CHAPTER TWO: Historical Overview and Resource Description

Historical Overview of the Blackstone River Valley's Industrial Development

In the early 17th century, the Blackstone River Valley was claimed by Native Americans of three principal tribal groups: the Narragansett, the Wampanoag, and the Nipmuc. They lived in semi-permanent villages, moving periodically in search of more fertile soil. The Native Americans developed a major trail along the Blackstone River's length and a number of minor trails throughout the valley, which were used and developed into roads by later settlers. The arrival of early explorers, fishermen, and fur traders severely disrupted this pattern of life, and infectious diseases carried by the Europeans virtually wiped out much of the Native American population by the 1630s.

Attracted by religious freedom and rich and abundant resources, Europeans settled the region beginning in the mid to late 17th century. In 1675 local Native Americans, roused to desperation by repeated incursions into their ancestral territories by European settlers, rose in concert under the Wampanoag leader, Metacomet (also known as King Philip) to defend their lands and way of life. During the conflict, nearly every European settlement in the valley was destroyed, but the war was equally devastating to the Native American communities. The war ended in 1677 and reconstruction of colonial villages commenced first in the southern portion on the Valley and later in the north. The region remained largely agricultural through the 18th century, though urban centers like Worcester and Providence began to emerge as market and financial centers.

During the 19th century the United States underwent fundamental changes that transformed the country from a predominantly agrarian society in which manufacturing (where it existed at all) had scarcely progressed beyond the handicraft level, into the world's leading industrial power. Industrialization took place first and primarily in the textile industry and this sector remained in the forefront of industrialization into the mid-20th century.[9] The profound transformation that industrialization brought first emerged and succeeded in the Blackstone River Valley of Rhode Island and Massachusetts, where its effects were long-lasting and its physical evidence remains clearly visible today. The success of Samuel Slater (1768-1835) as an American pioneer, applying new industrial technologies in Pawtucket, RI, was monitored by Alexander Hamilton, then the nation's newly appointed first Secretary of the Treasury. As Slater's early operation evolved, Hamilton explored the potential of bringing the private and public sectors together to advance the nation's industrial development through the creation of the Society for Establishing Useful Manufactures (S.U.M.). In 1792, S.U.M. acquired 700 acres of land on the Great Falls in Paterson, New Jersey and with significant capital sought to undertake the development of a major planned industrial center, where the first water-powered mill came on line in 1794. While Paterson's industrial development lagged in those early years, the Rhode Island System of manufacture pioneered by Slater continued to grow and thrive.

A number of serendipitous geographical factors converged to make the compact region of the Blackstone River Valley into America's first center of industrialization. Wealthy merchant families in Providence, Rhode Island, had accumulated surplus capital from the transatlantic trade and were looking for opportunities to invest. Taking advantage of the city's excellent port, they had developed a network of profitable commercial connections. The hinterland was largely agricultural and generated a surplus of labor, primarily women and children who possessed domestic handicraft skills but had not previously been part of the labor market. Many men were skilled tinkerers, familiar with mechanical processes and receptive to labor-saving methods. Perhaps most important, the Blackstone River and its tributaries offered many sites that were suitable for water-powered mills.

Although the core technologies of this transformation were imported (some would say stolen) from Britain, their applications in the Blackstone Valley were distinctly American. The Blackstone Valley continued to be a significant center of manufacturing throughout America's industrial age, and features that made it distinctive remain visible in its buildings, communities, and landscapes.

Capital, labor, and energy were already in place in the Blackstone Valley when Samuel Slater introduced the technological and organizational components that had been missing in earlier unsuccessful attempts to mechanize textile production in the U.S. By 1790, English inventors had developed a wide range of machines and processes that gave their country an enormous competitive advantage. Slater, arriving in the U.S. in 1789, brought working knowledge of

9 "For all intents and purposes the so-called 'industrial revolution' of the late 18th and early 19th centuries was a revolution in textile production." (Walter Licht, Industrializing America: the 19th Century [Johns Hopkins Univ. Press, 1995], 25.)

Richard Arkwright's machinery for spinning cotton yarn[10] and in doing so circumvented British laws against taking technology out of the country. Soon he connected with Moses Brown, a civic-minded and intellectual merchant of Providence, whose previous efforts to launch cotton manufacture had enjoyed only limited success. Over the next two or three years, assisted by skilled local mechanics, Slater perfected the manufacturing process. These advances were embodied in a new mill in Pawtucket, Rhode Island, whose construction he supervised in 1792-93.

Together, these elements reached critical mass generating an outburst of industrial growth that seems revolutionary because of its speed. Textile manufacturing grew slowly in the early 1790s, even after Slater's successful demonstrations, but took off in the new century. Nascent American industry took advantage of turmoil in Europe, especially after Jefferson's embargo of 1807 blocked textile imports from Britain. Treasury Secretary Albert Gallatin's census of manufactures found 40 cotton mills operating within 30 miles of Providence in 1809, and these accounted for about two-thirds of the active spindles in New England. After a period of explosive growth, another report by the Secretary of the Treasury counted 119 mills in Rhode Island alone in 1832.[11] By then, the Blackstone had earned a reputation as America's "hardest-working river."[12]

Samuel Slater found conditions in the Blackstone Valley congenial and was able to transplant not only the Arkwright process but much of the physical and social organization of the English factory villages he remembered. New mill villages, many started by Slater, his associates, or men he trained, sprouted up at sites that were previously unsettled, or at most contained proto-industrial grist or saw mills. These "mills in the countryside" were a defining feature of the Slater System (also referred to as the Rhode Island System of manufacture) and made it appear less threatening to Americans who had heard enough of English industrialization to dread the smoky, congested horrors of Manchester's "Satanic Mills."

In the early Republic, many Americans believed that the nation's future should be agrarian and feared that English-style industry would create hellish living conditions, destroy individual independence, and threaten the democratic ideal of relative social equality. The mill villages and their small factories, employing familiar vernacular architecture, blended into their surroundings in a way that soothed such societal fears.

> The manufacturing operations of the United States [in 1832] are carried on in little villages or hamlets, which often appear to spring up as if by magic in the bosom of some forest, around the water-fall which serves to turn the mill wheel... God forbid... that there ever may arise a counterpart of Manchester in the New World.[13]

Another factor that made industrialization acceptable was that the first generation of textile mills used power only for spinning. Weaving was not easily mechanized and remained a handcraft "putting out" operation, in which households near a mill could be profitably engaged without excessive disruption of their lifestyles. This assured a continuation of established practice, in which rural families were accustomed to using carding, fulling, and finishing mills in conjunction with home looms. Power loom weaving, introduced in the 1820s, was for many years confined to simple, sturdy fabrics. Handloom weaving of fine and specialized fabrics thrived in home outwork and small shops through the first half of the 19th century. In that sense, mechanization of textile production was a step-wise change, not a wholesale disruption of traditional arrangements.

Although individually owned and operated, the mill villages formed a dense network, linked by physical resemblances, similarities of process, and a multitude of close alliances among the owners. The result was the formation of a sprawling but cohesive industrial district that covered the watershed of the Blackstone River and soon extended beyond it. Money and technical expertise permeated political boundaries and expanded the district's physical and economic features into the nearby Woonasquatucket and Pawtuxet River Valleys of Rhode Island and the Quinebaug River Valley of eastern Connecticut and adjoining Massachusetts. So attractive was this "colony" that more textile mills were built in eastern Connecticut in the 1820s than in Rhode Island, though suitable sites were still available in the Blackstone Valley. In the opposite direction, the textile industry organized on the Rhode Island System spread into southeastern Massachusetts to Taunton and beyond. Before long, this form of industrial organization was transferred to

10 Cotton was amenable to handling by machine. Irregular wool, worsted, and linen fibers were far more resistant to mechanization, and industrialization of those segments of the textile trade lagged by one or two decades.

11 Caroline F. Ware, The Early New England Cotton Manufacture (Houghton Mifflin, 1931), 24, 35, 155.

12 Winthrop Packard, "America's Hardest Working River," Technical World Magazine. Vol. 12, Number 2. October 1909.

13 Zachariah Allen, The Practical Tourist (1832), as quoted in Gary Kulik, Roger Parks, and Theodore Z. Penn, eds., The New England Mill Village, 1790-1860. (Massachusetts Institute of Technology, 1982), 7.

"outliers" much farther afield. In his study on industrialization, historian Walter Licht summarizes the trend: "Numerous circumstances could force the disintegration of the incorporated mill village, yet the form prevailed, spread, and persisted. From the northern wilderness of Maine to the hamlet of Rockdale in southeastern Pennsylvania, along creeks and narrow rivers, sprang up hundreds of mill communities during the first half of the nineteenth century."[14]

In essence, the mill villages were planned communities, since they were initially constructed in a short span of time where there had been little or no previous settlement. This meant that in most cases the mill owners had to provide housing and community buildings in addition to their factories. The resulting assemblage of structures reflected their ideas of thrift, order, and social hierarchy. Slatersville, Rhode Island, developed at Samuel Slater's behest largely by his brother John in 1807, is a prototype not only of the planned mill village but the "company town " as well. Most of the features that defined the later company towns were already in place, with the possible exception that it and other Rhode Island examples were not set off into separate political entities.[15] However, even this qualification is far from absolute: sometimes industrial villages split off to form new municipalities, and in many cases the power of the mill owners was sufficient to direct the political process of existing towns.[16]

Samuel Slater remained a traditionalist in social matters. Thus, the industrial labor system he introduced, commonly termed "full-family employment" and largely replicated from his English experience, was essentially paternalistic.[17] In dealing with the family as a unit, Slater consciously reinforced firm paternal rule within the nuclear family, which he considered to be the natural order. Under this system, mill owners not only felt some degree of responsibility for their employees but were also able to exercise broad control over the lives of their workers. In implementing this system of management, Slater and his followers frequently provided schools, churches, and stores in their villages. Company stores both filled a need in isolated villages and provided another avenue of control. Having little negotiating leverage, employees who were unhappy with any aspect of life in the mill village had little choice but to leave the community. Paternalistic attitudes endured and became broader in scope at Hopedale and Whitinsville, Massachusetts.

Slater seldom allowed the benign features of paternalism to interfere with profit. Although he had been an apprentice, he adopted a system of wages rather than apprenticeship. The rise of the mill village and its labor system redefined the role of women and children by involving them in the wage economy, but it also had a broad impact on the position of men. The mills offered men employment compatible with their self-esteem as mechanics, supervisors or farmers and thereby strengthened their position of authority within the family. This may well have been a consideration in Slater's practice of establishing farms in association with his mill villages and allowing private gardens to flourish. Slater-style villages were configured to allow space for family gardens and livestock.

