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POLLUT

Austin, Texas

Protecting the Edwards Aquifer

Austin is a handsome, historic city in a pleasant part of Texas, with rolling hill country to the west and the remains of the blackland prairie to the east. In the 19th century, the region supported immense herds of cattle. Now, the remains of ranches surround Austin, and a few ranchers still graze a scattering of cattle, goats, and sheep. The region has undergone tremendous development in recent decades—its beauty and culture lure new residents and industries, particularly high-tech companies in search of a high quality of life for their employees. The population of the greater Austin area has tripled since 1970, to over 540,000 in 1996.

The city of Austin—which owns the local water utility—draws its drinking water from three reservoirs on the Colorado River, which flows through the city. Lake Travis, Lake Austin, and Town Lake are part of a chain of reservoirs collectively known as the Highland Lakes, which in addition to providing drinking water, also are important recreational resources.

The Edwards Aquifer, an underground water source that contributes to the river, sits on the western side of the city and is the sole source of drink-

the pollution found was largely attributable to nonpoint sources. Such pollution would increase substantially under current development plans, particularly at places such as Barton Pool.

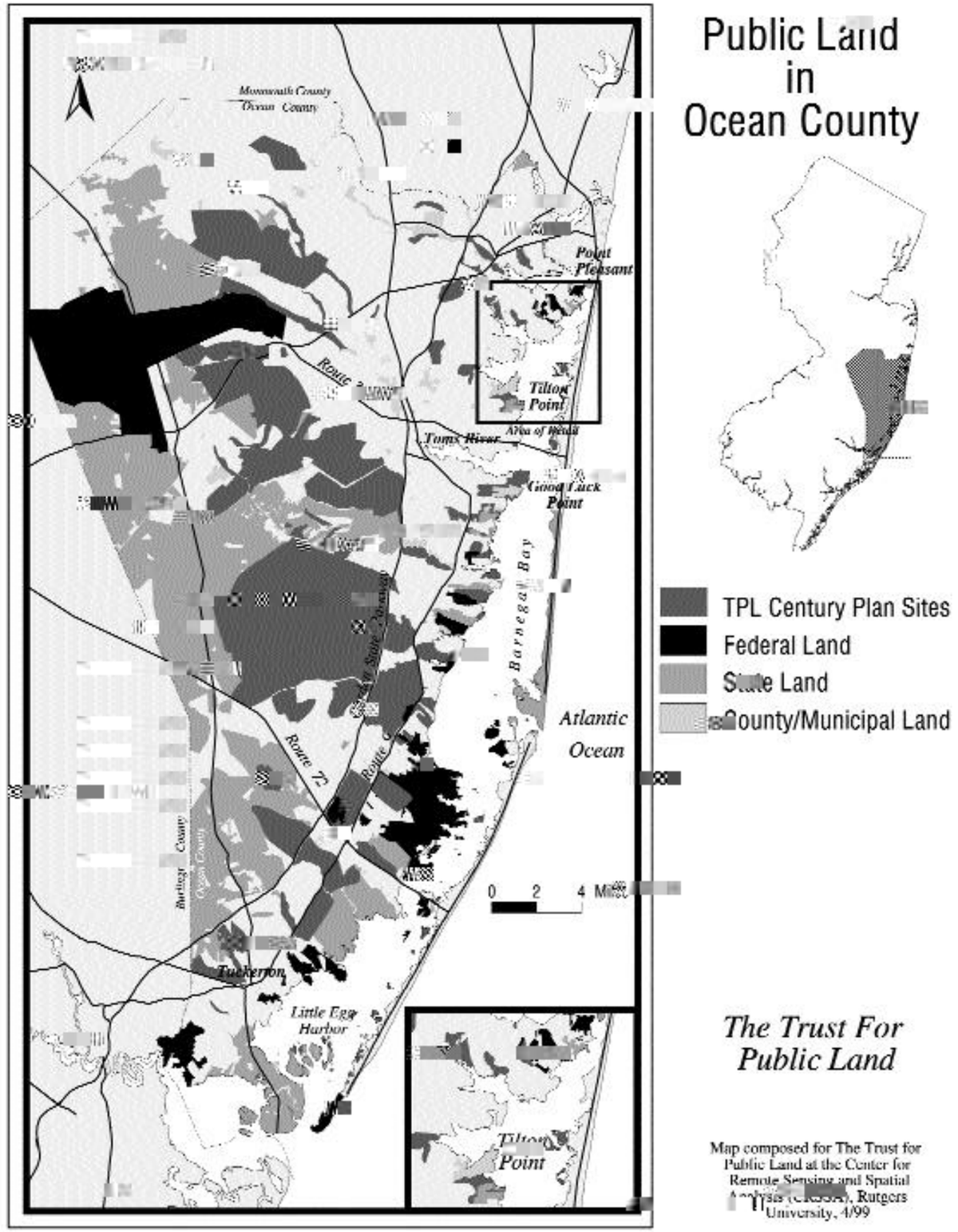
ATTENTION Austin voters resoundingly adopted the Save Our Springs Ordinance in 1992, after grass roots efforts by environmental groups.

