

P A R T I V



LAND ACQUISITION AND REGIONAL PLANNING



ECOREGIONAL CONSERVATION

A COMPREHENSIVE APPROACH TO
CONSERVING BIODIVERSITY

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Biodiversity conservation has evolved in recent decades, fueled by the activities of practitioners supported by new research in ecology and conservation biology. Scientists have increasingly recognized shortcomings in the single species approach to conservation and are accordingly emphasizing the conservation of ecological communities and ecosystems. Coupled with this emphasis has been an increased appreciation for natural processes and landscape-level factors that sustain these communities and ecosystems.

These developments have led The Nature Conservancy (TNC) to evolve new principles for conservation planning. The mission of The Nature Conservancy is the long-term conservation of all biodiversity present in all ecoregions. This broad objective encompasses every living thing, from rare salamanders or large carnivores to whole ecosystems such as oak-hickory forest with all its associated species diversity, along with structural components and ecosystem functions. In broadening the scope of its work, the Conservancy has shifted toward protecting landscapes on an ecoregional scale. Planning by ecoregions, or areas that are unified in climate, topography, geology, and vegetation, is more sensible ecologically than planning within political boundaries such as states or provinces.

Ecoregional conservation, or selecting conservation areas within ecological areas, expands the traditional approach of protecting rare species and terrestrial communities by including common ecosystems that are representative of each ecoregion. Protection of viable examples of these representative ecosystems can serve as a “coarse filter,” protecting a broad diversity of both common and rare species. The New Jersey Pine Barrens, for example, falls within the North Atlantic coast ecoregion.

Landscape-scale conservation, a finer-scale strategy, determines what actions need to take place in each of these areas. Within New Jersey, for example, TNC has completed four landscape-scale conservation plans, including ones for the Pine Barrens and the Delaware Bayshores. The intent of these efforts is to develop a scientific context and a flexible strategy for successful conservation in each ecoregion.

A MULTIPLE-SCALE MODEL FOR CONSERVATION AREAS

The overall goal of ecoregional conservation is to assemble a portfolio of public and private conservation areas that collectively conserve the full biological diversity of an ecoregion. Each portfolio is meant to encompass multiple examples of all native species and ecological communities in sufficient number, distribution, and quality to ensure their long-term persistence within the ecoregion. In the Northeast and Mid-Atlantic United States, the portfolios have focused first on terrestrial ecosystems, defined using a standard classification system. Freshwater aquatic systems have been integrated into the portfolios as scientists develop new analytic techniques and richer data sets. The terrestrial ecosystems occur at three basic size scales: matrix-forming, large patch, and small patch.

Matrix-forming ecosystems in the eastern United States are dominant forest communities delineated by large intact areas of forest on the scale of thousands to millions of acres. Conservation areas must be big enough to absorb and recover from infrequent but catastrophic regional-scale disturbances such as hurricanes, tornadoes, fire, and insect outbreaks. They must also be large enough to ensure that multiple breeding populations of forest interior species have the habitat they need to survive. Conservation of the matrix forest is particularly important to the biological integrity of the ecoregion. In the North Atlantic coast, we identified forest blocks of 10,000 acres or greater.

Large patch-forming ecosystems are associated with environmental conditions that are more specific than those of matrix forests. Examples include red maple swamps, riparian river systems, and fire-dependent pine barrens. Conservation areas may be an order of magnitude smaller than the matrix-forming ecosystems, but they must still be large enough to contain the many species that associate with them, usually 50 to 1,000 acres. In the case of the North Atlantic coast ecoregion, we identified natural areas of 100 to 1,000 or more acres.

Small patch-forming ecosystems form small, discrete patches of cover and often contain a disproportionately large percentage of species that associate with very specific ecological conditions. Examples from the North Atlantic coast include maritime forest, coastal plain ponds, beach-dunes, and coastal salt ponds.

The protection of many rare species, such as the best remaining populations of a rare dragonfly and its supporting habitat, may be accomplished by protecting patch-forming ecosystems. Other focal species, such as piping plover, that we believe cannot be adequately conserved by protection of ecosystems alone but require explicit conservation attention, whether because they are globally rare, in decline, native to the ecoregion, or designated as threatened or endangered by state

or federal agencies, are designated “fine-filter” conservation targets. Explicit conservation attention, for example, may include targeted direct management such as closing portions of beaches where plovers nest.

