

# Pinelands National Reserve: An Intergovernmental Approach to Nature Preservation

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**ABSTRACT /** The Pinelands National Reserve was created in 1978 when private interests and federal, state, and local governments allied to protect 378,000 ha (935,000 acres) of New Jersey's Pine Barrens from encroaching development. An intergovernmental authority, the Pinelands Commission, manages the reserve by implementing a regional plan to guide development away from environmentally sensitive areas and

into designated growth centers. Through transferable development rights, financial gains from development in growth centers are used to compensate owners and localities in the reserve who might otherwise have developed their lands.

The national reserve strategy contrasts with other federal strategies for preserving unique environments in which the federal government exercises exclusive control (e.g., national parks, monuments, and recreation areas). This article describes the strategy applied in the Pinelands and discusses the conditions in which it may be more or less effective than other strategies used to protect unique or valued landscapes. It then compares the Pinelands model with the strategies and conditions of California's Redwood National Park and Point Reyes National Seashore to develop propositions about the circumstances in which one or another strategy is more likely to be viable. Finally, it applies these propositions to the possibilities for future forest preservation in New England.

The New Jersey Pine Barrens are a unique region of sandy soils, scrub oaks, and unusually stunted pygmy forests. Sphagnum moss bogs and majestic swamps of Atlantic white-cedar border its small streams. Rare and unusual plant and animal species thrive there, and an impressive number of plant species reach their northern or southernmost geographic limits in the region. The Pine Barrens are the largest forested region remaining in the Boston-Washington megalopolis and contain one of the last unspoiled major aquifer systems in the industrial northeast. Despite its location, they have escaped extensive development (Figure 1). In fact, much of the region's one-half million hectares (1.4 million acres) is accessible only on foot or by boat.

In the 1960s, however, the future of the Pine Barrens was increasingly uncertain. Urban sprawl from New York, Atlantic City, and Philadelphia slowly encroached upon its edges. But as proposals for retirement villages and "jetports in the pines" grew, so did attempts to save this large remnant of open space and its distinctive ecological and cultural qualities.

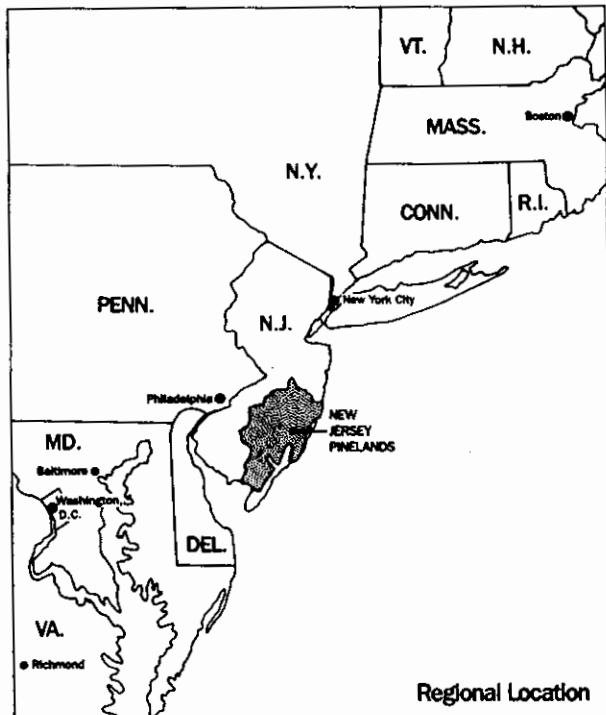
**KEY WORDS:** Comparative preservation strategies; Environmental planning; Land-use planning; Pinelands National Reserve; Point Reyes National Seashore; Redwood National Park

These forces culminated in 1978 with the establishment of the Pinelands National Reserve, an intergovernmental regional planning effort that protected 378,000 ha (935,000 acres) of the region. The Pinelands Reserve contains two zones, each with different kinds and intensities of allowed use: a relatively pristine core and a larger surrounding area of graded intensities of land uses. Land uses included in this second zone range from forestry and agricultural production to peripheral growth centers designed to concentrate development that otherwise would have penetrated and spread across the entire region.