The popular construct of farm *to* factory is oversimplified and misleading. More accurately, the process was farm *and* factory. Industrialization displaced agriculture only in relative terms, as a sector of the overall economy.[18] In absolute terms, agriculture expanded to feed the growing populations of mill villages. Thus, the farms and factories were interdependent and mutually supportive. This is one of the factors that caused the mills to be welcomed as a positive economic benefit by the rural population. People who had been deeply shaken by the outflow of New England's sons and daughters welcomed the employment provided by the factories and the reinvigoration of the farms. In response to the changing economic climate, many farms made the move from subsistence to market farming, producing dairy products, fruits, and vegetables for local sale.

In its initial decades, industrialization was largely synonymous with the cotton textile industry. This business was important not only for its direct impacts, but for its role in stimulating other forms of industrial activity. Among these is the chemical industry, through its role in furnishing dyes for cotton fabrics. More significant was the machine tool industry, which expanded rapidly to fill the needs of the textile factories. The Blackstone Valley emerged as a critical node for developing and disseminating advances in the manufacture of machine tools and machinery, and this expanding capability had widespread consequences in all as-

14 Industrializing America, 24.

15 "I think the Blackstone's communities fit into most definitions of company towns. John Garner, for instance, defined a company town as one constructed, supervised, and owned by a single business enterprise. But 'mill village' is the term preferred locally and it also characterizes these communities adequately."(Alison Kim Hoagland, "Report on Site Visit, Blackstone River Valley Special Resource Study, Feb. 14-16, 2008," www.nps.gov/blac/parkmgmt/special-resource-study.htm, 3.

16 The traditional New England town is the functional equivalent of townships in other parts of the country.

17 This is discussed more fully by Barbara M. Tucker, Samuel Slater and the Origins of the American Textile Industry, 1790-1860 (Cornell Univ., 1984).

18 David R. Meyer, "Report: Blackstone River Valley Special Resource Study," www.nps.gov/blac/parkmgmt/special-resource-study.htm, 2008, p.2; Claire W. Dempsey and Myron O. Stachiw, "The Late Industrial Period in the Blackstone Valley: Industry, Agriculture and a Changing Population," (report for Blackstone Valley National Heritage Corridor, n.d.)

pects of life. A busy network of inventive mechanics gathered, exchanged news of new machines and techniques, and spread them to outlying areas where the textile industry had taken hold. The Wilkinson family, related to Samuel Slater by marriage, provides a conspicuous example of those who engaged in this network. David Meyer, author of a recent study of the subject, concludes that the Blackstone Valley "constituted one of the leading machine shop, machinery and machine tool complexes in the nation."[19] Worcester and Providence remained centers of machine and precision tool manufacturing through World War II. In many ways, their tool builders reflected the flexibility and adaptability of the region's textile manufacturers.

The influence of the textile mills and the wealth they generated was felt in other ways, particularly by the transportation infrastructure. Mill owners in Rhode Island promoted turnpikes such as the one connecting Providence and Pawtucket. More importantly, they constructed the Blackstone Canal, a transportation artery extending from the port of Providence nearly the entire length of the Blackstone River to the inland town of Worcester, thereby shaping the Valley into a cohesive entity and stimulating the development of Worcester as an important urban manufacturing center.[20] As their wealth increased, mill owners gave architectural expression to their power and prestige in the magnificent homes, libraries, municipal buildings, churches and parks that still embellish the region and bear their names.

Slater's achievements in the Blackstone Valley demonstrated that textile manufacture could be successful and profitable in the U.S., at least under a favorable tariff regime. Once this critical point had been confirmed, others began to experiment with alternative models. The transformation that made the U.S. into a mighty industrial power was so sweeping and dramatic that it was popularly enshrined as the "Industrial Revolution." American scholars have abandoned this term as too restrictive in both time and process, replacing it with the more comprehensive construct "industrialization."[21] The richer understanding of the industrial phenomenon that has emerged since the initial surge in scholarly interest in the 1970s shows that it occurred over an extended period, at several locations, and in a variety of forms.

Although industrialization reshaped all aspects of American life, it did not follow a uniform process. The Blackstone Valley exemplifies one of several main paths to industrialization. This distinctive form was so closely associated with the area where it originated that it became known as the Rhode Island System of manufacture. In general, the Rhode Island System was characterized by its relatively small-scale mills, ownership by individuals or partnerships rather than corporations, use of families as the labor force, location in multiple detached villages in a rural setting, and a symbiotic relationship with agriculture. It represents the first successful application of the factory system of manufacturing in the U.S., employing machines driven by a central power source and tended by semi-skilled workers.

The major alternative system in textile manufacture was pioneered at Waltham, Massachusetts, but it reached its mature form in the mid-1820s at the planned industrial complex at Lowell, Massachusetts. Variously known as the Waltham, Lowell, or Northern New England system, it was characterized by large-scale integrated factories where raw cotton was converted into finished fabric (from "bale to bolt") in a single establishment. From the outset, Lowell mills produced vast quantities of fairly standardized cotton fabric. They required more power, more workers, and vastly more capitalization than Blackstone Valley textile operations. This model became feasible only after some two decades of experience in the Blackstone Valley had proven the potential of American textile manufacturing. By the time the massive mills at Lowell came on line, more than 400 textile mill villages of the Rhode Island style flourished in the U.S., predominantly in southern New England.[22]

The Waltham and Lowell mills and their successors operated on a much larger scale than their Rhode Island counterparts and were designed to be more vertically integrated.

19 "Report: Blackstone River Valley Special Resource Study," www.nps.gov/blac/parkmgmt/special-resource-study.htm, 2008, p.6. For a fuller development, see Meyer's Networked Machinists: High-Technology Industries in Antebellum America (Johns Hopkins Univ. Press, 2006).

20 The Middlesex Canal linked the area that became Lowell with the port of Boston before Lowell was developed, but Lowell is best known for its system of power canals. Nothing as elaborate as these power canals existed in the Blackstone Valley, nor was necessary due to the region's geography; and this is one of the vital differences between the two manufacturing systems.

21 A consensus on this point was achieved by the scholars who participated in the Blackstone River Valley Special Resource Study site visit, Feb. 14-16, 2008. See reports by Gary Kulik, Walter Licht, David Meyer, et al., www.nps.gov/blac/parkmgmt/special-resource-study.htm. Licht summarized "That term Industrial Revolution has been discarded, utterly discarded into the dust bin by scholars for at least 30 years." (Remarks at public meeting, Whitinsville, MA, Feb. 16, 2008, transcribed by Alice Darling Secretarial Services, available from Blackstone River Valley National Heritage Corridor, NPS.

22 Licht, Industrializing America, 24, and "Report of the Organization of American Historians and the National Park Service on the Blackstone River Valley Industrial Heritage Corridor, www.nps.gov/blac/parkmgmt/special-resource-study.htm p.2.

They relied on the corporate form of organization, and at the outset employed young, single women. Especially in the initial stages, the scales of the two systems differed vastly. Around 1840 Lowell had a population in excess of 20,000, of whom perhaps one-third worked in the factories. There were 26 separate cotton mills with a capacity of 166,000 spindles. By contrast, the typical Blackstone mill village employed perhaps 100 workers in one or possibly two mills with a total capacity of 1,000 spindles.[23] The amount of capital employed reflects the same wide divergence: whereas the Lowell corporation was capitalized at $400,000 or more, a village mill could be bought for as little as $10,000. By concentrating on large-scale, vertically integrated production of a single type of fabric, Lowell-style mills sometimes suffered the vicissitudes of market saturation or changing fashion. Smaller Rhode Island-style mills sometimes weathered these changes more nimbly. If demand for their product fell in one sector, they often found markets in another.

The impacts on the physical and social landscape were in roughly the same proportion. While both systems were segments of the textile industry, and their products were sometimes similar, they were grounded in fundamentally different concepts of organization, and these differences had profound effects on the social and built environment. This is evident not only in the scale of the factories, but in the residential architecture. Whereas the boarding house is the characteristic expression of the Waltham System, the single or two-family house is a defining feature of the Rhode Island construct. In the Rhode Island System, in its initial form, members of the owner's family might work in the mills, at least in a technical or supervisory capacity. There were examples of former workers rising to become mill owners, which was almost unimaginable under the Waltham model.

It is misleading to conceive of American industrial history as an inevitable progression from small to giant scale. Lowell and "smokestack industries" such as steel mills and the massive vertically integrated automobile factories that expanded on its model captured the public imagination by their overwhelming size and thereby have concealed the parallel survival of family-sized manufacturing throughout the course of American industry.[24] Lowell and its successors were conspicuous for obvious reasons, but remained atypical within the context of American industrial production. In 1878 in Massachusetts, only 520 of 11,000 manufacturing companies were organized as corporations.[25] Places like Lowell attracted visiting delegations and writers looking for stories about the impact of industry, while mill communities of the Rhode Island type were so ubiquitous that they often escaped notice. Nevertheless, they persisted and were more likely to be the source of technological innovation than the vast industrial complexes.

With rival systems coexisting, some convergence became inevitable, making it more difficult to find "pure" examples of each type. Moreover, the far-reaching success of the Rhode Island model entailed the modification of some of its defining characteristics, diminishing the disproportionate early influence of the Blackstone Valley. Several aspects of this process of dilution can be traced. First and most obvious was geographical expansion, as this system of industrial organization spread throughout New England and beyond. Into the 20th century a Rhode Island influence was discernible in the Southern Piedmont (an area that extends through central North Carolina, South Carolina, and Georgia, into eastern Alabama), as a member of the Draper family who owned the Hopedale plant transferred elements of mill village design to the American South. In her study of company housing, Margaret Crawford observes "Like the New England textile towns a century earlier, the [southern] mill village embodied a social order directly reflecting the economic logic of the textile industry," and adds that "Southern mills repeated the archetypal experience of modernization pioneered in the New England textile mills..."[26]

Another aspect of diffusion was the diversification of industrial production. First, the textile industry became more varied as the weaving process was mechanized and the industry offered a wider range of products. The industries that arose to support textile manufacturing, notably the manufacture of machinery, built on their advancing capabilities to serve many other users. A node of technological expertise formed in the Blackstone Valley at firms like Brown & Sharpe, Crompton & Knowles, Draper, and Whitin Machine Works, where skilled machinists steadily improved machines and manufacturing techniques. The Valley became an incubator for and disseminator of this

23 Kulik, Parks and Penn, New England Mill Village, xxvii-xxviii.

24 "In fact, as of the late nineteenth century all of these manufacturing approaches continued to operate, and the large-scale, mass production factories existed in only a few industries." David Meyer, "Report: Blackstone River Valley Special Resource Study," www.nps.gov/blac/parkmgmt/special-resource-study.htm, 2008, p.2.

25 Robert L. Heilbroner and Aaron Singer, The Economic Transformation of America, 2nd ed. (Harcourt, Brace, Jovanovich, 1984), 189.

