

DIRT IN THE CITY: URBAN ENVIRONMENTAL HISTORY IN THE MID-ATLANTIC

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The American Mid-Atlantic has no Yosemite National Park, no Walden Pond, no vast prairie or Great Salt Lake. Its mountains are comparatively small; its waterways are tamed; its forests cut over; its farmland mixed among suburban tracts. Environmental historians of the United States have often looked to more dramatic, more romantic, more seemingly pristine regions for their work—even as that work demonstrates the ways in which such places are not as “natural” as they seem. But those historians who look for nature in the city have long been drawn to the Mid-Atlantic for the very reasons others look away. Urban environmental historians have rich material in the landscapes of Harrisburg, Philadelphia, Pittsburgh, New York City, Baltimore, and Washington, DC—both within the cities’ formal boundaries and in their relationships with environments beyond. The region’s intense intertwining of the urban, suburban, industrial, rural, and seemingly wild has meant that connections obscured elsewhere are inescapable there.

Popular and scholarly narratives of Mid-Atlantic cities have long been infused with nature. Histories of the region’s parks,

forests, and waterways have been consistently tied to urban space, while social reformers have been pointing to connections between its urban and rural environments for over a hundred years. Even before urban environmental history came into its own as a field in the early 1990s—led by Joel Tarr and Martin Melosi—historians of Mid-Atlantic spaces and places wrote of rivers, parkland, woods, farms, and city centers as locales where natural and built environments shaped one another. While western landscapes nurtured early waves of much American environmental history, the landscapes of the East—and of the Mid-Atlantic in particular—first brought the nature of cities sharply into focus.¹

Carl Bridenbaugh's 1938 work *Cities in the Wilderness: Urban Life in America, 1625–1742* gets to the connections right in his title. He writes of cities along the entire East Coast, but both Philadelphia and New York framed key issues in significant ways: waterways as trade routes and water sources; trees for shade, beautification, and timber; horses as tools for transportation and sources of trouble; and sewage as a nuisance and a challenge. These were all themes that environmental historians would later explore in greater detail.² Nelson Blake's 1956 *Water for the Cities*, for example, is a history of technology and politics that demonstrates the complexities of urban dependence on hard-to-harness natural resources. His story begins, as it must, in Philadelphia, where the nation's first municipal waterworks was constructed in 1801, and he connects histories of urban fire, disease, property and power all to the history of water. Later histories of urban water politics, such as Sara Elkind's 1998 *Bay Cities and Water Politics: The Battle for Resources in Boston and Oakland*, brought the insights of environmental history to bear on these earlier works, highlighting the agency of nature within political and technological narratives.³

In *Making Mountains: New York City and the Catskills* (2010), David Stradling returns the focus to the Mid-Atlantic as he takes the next step, arguing that the Catskills and New York City are part of a single landscape, dependent on and created by one another, with water a primary connector between city and countryside. His work argues explicitly that New York City was deeply embedded in natural systems, just as the city's technologies and demands shaped landscapes far away. The upstate mountains were reshaped by New York City residents' demands for both recreation and water, and the city survived on water coming down from the hills.⁴



FIGURE 1: This 1949 photograph taken in Westchester County, NY, shows a stone wall surrounding former agricultural fields. Before drought recreated this vista, it had been under water since being flooded in 1842 to create Croton Reservoir, part of the New York City water supply system. The microfiche caption to the photo reports that “heavy over-use of water and rainfall deficiency have combined so that for the first time in 107 years the bottom of the reservoir can be seen. Amount of sediment is almost negligible, a remarkable tribute to the effectiveness of forested lands in preventing siltation of reservoirs.” (U.S. Forest Service Region 9 photograph R9_458213, courtesy of the Forest History Society.)

Likewise, Elizabeth Blackmar’s and Roy Rosenzweig’s 1992 *The Park and the People* is a social and political history that reveals the labor and machinations behind the creation of New York City’s Central Park. Their work remains a touchstone for scholars who write and teach about the careful construction of seemingly natural spaces. Central Park is no vestige of a once-wild Manhattan, but a landscaped, pastoral creation of the mid-nineteenth century that required the eviction of roughly 1,600 poor people, including the African-American residents of Seneca Village, whose churches and school were demolished to make way for the park. Rosenzweig and Blackmar’s

brilliant, detailed history of a seemingly natural yet entirely constructed oasis of green in a decidedly urban place pointed the way to later work on urban, rural, and even wilderness parks in both the Mid-Atlantic and the West. Among the most important such works are Louis Warren's *The Hunters Game* (1997), Mark Spence's *Dispossessing the Wilderness* (1999), and Karl Jacoby's *Crimes Against Nature* (2001), all of which illuminate the ways in which "protecting" nature has often meant taking property and rights away from people with little political or economic power.⁵