Since the viability of the reserve depends upon the balance of intensities among zones relative to pressures for development on the area as a whole, the Pinelands model contained a number of novel features to ensure flexibility in land use, equity among the diverse interests in the reserve area, and sustained effectiveness in preserving the unique features of the region.

In contrast to more traditional protection efforts, the Pinelands model changed existing patterns of land ownership and governmental jurisdiction as little as possible. Regional preserves in the United States typically have transferred to public ownership lands that were or eventually could be in private hands and local jurisdictions; a federal agency then managed the lands in accordance with congressional mandates, which often formed contentious, ineffective, or costly islands.

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**Figure 1.** The New Jersey Pine Barrens. From *Protecting the New Jersey Pinelands: A New Direction in Land-Use Management*, by Beryl Robichaud Collins and Emily W. B. Russell. Copyright © 1988 by Rutgers, The State University. Used with permission of Rutgers University Press.

The Pinelands National Reserve was designed instead largely to maintain existing mixed ownership and jurisdictional patterns and to create incentives that encourage landowners and counties to comply with preservation objectives. Landowners in protected areas receive tradable development credits to compensate for their loss of land-use options; rising land values in growth centers thus compensate owners of limited-use lands. Local governments are compensated for lost tax opportunities through payments in lieu of taxes. Instead of changing ownership and jurisdictional patterns, the Pinelands model creates opportunities for trade that accomplish its ends without disservice to local interests and needs.

The Pinelands model, although creating a national preserve, placed minimal authority in the federal government. The reserve is managed by an intergovernmental authority, the Pinelands Commission, that reflects existing local, state, and federal jurisdictions (Batcher 1983). Federal authority is available to supplement or balance state and local interests and capacities if and when the national interest might so require. County compliance with the reserve's objectives has led

some observers to describe it as the most successful regional land-use planning effort in the United States (Collins and Russell 1988).

The Pinelands model sought to satisfy national interest largely through local motives and abilities. Interior Secretary Manuel Lujan called it a model for protecting other places in the United States (Pinelands Commission 1989a), but to what extent is the apparent success of the Pinelands Reserve due to the model or to the particular conditions in which it developed? In what circumstances is the model likely to be more or less viable than other strategies for preservation? This article seeks to answer these questions by comparing and contrasting the conditions in which the Pinelands Reserve evolved with those in which other preservation strategies have been applied in the United States.

### Early Settlement and Land Use in New Jersey's Pine Barrens

The first European settlers recognized the Pine Barrens' poor soils and limited resources and settled around the edge of the region, with little development within. Even today, after numerous attempts at agriculture, much of the region can commercially support only blueberry and cranberry production. As a result, the Pine Barrens averages fewer than 65 people per square kilometer (175 per square mile) while New Jersey's overall population density exceeds 375 (1000 per square mile) (Collins and Russell 1988).

The Pine Barrens were not entirely devoid of resources. The region's forests have supplied various wood products since before the American Revolution. Although the Pine Barrens' forests have been cut several times over, the region still supplies some 100–175 thousand cubic meters (30–50 thousand cords) of pine and oak pulpwood each year and supports at least 25 sawmills (Berger and Sinton 1985).

In the mid-1700s, the discovery of iron deposits in the region's swamps spawned numerous ironworks. The region's extensive forests provided a ready source of fuel, while coastal shell deposits served as flux in the smelting process; however, the Pineland's iron industry was relatively shortlived. By the mid-1850s, competition from higher-grade Pennsylvania ores and more efficient coal fuel forced the closure of New Jersey's ironworks (Pierce 1957).

Perhaps the most valuable and controversial resources in the Pine Barrens are the Kirkwood and Co-hansey aquifers, which are estimated to hold over 64 billion cubic meters (17 trillion gallons) of water (Forman 1979). In the 1880s, Philadelphia financier Joseph Wharton amassed nearly 4000 ha (10,000 acres) of the

Pine Barrens with the intent of selling drinking water to Philadelphia. His plans were thwarted when New Jersey passed legislation prohibiting the export of water from the state. Conflict over the region's aquifers continues. Currently, nine counties in southern New Jersey are searching for new groundwater supplies; potential sources are the Kirkwood and Cohansey aquifers. The Pinelands Commission, in cooperation with other government agencies and Rutgers University, is designing a study to assess the ecological impacts of future water withdrawals on the Pine Barrens ecosystem (Pinelands Commission 1989b).