26 Building the Workingman's Paradise: The Design of American Company Towns (Verso, 1995), 174, 175.

technology throughout the nation.[27] Meanwhile, the textile industry remained important in the U.S. into the 20th century, but with diminishing influence. The industry continued to flourish in its natal region, with production increasing in absolute terms, although the lopsided early dominance did not continue. In response to competition from larger entities, factories in the Blackstone Valley adapted by turning to more specialized products and those requiring more skill.

In the late 19th and early 20th centuries, new factories in the Blackstone Valley were built on a larger scale and some expanded into vertically integrated production. This trend seemed to represent the blending of some of the defining characteristics of the Rhode Island and Waltham systems. This physical similarity may be more superficial than substantial, although the boundaries between the two classic systems undoubtedly blurred. Company housing and related facilities increased in proportion, and it is noteworthy that in most cases the mill villages retained their characteristic forms of ownership, management, and operation. The nature of the workforce changed and, except for some of the skilled occupations, mills employed largely immigrants or the children of immigrants. This represents a degree of convergence with the Lowell model, where the initial reliance on young single women of largely rural origins was substantially modified beginning as early as the 1840s. In sum, although neither system maintained its original "pure" form, recognizable distinctions between them persisted. Factory workers in the Blackstone Valley continued to live within the familiar social construct of the mill village: family-owned, stratified, discrete, and self-contained in important respects.

Another noticeable shift in the Blackstone Valley was the greater urbanization of industry. In part this was caused by the expansion of mill villages. Since these villages were close to each other to take advantage of water power, clusters of formerly separate villages sometimes coalesced into a larger unit. This was especially notable at Woonsocket, in the middle of the valley, where continued growth created the need for a local business center between the major anchor cities at each end. In other cases, industries simply located in existing urban centers such as Providence and Worcester, where they could enjoy the advantages of better transportation, a varied work force, and the presence of banks and other support facilities. This phenomenon was more characteristic of the machine-making industry and its allies, which gathered in the two anchor cities and transformed them into industrial centers noted for producing an amazing diversity of manufactured goods. Over the course of time, the evolution of urban centers in the Valley became one of the defining characteristics of the overall region.

Nevertheless, Whitinsville, a significant producer of machinery, continued to flourish as a detached village. Despite changes in detail, the mill villages of the Blackstone River Valley retained their continuity of character into the mid-20th century.[28]

Beginning as early as the closing decades of the 19th century, the textile industry began to shift out of New England, first to the South, and ultimately offshore. The one-time industrial dominance of the Valley—and New England in general—faded dramatically. However, many Blackstone Valley firms were able to adapt for a time by concentrating on specialized niches in the textile industry, or by diversifying into other industries. The interest and involvement of the established proprietary families often persisted. As late as the 1920s, the owners of Slatersville updated their village by introducing elements of the prevailing Colonial Revival movement. In doing so, they invoked a shared past that, while not literally accurate, demonstrated both their commitment to historical continuity and their confidence in the viability of manufacturing.

In the Blackstone Valley, 20th-century deindustrialization followed a pervasive and harsh course and resulted in a period of demoralization. Subsequently, however, the establishment of the Blackstone River Valley National Heritage Corridor in 1986 both exemplified and contributed to renewal. Although industrial production in the Blackstone Valley is now greatly diminished, the industrial character of the region remains overwhelmingly evident. It has shaped the spatial arrangement and the physical appearance of the Valley, and perhaps also the attitudes of its inhabitants. The ongoing adaptive reuse of former mills and mill village housing, as well as efforts to preserve the context of open land in which the mill villages thrived, confirm that the distinctive and deeply embedded character of the region can provide the basis for a successful future.

27 Speaking of the Blackstone Valley, Gary Kulik concludes, "It is not totally present-minded to say this was the Silicon Valley of the 19th century." (Remarks at public meeting, Whitinsville, MA, Feb. 16, 2008, transcribed by Alice Darling Secretarial Services, (available from Blackstone River Valley National Heritage Corridor, NPS). A similar statement is contained in his "Notes on the Historical Significance of the Blackstone Valley," www.nps.gov/blac/parkmgmt/special-resource-study.htm, 4.

28 "The mill villages of the Blackstone River Valley contained small and large-scale renowned enterprises—they belie quaintness—and they endured into the twentieth century (not ephemeral contributors to American industrial history)." Walter Licht, "Report of the Organization of American Historians and the National Park Service on the Blackstone River Valley Industrial Heritage Corridor, www.nps.gov/blac/parkmgmt/special-resource-study.htm, p.2-3.

Cultural Resource Areas

Introduction

The Blackstone River Valley of Rhode Island and Massachusetts presents an industrialized landscape developed over a period of more than 100 years, beginning with Old Slater Mill in the early 1790s. In subsequent decades, industrialization spread along the Blackstone River and its main tributaries, overlaying or filling in the existing agrarian landscape. This industrial development employed a distinctive form of organization which, because of its origins and prevalence in this region, became known as the Rhode Island System of manufacture. It is characterized by production in discrete villages centered around mills that drew power at suitable sites along the Blackstone River and its tributaries. By 1850, dozens of such villages flourished in the Blackstone Valley, and the river had been intensively engineered to provide controlled power for the mills. These mills were massively constructed for reasons of safety and stability, and to convey a feeling of permanence.

The manufacturing facilities were almost entirely devoted to textile production and allied industries, notably machinery and tools. This industrial monoculture guided by a unifying concept of organization and manifested in similar forms and structures, formed a dense and cohesive industrial district along the waterways of the Blackstone Valley. The industrial development of this district was so pervasive and deeply rooted that decades of deindustrialization, extending through much of the 20th century, has not erased its imprint. Throughout the valley, evidence of the industrial past is inescapable and continues to define the region's character. It is visible in the numerous mill villages in various states of completeness, with their defining mills, similar but stratified housing, public buildings, and water control facilities, all strung along the Blackstone or any tributary capable of being harnessed, and often set off against an agrarian backdrop whose architecture maintains some of the traditional character of New England.

The cumulative nature and significance of the Valley's industrial resources has been recognized since at least 1986, when the Blackstone River Valley National Heritage Corridor was established by Congress. Through this Special Resource Study, the National Park Service continues to examine the industrial heritage resources of the Valley in depth. After evaluating numerous resources Valley-wide, including over 20 mill village locations, a group of seven outstanding resources has been selected because they best illustrate the region's nationally significant themes and possess the greatest levels of completeness and integrity:

- The Blackstone River & Its Tributaries
- The Blackstone Canal Historic Districts
- Old Slater Mill National Historic Landmark District
- Mill Villages
  - · Slatersville Historic District
  - · Ashton Historic District
  - · Whitinsville Historic District
  - · Hopedale Village Historic District

The Valley Landscape

Stretching from Providence, Rhode Island, north to Worcester, Massachusetts, the 46-mile long Blackstone River forms the Valley's "spine" and supported the majority of the region's water-powered mills, while its many tributaries – including the Branch, Mumford, and Mill rivers – enabled industrialization to spread throughout the watershed. The decline of the region's industry in the early 20th century led to disinvestment and economic stagnation, while in recent years suburbanization has taken hold, with residential development consuming open space and, in some cases, blurring the once-clear boundaries of the self-contained mill villages. The Blackstone Valley continues to be a working landscape characterized by a number of resource types, including: mill villages, urban centers, rural agricultural land and open space, and at its core, the Blackstone River itself. The interrelationships among these resource types contribute to a distinct sense of place that pervades the Valley and provides the essential context for the resources under consideration in this analysis.

Mill Villages

Mill villages in the Blackstone Valley represent the characteristic physical expression of rural industrialization known as the Rhode Island System of manufacture. Initially modeled on English precedents, the mill villages were centered on a mill and its infrastructure with family worker housing, commercial enterprises, and community amenities provided by the mill's owners. In her Blackstone Valley Site Visit report, Alison K. Hoagland offers the following characterization of the Valley's mill villages:

> The mill villages are an engineered landscape, just as the mills and their power systems are. These villages did not spring up organically. They are manifestations of the companies, particularly in their intentions and attitudes toward their workers. In the housing,

> the hierarchy of a village is often apparent, both in the size of the dwellings (management receiving larger houses) and in their location (management housing located on high ground, farther from the mill). These corporate communities often demonstrated a paternalistic interest in the morality of their employees, complemented by a rigid sense of social hierarchy. This early 19th century attitude continued in some of these villages long after other industrialists took a more businesslike and detached attitude toward their employees.[29]

The mill villages described subsequently were highlighted in the Special Resource Study process because of their particularly high level of physical integrity and completeness and for the outstanding visitor experience potential that they offer in terms of opportunities for education, interpretation, and further study.

Urban Centers

The historic industrial development of the Blackstone Valley is also reflected in its urban centers. By the late 18th century, Providence, a port city, had a well-developed maritime trade and an established merchant class, whose wealth fueled industrial innovation and development throughout the Valley. The College Hill Historic District, a National Historic Landmark District in Providence, includes the mansions of many of the financiers of the industrial revolution. Home to Slater Mill (1793), discussed in greater detail below, Pawtucket made the transition from a small mill village to an industrial city over the course of a century. The city of Woonsocket was formed when six industrial villages merged and were incorporated in 1888. Remnants of the former industrial villages are evident in the city's neighborhoods. Finally, the City of Worcester evolved as a regional market center for central Massachusetts in the late 18th century. Its major development as an industrial center occurred after the opening of the Blackstone Canal in 1828 and was greatly accelerated by the coming of the railroad in the 1830s.

Agricultural Land and Open Space

Industrialization in the Blackstone Valley was overlaid on an agrarian landscape that had developed over more than 150 years. Though diminished by late 20th-century suburbanization, areas characterized by agriculture, open space, and woodland remain and evoke the region's historic landscape. Surviving elements of this landscape contribute to our understanding of the context and important characteristics of the industrial mill villages as they developed. This rural landscape is especially evident within the Great Road Historic District in Lincoln, Rhode Island, and at River Bend Farm in Uxbridge, Massachusetts. Traditional upland rural town centers that co-existed with the mill villages are visible in places such as Grafton and Sutton, MA. The Southwick-Daniels Farm in Blackstone, MA, predates industrialization and remained an active family farm into the mid-20th century. At Whitinsville, the Whitin family set up Castle Hill Farm, a model farm that provided milk for Whitin employees and also provided work when times were slow at the mills.

Blackstone River and its Tributaries

The Blackstone River forms the natural spine of the Blackstone Valley and is the source of the region's physical and historical identity. In its 46-mile journey from its headwaters in Worcester to Narragansett Bay in Providence, the river meanders past quiet, wooded landscapes, courses through once-bustling mill villages, and is channeled through intensely developed urban centers. The Blackstone River is joined by four major tributaries (the Branch, Mumford, Quinsigamond, and West) along with many smaller branches, to form a watershed that encompasses 500 square miles and supports over 1,300 acres of ponds, lakes, and reservoirs.