Kenneth T. Jackson's 1985 *Crabgrass Frontier: The Suburbanization of the United States* also puts the manipulation of nature within its crucial political and economic contexts. Although Jackson did not write *Crabgrass* as an urban environmental history per se, its careful explication of the policy choices that created U.S. suburban landscapes make it a classic of the field. His story is a national one, but its center and heart are in New York, with many side trips to Philadelphia. In paying close attention to the social, cultural, and financial underpinnings of American land-use choices, Jackson provided the foundation for later studies such as Adam Rome's 2001 *Bulldozer in the Countryside* and Christopher Sellers's 2012 *Crabgrass Crucible: Suburban Nature and the Rise of Environmentalism in Twentieth-Century America*, both of which explicitly take on the environmental consequences of suburbanization and their relationship to the modern environmental movement.⁶

The environmental history of urban infrastructure also finds important roots in the Mid-Atlantic, once again with a work not written explicitly as such. Sam Bass Warner's 1968 *The Private City: Philadelphia in Three Periods of Its Growth* suggested ways that the physical shape of a city and its constituent physical parts affect the lives that are lived there. Works like Matthew Gandy's *Concrete and Clay: Reworking Nature in New York City* (2003) and Zachary Schrag's *The Great Society Subway: A History of the Washington Metro* (2006) focus in even more detail on the anatomy of the cities they analyze. Like Max Page's *The Creative Destruction of Manhattan* (2001), they show just how much can be read from the aging, decaying, and reconstructing of the built environments of Mid-Atlantic cities, as well as the nature within and around them. It is in part the age and constant rebuilding of the region's cities that provide urban environmental historians with such rich material.⁷

Histories of health and disease are closely tied to these histories of infrastructure, as transportation networks, water-supply systems, and sewer construction all shaped the paths by which disease was spread and controlled. In his 1962 book *The Cholera Years*, for example, Charles Rosenberg argued

that changing social, political, and intellectual understandings of cholera epidemics in the nineteenth century led to different strategies of dealing with both the disease and the people who contracted it, with the public management of New York City's water supply again being key. As with so many other early works on nature in Mid-Atlantic cities, Rosenberg's book was not written as an urban environmental history, but it laid the groundwork for later studies of environmental justice and health. Julie Sze's *Noxious New York: The Racial Politics of Urban Health and Environmental Justice* (2006), for example, and Gregg Mitman's *Breathing Space: How Allergies Shape Our Lives and Landscapes* (2007) both follow Rosenberg in highlighting the social construction of health, disease, and social responses to crises. But where Rosenberg sees technological and bureaucratic innovations solving the health crisis he studies, both Sze and Mitman focus on ways in which technology and bureaucracies created environmental inequities and unequal access to healthy places to live. Sze pays particular attention to inequitable exposures to environmental risks within the city, and Mitman focuses on the ways that defining a crisis can limit what are seen as solutions. Mitman in particular is eloquent in demonstrating that health, housing, economic, industrial, and environmental policies do not function independently, but are always intertwined. He shows that considering the various threads in concert is critical to creating environments that can be both healthy and just.⁸

When thousands of humans live closely together in dense settlements, the challenges of access to sufficient food, safe water, and clean air demonstrate just how inescapable nature is, no matter how constructed an environment might seem. And those inescapable connections so visible in the Mid-Atlantic were early fodder for the scholars to whom urban environmental historians owe their largest debts for self-consciously and intentionally crafting the field: Joel Tarr and Martin Melosi. The seminal essays in Melosi's 1980 edited volume *Pollution and Reform in American Cities* and his 1981 monograph *Garbage in the Cities: Refuse, Reform, and the Environment, 1880–1980*, along with Tarr's many foundational articles on urban pollution, culminating in his masterful 1997 volume *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective*, all highlight the challenges facing cities such as Philadelphia, Pittsburgh, and New York. Together, those works paved the way both for future urban environmental historians and also for Tarr and Melosi's continued leadership of the field. Melosi's *The Sanitary City* (2000) and Tarr's 2004 edited volume *Devastation and Renewal: An Environmental History of Pittsburgh and Its Region* show how those early questions about waste and infrastructure

reveal how deeply and broadly cities and their residents are tangled with both local and distant environmental networks. In 2007 Clay McShane joined Tarr in making the “nature” of the region’s urban infrastructure even clearer in *The Horse in the City: Living Machines in the Nineteenth Century*. In McShane and Tarr’s telling, horses are technology, transportation, tools, animals, consumers of resources, and producers of waste; to understand the urban horse is to grasp how tangled nature and artifice must be.⁹