### First Attempts to Protect the Pine Barrens

The postwar construction boom, improved transportation systems, and subsequent suburban sprawl increased development pressures on the Pine Barrens. However, as development pressures grew, the ecological uniqueness and fragility of the Pine Barrens gained recognition as well. Environmental groups like the New Jersey Audubon Society and the Pine Barrens Conservationists appealed for legislative protection in the early 1960s. Soon after, the State of New Jersey initiated studies of the region and its threats, but conflicting views on development, combined with diverse administrative and political authorities, spawned a complex history of Pinelands management proposals. These conflicts would result in a 20-yr delay in implementing a comprehensive management plan for the region.

The Pinelands Regional Planning Board, one of the first planning bodies, released a report in 1963 that detailed the impacts of four regional growth scenarios (Pinelands Regional Planning Board 1963). The land-use plan adopted by the board called for the construction of an international jetport and new city covering over 17,000 ha (43,300 acres) in the Pinelands. The jetport would be the largest in the world, completely displacing the region's unique pygmy forest and an entire state forest (Collins and Russell 1988).

Shortly after the release of the Regional Planning Board's report, the National Park Service and the Academy of Natural Sciences in Philadelphia began a study of the natural features of the central Pine Barrens. The report determined that a 65,000-ha parcel (160,000 acres)—part of which would have been covered by the jetport—had scientific values of national importance (McCormick 1968). In response, the Secretary of Interior's Advisory Board on National Parks, Historic Sites, Buildings and Monuments directed the National Park Service to develop methods to protect the Pine Barrens.

The National Park Service report offered four protection strategies (National Park Service 1968). In each,

the State of New Jersey was encouraged to play a leading role in developing a comprehensive management plan. The Park Service recognized early the infeasibility of national park or monument status, which would have been prohibitively expensive and would have disrupted traditional land uses like agriculture, logging, and mining.

John McPhee's book *The Pine Barrens*, published in 1967, sharpened attention to the region's cultural and natural resources (McPhee 1967). As McPhee writes: "He asked where I was going, and I said that I had no particular destination, explaining that I was in the pines because I found it hard to believe that so much unbroken forest could still exist so near the big Eastern cities, and I wanted to see it while it was still here." McPhee's narrative of a simple, vanishing way of life amidst the nation's most densely populated state fostered interest in the region beyond state borders.

In 1972 the New Jersey Legislature created the Pinelands Environmental Council (PEC), a 15-member body dominated by local interests that was to develop a comprehensive plan to protect the region and to review development projects. Three years later, the council released a management plan entitled *A Plan for the Pinelands* (Pinelands Environmental Council 1975). Described as a land speculator's dream, the plan drew immediate fire from conservationists (Collins and Russell 1988). In response to the PEC's pro-development bias, no state funds were appropriated for the council after 1975.

Conservation interests and personnel in New Jersey's Department of Environmental Protection, disillusioned by the PEC's plan, approached the Department of Interior's Assistant Secretary for Fish and Wildlife and Parks to assess interest in a cooperative federal-state protection effort. The resulting federal task force report reiterated the national significance of the Pine Barrens and the desirability of a shared federal-state partnership in protecting the region as an ecosystem (Bureau of Outdoor Recreation 1976). The report effectively challenged the state to strengthen existing land and water policies before any federal role in protection would be realized.

Shortly thereafter, New Jersey's Governor Brendan T. Byrne announced his support for a regional protection effort. The governor upgraded water quality standards in the Pine Barrens, allocated \$10 million from the state's Green Acres Fund for land acquisition, and created a cabinet-level Pinelands Review Committee (PRC) to coordinate state programs in the region, delineate the Pine Barren's boundaries, and produce a plan that would guide the state's protection efforts. The plan, *Planning and Management of the New Jersey Pine-*

lands, was released after the federal protection legislation, but provided many ideas that were later incorporated into the state's protection strategy—namely, that the Pinelands be divided into inner and outer protection areas (Pinelands Review Committee 1979).