The Blackstone River drops a total of 438 feet along its route. Beginning in the late 18th century, this water power was exploited with the construction of dams to support manufacturing. By the time of its peak industrial use in the early 20th century, there were 34 dams along the Blackstone River, 11 of them in Rhode Island. Scores of mills and mill villages sprang up along the river's banks, forever altering the Valley's landscape and giving rise to the Blackstone's reputation as the "hardest working river in America." The effects of industrialization were obvious: a 1990 report sponsored by the Environmental Protection Agency called the Blackstone "the most polluted river in the country with respect to toxic sediments." While water quality remains an issue, considerable progress has been made since the passage of the Clean Water Act in 1972 and through the efforts of public agencies, as well as concerned citizens who, beginning in the 1970s, have organized clean-up efforts and water quality monitoring programs. In 1998, the Blackstone River was designated an American Heritage

29 Margaret Crawford, Building the Workingman's Paradise: The Design of American Company Towns (London: Verso, 1995), 33, mentions Whitinsville and Hopedale in this regard, as quoted by Alison Kim Hoagland, "Report on Site Visit, Blackstone River Valley Special Resource Study, Feb. 14-16, 2008.

River to acknowledge both its special importance in American industrial history and the sustained efforts to restore it.

The harnessing of the Blackstone River and its tributaries is still evident throughout the Valley. Historic dams and their resulting impoundments continue to be managed and used for a variety of purposes, including a number of small-scale hydropower projects, flood control, and recreation. Seventeen of the original 34 dams on the Blackstone River remain intact. Likewise, numerous historic dams and impoundments on its tributaries survive including sites in Slatersville, RI, Whitinsville, MA, and Hopedale, MA.

Blackstone Canal

National Register of Historic Places – MA segment 1995; RI from Providence to Ashton 1971; RI from Ashton to MA state line 1991.

First proposed in the 1790s and constructed between 1824 and 1828, the Blackstone Canal connected the port of Providence to the inland town of Worcester, paralleling the Blackstone River along its approximately 46-mile route. Tow paths ran the length of the canal to accommodate the draft animals used to move the canal boats. Granite markers, set upright in the towpath, denoted each mile. The Blackstone Canal, with 48 locks that enabled boats to negotiate elevation changes, was constructed largely by hand and followed the contours of the river as much as possible. A system of dams and reservoirs – most created from natural water bodies – helped regulate the water level in the canal and, in some cases, also served local manufacturers' power needs.

Though sometimes used as a means of transportation for people, the canal was primarily a way to ship goods; raw materials were brought to industrial centers, while finished goods were shipped to urban markets. A variety of factors, including financial difficulties, disputes over water rights, difficulty maintaining consistent water levels, and the impossibility of using the canal in the winter, led to the closing of the Blackstone Canal in the 1840s. The final blow was the opening of the Providence & Worcester (P&W) Railroad in 1847, which provided a faster and less expensive means of transportation in the Blackstone River Valley. All operations of the Blackstone River Canal Corporation ceased in 1848. The P&W purchased much of the canal property, and its route generally followed that of the canal; in some sections, the railroad tracks were laid on the towpath. In many locations, the canal trench was converted to power canals to serve existing and new mills.

The full length of the Blackstone Canal, from Providence to Worcester, is listed in the National Register of Historic Places as two separate districts – one in Massachusetts, one in Rhode Island. Segments of the canal trench and towpath, along with other canal features – some remarkably intact – survive in both states. The best-preserved section of canal in Rhode Island is located in the town of Lincoln, within the Blackstone River State Park. Owned and operated by the Rhode Island Department of Environmental Management (RI DEM), the park consists of a 3-mile-long segment of the canal, located to the west of the river, and approximately 150 acres of land on either side of the canal trench.

In Massachusetts, the most intact section of canal and towpath is located within the Blackstone River & Canal Heritage State Park, which encompasses about 1,000 acres in the towns of Uxbridge and Northbridge and is owned and operated by the Massachusetts Department of Conservation and Recreation (MA DCR). The park property conveys a strong rural character with its rolling hills, wooded areas, and former agricultural fields. At the southern end of the towpath trail is the Stanley Woolen Mill, an 1852, 4-story, wood-frame textile mill in private ownership. Rice City Pond, a holding pond created by the construction of a dam in 1865-69, is located at the northern end of the towpath trail. Three sets of water-control structures that supported the operation of the canal were recently restored.

A trail leads to Goat Hill Lock in Northbridge, where one can see the components of a relatively intact canal lock. At Plummer's Landing in Northbridge, the archaeological remains of a landing basin and trading house are visible, along with portions of a canal lock. The best-preserved lock on the Blackstone Canal is located in the town of Millville and is owned by the MA DCR. The approximately 12-feet-tall, cut granite walls are intact and structurally sound. The sockets necessary to accommodate the now-missing canal gates are still visible.

Old Slater Mill National Historic Landmark District, Pawtucket, Rhode Island

National Historic Landmark, 1966. Amended 1975.

Industrialization in America traces its origins to the banks of the Blackstone River in Pawtucket. It was here in 1790 that Samuel Slater, recently arrived from England, worked with local machinists and investors to transplant the Arkwright system from England, establishing America's first successful water-powered cotton spinning mill. Slater began his operation in an old fulling mill, where it remained for three years; in 1793, he constructed a new mill

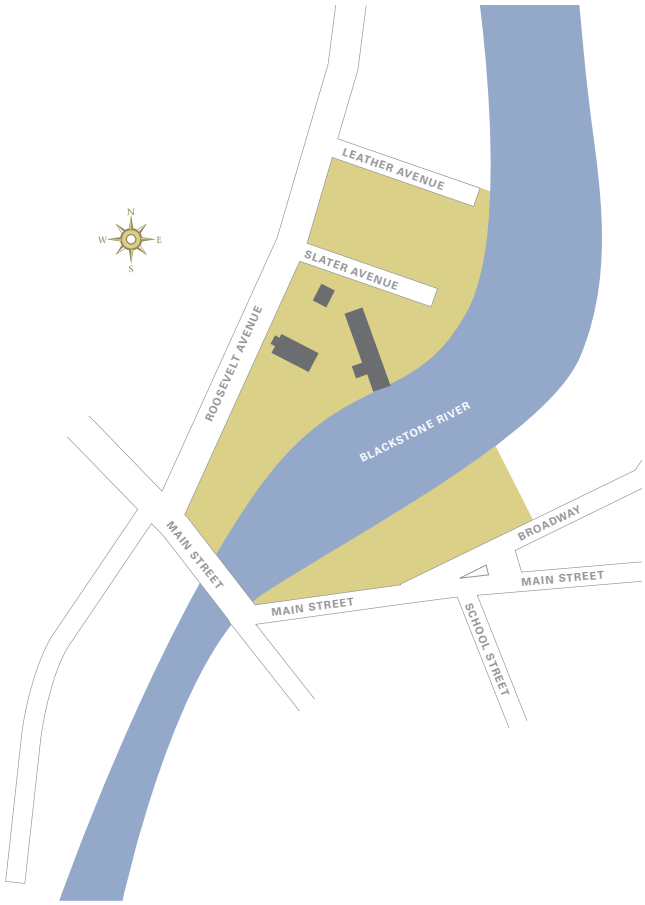

Figure 2: Old Slater Mill National Historic Landmark District – Not to Scale.

built specifically for spinning cotton thread. Now known as Old Slater Mill, the building is considered America's earliest factory.[30] The site was declared a National Historic Landmark (NHL) in 1966.

The Slater Mill Historic Site NHL includes three buildings on the west bank of the Blackstone River in downtown Pawtucket: Old Slater Mill (1793 et seq.), Wilkinson Mill (ca. 1810 et seq.), and the Sylvanus Brown House (ca. 1758; moved to the site in 1962). The approximately 4.2-acre site also encompasses an open parcel on the opposite side of the river, two dams, and a parking area. The NHL district is managed by the Old Slater Mill Association (OSMA) as the Old Slater Mill Historic Site and Museum.

The centerpiece of the Slater Mill Historic Site is **Old Slater Mill**, sited at the edge of the Blackstone River, a 2½-story, wood-frame building with a trapdoor monitor and a prominent bell tower. The oldest part of the mill was constructed in 1793, with additions around 1817 and 1835.

A tailrace stone arch, believed to date to 1793, marks the location of the power canal that ran under the south end of the building. Typical of mills of this period, Slater Mill differed "very little from the simpler building types of the day. The end seen alone might be taken for a large eighteenth century farmhouse...; the projecting wing with its belfry might well be the front of a country meeting house".[31] Despite their vernacular appearance, early mills represented a new regional building type, and their form reflected their purpose. The large, open interior spaces and elongated floor plans were designed to accommodate rows of machinery running off a system of drive belts and overhead shafts, while the need for natural light called for large windows and skylights.[32]

The ca. 1810 **Wilkinson Mill** is a large, 3½-story, rubblestone building located immediately to the southwest of Old Slater Mill. A brick stair tower and belfry was added around 1840. Important textile machinery was designed and manufactured by David Wilkinson in this building. Today, a reproduction waterwheel provides power to the extensive machine collection housed on the building's first floor.

In 1962, the Old Slater Mill Association moved the **Sylvanus Brown House**, threatened with demolition, to the

30 Richard E. Greenwood, "Industrial Architecture of the Blackstone Valley." In Claire W. Dempsey, Richard E. Greenwood, and William McKenzie Woodward, The Early Architecture and Landscapes of the Narragansett Basin, Volume II: Blackstone River Valley and Providence. (The Vernacular Architecture Forum, 2001.), 21.

31 Henry-Russell Hitchcock, Rhode Island Architecture. (New York: Da Capo Press, 1968.), 39.

32 Richard E. Greenwood, "Industrial Architecture of the Blackstone Valley." 21-22.

site. Constructed around 1758, the wood-frame, 1½-story dwelling once served as a multi-family residence and boardinghouse. Tradition holds that Samuel Slater spent his first night in Pawtucket in this house, whose owner, Sylvanus Brown, made patterns and wood parts for Slater's machines.

Old Slater Mill Historic Site and Museum is owned and operated by the Old Slater Mill Association (OSMA), which offers regularly scheduled tours and programs to the general public. OSMA has been preserving and maintaining the site since 1921. Staff members from the Commission currently provide operational and programmatic support to the museum.