These inescapable connections between Mid-Atlantic cities and nature—in the form of resources, landscapes, and technologies—influence those writing urban environmental histories of the Mid-Atlantic today. David Stradling’s work on New York City and the Catskills, Geoffrey Buckley’s recent book on forestry in Maryland, *America’s Conservation Impulse* (2010), Susan Rimby’s forthcoming biography of Pennsylvania City Beautiful activist and forest advocate Mira Dock, Brian Black and Michael Chiarappa’s forthcoming edited volume on the environmental history of Philadelphia, the essays in Tarr’s Pittsburgh volume *Devastation and Renewal*, and my own *Nature Next Door: Cities and Trees in the American Northeast* (2012) all build on decades of work by urban environmental historians of the Mid-Atlantic who have shown us the nature of cities, the construction of wild places, and the ways they shape each other.¹⁰

Historians have come to understand what residents of the Mid-Atlantic have long known. Here, even forest history cannot be written without attention to urban space. The experiences of forest advocate and urban reformer Mira Dock, for example, illustrate just how clearly some observers grasped the permeability of human-built and seemingly wild spaces in the region over a century ago. Dock, a Harrisburg resident who had studied botany at the University of Michigan, was in her mid-forties when she began traveling throughout Pennsylvania in the 1890s to speak on behalf of trees. Through her entertaining and lively lectures, which she punctuated with glass lantern slides of both beautiful and devastated spaces, Dock worked tirelessly to convince her listeners that their wealth, health, and future depended on the woods. She explained that trees were Pennsylvania’s most critical resource, and that safeguarding remaining woods and replanting bare hills and fields were essential to protect wood, water, and soil, as well as the health and welfare of the region’s residents, both within cities and outside.¹¹

Dock’s passion for trees had less to do with love of nature, she claimed, than with love of people. She explained that her intense interest in forestry had arisen from seeing a colony of woodcutters thrown out of work after a

forest fire, and since then she had learned how crucial forested lands were to protecting the health and viability of communities throughout the state. People and trees, in Dock's experience, depended on one another, particularly when it came to water supplies. Forests were crucial for maintaining stable watersheds, and the trees were disappearing.¹²

When she first started out, Dock most frequently spoke to audiences of women, and she framed her comments in language that would appeal specifically to them. Her rhetoric seems familiar at first: like many men and women in the closing years of the nineteenth century, Dock believed fervently that cleaner, more organized, more beautiful cities would be healthier, safer places to live. She was an enthusiastic participant in the turn-of-the-century City Beautiful movement and, like many of her contemporaries, she drew on women's socially acknowledged authority over order and cleanliness at home to claim the broader political role of seeing to the health, safety, and comfort of the city as well.¹³

The women's clubs and civic associations that invited Dock to speak wanted to hear her ideas on "Village Improvement," and "How to Make a Town or City More Beautiful." She gave them what they were looking for, speaking in fervent support of creating parks, planting shade trees, and improving garbage collection. Trees, she argued, made a city more livable and lovely, and beauty brought with it physical, mental, moral, and financial benefits. Women, she told her audiences, had a particular obligation to beautify their towns: "Poor Uncle Sam has no wife but Columbia, who stands on a pedestal with long clothes draped about her and looks down on us all," she complained. "What he needs is a real 'Aunt Sam' who will see to the housekeeping." Yet Dock's "Aunt Sam" would not be content with tidying street corners and planting shrubs. As a trained scientist who was rapidly becoming a recognized expert on forests, she wanted to foster in both women and men an understanding of cities' dependence on trees beyond downtown.¹⁴

In the 1890s and early 1900s, Dock and women and men like her pressed their contemporaries to think more seriously and in more sophisticated ways about the importance of forests, which were fast disappearing when they were not already gone. To win public support for reforestation efforts, activists like Dock drew on aesthetic and romantic ideas about the value of trees, but they drove their points home with a forceful scientific claim: a region without forests would be a region without water. Cities were dependent on forests to slake their thirst.