During this same period, the North Atlantic Regional Office of the National Park Service initiated a study in conjunction with Rutgers University's Center for Coastal and Environmental Studies to examine how the Pine Barrens could be incorporated into the National Park System. The report, *A Plan for a Pinelands National Reserve*, was released in 1978 and proved valuable in formulating federal protection legislation (Collins and Russell 1988).

By the mid-1970s, the idea of a regional planning effort to protect the Pine Barrens had gained broad public support. Still undecided were the mechanisms of protection and the preserve's actual boundaries. It would take several years of intense lobbying by affected interests before federal legislation finally resolved how the New Jersey Pine Barrens would be protected.

### The Pinelands National Reserve

On November 10, 1978, President Carter signed the National Parks and Recreation Act. Section 502 established the Pinelands National Reserve; its goal was to preserve, protect, and enhance the significant values of the Pinelands. The reserve was the first of its kind in the country: although national in status, its management was to be determined substantially by state and local governments.

Section 502 directed New Jersey Governor Byrne to create a commission to develop a comprehensive management plan (CMP) for the Pinelands. The 15-member commission was to represent local, state, and federal interests, with one member appointed by each of the seven counties within the Pinelands, seven appointed by the governor, and one appointed by the secretary of the interior. In response to the federal directive, Governor Byrne issued Executive Order 71 on February 8, 1979. The order established the Pinelands Commission and placed most development activities in the Pinelands under commission approval during the planning period. In June 1979, the New Jersey State Legislature passed the Pinelands Protection Act, endorsing Section 502 and the governor's order. The state act divided the Pinelands into two contiguous regions—a 229,000-ha (556,000-acre) protection area and a 149,000-ha (369,000-acre) preservation area that included the parcel identified by the National Park Service as having scientific values of national importance.<sup>1</sup> Funding for the reserve was to come primarily from

state and federal sources. Additional revenues would be self-generated or come from outside donations and grants.

In drafting the CMP, the Pinelands Commission first assessed the scenic, aesthetic, cultural, open-space, and outdoor recreational resources of the region. There was extensive consultation with the public and various local government agencies and officials since, ultimately, the plan was to be implemented at the local level through municipal zoning authorities.

The CMP recognized eight management areas, each accompanied by a comprehensive statement of land uses and policies (Figure 2) (Pinelands Commission 1980). These management areas range from the preservation area to regional growth areas—existing settlements that could support additional growth and development.

