:** hoe, rake, ax, scythe, sickle, flail, plow (Walker, 124).

**1827:** Winnowing Mill, improved plow and revolving rake (Walker, 125).

**1849:** Threshing machine (Walker, 125).

**1860:** drills, planters, reapers, mowers, horse rakes, threshers, feed grinders, plows (Walker, 124).

**1876:** mowing machine, grain drill, roller, single and double Hoca plows, spike and hoe harrows, fodder cutter, portable engine (Walker, 125).

## FIELD CROPS

### BARLEY

*Hordeum vulgare*. An annual grass-like cereal growing to 3 1/2 feet and believed to have originated from western Asia or northern Africa. Winter barley is sown in the autumn, versus spring barley, which is sown in spring or summer. Difference exist among rows of kernels (2, 4 and 6 rows), and three types of hulls (none, tightly or loosely attached). Used in beer and whiskey, milled for flour/bread making, or used for livestock feeding (animals can be

## BUCKWHEAT

turned loose in barley fields to graze). Food value is similar to wheat. 1-2 bushels used for seed, yielding 35-40 bushels per acre.

*Fagopyrum saggitatum* (or *F. esculentum*.) and *F. tataricum*. Three-foot tall cereal-like plant, Asian in origin. Buckwheat flowers are described as either gray and black (WB), while others (Bianchini) note them as pink and white, borne on the tops of the plants, giving the appearance of a garden in flower. Leaves are heart-shaped, and the flowers contain rich nectar, much visited by bees, making a dark pleasant tasting honey. Each flower produces one seed, which is ground into flour for pancakes and livestock feed. Has plentiful supply of starch, but less protein than wheat and other grains. Can grow in areas too wet or poor for other grains, was planted much more in the 1800's than today, and has few diseases and pests. Due to quick maturation (60-80 days), could have been used in case of crop failure {wheat, rye etc.} (Whealy, 406), turned over into soil (green manure), also flowers used for a brown dye.

In 1798, Samuel Cox plants buckwheat as part of his share-cropping agreement with Hopewell Furnace.

In 1840 Union Twp., Berks County recorded 598 bushels of buckwheat harvested, comprising about 1% of the corn and grain crops (Rupp, 251).

## CLOVER

*Trifolium spp.* 6 inch to 2-foot tall legumes sometimes grown as food for livestock. 300 types known. **Red clover** *T. pratense* (under 1-foot high short lived perennial) grown for hay, pasture for farm animals, for soil enrichment (nitrogen fixing); bumblebees required to produce seed. **White clover** *T. repens* (low growing and quickly spreading perennial) grown for pasture crops, nectar used by bees for honey, usually grown with other grasses and clovers. **Alsike clover** {Swedish Clover} *T. hybridum* (1-3 foot tall perennial) flowers white to pink on rounded heads. **Crimson clover** *T. incarnatum* (annual) livestock feed, flowers typically red, also can be white or yellow.

In 1804, Elishu Bard, performs numerous farming functions, including cutting clover underplanted in "young orchard" area (Walker, 123).

In 1829, contract between Isaac Hayer and Hopewell Furnace, plants clover seed (Walker, 122).

Stuart Wells writes that clover was part of the crop rotation system at Hopewell {winter crop cover after harvest of corn or grains}. (Wells, 38-9).

## CORN

**Maize, Corn** (*Zea mays*.) a native plant, introduced from Americas to Europe in Colonial period, now perhaps the most important food source world wide. Male flowers in a tassel at the top, female flowers in spikes known as "ears;" 2-4 at the axis of the leaves, about halfway up the stalk. Ears are enclosed by thick bracts

forming the husks (once used to make cheap mattresses). Kernels arranged in rows on the ears of a cob. Other types include **flint corn** (*Zea indurata*), field corn for fodder and silage; **sweet corn**, more modern, (*Zea saccharata*) cooked as a vegetable, and popcorn (*Zea eborata*). Typical yield is 20-29 bushels per acre (ca. 1930). In 1950, yield of 50 bushels per acre due to hybridization and better land management (crop rotation, fertilizers etc.) 100 bushels per acre now not unusual due to increased hybridization, fertilization and closer planting (Dick Lahey).

Balance of trade; equal when \$100. hogs = 11.4 bushels of corn. If one or the other is higher, the other is affected (i.e. if corn is more expensive, it is sold rather than fed to hogs and vice versa).

Polenta is a coarse meal left after the oil is squeezed out of the kernels, used mainly by the poor; it is easily digested and high in calories. Corn is rich in Vitamin A, thiamin (vitamin B<sub>1</sub>) and riboflavin, (although lacking in nicotinic acid (vitamin PP- pellagra preventing).

Sweet corn varieties are Sugar and Gold, Buttercorn, Butter and Sugar, Gold Mine, Sunchief, Golden Cross Bantam, White Jewel, and Silver Queen. Flint or field corn vary from state to state, including Pioneer 306, Cornell M4, DeKalb 29, Funk's G6 and Seneca XX155.

In **1798** Samuel Cox planted corn as part of his share-cropping agreement, split product with Hopewell Furnace (Walker, 122).

Ca. **1800** usual grain crops included corn (Walker, 124).

In **1804** Elishu Bard, performed numerous farming functions including hauling corn and bringing back processed flour from local mills (Walker, 123).

In **1840** Union Twp., Berks County recorded 14,839 bushels of corn harvested, comprising about 29% of the corn and grain crops (Rupp, 251).

## DISEASES

Known historical problems encountered during the nineteenth century within the Hopewell Furnace area included locusts, grasshoppers, cutworms (corn), Hessian fly (wheat), smut (various), mildew (wheat and rye) and {Irish potato} rot (potatoes). Note the predominance of dampness type diseases, presumably due to proximity of French Creek and poor drainage in some fields.

## FERTILIZER

Fertilizers mentioned as being spread on Hopewell Furnace lands included limestone / ground plaster and dung (manure) from on-site sources (Walker).

**1795:** James Wilson demands 1,000 bushels of lime be put on arable Furnace lands. (Walker, 125)

## FLAX/TURNIP FIELD

See Stuart Wells discussion on page 39 and within fn. 87.

Flax mentioned by both Walker and Wells as large plot crop (half acre or more) in village core. Walker notes that after flax crop was harvested, turnips were planted {in same field}. (Wells, 30; Walker, 123). Flax (*Linum usitatissimum*) has been growing since 1600's, used for linen cloth. Cotton became more prevalent following the invention of the cotton mill due to reduced prices. 1 lb. of seed plants and area 15 feet by 15 feet (Landis, 15).