Pennsylvania is forested today because a century ago experts like Dock and their receptive audiences in cities and towns throughout the state demanded that the trees be brought back. At the end of the nineteenth century, after decades of timber-harvesting and of land-clearing for both agriculture and industry, less than 40 percent of Pennsylvania was forested. The citizenry worried that in a few decades even those trees would be gone, leaving the state bereft not only of lumber, fuel, and the income of the lucrative timber industry, but of potable water as well. Forests, city residents were coming to believe and fear, meant less siltation in streams, better buffers against water pollution, and more water held in soils to fend off both flood and drought. But the trees were almost gone.¹⁵

Over a century ago, at the urging of urban residents who feared for their water supplies, the Pennsylvania State Legislature created a forest commission and charged it with studying the watersheds of the state to determine how they might best be protected.¹⁶ Shortly after the commission was established, it was given authority and funds to begin purchasing land, which the legislature specified would “become part of a forestry reservation system, having in view the preservation of the water supply at the sources of the rivers of the State, and for the protection of the people of the Commonwealth and their property from destructive floods.”¹⁷ Mira Dock became one of the commission’s first members and traveled extensively throughout the state on speaking engagements and forest commission business. Just as she advocated for the protection of Harrisburg’s watershed, she was concerned about the watersheds of Philadelphia and Pittsburgh, and spoke forcefully about the ramifications that actions throughout the state’s watersheds had for people downstream, pushing to create an expanded role for both the state and the federal government in managing the watersheds of major rivers.¹⁸

By 1904 the state had acquired over a half-million acres of forest reserve land, most of it cobbled together from parcels that had been abandoned by previous owners, many of whom had first stripped the land of trees. Rebuilding the forests would take years, but Mira Dock was soon admonishing other states and the federal government to emulate Pennsylvania’s success in forest and watershed management. In a 1908 letter to Thomas Will, Secretary of the American Forestry Association, Dock touted the “remarkable work” being done by Pennsylvania state agencies in protecting the resources of both the state and the nation. Indeed, she wrote, the only waters of the nation’s capital’s major river, the Potomac, that were in any degree protected were “within the boundaries of Pennsylvania, where in fact they [were]

triply protected by the State Forest, Water, and Health Departments.” The national organization should, she argued, learn from Pennsylvania’s actions and devote more space in its publication *Forestry and Irrigation* to the state’s dramatic success.¹⁹ By 1914 the state controlled over one million acres, and by the end of the twentieth century there were over two million acres of state forest reserves, and another half million acres of forests in state parks and game lands.²⁰

The campaigns of Dock and her allies were successful: at the end of the twentieth century, far from being faced with a timber famine, almost two-thirds of the state was covered in trees. Large portions of the new forests are on state-owned land, and many more acres are privately owned parcels that have been planted with trees from state nurseries. These new forests are artifacts of twentieth-century urban growth and are tangible evidence of the power and influence that city residents wielded over landscapes far from their homes.²¹ All of this means that over three million acres of new forests in Pennsylvania can be directly linked to efforts to secure drinking water for urban residents. In the twentieth century most cities—both in Pennsylvania and elsewhere—added water-treatment and filtration plants to their municipal supply systems, no longer depending on forests alone to protect the supply. Nevertheless, residents of over a hundred municipalities in Pennsylvania depend in part on state forests to protect the water they drink.²²

Activists concerned with watersheds were also the moving force behind the creation of the half-million acre Allegheny National Forest in 1923. Both the Pennsylvania Water Supply Commission and the Pennsylvania Forest Commission voiced strong support for the creation of the national forest to protect the Allegheny River. The Weeks Act of 1911, which authorized acquisition of lands for national forests in the East, drew its authority from the federal government’s jurisdiction over navigable waterways. As is so often the case, the power to regulate interstate commerce provided a constitutional justification for other powers not explicitly granted in the Constitution. Before the passing of the Weeks Act, there had been no mechanism by which the federal government could acquire land to create a national forest in the East. The connection between water and forests, however, provided the route. Rivers needed forests, and cities needed rivers, and rivers carried trade goods across state lines: the federal government could be involved, and the Allegheny National Forest is one of the legacies.²³