Mill Villages

Slatersville Historic District,
North Smithfield, Rhode Island
National Register of Historic Places, 1973

Following the success of his Pawtucket enterprise, Samuel Slater, his protégés and others established mills up and down the Blackstone River and its tributaries, transforming the region's economy and its landscape. As one of "the generative centers of the American Industrial Revolution," the Blackstone Valley became the source of "new technology, new building types, and new community forms."[33] The first of this new type of community was called Slatersville and was established in 1806-1807 by Samuel Slater and his brother, John (with financial backing from Almy & Brown), on the Branch River, about 10 miles northwest of Slater Mill. Slatersville was located far from a population center, and the Slaters attracted workers by providing family housing as well as civic and social amenities. A self-contained community centered around the mills, Slatersville is considered "the first successful industrial landscape in America, a reproducible type of company town," which was duplicated hundreds of times over, throughout the Blackstone Valley, across New England, and up and down the east coast.[34] In addition to being an extremely important prototype, Slatersville was one of the longest-surviving company towns in the country; the town remained under ownership of the Slater family until ca. 1900, when it was sold to James R. Hooper, who converted the mills into a bleaching and dyeing operation. The company and village were purchased in 1915 by Henry Kendall, a textile manufacturer, who retained ownership until 1954.[35]

The village of Slatersville, which still looks much as it did in the 19th century, was organized along two axes, with the mills occupying a site on low ground on the north bank of the Branch River. A reservoir system provided the power needed to support the operation and included two large ponds, dams (ca. 1849 and ca. 1876), canal trenches (ca. 1806-1807, ca. 1821, and ca. 1876) and spillways (1849 and 1876). Most of the power canal system survives today, a reminder of the extent to which the Slaters and their successors manipulated water resources to provide the power needed to run the mills.

The earliest mill in Slatersville was constructed ca. 1806-1807 and was likely wood-frame; it burned in the 1820s. One factory building from that period survives and was used at the end of the 1800s as an office; it may originally have been a bobbin mill.[36] In 1826, the Slaters replaced the mill that had been destroyed by fire with the Center Mill, also known as Mill #1, a massive, 4-story, ashlar masonry building with a clerestory monitor and a full-height stair tower capped with a belfry. The building was raised to five stories and its monitor removed sometime before 1894. The four-story Mill #3 – similar in appearance to Mill #1 – was built nearby in 1843. Both have recently been rehabilitated as apartments with the help of historic rehabilitation tax credits and according to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Housing was located on higher ground, and included numerous wood-frame, 1½- and 2½-story workers' dwellings which, although designed to resemble traditional single-

33 Richard E. Greenwood, "Industrial Architecture of the Blackstone Valley." 21.
34 Margaret Crawford, Building the Workingman's Paradise: The Design of American Company Towns. (London: Verso, 1995), 19.
35 Richard E. Greenwood, "Slatersville, North Smithfield, RI" In Claire W. Dempsey, Richard E. Greenwood, and William McKenzie Woodward, The Early Architecture and Landscapes of the Narragansett Basin, Volume II: Blackstone River Valley and Providence. (The Vernacular Architecture Forum, 2001.), 49-51.
36 Richard E. Greenwood, "Slatersville, North Smithfield, RI." 49-50.

family homes, were divided into multiple units. The earliest of these houses were built between ca. 1806 and ca. 1840, and many survive along the village's main axis. Additional workers' housing – more modest than the original – was constructed in the second half of the 19th century, and numerous examples remain. Dozens of supervisors' houses were built between 1850 and the late 1920s. Two structures, John Slater's residence (ca. 1806; moved 1844), a 2½-story, wood-frame dwelling, and the Elisha Bartlett House (ca. 1844), a Greek Revival-style residence built by Slater's son-in-law, provide examples of the homes occupied by mill owners.

Public amenities in Slatersville include a meeting house (1808; moved in 1816 and again in 1887), used for religious purposes as well as for public meetings and as a school, and two 3½-story, masonry commercial blocks (1850 and 1870), which housed stores, the post office, a bank, and a social hall. Three churches were constructed

in the 1800s: the Congregational Church in 1838, fronting onto a newly created "village green"; the Roman Catholic Church in 1872; and the Episcopal Church in 1897. Even in the 20th century, when the town was owned and operated by the Kendall Company, civic buildings continued to be constructed, including the town hall (1921) and the WPA-era Kendall Dean School (early 1930s) reflecting the later industrial period.

Figure 3: Slatersville Historic District – Not to Scale.

Ashton Historic District, Cumberland, Rhode Island
National Register of Historic Places, 1984

The village of Ashton was developed beginning in the mid-1800s by the Lonsdale Company, one of the most prosperous and productive of Rhode Island's textile manufacturing firms. The company eventually owned and operated three distinct mill villages along the Blackstone River: Lonsdale (est. 1830s), Ashton (acquired 1840s; expanded 1860s), and Berkeley (est. 1870s). All three villages are listed in the National Register of Historic Places. Ashton retains a particularly high level of integrity, both in terms of its overall layout and its individual buildings.

Industrial development in the area of present-day Ashton began in the 1810s, when the Smithfield Cotton & Woolen Company built a small mill (no longer extant) and some workers' housing on the west side of the Blackstone River, in the town of Lincoln. The Lonsdale Company acquired the struggling mill in the 1840s and, spurred by the opening of the Providence & Worcester Railroad on the Cumberland side of the river in 1848, created a successful enterprise. The company acquired additional land in Cumberland in 1863 and soon began building the village of Ashton, a premier example of a planned mill village, which survives largely intact to this day.

Like Slatersville, Ashton was conceived as a self-contained village, and it reflected many of the characteristics of the Rhode Island System of manufacture. Mendon Road (Rte. 122) runs north-south through the village along a ridge, effectively dividing Ashton into two sections: the lower village, consisting of the mill and numerous workers' dwellings hugging the east bank of the Blackstone River, and the upper village, with houses and civic amenities along Mendon and Scott Roads. The focal point of the village is the Ashton Mill, a large brick building constructed in 1867. Ancillary mill structures include a 1½-story brick building with a mansard roof, originally the mill office,

Photo Credit: Bill Murphy.

Figure 4: Ashton Historic District – Draft – Not to Scale.

and a largely unadorned power house that sits on the river bank. One of the earliest high-speed spindles developed in America, the Sawyer spindle, was first tested on a large scale at the Ashton Mill. The Lonsdale Company continued to produce textiles here until closing the operation in 1935. The main mill building, mill office, and power house have recently been adaptively reused as rental apartments, with assistance from historic rehabilitation tax credits and according to the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Near the mill complex, just across the railroad tracks, the Lonsdale Company built a tight cluster of simple housing for its employees in 1867. Nineteen brick, multi-family workers' dwellings remain; eleven of these are simple, 1½-story houses, and the remaining eight are similar in

style and materials, though somewhat larger at 2½-stories. The company also built a 1½-story, brick row house and a 2½-story brick tenement building, identical to the multi-family housing in style and materials but significantly larger. All of these dwellings survive and remain in residential use. According to the National Register nomination for Ashton Village, "the rows of brick dwellings near the mill are…noteworthy for the strong visual impact created by the grouping of a few standard building types similar in form and identical in scale, materials, and detailing."[37]

The upper village at Ashton, though separated by topography from the mill and brick housing described above, has strong visual and functional connections to the rest of the village. Three 2½-story brick, multi-family houses are located on Mendon Road, overlooking the cluster of housing below. Built in 1867 and similar in style and materials to the housing in the lower village, these properties exhibit a slightly higher level of architectural detail – for example, they feature granite sills and lintels – and were probably built for supervisory staff. The Lonsdale Company built some notable civic amenities around the same time. A 2½-story, brick schoolhouse was constructed on Mendon Road ca. 1868 to serve the mill village's residents; like the housing, the presence of a schoolhouse reflects the employment of whole families at the mill. The paternalism of the Lonsdale Company is evident in the construction of a small, wood-frame Episcopal chapel ca. 1860 (enlarged in 1907 and converted to a Parish House) and, in 1868, the large, wood-frame, Carpenter Gothic-style St. John's Episcopal Church.

Whitinsville Historic District, Northbridge, Massachusetts
National Register of Historic Places, 1983

The village of Whitinsville is the largest and most intensely developed of the Blackstone Valley mill villages, with a historic district that encompasses about 250 acres and approximately 350 structures built over the course of a century. Organized around three factory complexes along the Mumford River, Whitinsville provides "an unusually complete record of the phased expansion of an industrial community" with "remarkably full-blown and intact examples of the economic and social institutions of mill village life."[38] In addition to the mills, Whitinsville contains hundreds of dwellings – built for mill owners as well as mill workers – and a distinctive assemblage of company-sponsored civic facilities. The Whitinsville Historic District was placed on the National Register of Historic Places in 1983.

Whitinsville is named for the Whitin family, who were prominent in textile production and textile machinery manufacturing. However, the industrialization of the area preceded the Whitins. A textile mill (no longer extant) was founded in the village in 1809, and an iron forge was established in the 18th century, near the present-day village center. The original building no longer stands, though portions may survive within the 1879-1886 forge that replaced it. The earliest industrial building associated with the Whitin family is the 1826 Old Brick Mill, a cotton factory built by Colonel Paul Whitin and Sons. It is representative of a period of expansion in textile mills and is considered "one of the most significant examples of its type and period of factory construction still standing in New England."[39] The Whitinsville Spinning Ring Company, which dates from 1873, began in the Old Brick Mill and the Forge and gradually expanded, creating a large industrial complex. The entire complex was recently rehabilitated and now houses offices, apartments, a theater, and commercial space.

The Whitinsville Cotton Mills complex is located immediately on the north bank of the Mumford River. Built by Paul Whitin and Sons in 1845, the large factory has exterior walls of ashlar, a clerestory monitor roof and a belfry. It is an excellent example of an 1840s mill, its large size reflecting a scale of production made possible by advances in water-power technology and the introduction of turbines and belt-drives. Its rear addition, constructed in 1864, housed a steam-power plant. The building was converted into apartments in the 1980s.

The last of the three industrial complexes located in Whitinsville is the Whitin Machine Works, a sprawling factory developed by John C. Whitin to produce textile machinery. This ancillary industry was a critical component

37 Robert O. Jones, National Register of Historic Places Inventory – Nomination Form, Ashton Historic District. 1982.

38 Wendy Frontiero with Michael B. Zuckerman and Kenneth Warchol. National Register of Historic Places Inventory – Nomination Form, Whitinsville Historic District. 1983.

39 Wendy Frontiero. Whitinsville Historic District. 1983.

Figure 5: Whitinsville Historic District – Draft – Not to Scale.

of the Blackstone Valley economy and a key element in the Whitin family's success. John C. Whitin patented a cotton picker in 1831, which was followed by other inventions, all of which contributed to the family's dominance in picking, carding, and spinning machinery production. Whitin began the construction of the Machine Works in 1847, and the complex was expanded every ten years or so through the 1920s, ultimately including buildings on both sides of the Mumford River and encompassing 1.75 million square feet of floor space. The complex is partially occupied and is being rehabilitated in stages.