## HAY

Horse and cattle feed made from dried stems and leaves of plants, especially **timothy, bluegrass, redtop, and wild prairie grasses**. **Alfalfa, clover, velvet beans, rye, barley and oats** are also used for hay and straw. After cutting, the plants are spread to dry on the ground. Sometimes mounded into haystacks to avoid dampening by dew or rain, then re-spread. Hay sometimes stacked outdoors in ricks or round stacks, often covered with loose hay or straw. Indoors, it is put into barns or mows. Hay generates heat while drying, can become scorched and useless or even cause fire. Fresh hay should not be fed to cattle. Hay makes excellent winter feed for livestock, but must be mixed with grains. Dick Lahey, current farmer at Hopewell, states that fresh hay is fed by local farmers. Use of grains dependent on ultimate energy need of animals (i.e. work, breeding). Currently, the system is to cut, rake into windrows, turn, mound, gather.

In **1803** John Booker to Mattias Brooke – mentions that grain is threshed (separation of grain from straw portions of field crop, presumed oats, rye or wheat). (Walker, 123).

In **1804** Elishu Bard performs numerous farming functions including producing straw from grain plants after threshing.

In **1840** Union Twp., Berks County recorded 1,719 tons of hay harvested (Rupp, 251).

## OATS

*Avena sativa*. 2 to 4 feet tall, annual grass, graceful waving grain with spikelets with seeds, especially handsome. Prefers loam & clay soils; dislikes rich soils. Used as animal (esp. horse) feed, although not for pigs; cut as hay or grits. Oat flour used in bread, biscuits, and cookies. Cultivars include Alamo, Barnett, Clinton, Cherokee, Fulghum, & Mankton. Fields plowed in autumn, harrowed in early spring, seed 2-3 bushels per acre immediately after harrowing, harvest in July; ave. yield (20th century) 35 bushels per acre (USA). Bushel of oats = 32 lbs. Not usually fertilized, as the grain bends down when it grows too thick and destroys the crop.

In **1798** Samuel Cox planted summer and winter grains presumed to include oats as part of his share-cropping agreement, split product with Hopewell Furnace (Walker, 122).

Ca. **1800** usual grain crops included oats (Walker, 124).

In 1804 Elishu Bard hauled oats for Hopewell Furnace (Walker, 122).

In 1829 a contract between Isaac Hayer and Hopewell Furnace noted thirty acres of summer and winter grain, taken to Birdsboro (for milling), product to Brooke, could have included oats (Walker, 122).

In 1840 Union Twp., Berks County recorded 18,062 bushels of oats harvested. This comprised about 35% of the corn and grain crops (Rupp, 251).

## ORCHARDS / FRUIT

*Malus (Malus spp.)* varieties are found in Hopewell's orchards. Cultivated since the stone age; imported into North America in the early 17th century. There are thousands of varieties maturing in summer, autumn, and winter; some best eaten fresh and some better for cooking. Used in jelly, preserves, apple butter, compotes, juice (fresh and cider), distilled into apple jack, baked in pies, strudels, flambeed, fritters, stewed etc. Medicinal use as disinfectant, syrup for chest colds and whooping cough, thought to reduce fevers. Filled with carbohydrates, vitamins, salts, and water. Vitamins include C and several of B series. Highly digestible, helps normal digestion after meals.

Four classifications: cooking, eating, cider and drying.

Summer apples: Red Astrachan, Summer Rambour, Yellow Transparent and Duchess.

Fall apples: English Cellini, Autumnal Gray Rennet.

Winter Apples: America, Yellow Beauty.

Winter storage: Stayman, Rome Beauty, Baldwin, Wealthy.

Eating raw or cooking: Red, Golden and reg. Delicious, Starking, Richard, Starkcrimson, Cortland, York Imperial, Jonathan, McIntosh, Granny Smith, Golden Delicious, Grimes Golden, Yellow Newtown.

Hopewell Village fruit was a product of local orchards. Company store had a market for the following; apples, plums & prunes, quinces, peaches, cherries, cider, vinegar, dried apples and peaches (Walker, 133).

Apple jack (apple {as well as rye} whiskey) likely produced at Hopewell from its orchard products as one customer requested that his payment be made that way (Walker, 133).

In 1804 Elishu Bard works with orchard elements including harvesting clover among trees, clearing brush, and fixing cider press (Walker, 123-4).

1835 Peach orchard at Hopewell (Walker, 133).

Walker believes that old apple trees are replaced by new rather than opening up new ground (Walker, 133). Apple orchard mentioned 1787-88 (250 trees in young orchard). New apple trees bought in 1829 (160); 1834 (304); 1844 new orchard mentioned. Work in orchard mentioned in 1804 (trimming by Elishu Bard); also 1807 and 1827. (Walker, 133).

An apple expert believed Baldwin, Northern Spy and Rhode Island Greening are three types of apples thought to have been grown at Hopewell Furnace. Baldwin & Northern Spy seen in Hopewell orchard by Cyrus Fox in 1916. Rusty Coat, Rambo, Pippin and Grindstone varieties known to have been grown nearby (Walker, 133).

## POTATOES

*Solanum tuberosum*. Annual vegetable originating from South America, introduced into Europe by Spanish explorers in the 1500's, believed to have been introduced into North America in 1621. Irish brought potatoes to New Hampshire in 1719. It is a member of the nightshade family and related to tomatoes, red peppers, tobacco and eggplant. White Potatoes are the world's most widely grown and valued vegetable. Typically one and one-half to five feet tall, with a one and one-half to two-foot spread, the above ground part has spreading stalks and coarse dark green foliage like tomato plants. Flowers are small and white, yellow or purple. The edible portions grow below ground from tubers off the main stem, and range in size from the size of a pea to six inches in length. Ten to twenty potatoes may develop per plant, although a plant (1950) typically produces two to three marketable potatoes. Typically, (1950) 200-250 bushels are produced per acre. Individual plots can be harvested as needed, leaving the rest of the potato crop in the ground until needed.