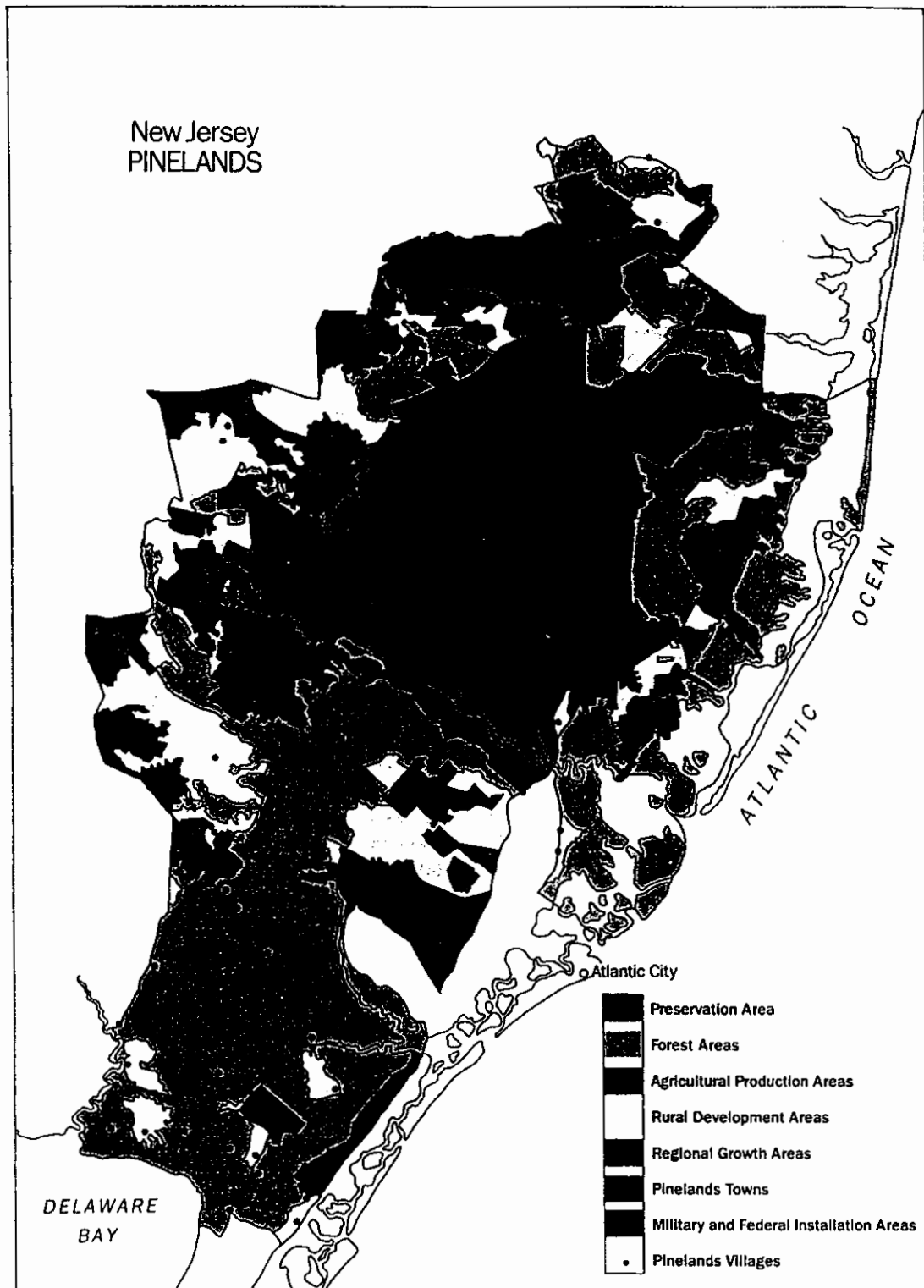
Both the state and federal acts utilized existing public holdings to minimize private land acquisition. While the majority of land in the preservation area was state-owned, the CMP recommended the acquisition of an additional 40,000 ha (100,000 acres) of key parcels throughout the reserve.<sup>2</sup> The plan specifies both fee-simple and less than fee-simple acquisition to ensure compatible land uses and public access (Pinelands Commission 1980).

A Pinelands Development Credit System was created to compensate landowners in the preservation, agricultural production, and special agricultural production areas for rights lost due to zoning restrictions. Development credits can be sold to developers in regional growth areas, with each credit allowing a developer to build additional "bonus" housing units over the density limits specified in the CMP up to a maximum ceiling density. A State Pinelands Development Credit Bank serves as a marketplace in the buying and selling of credits.

The CMP was adopted in 1980 and is implemented through county and municipal governments. The CMP recommended state payments in lieu of taxes to municipalities whose zoning ordinances complied with the

<sup>1</sup>While federal legislation placed 438,000 ha (1,083,000 acres) in the national reserve, the state's legislation included only 378,000 ha (935,000 acres). Lands included in the federal act but omitted by the state are located along the Delaware River and Atlantic coast. These areas are jointly managed under the state's Coastal Area Facility Review Act by the Pinelands Commission and New Jersey's Department of Environmental Protection.

<sup>2</sup>The Pinelands Commission was not given the authority to directly purchase lands. Instead, the commission identifies lands for acquisition and makes a recommendation to the state's Department of Environmental Protection. The commission may recommend how parcels are to be acquired and specify subsequent management direction.



**Figure 2.** Management areas of the Pinelands National Reserve. From *Protecting the New Jersey Pinelands: A New Direction in Land-Use Management*, by Beryl Robichaud Collins and Emily W. B. Russell. Copyright © 1988 by Rutgers, The State University. Used with permission of Rutgers University Press.

plan to compensate for tax revenues lost due to zoning restrictions and public land acquisition (Pinelands Commission 1980). The CMP also recommended financial incentives offered by the state ranging from favorable tax treatment to special loan and grant assistance for specific management practices that promote land uses consistent with the CMP's goals.