The exact limit and extent of the buffer was determined using a "combination of art and science," says Nancy McClintock of Austin's Water Protection Department—the "science" being information from water-

Barnegat Bay

Protecting a Coastal Ecosystem

New Jersey is the most densely populated of all the states, and is also the



Note: Protected Lands in Private Ownership Not Indicated

THE IMPORTANCE OF THE NATIONAL ESTU ARY PR OGRAM

EPA's National Estuary Program (NEP) has provided important coordination for the diverse protection activities within the Barnegat Bay watershed. NEP plays the role of convener and facilitator, with NEP committees including all major players: politicians, appointed officials, scientists, environmentalists, and members of public interest groups. Together, they develop and implement the Comprehensive Conservation and Management Plan (CCMP), the goal of which is to restore and protect the bay.

"NEP brings people together in a very important way," says Bob Scro, director of the Barnegat Bay NEP. "It brings the issues to the table, and they are dealt with effectively." Because NEP is a national program, a NEP des-

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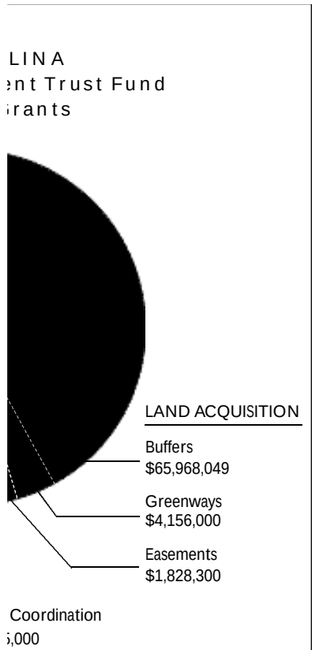


on basin size, detention time, presence of adjoining wetlands, and maximum potential amount of impervious cover based on local zoning. Three maps were generated, based on differing degrees of future development. The maps suggested which parcels should be protected to guarantee maximum water quality in various stream segments.

According to Owen Furuseth, professor of geology at the University of North Carolina and director of the modeling project for CLCN, "With this information in hand, local governments can steer development away from areas with the greater water-quality risk, and conservation groups can focus on the most environmentally sensitive lands for conservation."