Potatoes are typically grown from bud parts of the tubers, but can also be grown from seed. It is a cool weather crop requiring 90-120 days to mature: In Pennsylvania it is typically planted in May and June and harvested in July, August and October. Buds planted two to five inches deep, six to sixteen inches apart in rows thirty to thirty-six inches apart. Seven to fifty bushels of seed potatoes can be planted per acre. Potatoes are grown best in loamy well-aerated soil supplied with plenty of water. Stable manure, used as a fertilizer may increase disease potential (foliage attacked by Colorado potato beetle, leafhopper, flea beetle, aphid, & potato psyllid). Tubers are attacked by white grub, wireworm, potato tubeworm and scab gnat). The plant is also subject to fungus, bacterial and viral diseases.

Potatoes are easily digested and often served with meats and other vegetables in a wide variety of preparations. They are also used in the manufacture of alcohol, flour and starch, as well as animal feed (more common in Europe). Potatoes contain 70% calories, and are

filled with carbohydrates, niacin (nicotinic acid), iron, vitamins B<sub>1</sub>, B<sub>2</sub> and C.

Well known varieties include Bea, Burbank, Caludia, Cobbler, Green Mountain, Naples round, Triumph, Katahdin, Kennebec, and Russett White Rose.

In **1829** a contract between Isaac Hayer and Hopewell Furnace noted the planting of a half acre of potatoes (Walker, 122).

In **1840** Union Twp., Berks County recorded the harvesting of 8,375 bushels of potatoes (Rupp, 251).

## RYE

*Secale cereale*, a native of central Asia. Rye is a large herbaceous plant that grows to three feet tall or more. Rye flower is often mixed with wheat for flavor and nutrition (10-15% proteins, 1-2% lipids and 70% carbohydrates). Sometimes it is used as green manure and/or a cover crop. According to Landis, "The PA Germans traditionally grew a long stemmed rye to use in roof thatching and in rye-straw basket making," (Landis, 15-16). In the United States rye and corn are utilized to distill whiskey.

In **1798** Samuel Cox planted summer and winter grains presumed to include rye as part of his share-cropping agreement. He split the product with Hopewell Furnace (Walker, 122).

Ca. **1800** usual grain crops included rye (Walker, 124).

In **1829** a contract between Isaac Hayer and Hopewell Furnace noted thirty acres of summer and winter grain [presumed rye or wheat], taken to Birdsboro (for milling) with the product returned to Brooke (Walker, 122).

In **1840** Union Twp., Berks County recorded the harvesting of 11,013 bushels of rye, comprising about 22% of the corn and grain crops (Rupp, 251).

## SORGHUM

*Sorghum vulgare*. Sorghum or Millet is often used for fodder and cut when still green. Grains of mature plants are sometimes used for livestock feeding and syrup. The variety (*Sorghum vulgare technicum*) is used in the manufacture of brooms (male panicles, freed of grains, are bound together around a pole).

No reference (to date) of use of sorghum at Hopewell Furnace.

## STRAW

Obtained from the dried stems of grains such as wheat, rye, oats & barley; and used as animal bedding and fertilizer. Straw is used in hat, basket, saddle, suitcase, paper and strawboard production. It is also used to produce carbon, phenol oil, pitch and tartaric acid.

Used and sold at Hopewell Furnace and presumed to be a by-product of above mentioned grains.

## WHEAT

*Triticum vulgare* is a source of cultivars for soft wheat (most used for breads). *Triticum durum* is basis for hard wheats (spaghetti, pasta) and is one of the most important of cereals. Typically two to five feet tall, it is a graceful waving cereal grass that is green in summer, golden in fall. Grains are white, red & yellow in head, with coarse hairs called a "beard." Its kernel has germ (seed), bran (covering/shell) and endosperm (most useful part, made into white flour etc.). Wheat contains a large amount of protein called gluten, and is extremely important for bread making.

European import, not known in Americas prior to Colonial period. Average amount of wheat eaten per person (1950) was 126 lbs. Winter wheat currently grown in PA and other portions of United States. Fall planting, goes dormant in winter, begins to grow again in the spring, July and August harvests are typical in PA. Types of wheat planted (1950's) include Pawnee, Thatcher, Marquis. Wichita, Comanche, Elgin, Thorne are common standard varieties in the United States. Red Fife common in Canada, while Yeoman, Holdfast and Redman are common in Britain.

Typical sequence for winter wheat: plowing in fall (rough soil prep), harrowing (breaking larger soil clumps into smaller pieces; fine prep); seeding (three-quarter to two bushels/acre); growth (some weeding, disease, and animal control as necessary); harvest (thirty bushels/acre average yield {range in 1950 ten to fifty bushels/acre}). Harvest is desirable as soon as heads are dry and hard, and can be lost if heads become moist, i.e. timing of harvest is critical). Wheat can be damaged by hard rains//hailstorms, and drought).

Typical sequence for spring or summer wheat: plowing in spring (rough soil prep), harrowing (breaking larger soil clumps into smaller pieces; fine prep); seeding (three-quarter to two bushels/acre). PA was king of spring wheat until trains made shipping western wheat to eastern markets more economical (Dick Lahey).

Wheat grain used three-quarters for (human) food; one quarter for farming (both seed and animal feed).

In 1850 it took sixty-four hours per acre from soil preparation to harvesting of wheat (World Book).

In 1798 Samuel Cox planted summer and winter grains presumed to include wheat as part of his share-cropping agreement and split the product with Hopewell Furnace (Walker, 122).

Ca. 1800 usual grain crops included wheat (Walker, 124).

In 1829 a contract between Isaac Hayer and Hopewell Furnace noted thirty acres of summer and winter grain [presumed rye or wheat] was taken to Birdsboro (for milling) with the product returned to Brooke (Walker, 122).

## VEGETABLES

In 1840 Union Twp., Berks County recorded the harvesting of 6,386 bushels of wheat – this comprised about 13% of the township's corn and grain crops (Rupp, 251).

Numerous vegetables as described below.

Existing farm reminiscences by Harker Long; a quarter acre area located west of the barnyard (with whitewashed picket fence), half acre plot by the brick kiln (also fenced?). Also reference to “back field” with vegetables. (Walker, 133).

Vegetables grown at Hopewell (according to Walker) included onions, beets, radishes, lettuce, cauliflower, tomatoes, salsify, peas, cucumbers, squash, and eggplant (Walker, 133). {note turnips and potatoes not on this list, although mentioned frequently in Walker, possibly indicating a distinction between field and vegetable crops}.

Vegetables grown at Hopewell according to Stuart Wells included cabbages, potatoes, turnips, beets, and pickles (cucumbers). (Wells, 29). Stuart Wells lists typical vegetable seeds sold locally on p. 31 of his draft Historic Scene Report.