THE IDEAL CONSERVATION AREA

When examining a landscape, it becomes immediately clear that patch-forming ecosystems nest within matrix-forming ecosystems. By definition, this way of grouping systems recognizes a spatial hierarchy. For example, a large area dominated by pine-oak forest (a matrix-forming system) may, on close examination, reveal a network of hardwood swamps and marshes (large patch systems). These may contain even smaller settings of reedgrass savannahs and coastal plain ponds (small patch systems). Accordingly, the highest priority action will be given to those places where matrix, large, and small conservation targets are co-located at the same site. Nesting and clustering targets together increases their individual and joint viability and is cost effective. Thus an ideal reserve consists of a mosaic of viable matrix, large and small patch communities, and rare species populations.

What Is a Viable Example of a Matrix or Patch Ecosystem?

A viable example of an ecosystem is one that has the integrity in structure, composition, and internal and external processes needed to persist for over one hundred years without serious degradation. As this is difficult to evaluate directly, we measure three indirect factors, the size, current condition, and landscape context of each example and use the information to make judgments about viability.

For patch communities, landscape context is of primary importance as these communities typically depend on landscape level processes, such as intact hydrology or fire cycles, that operate beyond the actual acreage.

Size is particularly important for matrix-forming ecosystems. For example, based on historical records, hurricanes tend to create a mosaic of disturbance with patches of total destruction ranging up to about 1,000 contiguous acres. From this we estimate a reserve would need to be at least four times that size (4,000 acres) to remain viable with respect to hurricanes (so that no more than 25 percent of the reserve was disturbed at any one time). We can do similar calculations to ensure sustainable population sizes for species such as the black-and-white warbler. For instance, in order to ensure enough suitable forested habitat for twenty-five pairs of black-and-white warblers, we would estimate our reserve to be at least 250 acres.

A variety of observable features affect the condition of an ecosystem. Primary among these features are fragmentation by roads, trails, or land conversion, invasion by exotics, and human manipulation, such as cutting, grazing, mowing, altered soils, and altered natural processes, usually reflected in changes in vegetation structure and composition. Positive features such as signs of historical continuity or the development of biological legacies—critical features that take generations to develop (e.g., fallen logs and rotting wood in old-growth forests)—are evidence of good condition.

To allow for change and guard against unexpected attrition, viability also implies conserving replicate examples. Exactly how many examples of each type of ecosystem we need to conserve is not known with any precision. However, based on evidence from minimal viable population studies, we have generally set an initial minimum of twenty examples for small patch communities. For a widespread community type, examples can be spread throughout its native range, and protection can occur in several ecoregions. Conversely, if the community is completely restricted to a single ecoregion, then all twenty examples must come from that ecoregion. For instance, when we selected the piping plover as a target for the North Atlantic coast ecoregion, we first determined piping plover to have a limited distribution (the bulk of their population is along the eastern coast of the United States), and thus we would like to see at least ten viable occurrences within the North Atlantic coast ecoregion. We then divided the ecoregion into subsections (e.g., southern third, middle third, northern third) and determined if there were at least three viable occurrences in each subsection. The results of these types of analyses can then lead to the identification of new threats and potentially new site-specific strategies.

Placement of Conservation Areas

How do we select these conservation target examples to ensure that the full ecological variability of the communities and of the ecoregion is represented? To answer this question we turn to the geography and ecology of the ecoregion itself. Using maps and digital information we ask questions such as Where are the steep slopes, summits, ridgetops, valleys, floodplains, and wetlands? Which of these are underlain by resistant granite and which are constructed on sandstone? Where is the elevation change rapid and where is it slow? We summarize this information in a set of ecological land units (ELUs), which are unique combinations of elevation, bedrock, and topographic features. On this geographic framework we overlay all the viable examples of communities and species that have been located and evaluated by the State Natural Heritage Network, our long-term partners in biodiversity conservation. The Natural Heritage programs maintain an ongoing inventory of each state's flora, fauna, and communities. We then select replicate examples of each target from each of the different subregions to ensure that we conserve examples in a variety of ecological settings. At this stage we also identify gaps in our knowledge. This information is channeled back to our Heritage partners as recommendations on which areas and which targets need more inventory attention.

Selection of matrix-forming ecosystems and stream networks involves additional data analysis. With respect to the former, in recent years, a variety of methods have been developed to assess the location and condition of large unfragmented pieces of forest. The method we have used to delineate matrix forest examples in all northeast plans is based on roads, land cover, and expert interviews using geographic tools and data. Using road-bounded blocks to delineate matrix examples has practical advantages. The core idea behind the road-bounded block, however, was not practicality but that roads have altered the landscape so

dramatically that their presence provides a useful way of assessing the size and ecological importance of remaining contiguous areas of forest.