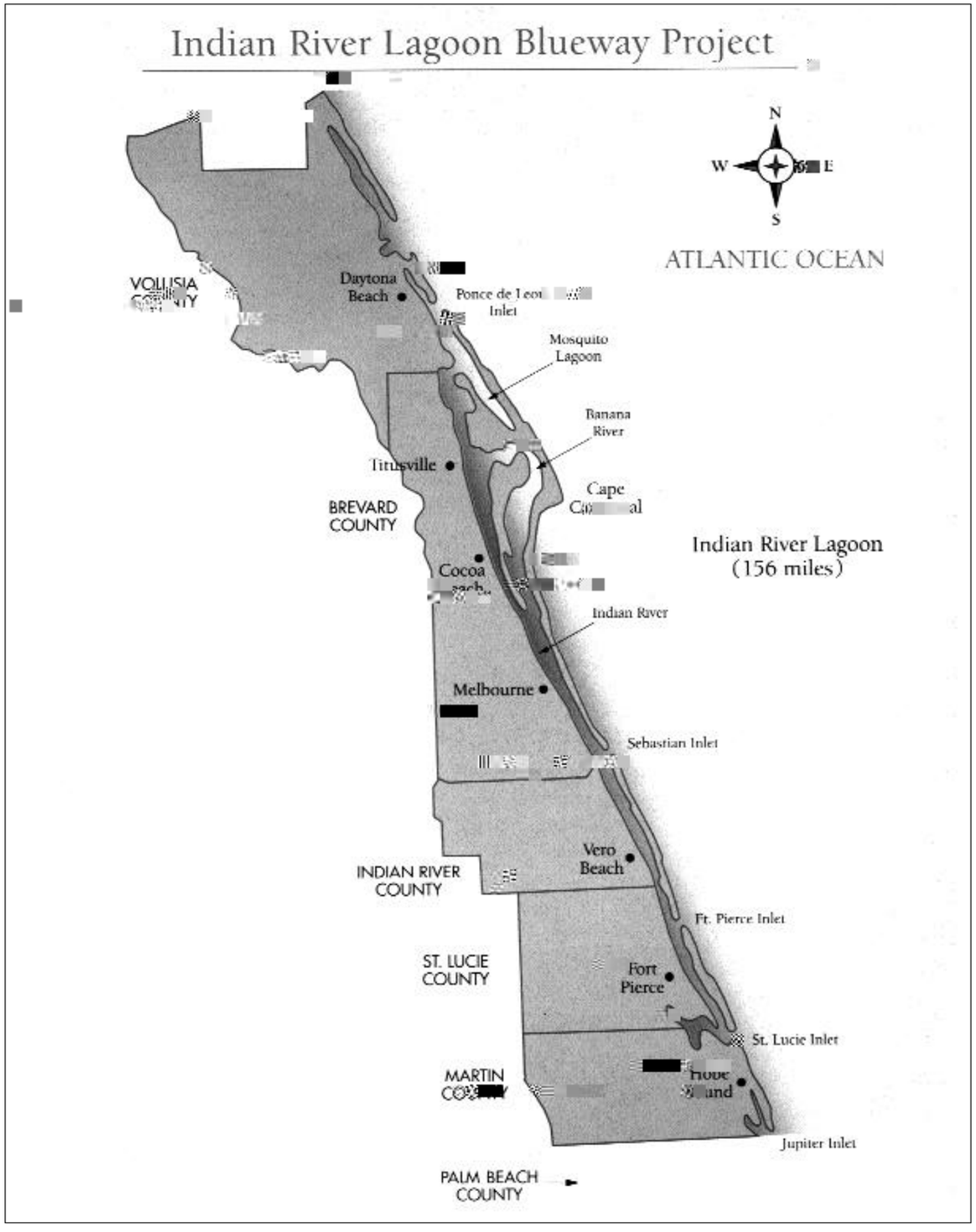
CONTINUING EFFOR TS

Local efforts to protect Mountain Island Lake take place in the context of North Carolina's water-supply protection program. Under the state's Water Supply Watershed Protection Act, all local governments having land-use jurisdiction within a water-supply watershed must adopt a management plan for that watershed. "While the state can levy fines or other sanctions on localities that do not implement its 1992 watershed regulation, most have [implemented them] voluntarily," says Steve Zoufally, director of the North Carolina Department of Environment and Natural Resource's Water Supply/Watershed Protection Group. "Localities must adopt the state rules as a minimum," Zoufally notes, "but may develop more stringent ones of their own."

The situation in the town of Huntersville, in Mecklenburg County north of Charlotte, illustrates this program. The town—which has extraterritorial jurisdiction over a significant portion of the Mountain Island Lake watershed—developed zoning and subdivision ordinances that rank lands according to their sensitivity relative to watershed protection. "Development pressure is high in this area," confirms Ann Hammond, Huntersville's chief planner, "particularly in areas closer to the river and lake, and land-use regulations are not popular."

For this reason, Huntersville is seeking authorization from the legislature for a transfer-of-development-rights program. While this program is intended primarily to preserve the rural heritage lands, it would also produce significant water-quality benefits and would complement land-acquisition programs being carried out by CMU and other entities within the watershed.

a functional ecological system that no longer functions in



gered species, but they draw the line at development that's going to harm their use of the waterways." This public awareness has enabled Florida to weather the anti-environmental backlash of the mid-1990s, Higgs believes. "Even the most extreme property rights advocates now recognize that protecting our waterways and the lands that affect them is a fundamental concern for our Florida public."

While some earlier land-acquisition efforts tended to focus on either wetlands or uplands, EEL's effort has tried to link marine and terrestrial ecosystems, according to Duane DeFreese, the program's former coordinator. "This is one of the first local land-acquisition programs to look at public land holdings as an integrated package," DeFreese says, "one that forms a conservation network, as opposed to a collection of individual parcels." The program—about 75 percent complete—has protected 15,000 acres, and while the tax has not produced as much money as was projected, those funds have been leveraged with support from the state's P-2000 program.