## VINEYARD

*Vitis spp.*. Grape varieties.

1832 included dressing the vineyard (twice) This included pruning vines for better grape production (Walker, 134+)

1857 included dressing the vineyard.

Grape arbor behind Tenant House # 2 – Stuart Wells thinks its location was to screen the outhouse (Wells, 33). Also found in the formal garden above the Ironmaster's House.

## TIMBER STANDS

### WOODS

Timber stands depleted at one thousand acres per year typical in New Jersey (Walker, 121).

Stands at Hopewell Furnace separated into areas by dominant type. These including mixed oak-black birch, chestnut oak-scarlet, oak-black cherry, white oak, tulip poplar-oak, tulip poplar-red maple, high density red maple, red maple-arrowwood, red maple-sycamore, red cedar, green ash-tulip poplar, American elm, and black walnut. (Russell). American chestnut was the most prevalent type around Hopewell Furnace in the 1800's.

One acre of southeastern PA land provided one cord of wood per year (Walker, 135).

Clement Brooke told Matthew Cary that six thousand cords of wood were burned at Hopewell Furnace; four thousand cords of woods were replenished at Hopewell Furnace {Walker implies that any deficit was acquired from adjacent wooded farm parcels;

however, it does not necessarily follow that all woods were cut at Hopewell Furnace at any given time}. (Walker, 135).

Woods regenerated from roots (sprouts) with careful management after cutting for timber/firewood/charcoaling operations (Walker, 135).

Cut over area fenced (presumably to keep animals out, such as deer, cows, horses and pigs (Walker, 135).

## FARM ANIMALS

### LIVESTOCK

Assume triple purpose cattle (first for milk/breeding, then for draught (especially oxen) and finally for meat. Bulls are five feet tall, and weigh two thousand lbs. Beef and dairy cows weigh 1,000 to 1700 lbs (WB).

**Beef Cattle:** 1,000-1,700 lbs. For fattening they typical eat 25 lbs. corn or sorghum silage, 4 lbs red clover hay, 14 lbs. corn or ground grain sorghum and 1 1/4 lbs linseed or cottonseed meal per day (1950's). Until 1840, no distinction was made between dairy and beef breeds.

**Dairy Cows:** 1,250 lbs. Typical they eat 30 lbs. silage, 10 lbs hay and 1 lb. grain (1950's) per day. Until 1840, no distinction was made between dairy and beef breeds.

**Horses:** Typically used for livery, field, and forest work. Horse were the most prevalent livestock at Hopewell Furnace because of their multiple use, and also because other animals (meat) could and was bought off-site (Lahey).

**Oxen:** Used for very heavy pulling (i.e. wagons with iron products) and didn't need roads.

**Mules:** Reliable small work animal for pulling loads

**Sheep:** Provided meat, skins, and wool

Average person ate 82 lbs. of beef, and drank 180 quarts of milk a year (1950's). (WB).

**1779:** Mark Bird had sixteen horses, twenty-one cows, forty-six sheep and other more common animals not listed on tax census. (Walker, 125).

In **1804** Elishu Bard mentions red and black beef. (Walker, 124).

Horses, mules, oxen, cows, and sheep known to have been at Hopewell Furnace (Walker, 125).

**1818:** Pair of oxen purchased (cattle for milk mentioned often, cows owned by workers. (Walker, 129).

**1820:** thirteen horses and 12 harnesses mentioned (Wells, 39).

**1828-30:** Eighty-four horses at Hopewell Furnace (Wells, 39).

**1832:** Hopewell Furnace reportedly had eighty-four horses (Walker, 125).

**1834:** Sheep at Hopewell Furnace provided food and sheepskins (Walker, 131).

**1837:** Twelve horses and six cows owned by Clement Brooke & Company (Wells, 40).

In **1840** Union Twp., Berks County recorded 303 horses (12%), 976 cattle (39%), 569 (22%) sheep, and 688 (27%) swine. Based on the township's population of 1,298 in 1840, this meant that on average there would have been one horse for each four people, three cows for each four people, and about 1 sheep and hog for every two people. This could be applied to Hopewell Furnace's population to estimate the total number of animals in the village.

**1844:** 234,710 pounds of wool recorded in Union Twp., Berks County .

**1841:** Fourteen horses and six cows listed for Hopewell Furnace (Wells, 40).

**1846:** Set of milk pans and bowls listed in the records (indicating dairy operation. Butter, cream and milk sold at store (Walker, 130).

**1850:** Draft animals at Hopewell Furnace included fifty oxen, horses and mules {Walker suggests (along with Harker Long) that the village barn could fit thirty-six. Others might have been housed in the barn located along the 1757 Road and shown on the ICNA insurance map (Walker, 126-7).

**Mid- to late-19th century.:** Bull ring (where steers were butchered) located near the Furnace. Twenty steer typically butchered in the autumn (Houck recollections). (Walker, 130).

Cows/cattle pastured along Birdsboro-Warwick Road by tenants as they had no access to the meadow (Wells, 24).

Stuart Wells suggests that oxen were used for pulling logs from otherwise inaccessible woodlands. Mine wagons were pulled by four horse teams. (Wells, 40).

Many workers owned milk cows, but not horses (Wells, 41).

## **HOGS**

Roasting pigs averaged 10-30 lbs.; meat and bacon types averaged 200-230 lbs. A hog can gain 1 1/2 lbs per day; 1/3 of meat in the United States. comes from hogs. Pigs are hogs that are less than ten weeks old. They are typically weaned at eight weeks. Hogs

mostly eat corn (1950's), sorghum, barley, wheat, rye and oats, as well as excess greens, from vegetables.

Hogs are typically marketed at five and one-half to seven months. They reach full size in one and one-half to two years. Typical products include pork cuts, smoked pork, lard and sausage. Prior to WW. I, hogs were divided into leaner and longer bacon types as well as rounder lard hogs. With the decreased use of lard, the latter all but disappeared (Lahey).

Because of their rooting instinct, some hogs are fitted with rings in their snouts to make such activity painful. Otherwise, hogs can damage gardens and pastures.

In 1804 Elishu Bard performed numerous farming functions that included killing hogs and hauling a load of pork from Reading (buying off-site meat?). (Walker, 123).

**Late 19th century.:** According to according to Harker Long, the pen east of the barn measured 40 feet square and held chickens and hogs (divided space). According to Walker, hogs were raised by both the Furnace and village families, "probably most of the tenant houses had pigpens on the premises" (little pigs, shoats and hogs). (Walker, 130).