Environmental and development groups, involved parties, landowners, and agencies generally agree that the commission has successfully balanced the various interests in the area, protecting the region without placing excessive burdens on any particular groups. County and local planning boards have complied with the CMP to a degree that surpasses all previous regional planning efforts in the United States, and the plan has successfully channeled development away from environmentally sensitive areas—of the 25,872 new homes approved since the plan took effect in 1981, only 74 are located in the preservation area (Pinelands Commission 1991).

The Pinelands National Reserve has stimulated other supportive institutional developments. Burlington County formed the Conservation Easement and Pinelands Development Credit Exchange to facilitate the sale of development credits before state legislation created a State Pinelands Development Credit Bank. Rutgers University created a Division of Pinelands Research, and the United Nation's Educational, Scientific, and Cultural Organization (UNESCO) named the Pinelands an International Biosphere Reserve—recognizing it as one of the world's outstanding natural areas. Such arrangements strengthen the reserve without formally increasing the powers of the commission.

### Applications of the Pinelands Model

The classic preserve—the park—transfers full land ownership to one level of government, which then uses its police powers to exclude undesired activities. The Pinelands model uses: (1) intergovernmental mixes of authority to achieve the desired balance between public and private control of land uses, (2) representative and participatory mechanisms for land use planning, and (3) mixes of fiscal and regulatory measures to discourage unwanted uses of the reserve and to create incentives for compliance with clearly stated public interests. Since these features can be varied by degree for different circumstances, the general model may have broad applications for preserving valued landscapes that developmental pressures would otherwise fragment, modify, or erode. It may apply to a broader range of conditions than does the classic park.

In this section, we consider the application of the

reserve strategy in three sets of demographic and economic conditions different from those of the Pinelands. One situation has lower population pressure than the Pinelands and higher local economic dependence upon resource extraction. The second situation has higher population pressure than the Pinelands and derives economic benefits from the qualities associated with open space rather than from resource extraction. The third situation is a rural region in which growing developmental pressures threaten the extractive base of the economy.

The Pinelands model appears to suit conditions in which: (1) population densities are sufficiently great that land ownership cannot be transferred to one governmental jurisdiction, (2) a reserve creates sufficient values outside its boundaries to compensate for any loss of developmental and extractive opportunities within, and (3) institutions are able to capture these values and transfer them to private owners and local jurisdictions within the reserve so that they have sufficient reason and capacity to maintain it.

#### Redwood National Park Expansion: Maintaining Pristine Environments in Resource-Dependent Rural Systems

Within months of creating the Pinelands National Reserve, President Carter also signed legislation authorizing a 20,000-ha (48,000-acre) expansion of the Redwood National Park in northern California. The expansion was the focus of intense conflict between national and local interests over the disposition of pristine redwood forests. The cost of acquiring nearly 25,000 ha (60,000 acres) of private land to create the park in 1968 made it the nation's most costly national park (Dana and Fairfax 1980). As the proposed expansion neared attainment ten years later, local hostility was manifest in accelerated clearing of adjacent private land, thereby increasing the stream sedimentation damages the expansion was supposed to alleviate.

The grant of national park status resolved the conflict on behalf of the national interest, but at the cost of continuing local embitterment about federal preemption of local opportunities for economic growth. In the long run, the affected localities may come to accept the national park as fully as is true where other such parks exist. It is also plausible that, as occurred in the years between Redwood National Park's establishment and later expansion, local antagonism will increasingly frustrate park management and possibly weaken the concept of inviolability that is so important to the National Park System as a whole.

The initial and expansion areas of Redwood National Park resemble in concept the preservation and

outer protection areas of the Pinelands National Reserve. In the Redwood National Park case, both zones were placed under equally absolute federal control. In the Pinelands, local and state powers gained formal authority and influence, as well as a clear local economic interest in preservation. While the sharing of authority may have jeopardized national interests, it also served to allay local concerns that might otherwise have undermined them.