One key to the EEL program's success was the rigor with which its scientific experts chose the lands to be acquired, DeFreese believes. The group had sought a quantitative method to select target parcels, but was unable to do this because of the need to include such unquantifiable considerations as politics, local economic needs, and existing landownership. In the end, selection was based on qualitative criteria including the presence of endangered species, connection to other parcels, importance to native communities, and the parcel's role in the larger ecosystem. Many critical wetlands and mangrove marshes have been restored as a result of the program—including former mosquito impoundments that have become once again the nursery and refuge for important fish species.

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ple, the St. Johns Water Management District has already bought more than 1,000 acres in Blueway parcels. “We have to act quickly when properties are available,” DeFreese points out. “If we don’t, we may lose our chance forever.”

NEP director Martin Smithson agrees that time is of the essence. “We need to accelerate our land-acquisition programs today,” he says. “Florida’s population projections are startling. We have to accomplish our work over the next 10 to 15 years if we are going to outpace development and growth.”

Discussion and Conclusions

Since the federal Clean Water Act of 1972, the nation has significantly limited industrial and municipal wastewater discharges. In recent years, nonpoint-source pollution has been recognized as the most important remaining source of U.S. water pollution, with clear links to agriculture and development—particularly sprawl development. EPA's 1998 Clean Water Action Plan calls polluted runoff the worst water-quality problem in the United States today.

One way to clean up water pollution from nonpoint sources is to build costly filtration and water-treatment plants. But for many communities, a better way is to protect water at its source. Source protection can be achieved through "best-management" practices for farmers and industries, or through regulation of development—such as limits on impervious cover, or restrictions on the size and type of developments in critical watersheds. However, a 1991 study by the American Water Works Research Foundation concluded that land ownership offers the most effective long-term protection.

The case studies show that land acquisition can be an effective tool for controlling nonpoint-source pollution while meeting other goals and that the case for land acquisition can be clarified and strengthened with specific data that shows how land-conservation programs reduce pollution loading.

The case studies reveal common features that spell success for watershed-acquisition programs

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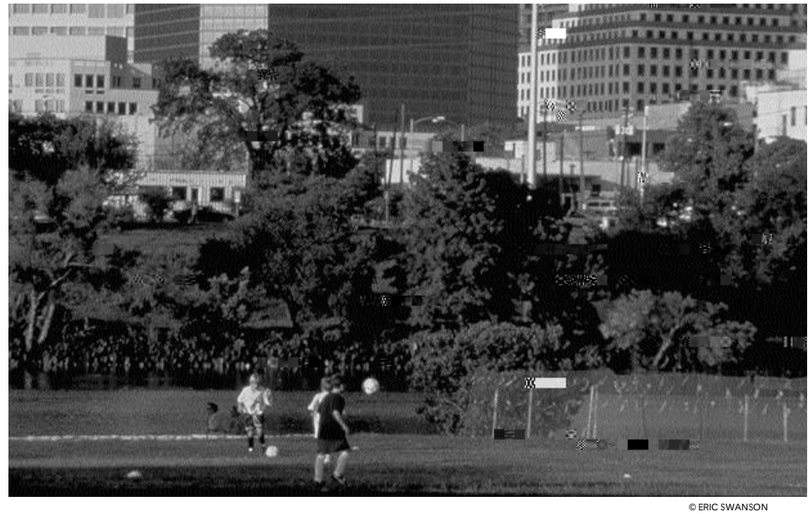
is being used as an economical alternative to advanced water treatment as a way of meeting or maintaining EPA water-quality standards. For example, the EPA gave New York City the option of, among other actions, buying up large portions of its watershed instead of building a filtration system at a cost estimated as high as $8 billion. Similarly, EPA offered the Massachusetts Metropolitan District Commission the option of acquiring 25 percent of its watershed land as an alternative to a $200-million filtration plant.



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Town Lak e, Austin, Te xas.Of the se veral ways of protecting watershed land,acquisition offers the best opportunity to open the land for recreation.

THE CASE FOR COST -EFFECTIVENESS

Determining cost-effectiveness of land acquisition can be a complex challenge. In some cases, the benefits are clear: New York City hopes to avoid building a huge $8-billion filtration facility by buying its watershed land; Austin will avoid the cost of extending infrastructure to areas where it bans development; and Gastonia, North Carolina, claims annual water treatment savings of $250,000 by using pristine Mountain Island Lake as a source.