Many workers owned hogs. At times the number allowed to run freely was limited to not more than two (Wells, 41-3).

**1800-1820:** Tax records note that the Hopewell Furnace owned five to ten hogs {this did not include hogs owned by tenants/workers, and/or possibly not those running free}. (Wells, 45).

In 1840 Union Twp. Berks County recorded 688 swine (27% of total livestock). On average this equaled one hog per each two people in the township (Rupp 251).

## OTHER

### Dogs

Not noted in many records, but known to have been common at Hopewell Furnace, as on most other farms.

**1850:** Dog breeding at Hopewell Furnace – puppy sold. (Walker, 131)

## POULTRY

Chickens, ducks, geese and turkeys. Chickens were raised in pens/cages at Hopewell Furnace; however, this may reflect more recent (more popular since 1930's) practices.

Typical American (1950) eats 24 pounds of chicken, 6 pounds of turkey, and 365 eggs per year. Hunting supplied quail, grouse, partridge and pheasant. Chickens can be eaten at 6-13 weeks (3-4 lbs.), turkeys at 4-7 months (14 lbs.), ducks 11 weeks (5-6 lbs.).

According to Harker Long a forty-foot square pen was located east of the barn, with chickens and hogs sharing the space in separate areas.

Most families kept fowl for eggs and meat. References from the 1850's mentioned chickens, turkeys, ducks and geese. It is thought that they had the run of the core village (they are mentioned as in the spring house, chick house, hog house, coal house, chicken house, calf stable). (Walker, 132).

According to Stuart Wells, poultry owned by workers was so common that little mention is made in furnace records (Wells, 43).

## **VETERINARIAN SERVICES**

Typical on country farm only as necessary from outside expert.

Swine castration, services for livery (unstated sickness) (Walker, 132).

## **References Cited**

- Bianchini, Francesco and Francesco Corbetta. *The Complete Book of Fruits and Vegetables* New York: Crown Publishers, Inc., 1973.
- Landis Valley Museum. *1991 Heirloom Seed Catalogue*. Lancaster, Penn.: Landis Valley Museum., 1991.
- Rupp, Daniel L. *History of the Counties of Berks and Lebanon*. Lancaster, Penn., G. Hills, 1844. Reprint. Spartanburg, S. C.: The Reprint Company, 1984.
- Russell, Emily W. B. "Vegetation Study, Hopewell Furnace National Historic Site," March 1987. Center For Coastal and Environmental Studies, Rutgers University, New Brunswick, New Jersey.
- Walker, Joseph E. *Hopewell Village: The Dynamics of a Nineteenth Century Iron-Making Community*. Philadelphia: University of Pennsylvania Press, 1966.
- Wells, Stuart W. "Hopewell Furnace Historic Scene Report," draft 1994. Typescript on file at Hopewell Furnace National Historic Site.
- Whealy, Kent. *An Inventory of Seed Catalogues Listing All Non-Hybrid Seeds Still Available in the United States and Canada*. Decorah, Iowa: Seed Saver Publications, 1988.
- The World Book Encyclopedia*. Chicago: Field Enterprises Educational Corporation, 1958.

**APPENDIX G**



**HISTORIC BASE MAPS**  
**1800, 1845, 1883, 1938, 1995**

**Key To Maps**

## 1800 Base Map - Overall Site

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- The inclusion of Tenant House and Boarding House outbuildings on this map are conjectural; however, these were common outbuildings and believed to have existed at the site.
- Vegetation layers included on this map are conjectural and based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs.
- Additional buildings may have existed on and off the site during this time period; however, current documentary evidence does not provide for their locations. Therefore, they are not included on this map.
- Use of fences and/or stone walls as boundary demarcations was common practice during this time period. Evidence exists for this practice at Hopewell Furnace; however, current documentary evidence does not provide for all locations or dates of erection of fences or walls, and therefore, are not included on this map.
- The 1804 and 1809 Roads are presumed to have existed prior to their formal designations and are included on this map.

### Building Number and Name:

- 71. Thomas Lloyd House
- 72A. Harrison Lloyd Barn
- 72B. Harrison Lloyd House
- 72C. Harrison Lloyd Blacksmith Shop
- 79. Bethesda Baptist Church
- 80. Bethesda Baptist Church Carriage Shed

## 1800 Base Map - Core Area

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- The inclusion of Tenant House and Boarding House outbuildings on this map are conjectural; however, these were common outbuildings and believed to have existed at the site.
- Vegetation layers included on this map are conjectural and based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs.
- Additional buildings may have existed on and off the site during this time period; however, current documentary evidence does not provide for their locations. Therefore, they are not included on this map.
- Use of fences and/or stone walls as boundary demarcations was common practice during this time period. Evidence exists for this practice at Hopewell Furnace; however, current documentary evidence does not provide for all locations or dates of erection of fences or walls, and therefore, are not included on this map.
- The 1804 and 1809 Roads are presumed to have existed prior to their formal designations and are included on this map.

### Building Number and Name:

1. Ironmaster's House
2. Furnace Barn
3. Office and Store
6. Blacksmith Shop
7. Furnace Complex
8. Wheel House
9. Charcoal House
19. Tenant House No. 1
20. Tenant House No. 2
32. East Head Race
111. West Head Race
- 115A. Birdsboro-Warwick Road Bridge
- A. Tenant House No. 1 Barn
- B. Tenant House No. 1 Privy
- C. Tenant House No. 2 Barn
- D. Tenant House No. 2 Privy

## 1845 Base Map - Overall Site

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- The inclusion of Tenant House and Boarding House outbuildings on this map are conjectural; however, these were common outbuildings and believed to have existed at the site.
- Vegetation layers included on this map are conjectural and based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs.
- Additional buildings may have existed on and off the site during this time period; however, current documentary evidence does not provide for their locations. Therefore, they are not included on this map.
- Use of fences and/or stone walls as boundary demarcations was common practice during this time period. Evidence exists for this practice at Hopewell Furnace; however, current documentary evidence does not provide for all locations or dates of erection of fences or walls, and therefore, are not included on this map.