Would the Pinelands model have worked in the Redwood situation? Even speculative answers may identify conditions in which the Pinelands model is more or less appropriate. It appears that the model would not have worked in the Redwood region at the time. The Pinelands model concentrates development pressures in controlled areas, captures the financial surplus generated by the contrived land scarcity and the more predictable future of the region, and uses these funds to compensate owners and counties for their foregone opportunities. In these terms, the Pinelands model would be expected to work if development pressures were sufficient to generate fair compensation and if arrangements to claim and exchange the funds were feasible. If these pressures and capacities are related to population density, they were exceedingly weak in the region of Redwood National Park, while the anticipated losses by landowners and counties were huge—the perceived choice was limited to either clear-cutting or preserving old growth redwood. The financial conditions for the Pinelands model appear to have not existed in the Redwood case.

A second feature of the Pinelands model is that it organizes its political and administrative authorities according to the comparative advantages of different levels of governmental jurisdiction. The viability of the organization depends upon the diversity, complementarity, and balance among its member jurisdictions. The model would be expected to work to the extent that member jurisdictions have diverse interests and capabilities but share a common purpose and can negotiate flexibly toward a unified strategy. None of these conditions was present in the Redwood National Park case, where two poor counties, their economies totally dependent upon redwood lumber production, faced a federal government and its national environmental constituency, and where the state was too torn by competitive interests to mediate effectively. The political conditions for the Pinelands model appear to have not existed.

The Pinelands and Redwood situations had but one common feature other than their time of settlement: the dependence of local economic well-being on how the federal government chose to use and share its powers. The federal choice in the two cases differed radi-

cally. While our analysis suggests that the Pinelands model has done well in New Jersey and would have done poorly in California, the national park model has little to show for itself in the Redwood case, which has a heritage of hostility almost as enduring as the groves now preserved. A modified approach to the park, greater sharing of power with local and state interests for example, might better have satisfied long-run national goals than did use of a model developed largely for uninhabited areas.

#### Point Reyes National Seashore: Maintaining "Natural" Environments near Urban Areas

The Point Reyes National Seashore lies within San Francisco's metropolitan Bay Area, a national preserve in even more densely populated conditions than the Pinelands. Established in 1962, the seashore linked many other public holdings and preservation zones to form a contiguous mosaic that includes state, county, and city parks; county watershed districts; federal military reserves; and state-county zones of private agricultural, forest, and coastal preserves. Contrary to the Pinelands model, in which diverse ownerships and jurisdictions cooperate in a unitary planning framework, the regional mosaic reflects the diversity, specialization, and financial resources of single-interest and single-jurisdictional commitments. Although fragmented jurisdictionally, the mosaic nevertheless forms a unified natural framework for the metropolis.

Would Pinelands-style coordinated governance strengthen the Bay Area model of nature preservation? The current Bay Area system generates the political and fiscal basis for its own local support, which it mobilizes primarily through special rather than general interests and funds. Even the national seashore enjoys local support. Recent fund-raising efforts allowed the construction of a new \$1.4 million visitors' center from private donations alone. Diversity appears to be a strength of the Bay Area system and may be too great and too valuable to permit the consensual agreements that coordination requires and that participants in the Pinelands achieved. Perhaps the Pine Barrens region would have assumed the Bay Area model if federal action had been delayed for another generation.

Nevertheless, Point Reyes' urban law enforcement problems drain financial resources from elsewhere in the National Park System. These problems create a need for greater budgets, user fees, or locally shared power and fiscal responsibility as in the Pinelands model and as recommended in the report of the President's Commission on Americans Outdoors (1987). In the Bay Area, intergovernmental coordination may be prompted more by the need to protect preserves from

their beneficiaries than to protect land from development.

New England's Forests: Maintaining "Natural" Environments in Resource-Dependent Rural Systems

Much of New England's forests have traditionally been under relatively stable forest industry control, but rising land values and development pressures, combined with industry policies to maximize shareholder returns, have led the region's forest products firms to reevaluate corporate land policies. The result—recent industry sales of nearly 300,000 ha (750,000 acres)—has heightened regional concerns over future public access, forest management, and the region's economic future (Blackmer 1989, Hagenstein 1987).