Of course, the benefits of such purchases must be balanced with the cost of protecting the land, with the loss of property tax revenue to the community and, some might argue, with jobs lost due to lack of development. Still, treatment for nonpoint-source pollution becomes increasingly complex and expensive as development increases in a watershed. Control over the land through acquisition often offers the best opportunity to restore land and protect water quality. For this reason, water managers cited in this report are turning to land conservation when a funding program can be found to match their needs.

Other benefits of land acquisition, while tangible, are more difficult to quantify. In addition to protecting water quality, land conservation offers multiple benefits to the public, including recreation, flood control, and the preservation of wetland and forest habitats. Less tangible are the "quality of life" values fostered by the Smart Growth movement. In Austin, for example, one "plus" of land acquisition for voters—and for the high-tech industries that have been attracted to the area—was the opportunity to retain open space around the city and to preserve an element of the Texas ranching heritage. In Ocean County, New Jersey, voters who supported the creation of the Natural Lands Trust were partly motivated by a desire to preserve the rural character of their county.

Land acquisition also affords public agencies full access to, and control of, land for restoration and other site manipulation—an issue key to Indian River Lagoon managers in their effort to restore historic hydrologic patterns and remove exotic species.

Protection of Mountain Island Lake has received broad public support.

KEN SHERMAN

Without public understanding and support for the link between water quality protection and land conservation, development will prevail in the planning process.

mental Services, which will allow municipalities to acquire watershed land or easements. The proposal is based on a 1998 EPA-funded study by the Society for the Protection of New Hampshire Forests, which found very

Mountain Island Lake

Centralina Council of Governments and Carolinas Land Conservation Network. *Mountain Island Lake Technical Study Final Report.* Charlotte, NC: 1999.

Clean Water Management Trust Fund. *Report to North Carolina.* Charlotte, NC: 1998.

Duke Power Company. Catawba. Charlotte, NC: 1996.

Electric Power Research Institute (EPRI). "EPRI's Watershed Analysis Risk Management Framework: a Tool for Application of a Watershed Approach to Water Quality Management," *EPRI Technical Brief - Environment Group*. Palo Alto, CA: May 1996.

Henderson, Bruce. "Buying Land to Save Water," *The Charlotte Observer*, Charlotte, NC: January 26, 1999.

_____. "Initiative for Mountain Island Lake," *Clear Thinking*, 1998.

Mecklenburg County (GA). SWIM Stream Buffer Plan Consensus Document. October 15, 1998.

North Carolina Department of Environmental and Natural Resources. *Basinwide Wetlands and Riparian Restoration Plan for the Catawba River Basin.* Charlotte, NC: 1998.

North Carolina Clean Water Management Trust Fund, North Carolina General Statutes, Article 13A, Chapter 113 of the North Carolina General Statutes, 1996.

North Carolina Water Supply Watershed Protection Act, North Carolina General Statutes, 143-214.5 and 143-214.6, 1989.

Tuttle, Steve. "What Price Clean Water?" *North Carolina*, February, 1999.

Austin

City of Austin. *Austin Tomorrow Plan.* Austin: 1980.
_____. *The Barton Creek Report.* Austin: April 1997.

Watson, Kirk. "Vote for Smart Growth," *Austin American-Statesman*, April 30, 1998.

Lindell, Chuck. "Aquifer Buffer Purchase All Win," *Austin American-Statesman*, May 3, 1998.

_____. "Saving the Ranch: City Reveals Proposition 2 Land List," *Austin American-Statesman*, April 29, 1998.

_____. "Buying Land to Fight Pollution," *Austin American-Statesman*, April 27, 1998.

_____. "Protecting Water Supply is Key to Land Purchase: City's Plan: Green Zone for Aquifer: If Voters Approve - Land Purchases Would Guard Against Water Pollution," *Austin American-Statesman*, March 22, 1998.

Northern Virginia Soil and Water Conservation District. *Developing Successful Runoff Control Programs for Urbanized Areas*. July 1, 1994.

Ross, Lauren and Jeanine Sih. "Water Fights: Citizens Struggle to Shape a City in Central Texas." http://www.sosldf.org,

excerpt from *Under the Blade: The Conversion of Agri - cultural Landscapes*, University of Nebraska-Lincoln. n.d.

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