### Building Number and Name:

- 27. Church House
- 28. Church Barn
- 71. Thomas Lloyd House
- 71A. Thomas Lloyd Wagon Shed
- 72A. Harrison Lloyd Barn
- 72B. Harrison Lloyd House
- 72C. Harrison Lloyd Blacksmith Shop
- 76. Woodlot House
- 79. Bethesda Baptist Church
- 80. Bethesda Baptist Church Carriage Shed
- 87. Thomas Lloyd Spring House
- K. Manning Barn
- L. Manning House

## 1845 Base Map - Core Area

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- The inclusion of Tenant House and Boarding House outbuildings on this map are conjectural; however, these were common outbuildings and believed to have existed at the site.
- Vegetation layers included on this map are conjectural and based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs.
- Additional buildings may have existed on and off the site during this time period; however, current documentary evidence does not provide for their locations. Therefore, they are not included on this map.
- Use of fences and/or stone walls as boundary demarcations was common practice during this time period. Evidence exists for this practice at Hopewell Furnace; however, current documentary evidence does not provide for all locations or dates of erection of fences or walls, and therefore, are not included on this map.

### Building Number and Name:

- |     |                           |      |                          |
|-----|---------------------------|------|--------------------------|
| 1.  | Ironmaster's House        | 32.  | East Head Race           |
| 2.  | Furnace Barn              | 33.  | Cast House               |
| 3.  | Office and Store          | 41.  | Smoke House              |
| 6.  | Blacksmith Shop           | 111. | West Head Race           |
| 7.  | Furnace Complex           | A.   | Tenant House No. 1 Barn  |
| 8.  | Wheel House               | B.   | Tenant House No. 1 Privy |
| 9.  | Charcoal House            | C.   | Tenant House No. 2 Barn  |
| 10. | Bridge House              | D.   | Tenant House No. 2 Privy |
| 13. | Ironmaster's Greenhouse   | E.   | Privy                    |
| 16. | Ironmaster's Bake Ovens   | F.   | Tool House               |
| 17. | Ironmaster's Spring House | G.   | Ice and Summer House     |
| 18. | School House              | H.   | Boarding House Barn      |
| 19. | Tenant House No. 1        | I.   | Boarding House Privy     |
| 20. | Tenant House No. 2        | J.   | Wagon Scales             |
| 24. | Boarding House            |      |                          |

## 1883 Base Map - Overall Site

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- The inclusion of Tenant House and Boarding House outbuildings on this map are conjectural; however, these were common outbuildings and believed to have existed at the site.
- Vegetation layers included on this map are conjectural and based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs.
- Additional buildings may have existed on and off the site during this time period. Current documentary evidence does not provide for their locations; therefore, they are not included on this map.
- Use of fences and/or stone walls as boundary demarcations was common practice during this time period. Evidence exists for this practice at Hopewell Furnace; however, current documentary evidence does not provide for all locations or dates of erection of fences or walls, and therefore, are not included on this map.

### Building Number and Name:

- 27. Church House
- 28. Church Barn
- 55. Brison House
- 71. Thomas Lloyd House
- 71A. Thomas Lloyd Wagon Shed
- 72A. Harrison Lloyd Barn
- 72B. Harrison Lloyd House
- 72C. Harrison Lloyd Blacksmith Shop
- 76. Woodlot House
- 79. Bethesda Baptist Church
- 80. Bethesda Baptist Church Carriage Shed
- 87. Thomas Lloyd Spring House
- K. Manning Barn
- L. Manning House

## 1883 Base Map - Core Area

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- The inclusion of Tenant House and Boarding House outbuildings on this map are conjectural; however, these were common outbuildings and believed to have existed at the site.
- Vegetation layers included on this map are conjectural and based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs.
- Additional buildings may have existed on and off the site during this time period; however, current documentary evidence does not provide for their locations. Therefore, they are not included on this map.
- Use of fences and/or stone walls as boundary demarcations was common practice during this time period. Evidence exists for this practice at Hopewell Furnace; however, current documentary evidence does not provide for all locations or dates of erection of fences or walls, and therefore, are not included on this map.

### Building Number and Name:

1.	Ironmaster's House	26.	Nathan Care Barn
2.	Furnace Barn	32.	East Head Race
3.	Office and Store	33.	Cast House
6.	Blacksmith Shop	39.	Charcoal Kilns
7.	Furnace Complex	41.	Smoke House
8.	Wheel House	111.	West Head Race
9.	Charcoal House	A.	Tenant House No. 1 Barn
10.	Bridge House	B.	Tenant House No. 1 Privy
11.	Anthracite Furnace Ruin	C.	Tenant House No. 2 Barn
13.	Ironmaster's Greenhouse	D.	Tenant House No. 2 Privy
16.	Ironmaster's Bake Ovens	E.	Privy
17.	Ironmaster's Spring House	F.	Tool House
18.	School House	G.	Ice and Summer House
19.	Tenant House No. 1	H.	Boarding House Barn
20.	Tenant House No. 2	J.	Wagon Scales
21.	Tenant House No. 3	M.	Carpenter's Shop
24.	Boarding House	N.	Care Log Cabin
25.	Nathan Care House	O.	Tenant House No. 4

## 1938 Base Map - Overall Area

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- Vegetation layers included on this map are based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs and mapping.
- Additional buildings may have existed on and off the site during this time period; however, current documentary evidence does not provide for their locations and therefore, are not included on this map.
- Only roads known to have been paved during this period are shown as paved, all others are shown as unpaved.

### Building Number and Name:

- 27. Church House
- 28. Church House Barn
- 55. Brison House Ruin
- 71. Thomas Lloyd House
- 71A. Thomas Lloyd Wagon Shed
- 72A. Harrison Lloyd Barn
- 72B. Harrison Lloyd House
- 72C. Harrison Lloyd Blacksmith Shop
- 76. Woodlot House Ruin
- 79. Bethesda Baptist Church
- 80. Bethesda Baptist Church Carriage Shed
- K. Manning Barn Ruin
- L. Manning House Ruin
- R. Baptism Creek Picnic Area Parking

## 1938 Base Map - Core Area

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- Vegetation layers included on this map are based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs and mapping.
- Additional buildings may have existed on and off the site during this time period; however, current documentary evidence does not provide for their locations and therefore, are not included on this map.
- Only roads known to have been paved during this period are shown as paved, all others are shown as unpaved.