In this region, built and rebuilt by so many generations of residents and such shifting economies, urban environments have long been visibly complex

and tangibly intertwined with distant places. City dwellers are dependent on “natural” resources and landscapes, both inside their own boundaries and within their growing reach. Reservoirs, forests, buildings, roads, railways, animals, and the city residents who have shaped and been shaped by them all, are each integral components of the region’s ecological systems. Parks, forests, reservoir shores, and protected riverbanks are not just wild areas or bucolic picnic spots. They are part of a layered regional landscape in which cities cannot be disentangled from their water and woods. Elsewhere in the United States, it has been more plausible to imagine cities, farms, and wild places as distinct, but residents and historians alike have long understood Mid-Atlantic cities as both containing and being embedded in nature. Urban environmental historians are teaching us that protecting natural systems and building better cities are part of the same project, but there is still much work to be done—both by historians and by those actively involved in shaping policy. The Mid-Atlantic offers the richest workshop for both.

NOTES

1. See, for example, Martin V. Melosi, “The Place of the City in Environmental History,” *Environmental History Review*, 17, no. 1 (Spring 1993): 1–23; *Environmental History Review* 18, no. 1 (Spring 1994), Special Issue on Technology, Pollution, and the Environment by Joel A. Tarr and Jeffrey K. Stine; *Journal of Urban History* 20, no. 3 (May 1994): Special Issue Devoted to the Environment and the City by Christine Rosen and Joel A. Tarr.
2. Carl Bridenbaugh, *Cities in the Wilderness: Urban Life in America, 1625–1742* (New York: Ronald Press, 1938).
3. Nelson Manfred Blake, *Water for the Cities: A History of the Urban Water Supply Problem in the United States* (Syracuse, NY: Syracuse University Press, 1956); Sarah S. Elkind, *Bay Cities and Water Politics: The Battle for Resources in Boston and Oakland* (Lawrence: University of Kansas Press, 1998).
4. David Stradling, *Making Mountains: New York City and the Catskills* (Seattle: University of Washington Press, 2010).
5. Roy Rosenzweig and Elizabeth Blackmar, *The Park and the People: A History of Central Park* (Ithaca, NY: Cornell University Press, 1992); Louis S. Warren, *The Hunter’s Game: Poachers and Conservationists in Twentieth-Century America* (New Haven, CT: Yale University Press, 1997); Karl Jacoby, *Crimes Against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley: University of California Press, 2001); Mark David Spence, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks* (New York: Oxford University Press, 1999).
6. Kenneth T. Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press, 1985); Adam Rome, *The Bulldozer in the Countryside: Suburban Sprawl and the Rise*

- of *American Environmentalism* (New York: Cambridge University Press, 2001); Christopher Sellers, *Crabgrass Crucible: Suburban Nature and the Rise of Environmentalism in Twentieth-Century America* (Chapel Hill: University of North Carolina Press, 2012).
7. Sam Bass Warner, *The Private City: Philadelphia in Three Periods of its Growth* (Philadelphia: University of Pennsylvania Press, 1968); Matthew Gandy, *Concrete and Clay: Reworking Nature in New York City* (Cambridge, MA: MIT Press, 2003); Zachary M. Schrag, *The Great Society Subway: A History of the Washington Metro* (Baltimore: Johns Hopkins University Press, 2006); Max Page, *The Creative Destruction of Manhattan, 1900–1940* (Chicago: University of Chicago Press, 2001).
 8. Charles E. Rosenberg, *The Cholera Years: The United States in 1832, 1849, and 1866* (Chicago: University of Chicago Press, 1962); Julie Sze, *Noxious New York: The Racial Politics of Urban Health and Environmental Justice* (Cambridge, MA: MIT Press, 2006); Gregg Mitman, *Breathing Space: How Allergies Shape Our Lives and Landscapes* (New Haven, CT: Yale University Press, 2007).
 9. Martin V. Melosi, *Pollution and Reform in American Cities, 1870–1930* (Austin: University of Texas Press, 1980); Melosi, *Garbage in the Cities: Refuse, Reform, and the Environment, 1880–1980* (College Station: Texas A&M University Press, 1981); Joel A. Tarr, *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective* (Akron, OH: University of Akron Press, 1996); Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore: Johns Hopkins University Press, 2000); Tarr, *Devastation and Renewal: An Environmental History of Pittsburgh and Its Region* (Pittsburgh, PA: University of Pittsburgh Press, 2004).
 10. Stradling, *Making Mountains*; Geoffrey Buckley, *America's Conservation Impulse: A Century of Saving Trees in the Old Line State* (Chicago: Center for American Places at Columbia College, 2010); Susan Rimby, *Mira Lloyd Dock and Progressive Era Conservation* (University Park: Pennsylvania State University Press, forthcoming 2012); Brian Black and Michael Chiarappa, eds., *Nature's Entrepot: Philadelphia's Urban Sphere and its Environmental Thresholds* (Pittsburgh, PA: University of Pittsburgh Press, 2012); Tarr, ed., *Devastation and Renewal*; and Ellen Stroud, *Nature Next Door: Cities and Trees in the American Northeast* (Seattle: University of Washington Press, 2012).
 11. "To Protect Forests," *Baltimore News*, January 21, 1903, clipping in Box 4, Folder 34, Mira Dock Collection (Manuscript Group 43), Pennsylvania State Archives, hereafter referred to as MDC. See also *Nature Next Door*, 40–48, in which I also discuss Dock's role as an advocate for both forests and cities.
 12. "An Evening of Entertainment: Miss Dock Addressed the Clio Club," *Williamsport, Pa. Gazette*, April 28, 1899, clipping Box 4, Folder 34, MDC.
 13. See Susan Rimby, "'Better Housekeeping Out of Doors': Mira Lloyd Dock, the State Federation of Pennsylvania Women, and Progressive Era Conservation," *Journal of Women's History* 17, no. 3 (2005): 9–34.
 14. Unidentified newspaper clipping from Richmond, Virginia, March 20, 1898; "Village Improvement: Beautiful Surroundings Help to Make Beautiful Minds," *Evening Star* (Ridgeway, PA), February 21, 1899, 1; "Town Improvements: Miss Dock's Lecture, Giving Valuable Hints," *Wilkes-Barre Record* (Wilkes-Barre, PA), April 18, 901; all clippings in Box 4, Folder 34, MDC.
 15. *Annual Report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania for the Year Ending November 30, 1904* (Harrisburg: Wm. Stanley Ray, State Printer of Pennsylvania, 1905), B326–B327.