Some states and conservation groups have independently responded to the sale of large industrial and private ownerships. The Wilderness Society's recent report, *A New Maine Woods Reserve* (Kellett 1989), calls for the protection of northern Maine's forests by employing methods similar to those used in the Pinelands. The State of New Hampshire took more direct action by recently purchasing 16,000 ha (40,000 acres) of former Diamond International lands with assistance from the Nature Conservancy and the Society for the Protection of New Hampshire's Forests, two nonprofit conservation organizations (American Forestry Association 1989). As currently planned, the state will retain ownership of the land while the Forest Service purchases development rights through a conservation easement.

But the likelihood of continued development pressures has led to broader, more coordinated responses. In 1988, the governors of New York, Vermont, New Hampshire, and Maine appointed a Governors' Task Force on Northern Forest Lands to study the forest resources and ownership patterns of 10.4 million hectares (25.8 million acres) of New England's forests. Shortly thereafter, Congress directed the USDA Forest Service to assist the task force in preparing strategies to reinforce current patterns of land ownership and use (American Forestry Association 1988).

The resulting report, the *Draft Northern Forest Lands Study*, was released in 1989 (Harper and others 1989). The report relied on public input to develop a "common vision" for the future of New England's forests and proposes strategies to maintain large undeveloped tracts of private forest land while keeping these lands open to the public. The report recognizes the prohibitive costs of relying solely on public land acquisition and proposes a wide range of innovative protection strategies including local and state zoning restrictions, conservation easements, expanded public lands, and vari-

ous tax incentives designed to discourage land speculation and conversion and encourage traditional land uses like forestry (Lilieholm 1990).

The *Draft Northern Forest Lands Study* in essence challenges the states of New England to take the initiative on a regional protection plan much like the Bureau of Outdoor Recreation's 1976 report that prompted state protection efforts in the Pinelands. The report encourages the states and the Governors' Task Force to identify and map important resources and begin developing strategies to achieve the "common vision" for the future. The report also proposes federal assistance in regional planning efforts and the establishment of a federal fund for emergency purchases of important parcels of land that enter the market.

Would the Pinelands model work in New England? Population densities and land values in much of the region prohibit outright public acquisition, and the creation of a reserve would probably generate enough value to compensate for lost development opportunities. Most importantly, the region's institutions are sufficiently developed to capture these values and transfer them to private owners and local jurisdictions within the preserve to foster continued local support.

But implementing the Pinelands model in New England would create new challenges as well. Most significant is the degree of interstate cooperation that would be needed to successfully devise and implement a unified protection strategy for the region. This hurdle may be less formidable than it appears. The creation of the Governors' Task Force prior to federal involvement indicates in principle a shared vision and purpose. Another challenge is implementing a regional planning framework in an area roughly 25 times greater than the Pinelands. While initial responses to the threats facing New England's forests are promising, it will take several more years to determine whether the pace of these events can be sustained and lead to an effective protection plan for the region.

## Conclusion

The Pinelands National Reserve provides useful lessons for future efforts to protect existing landscapes and land uses on a regional scale. The Pinelands model creates a flexible range of approaches for preserving sites intermediate between (1) relatively unpopulated areas in which economic alternatives and institutional capacities are too limited to compensate for the loss of extractive opportunities, and (2) urban areas that derive sufficient value from their qualities of open space to sustain the financial and institutional means for its preservation. The Pinelands model appears to protect areas



effectively that are moderately populated, large enough to encompass several types of ownerships and jurisdictions, have well developed and diversified economies and governmental institutions, and can contribute economically as preserves. The model may not be effective where special and jurisdictional interests are so diverse and powerful as to preclude agreement and where preservation places severe economic hardships on local communities.

The Pinelands model requires a reasonable consensus regarding the public interest and sufficiently inexpensive mechanisms to bridge differences between preservation goals and local and state needs. The degree of such differences dictates the opportunities for local and state participation in management since ultimate authority must be consistent with the need to resolve conflicts. The greater the divergence over protection goals, the more centralized the authority required to reach and enforce an agreement. In addition, funding mechanisms must be consistent with the distribution of authority and financial responsibility. The greater the pressure for development, the higher the cost and the more centralized the authority required for effective protection.

The Pinelands model is a refreshing attempt to protect environmentally and culturally sensitive areas without necessarily stopping development or displacing state and local authorities. Its lessons are important if viable preservation is to advance in conditions vulnerable to rapidly increasing population and economic pressures.

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