### Building Number and Name:

1. Ironmaster's House
2. Furnace Barn
3. Office and Store
6. Blacksmith Shop
7. Furnace Complex
9. Charcoal House
11. Anthracite Furnace Ruin
13. Ironmaster's Greenhouse
17. Ironmaster's Spring House
18. School House Ruin
19. Tenant House No. 1
20. Tenant House No. 2
21. Tenant House No. 3
23. Tenant House No. 3 Barn
24. Boarding House
25. Nathan Care House
26. Nathan Care Barn
32. East Head Race
39. Charcoal Kilns
41. Smoke House
51. Pump House
111. West Head Race
- O. Tenant House No. 4 Ruin
- P. Chicken House
- Q. Corn Crib

## 1995 Base Map - Overall Area

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Kutztown University "Disk Files of Hopewell Furnace NHS," Menke & Menke Field Survey including GPS readings, Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

### Notes:

- Vegetation layers included on this map are based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs and mapping.

### Building Number and Name:

27	Church House
28.	Church House Barn
55.	Brison House Ruin
66.	Warehouse
67.	Oil house
70.	Church Garage
71.	Thomas Lloyd House
71A.	Thomas Lloyd Wagon Shed
72A.	Harrison Lloyd Barn Ruin
72B.	Harrison Lloyd House Ruin
72C.	Harrison Lloyd Blacksmith Shop Ruin
76.	Woodlot House Ruin
78.	YCC Building
79.	Bethesda Baptist Church
80.	Bethesda Baptist Church Carriage Shed
87.	Thomas Lloyd Springhouse
122.	Baptism Creek Picnic Shelter (ESA Shelter)
R.	Baptism Creek Picnic Area Parking
S.	Quonset Hut
K.	Manning Barn Site
L.	Manning House Site

## 1995 Base Map - Core Area

### Sources:

Information contained on this map was compiled from numerous sources located predominantly in HOFU's archives and files. Key sources include: Kutztown University "Disk Files of Hopewell Furnace NHS," Menke & Menke Field Survey including GPS readings, Russell Apple's "Historic Base Map - Village Area 1830-1840" and his "Documentation for Historic Base Maps: 1830-1840," 1956; National Park Service, "Topography Hopewell Village - French Creek Demonstration Recreation Project, 1937, rev. 1938; aerial photographs dating from ca. 1920-1980s; historic structure reports; Delaware Valley Orienteering Association's "French Creek East, Orienteering Map," 1992; among others.

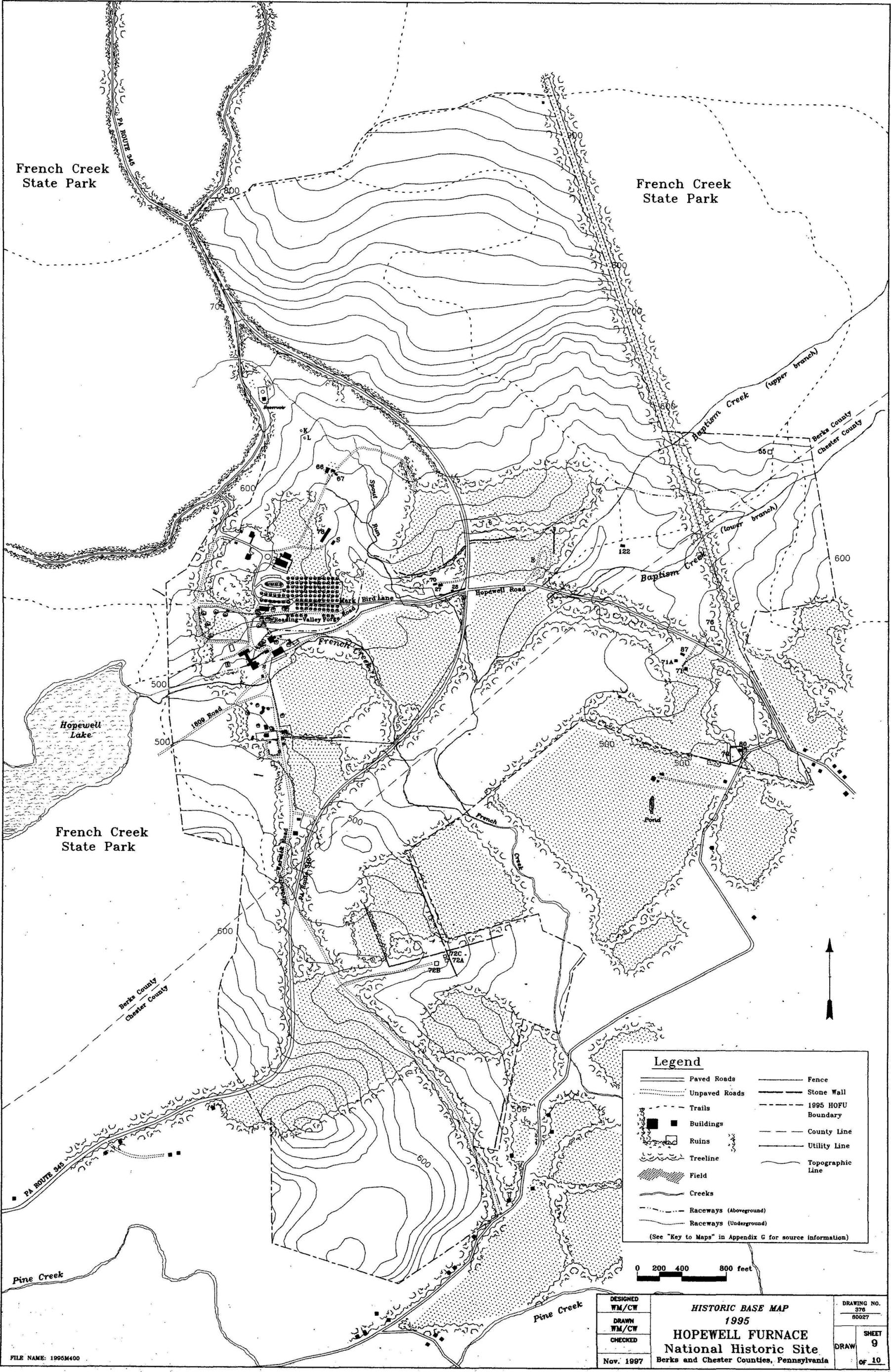
### Notes:

- Vegetation layers included on this map are based primarily on field survey, arborist's report, other previous reports, and twentieth century aerial photographs and mapping.