16. *Pennsylvania Laws* 1893, page 115, No. 68; *Report of the Water Supply Commission, 1905–1906* (Harrisburg, PA: Harrisburg Publishing Company, State Printer, 1907), 3, 4, 10, 11.
17. *Pennsylvania Laws* 1897, page 11, No. 10.
18. “To Protect Forests,” *Baltimore News*, January 21, 1903; “Women and Their Interests: Chief Events of the Week in the Leading Clubs, Home Thoughts, Household Suggestions, and a Review of the Fashions: Women’s Club News,” *New York Evening Post*, February 10, 1906; “Pleads for Forests: Miss Lloyd Dock Lectures Before Arundell Club,” *Baltimore Sun*, January 22, 1903; all clippings in Box 4, Folder 34, MDC.
19. Mira Dock to Thomas Will, March 3, 1908, Box 5, Folder 51, MDC.
20. Tabular State Forest Acquisition List; Carol L. Alerich, *Forest Statistics for Pennsylvania, 1978 and 1989* (Radnor, PA: U.S. Department of Agriculture Forest Service Northeastern Forest Experiment Station, January 1993), table 146.
21. Alerich, *Forest Statistics for Pennsylvania*, table 146; Douglas W. MacCleery, *American Forests: A History of Resiliency and Recovery* (Durham, NC: U.S. Department of Agriculture Forest Service, with the Forest History Society, 1992; revised May 1993), 49–53. Paul Nussbaum, “A Lush Renewal for Pa. Forests,” *Philadelphia Inquirer*, August 16, 1998, A1.
22. R. Y. Stuart, Secretary, Pennsylvania Department of Forests and Waters, “The State Forests of Pennsylvania,” *Pennsylvania Department of Forests and Waters Bulletin* 37 (Harrisburg, PA, March 1925); *The Delaware State Forest Public Use Map* (Harrisburg: Commonwealth of Pennsylvania Department of Conservation and Natural Resources, 1998); Watershed management information in Pennsylvania Bureau of Forestry, “Forest Resource Plans, 1985–1999.” There are twenty volumes, one for each forest, located in the Pennsylvania Department of Natural Resources Library, Middletown, Pennsylvania.
23. Alerich, *Forest Statistics for Pennsylvania*, Table 146; William E. Shands, “The Lands Nobody Wanted: The Legacy of the Eastern National Forests,” in *The Origins of the National Forests*, ed. Harold K. Steen (Durham, NC: Forest History Society, 1992), 19, 29, 31; *Reports of the Water Supply Commission of Pennsylvania, 1921–22*, 13.