All three factory complexes in Whitinsville were powered by the Mumford River, which was dammed in multiple locations. All told, about a dozen reservoirs were created by the Whitin Machine Works to provide power for the mills, as well as storing water for drinking and fire protection.

The reservoirs that powered the Machine Works were the largest in the system and were located on the main stem of the Mumford River.

The Whitins and their successors constructed rental housing for those who worked in their mills. Due to Whitinsville's large scale and its long period of development – ranging from the 1820s through the 1920s – it has an unusually extensive and stylistically varied collection of housing. In Whitinsville, one sees the "complete social spectrum of the factory village, from the mansions of the owners and top officials of the mills, to the commodious residences of mid-level managers, to the cottages of foremen, to the duplexes of skilled and clerical workers, to the multi-family tenements of unskilled laborers."[40] Numerous houses were built from the 1830s through the 1860s, coinciding with the establishment and subsequent expansion of both the Whitinsville Cotton Mills and Whitin Machine Works. Over 60 Greek Revival-style residences survive, including the ca. 1840 John C. Whitin mansion, as well as a range of dwellings for mill workers. These include 1½-story single-family residences; clusters of 1½-story duplexes with paired central doorways; and 2½-story multi-family tenements. The next great housing boom in Whitinsville occurred in the last quarter of the 19th century, when the Whitin Machine Works expanded significantly. Almost 100 houses date from this period, reflecting the popular Queen Anne style and including mill owners' mansions; middle-class dwellings; and scores of duplexes built as workers' houses. Residential construction continued in the 20th century, though at a somewhat slower pace. A group of Colonial Revival-style duplexes were built around 1900, while the years following World War I saw the construction of about 50 houses by Whitin Machine Works, mostly for upper-level workers.

In addition to its extensive housing stock, Whitinsville is notable for the many high-quality, architect-designed civic buildings constructed by the Whitin family and its successors between 1870 and 1920. Most are located at the village center, near Memorial Square, creating a civic core that speaks to the Whitins' deep paternalism. The oldest of these buildings is the 1872 Town Hall, a 2-story, brick, Italianate-style building. The Neo-Classical-style, 2-story, brick and cast stone Whitinsville Savings Bank / Post Office was erected in 1905, and the Whitinsville Social Library, a Neo-Classical-style, 1-story, granite building with a pedimented portico followed in 1913. George M. Whitin's daughters commissioned the Whitin Gymnasium, a 1-story, brick and cast stone building with Neo-Federal details, in 1923. Three schools were built with funding from the mill owners (Clarke School, 1878, Aldrich School,1890, and Whitin-Lasell High School,1906), as well as three churches (Village Congregational, 1898, St. Patrick's Roman Catholic Church, 1898, and the United Methodist Church,1911).

Finally, the mill owners built several company stores where mill workers could purchase dry goods and basic food, and established a farm that provided produce and dairy products. Castle Hill Farm, located on a hilltop to the south of the village center, was originally a 200-acre "hobby farm" owned by John C. Whitin. During the economic depression of 1874-1879, Whitin put many of his employees to work clearing the land and building a series of magnificent stone walls at the farm. A large, 19th-century stone-and-shingle barn burned in the 1950s, though the foundation and first-story stone walls remain. Castle Hill Farm's 200 acres are currently split between Whitinsville and the neighboring town of Uxbridge. Though no longer an operating farm, Castle Hill is the one of the only company-owned farms that has escaped development in the Blackstone River Valley.

40 Ibid.

Hopedale Village Historic District,
Hopedale, Massachusetts
National Register of Historic Places, 2002

Hopedale Village is the civic, residential, and industrial center of the town of Hopedale, which was settled as a utopian community in the 1840s but soon transformed into a model company town under the management of the Draper family. The Hopedale Village Historic District, added to the National Register of Historic Places in 2002, encompasses about 800 acres and includes almost 800 resources – buildings as well as designed landscapes, structures, and objects. Significant for its association with the Draper Company, which was the largest manufacturer of cotton textile machinery in the nation in the late 19th and early 20th centuries, it is an excellent (if somewhat unusual) example of a Blackstone Valley mill village. It includes truly exceptional examples of architect-designed residences and civic amenities and was recognized as the state of the art in the design of workers' housing at the turn of the 20th century.

The most important industrial venture in the community was the textile machinery factory operated by Ebenezer Draper, an early member of the utopian community, who was joined by his brother, George, in 1853. The Drapers' ca. 1843 factory building, now commonly known as the Little Red Shop, survives, though not in its original location. The simple, 1-story, wood-frame building was donated to the town by the Draper family in the 1970s and currently houses a collection of Draper textile machinery. In addition, a number of residences from the utopian period remain. They are typically front-gable, wood-frame dwellings, 1½ to 2½-stories tall and with Greek Revival-style detailing. Of particular note is the 1843 Greek Revival-style home of Adin Ballou, the community's founder and spiritual leader.

The utopian experiment at Hopedale failed in 1856, and the Draper brothers took over most of the community's assets, expanded their business, and ushered in a new era of secular paternalism. Ebenezer and George improved on their father's patented self-moving loom temple, developed new textile machinery, and acquired innovative small businesses that produced advances in relevant technologies.

The Draper Plant complex currently occupies about 27 acres and consists of a sprawling complex of massive inter-connected 3- to 4-story brick buildings that, with their similar height and massing, dominate the village center. Extant individual buildings include the ca. 1892 Machine Shop, Wooden Temple Shop, Blacksmith Shop, North Connecting Shop and Center Connecting Shop; the ca. 1900 Power Plant, with its tall brick chimney, and No. 1 and No. 2 Hose Houses, which provided on-site firefighting capacity; the ca. 1901 Carpenter Shop; the ca. 1903 Oil House; the ca. 1930 Dry Storage and Roughing Room; and several buildings dating from the mid-20th century. In addition, elements of the historic water power system are evident: Hopedale Pond, the Hopedale Pond Dam, and the Raceway (which directed water under the factory through a series of brick arches and piers) all date to ca. 1875, and an open-air, stone-lined tailrace (ca.1895) cuts across the southern part of the site. The Company's Main Office Building (1910-1911), designed in the Renaissance Revival style by Robert Allen Cook, a local architect, is a 2-story building constructed of brick with red terracotta trim, parapet, and cornice. The Main Office Building was adaptively re-used as an assisted living facility in 1998. The Draper Plant complex is privately owned.

Hopedale includes a range of housing, from company-built workers' dwellings to mill owners' mansions. The high quality of the housing – and the fact that much of it was architect-designed – is unusual and contributed to the village's reputation as a "model company town" at the turn of the 20th century. By the late 1880s, the Company had established three types of housing for its staff: single-family houses, boardinghouses, and double-houses for workers with families. The most common form of company-built housing in Hopedale Village was the double-house – there are scores of them throughout the village. Those constructed between the 1860s and 1910s were generally based on a handful of standard plans that could be modified in their exterior appearance and detailing. The earliest of these were built immediately adjacent to the Draper Plant.

From the late 1890s through the 1910s, the Company hired prominent landscape architects Warren Manning and

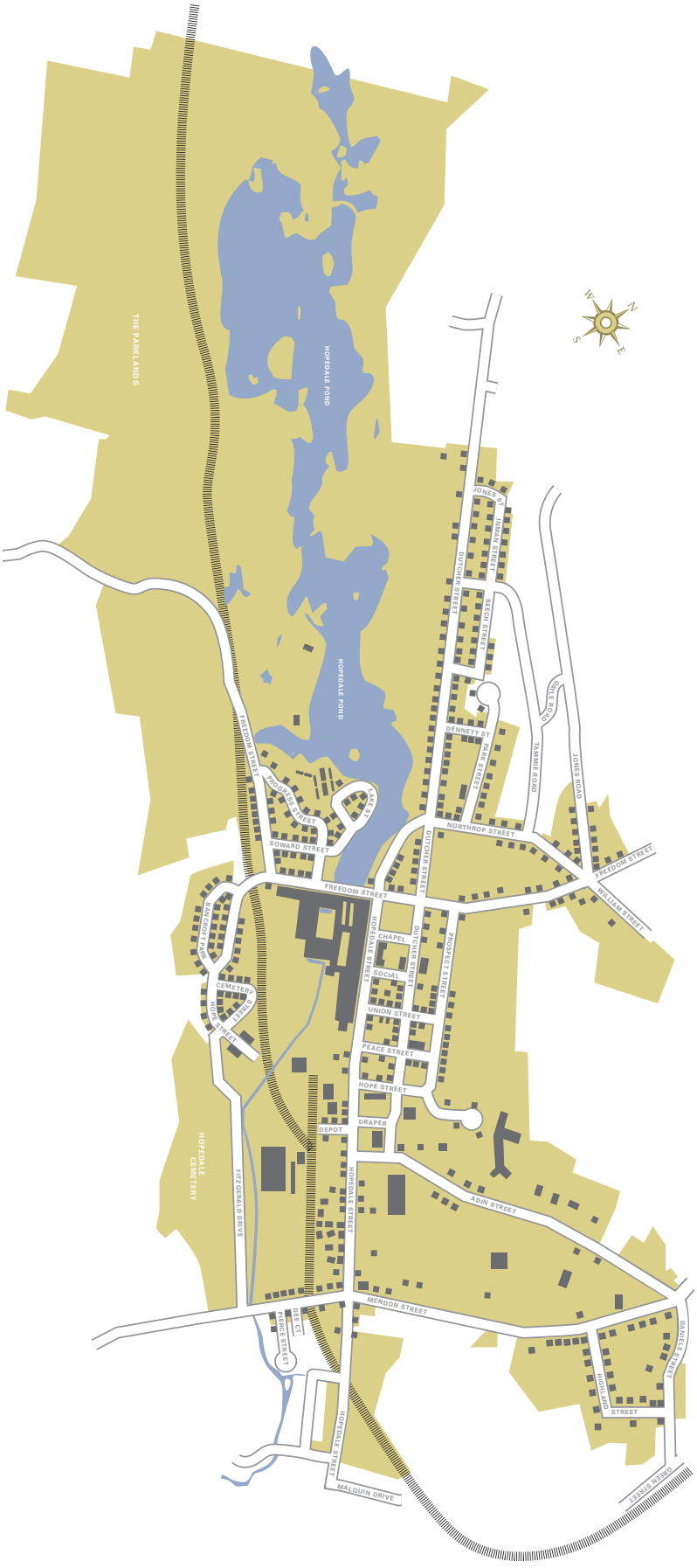

Figure 6: Hopedale Village Historic District – Draft – Not to Scale.