### Building Number and Name:

1.	Ironmaster's House	100.	Visitor Center
2.	Furnace Barn	101.	Maintenance Building
3.	Office and Store	102.	Bally Building
6.	Blacksmith Shop	110.	Tail Race
8.	Furnace Bank Retaining Wall	111.	West Head Race
7.	Furnace Complex	O.	Tenant House No. 4 Ruin
9.	Charcoal House	S.	Quonset Hut
10.	Bridge House	T.	Cedar pasture Stable
11.	Anthracite Furnace Ruin	U.	Car Port
13.	Green House Ruin	V.	Tenant house No. 4 Wall Ruin
17.	Ironmaster's Spring House	W.	Former CCC Garage
18.	School House Ruin		
19.	Tenant House No. 1		
20.	Tenant House No. 2		
21.	Tenant House No. 3		
23.	Tenant House No. 3 Barn		
24.	Boarding House		
25.	Nathan Care House		
26.	Nathan Care Barn		
32.	East Head Race		
33.	Cast House		
39.	Charcoal Kilns		
41.	Smoke House		
51.	Pump House		
78.	YCC Building		
98.	Quarters		
99.	Quarters		

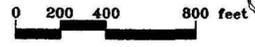




**Legend**

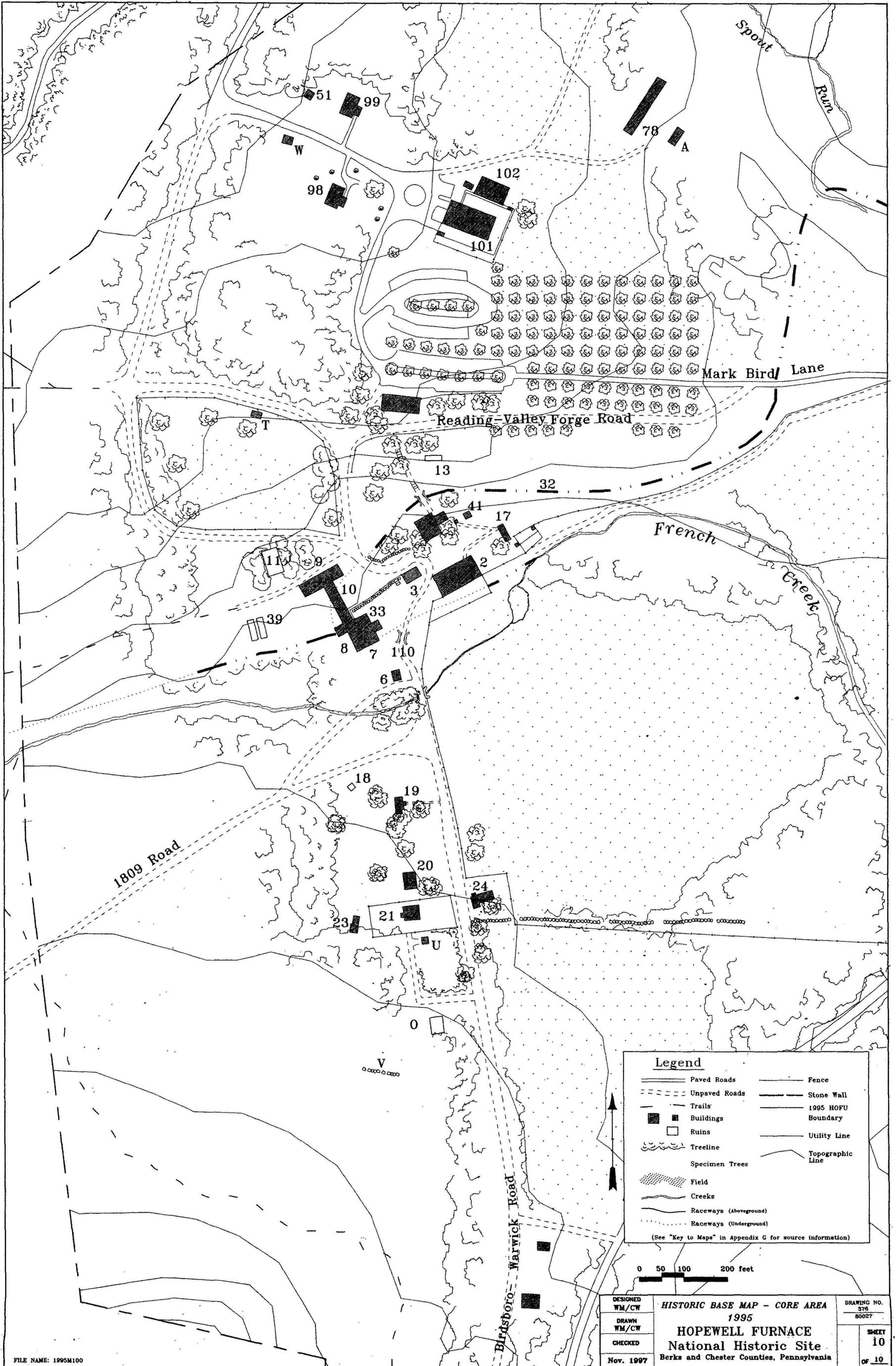
	Paved Roads		Fence
	Unpaved Roads		Stone Wall
	Trails		1995 HOFU Boundary
	Buildings		County Line
	Ruins		Utility Line
	Treeline		Topographic Line
	Field		
	Creeks		
	Raceways (Aboveground)		
	Raceways (Underground)		

(See "Key to Maps" in Appendix G for source information)



FILE NAME: 1995M400

DESIGNED WM/CW	<b>HISTORIC BASE MAP</b> <b>1995</b> <b>HOPEWELL FURNACE</b> <b>National Historic Site</b> Berks and Chester Counties, Pennsylvania	DRAWING NO. 576 80027
DRAWN WM/CW		DRAW
CHECKED		SHEET 9
Nov. 1997		OF 10



**Legend**

— Paved Roads	— Fence
- - - Unpaved Roads	— Stone Wall
- - - Trails	— 1995 HOFU Boundary
■ Buildings	— Utility Line
□ Ruins	— Topographic Line
~ Treeline	
••• Specimen Trees	
••• Field	
~ Creeks	
— Raceways (Aboveground)	
••• Raceways (Underground)	

(See "Key to Maps" in Appendix G for source information)



DESIGNED WM/CW	<b>HISTORIC BASE MAP - CORE AREA</b> 1995 <b>HOPEWELL FURNACE</b> <b>National Historic Site</b> Berks and Chester Counties, Pennsylvania	DRAWING NO. 376 80027
DRAWN WM/CW		SHEET 10
CHECKED		OF 10
Nov. 1997		