Arthur Shurtleff to lay out new subdivisions, integrating the houses into the natural topography. Most were executed in the Colonial Revival or Tudor Revival styles, while some were influenced by the Queen Anne. The Draper Company won a series of awards for its model housing, including a gold medal at the 1904 St. Louis Exposition and at international housing congresses in 1905 and 1906. In addition to the company-built dwellings for Draper Plant staff, Hopedale Village includes several mansions constructed by members of the Draper family and others associated with the business, which, in combination with the workers' housing, convey the social and economic stratification of the Village. These include the Joseph Bancroft House (ca. 1870, remodeled 1910); Warren W. Dutcher House (ca. 1868); the William Lapworth House (ca. 1875, remodeled 1890s); the Charles Roper House (ca. 1890); and the Eben S. Draper II House (ca. 1925).

Around 1887, Warren Manning was hired to redesign the Hopedale Village Cemetery, which had been established in 1845 as part of the utopian settlement. Manning also designed the Parklands, an extensive park that surrounds the Hopedale Pond. Its naturalistic landscape includes native and specimen trees, a rustic trail system, a bathing beach, and bathhouse. It encompasses 273 acres, including the Pond, and is not only a significant village amenity but also a testament to the Drapers' unusually sophisticated approach to the design of their mill village. Other public grounds include the Town Park, which was established by the Drapers around 1890 to accommodate active recreation, and the Adin Ballou Memorial Park (ca. 1900), which occupies the ½-acre former site of the spiritual leader's house.

In addition, the Drapers and others associated with the Company funded the construction of numerous high-quality, architect-designed civic buildings. These include the Richardsonian Romanesque-style Town Hall (1886-87), which originally housed municipal offices, a library, meeting halls and commercial space. The Romanesque Revival-style Bancroft Memorial

Library and the Draper Memorial Church / Hopedale Unitarian Church were constructed in 1898. The Drapers were also responsible for the construction of three schools; the Renaissance Revival-style Central Fire Station (1915-16); the Colonial Revival-style Hopedale Community House (1923), intended to be a social and civic center for the town; and the Harrison Block (1889), a 3-story commercial building.

Like the villages of Slatersville and Whitinsville, Hopedale remained a "company town" well into the 20th century. The Draper Corporation remained in business until 1967, when it was purchased by Rockwell International, which continued to manufacture textile equipment until the plant was closed in 1980.

Other Mill Villages

Remnant mill villages continue to dot the Blackstone River Valley landscape. Interwoven among the agricultural hill towns, they are not as intact or complete as the mill villages highlighted above. However, these remnant industrial nodes contribute to our understanding of the true scale and scope of industrialization in the Blackstone River Valley. In Massachusetts, these villages are found at Blackstone, Fisherville, Manchaug, New England Village, Quinsigamond Village, Rockdale, and Rogerson's Village, among other locations. Among these villages in Rhode Island are Berkeley, Lonsdale, and Harrisville.

Visitor Resource Areas

The visitor resource areas described in this section were strategically developed or refined to complement the efforts of the Corridor. In that context, each of these facilities interprets a different facet of the Blackstone River Valley's history and functions as a gateway to a particular resource or geographic area within the valley. The Commission provided support and assistance to all of these sites and facilities in the form of coordination, funding, and the development of interpretive programs and exhibits. In addition to continuing its support and assistance, staff from the Commission offer guided walks and other interpretive programs from these locations.

Blackstone Valley Visitor Center, Pawtucket, RI

Located immediately across Roosevelt Avenue from Old Slater Mill Historic Site and Museum, the Blackstone Valley Visitor Center is the southernmost visitor services facility in the valley and augments the current visitor experience at Old Slater Mill by providing a regional context. The first-floor visitor center includes a small theater space, open exhibit/ program space (including a large floor map depicting the Blackstone River Valley), public restrooms, and an information desk. A small café/ shop on the first floor adjoining the exhibit/ program space is operated by the Old Slater Mill Association. The visitor center building is owned by the City of Pawtucket, and the visitor center itself is maintained and operated by the Blackstone Valley Tourism Council. This building also houses a bus station, private offices, city department offices (Planning and Redevelopment), and classroom and administrative space leased by Salve Regina University.

Blackstone River State Park including Kelly House, Lincoln, RI

Owned and operated by the Rhode Island Department of Environmental Management, Blackstone River State Park encompasses 150 acres including segments of the Blackstone River Bikeway, walking trails, and a canoe portage. The park also contains historic resources including a well-preserved three-mile segment of the 1828 Blackstone Canal and tow path, the Captain Wilbur Kelly House, and archeological features associated with Old Ashton village. The park is located immediately across the river from the Ashton Historic District and is linked by a bridge. The Captain Wilbur Kelly House is operated as a museum featuring exhibits on the region's transportation history including the canal, railroad and highways. Visitor information is available on all Blackstone Valley historical sites and attractions. The Blackstone River State Park is one of the key sites along the Blackstone River Bikeway, with a visitor center and bikeway trailhead co-located at a highway rest area along U.S. Route I-295. The Commission has provided funding and technical assistance in preserving the Blackstone Canal segment and in developing the Blackstone

River Bikeway and provides operational and programmatic support at the Kelly House.

Museum of Work & Culture, Woonsocket, RI

The Museum of Work & Culture is housed in a rehabilitated textile mill building located in Woonsocket's Market Square Historic District. The building is owned by the city of Woonsocket. The museum, which is operated by the Rhode Island Historical Society, interprets the story of French Canadian immigrants who left Quebec to work in Woonsocket's mills and factories. The museum offers interactive exhibits, films, lectures, and other programs and provides brochures, guidebooks, and other information for visitors to the Corridor. The Commission has provided funding and technical assistance in developing the museum and its exhibits and provides operational and programmatic support.

Blackstone River & Canal Heritage State Park and River Bend Farm, Uxbridge, MA

Blackstone River & Canal Heritage State Park encompasses about 1,000 acres in the towns of Uxbridge and Northbridge and is owned and operated by the MA DCR. The park property conveys a strong rural character with its rolling hills, wooded areas, and former agricultural fields. At the southern end of the one-mile towpath trail is the 1852 Stanley Woolen Mill, a 5-story, wood-frame textile mill in private ownership. Rice City Pond, a holding pond created with the construction of a dam in 1865-69, is located at the northern end of the towpath trail. Three sets of water-control structures that supported the operation of the canal were recently restored.

A trail leads to Goat Hill Lock in Northbridge, where one can see the components of a relatively intact canal lock. At Plummer's Landing in Northbridge, the archaeological remains of a landing basin and trading house are visible, along with portions of a canal lock. The best-preserved lock on the Blackstone Canal is located in the town of Millville and is owned by the MA DCR.

The River Bend Farm Visitor Center is located within the heritage state park in a rehabilitated barn at the former Voss Farm and is the southernmost visitor facility in the Massachusetts portion of the Corridor. The visitor center houses an exhibit on early settlement and agriculture and provides information about trails, picnic areas, canoe launches and other programs available at the park and throughout the Blackstone Valley. The Commission provided funding and technical assistance in the development of the visitor center and continues to offer visitor programs.

Worcester Blackstone Visitor Center, Worcester, MA

Originally intended to be located in part of the former Washburn-Moen wire factory in the Quinsigamond section of Worcester, the Worcester Blackstone Visitor Center was under development when the effort was interrupted by a catastrophic fire in March 2010 that destroyed the most historic portion of the building. It was being developed in partnership with the Worcester Historical Museum (which planned to move its offices and exhibits there), the Worcester County Convention and Visitors Bureau, and the City of Worcester. The site is located near Route 146, Interstate 290, and the Massachusetts Turnpike, as well as the Blackstone River Bikeway. The facility would have served as the northern gateway to the Corridor. The building has been condemned and will be razed. Planning continues for a Worcester visitor center, either at the original site or in another location.

Natural Resources

Much of the biological information cited below was developed by others for the Blackstone River watershed or basin, which does not precisely correspond with the boundaries of the study area. The resource base of the watershed provides an adequate overview of what one may expect to find within the Corridor boundary for the purpose of this evaluation.

Geological resources

Topography

The Blackstone River Basin is located within two major physiographic regions, the New England Upland Region and the Narragansett Basin. Topography ranges from the low hills and plains of less than 200 feet above sea level in the Narragansett Basin (located in the southern portion of the Blackstone River Basin) to elevations ranging from 300 to over 1,000 feet above sea level in the New England Region (located in the northern portion of the Blackstone River Basin).

Soils

The soil profile in the Blackstone Valley is typically fine deposits (flood plains only) underlain by glacial outwash or till, and bedrock. The fine deposits are a loose mixture

of clay, silt, and sand that may or may not be sorted. The outwash and till are dense heterogeneous mixtures of clay, silt, sand, gravel, cobbles, and boulders.

Prime farmland

Prime farmland is determined by soils that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and are also available for these uses.[41] According to the USDA Natural Resource Conservation Service (NRCS), there are approximately 51,000 acres of prime farmland within the Corridor boundary – 36,000 acres in Massachusetts and 15,000 acres in Rhode Island. Nearly 30,000 additional acres within the corridor are identified as Farmland of State-wide Importance, defined as lands that fail to meet one or more of the requirements of prime farmland, but are important for the production of food, feed, fiber, or forage crops.[42]

Water resources

The hydrological source of the Blackstone River is located at an elevation of 1,300 feet on the slopes of Asnebumskit Hill near Holden, Massachusetts, from which it travels south into Rhode Island and eventually empties into Narragansett Bay. The headwaters of the river – wetlands and brooks feeding into the river stream – are found throughout the city of Worcester and beyond, many of them now buried into culverts. The Blackstone River is joined by four major rivers, in addition to many smaller tributaries. Along its way the river drops a total of 430 vertical feet and passes through the second and third largest population centers in New England – Worcester, Massachusetts and Providence, Rhode Island, respectively. The Blackstone River drainage system is one of the seven major river systems in the Northeast. The watershed supports over 1,300 acres of ponds, lakes, and reservoirs.

A number of large wetlands areas are present in the Blackstone River Basin. Most consist of forested wetland and scrub-shrub wetlands systems dominated by red maple. Wetlands with extensive emergent marsh or wet meadow are rare. The most extensive emergent marsh system is the Valley Falls (Lonsdale) Marshes on the Blackstone River in Lincoln and Central Falls, Rhode Island. Diverse emergent marsh/ wet meadow systems have also developed on the Blackstone at the Rice City, Fisherville, and Manville Dam impoundments, and at the Lackey Dam impoundment on the Mumford River.

Biological resources

Vegetation

In forested areas, commonly occurring species include red maple and white pine; white cedar and black spruce are also evident. Common understory species include high bush blueberry, arrowwood, common elder, swamp azalea, skunk cabbage, and cinnamon fern. In scrub/ shrub areas, common species include speckled alder, willows, sweet pepperbush, high bush blueberry, dogwoods, arrowwood, skunk cabbage, and cinnamon fern. In emergent wetland areas, common species include cattail, purple loosestrife, woolgrass, soft rush, pickerelweek, smartweeds (*Polygonum* spp.), reed canary grass, phragmites, other aquatic grasses, sedges, rushes, bulrush, spikerush, and burreed. In open water, pondweeds (*Potamageton* spp.), water-shield, water lilies, and wild celery are common native species. The aquatic weed Eurasian water milfoil is common in eutrophic ponds, lakes, and impoundments.

Riparian habitat in the Blackstone River basin is primarily wooded. Forested riparian areas are typically dominated by red maple. White pine and oak are common in drier locations. Common species in scrub-shrub riparian habitat include alder, dogwoods, willows, and buttonbush.

Undeveloped upland (non-wetland) habitat in the Blackstone River basin is primarily forested. The basin lies in the Central Hardwoods-Hemlock-White Pine forest region. This region is a mixture of species common to more northerly or southerly areas. Until it was wiped out by the Chestnut blight late in the 19th century, American chestnut was the dominant tree. Currently the major species include red, black and white oaks; hickories; gray, yellow, and black birches; and maple, with red maple occurring at wetter sites. White pine and hemlock are the dominant evergreens.

Old fields and other open land are typically colonized by shrub species such as staghorn sumac, gray birch, and white pine saplings. Although some pasture is present, grassland habitat that is not grazed or regularly mowed is very rare.

Wildlife

The Blackstone watershed provides habitat for hundreds of wildlife species. A few such as striped skunk, coyote,

41 United States Department of Agriculture, Natural Resources Conservation Service.
42 Ibid.

cowbird, and blue jay, have thrived under human occupation. Many of the remaining species, however, have undoubtedly declined in population and range. Some species such as the spotted turtle and eastern box turtle may be in serious decline and in danger of being extirpated from their remaining habitat in the basin.

Many of the basin's mammals, amphibians, reptiles, and birds strongly depend on wetland or riparian habitat. Among the more common large mammals in the basin are white-tailed deer, raccoon, striped skunk, Virginia opossum, eastern cottontail, gray squirrel, red fox, coyote, and woodchuck. Species with an even greater territory occasionally noted in the basin include fisher, moose, and black bear.

Common amphibians include redback salamander, red-backed newt, eastern American toad, gray treefrog, northern spring peeper, green frog, and wood frog. Populations of many amphibians are in decline in the United States, but their status in the Blackstone Valley is unknown. Common reptiles include snapping turtle, painted turtle, and eastern garter snakes.

Waterfowl habitat provided by the Blackstone basin is nationally significant, since the area has been identified as an important flyway for migratory waterfowl by the North American Waterfowl Management Plan, overseen by U.S. Fish & Wildlife Service (USFWS). The principal nesting species are mallard, wood duck, and Canada goose. Black duck also breeds in the basin, but nesting populations have declined significantly during the last several decades, as is the case elsewhere in the northeast. Migrants include mallard, wood duck, Canada goose, black duck, mallard and black duck hybrids, green-winged teal, blue-winged teal, pintail, American widgeon, common and hooded mergansers, bufflehead, scaup, common goldeneye, grebes, ring-necked duck, and American coot.

The mainstem Blackstone and its major tributaries presently support an improving recreational warm-water fishery throughout the basin and a put-and-take stocked trout fishery in selected portions, e.g., the lower Blackstone River. Wild brook and brown trout exist only in the upper reaches of the basin, where suitable coldwater fish habitat and high dissolved oxygen levels persist.

The dominance of the current fish population by more pollution-tolerant species (e.g., white sucker, golden shiner, and carp) indicates that the Blackstone River system is still somewhat degraded by a combination of water and/or sediment quality. However, the presence in good numbers of less tolerant species (largemouth bass, yellow perch, and blue gill) demonstrates strong potential for the development of a more balanced fish community as habitat continues to improve.

Special Status Species

The Massachusetts and Rhode Island Natural Heritage programs have identified numerous sites in the Blackstone River basin that are known or thought to provide habitat for rare or protected plants and animals. With the exception of transient peregrine falcons, no federally listed species occur in the study area.

Socioeconomic Environment

Land Area

The study area coincides with the existing boundary of the John H. Chafee Blackstone River Valley National Heritage Corridor and encompasses 550 square miles (approximately 400,000 acres) in all or part of 24 communities located in south-central Massachusetts and northern Rhode Island.

Land Use Types and Trends

Cities such as Worcester, Massachusetts and Providence, Woonsocket, Cumberland, Lincoln, Central Falls, and Pawtucket, Rhode Island are primarily urban in nature, containing high levels of dense development. Many of the towns along the river are more suburban in nature, with relatively sparse residential development and areas of open space. Many have small town centers or villages characteristic of the mill villages established during the early industrial period.

In Massachusetts, the Central Massachusetts Regional Planning Commission (CMRPC) has developed a 2020 Smart Growth Strategy for Central Massachusetts. Its analysis defines the Massachusetts portion of the Blackstone Valley as encompassing the central (Worcester) and southeast subregions (Blackstone Valley) of its central Massachusetts planning region. Based on CMRPC's analysis of land use change, the southeast subregion lost roughly 2,500 acres (21 percent) of its farmland between 1985 and 1999. The area also lost approximately 7.3 percent of its forested lands. During this same period in central Massachusetts, the communities in the Blackstone Valley saw the largest increase of land used for new residential development in its history, with a nearly 44-percent increase in land devoted to

this use and a nearly 19-percent increase in land converted to commercial development. CMRPC has identified this area as focal point of significant growth and development in central Massachusetts.

In Worcester, what little farmland remained in 1985 had declined by 50 percent by 1999; forested areas declined by just under 12 percent. During the same period, commercial, residential, and industrial land use expanded by approximately 6, 7, and 10 percent, respectively.

As of 1999, about 19,200 acres of land were permanently protected from development in the Massachusetts communities within the Blackstone Valley (Source: CMRPC). According to a recent analysis completed by Massachusetts Audubon in its "Losing Ground" series, nearly 1,700 additional acres of land were protected between 1999 and 2005. In contrast, during the same time period, Massachusetts communities within the Blackstone Valley lost over 2,800 acres of open space to development. As of the end of 2010, about 22,600 acres of land were permanently protected from development in the Corridor's Rhode Island communities (Source: RI DEM).

Population & Trends

Based on projections made by the U.S. Census for 2009, the overall population of the Corridor is roughly 590,000. Because only a portion of the cities of East Providence and Providence are included within the Corridor boundary, their population figures were adjusted accordingly.[43] Given this adjustment, the distribution of population between the Massachusetts and Rhode Island segments of the Corridor is roughly even. If the total populations of East Providence and Providence are factored in, significantly more people reside in the Rhode Island segment of the Corridor.

According to the U.S. Census projection for 2009, Worcester, Massachusetts is the largest city in the region (estimated population of 182,000), followed closely by the city of Providence in Rhode Island.

The fastest-growing communities within the Corridor boundary are Douglas, Upton, and Mendon in Massachusetts, and Lincoln and Cumberland in Rhode Island. The population of these Massachusetts communities has grown by over 40 percent between 1990 and 2009, while Cumberland and Lincoln grew by about 20 percent during the same period. The cities of East Providence, Pawtucket, and Woonsocket were estimated to experience modest declines in population between 1990 and 2009 (less than 1 percent to just over 3.5 percent).

According to demographic projections prepared by the CMRPC, the Blackstone Valley is expected to be the fastest-growing area in central Massachusetts in terms of population over the next several decades.

The 1999 median household income in the Blackstone River Valley as calculated by town ranged from a low of approximately $23,000 to a high of $78,000. During the same period, per capita income ranged from $11,000 to $35,000. Valley-wide the average median household income was $55,000, and the average per capita income was $23,000.

The percentage of families in each town living below the poverty line ranged from a low of 1.8 percent to a high of nearly 26 percent. The high concentrations of families living under these economic conditions occur in the region's cities, predominantly located in the southern portion of the Corridor.

Based on the findings of the 2000 U.S. Census, there are approximately 284,000 housing units in the Blackstone River Valley. At that time the average median house value on a per-community basis was estimated at $145,000. About half the housing units were owner-occupied with the remaining half being rental units. The average contract rent at the time was about $560. Median housing values and contract rents fluctuated a great deal among individual communities, from a low of $ 88,000 to a high of $240,000 and a contract rent range of $460 - $700.

Statistics related to median housing values for 2008 in Rhode Island and for 2009 in Massachusetts reveal a significant rise in housing values. In Rhode Island communities, median housing values for 2008 ranged from $142,000 to $290,000. In Massachusetts communities, the 2009 median housing values ranged from $294,000 to $395,000.

Unemployment Rate

According to the U.S. Bureau of Labor Statistics – August 2010, the unemployment rate hovered around 8.8 percent of the civilian labor force in Massachusetts and around 11.8 percent in Rhode Island. The unemployment rates for Worcester and Providence counties were slightly higher than their respective state rates during the same period. At that time, the unemployment for Worcester County in Massachusetts was 9.4 percent and in Providence County, Rhode Island it was 12.8 percent.

43 For purposes of calculating the population within the BRVNHC, it was assumed that 10 percent of East Providence's population and 20 percent of Providence's population would be accounted for in this analysis.

Economic Sectors

The nature of the economies and employment in the different cities and towns along the Blackstone River varies. Providence and Worcester are large cities and have major employment bases. Many of the small towns in the Corridor serve as suburbs of Worcester and Providence, and to a lesser extent, distant suburbs of Boston. Worcester is by far the most intensively urbanized and developed area on the Massachusetts end of the Corridor. Providence, like the smaller Rhode Island cities of Woonsocket, Central Falls, and Pawtucket, possesses areas of both urban and suburban development, and a significant number and variety of employers.

Valley-wide, the actual number of jobs remained relatively stable between 2002 and 2007, but began to show signs of decline due to the recession in 2008. In Rhode Island, outside of Providence, the principle employment sectors included manufacturing, health care, and retail. The manufacturing sector showed a marked decline between 2002 and 2008 with a loss of approximately 11,000 jobs. As manufacturing declined, other sectors outside Providence made modest gains, including construction, finance and insurance, health care, and food and lodging. In Providence, the dominant employment sectors are health care, public administration, and education.

In Massachusetts, outside of Worcester, the principal employment sectors included manufacturing, retail, health care, and construction. As was the case in Rhode Island, manufacturing in the Corridor's Massachusetts communities declined between 2002 and 2008, though not as steeply, losing about 150 jobs. The manufacturing sector in the Blackstone River Valley in Massachusetts is considerably smaller than that sector in northern Rhode Island. Sectors making modest gains during this time included retail, health care, educational services, arts, entertainment and recreation, and food and lodging. In Worcester, the primary employment sectors were health care and education, followed by manufacturing and retail trade.