By combining potential forest blocks with ELUs in an ecoregion, we identify forest-landscape combinations. Experts review the forest-landscape groupings to ensure that they indeed capture the range of diversity within the ecoregion, and then, within each grouping, prioritize the matrix-forming areas based on their relative biodiversity values, the feasibility of protection, and the urgency of action. A similar approach is used for delineating critical watersheds. We evaluate watershed condition by examining additional features, such as dams, road-stream crossings, and proportion of agriculture or developed land.

Landscape-Scale Conservation Planning

After viable examples have been identified and selected, conservation areas must be designed to ensure their long-term viability. Like the ecoregional assessment, landscape-scale designs revolve around a series of questions.

- How is the landscape constructed and what is the condition of the forest?
- Where are the identified ecoregional targets and where are other potential ecoregional targets?
- What do we want these ecosystems and focal species populations to look like over the long term?
- What attributes of the landscape maintain these targets over the long term?
- What are the current and potential activities on the landscape that might interfere with the maintenance of those attributes? What can we do about those activities to prevent or mitigate them?
- Where, on the ground, do we need to act and what kinds of actions are necessary to accomplish our goals? Can we do enough to succeed in our goals?

Careful attention to these questions forms the basis for a site conservation plan. This plan is the foundation of our future stewardship and protection activities.

The Nature Conservancy completed a second iteration of its ecoregional plan for the North Atlantic Ecoregion in 2006, and this plan provides a good example of what ecoregional planning means in practice. The 2006 assessment sets out an agenda for preserving both the broad landscapes and specific sites where the region's surviving biological diversity can be found and saved from the threats they face due to human impacts. The assessment describes the region's ecology, maps large and small-scale ecosystems and the land use context in which they are found, and identifies and ranks priority areas for conservation. Finally, the assessment makes specific recommendations for conservation actions on the ecoregional scale that can be used by public and private agencies.

Taking coastal stream systems as an example of the many ecosystems addressed by the assessment, the plan focused on streams and tidal creeks flowing directly into the ocean. Size 1 rivers (those with <30 sq. mi. drainage areas) were classified into nine types based on their salinity and watershed size, because salinity is the key factor distinguishing the natural communities living in these streams and size is a

key element of ecological viability in a context of human impacts. Within each of these nine categories, each stream within the ecoregion was ranked for viability of its natural communities based on factors such as hydrologic regime, water chemistry and the percentage of land within the watershed and stream buffers that still had natural land cover (as opposed to development), the stream's degree of connectivity to upland habitats, and plant community structure. (The lack of consistent data for all streams required the analysis team to use proxy attributes in some cases.)

An initial screening process based on the context and condition of each stream was used to narrow the population of potential priority streams. Each stream was ranked using GIS data on land use and impervious surface impacts, connectivity and dam impacts, pollution point source impacts, presence of rare species, and similar criteria. The rankings were used to assign an estimated portfolio category of "yes," "maybe," or "no" to each watershed. Conservancy scientists interviewed local experts to gather additional information, not represented in this GIS analysis, to verify these initial portfolio recommendations. Incorporating all this information, the assessment designates final "yes" and "maybe" watersheds. These sites were then mapped on the ecoregional scale and compared with the recommendations from other, overlapping elements of the North Atlantic Coast Assessment, such as salt marshes, beaches, wetlands, forest patches, and species elements.

The assessment's final recommendations for inclusion in a conservation portfolio are designed to include the most viable watershed examples that are geographically well distributed and include all types of coastal stream ecosystem types in the ecoregion. The recommended portfolio includes 349 watersheds. These represent 21 percent of all watersheds, 25 percent of all direct-to-ocean connected examples in the ecoregion, and more than 10 percent of each of the nine types. The majority of the portfolio tidal creeks suffer to some degree from the impacts of human activities. Fragmentation by dams and roads' impervious surfaces, agriculture, riparian buffer conversion, and/or point sources of pollution can be found in many of the watersheds. Nevertheless, the portfolio watersheds demonstrate sufficient integrity to believe their preservation will save the native biodiversity of the ecoregion's coastal streams. The assessment includes a similar analysis and set of portfolio recommendations for each of the other ecosystem types within the ecoregion.

Beyond the identification of priority sites for conservation, the assessment analyzes the threats facing the ecoregion and makes recommendations for regional conservation action planning. The assessment focuses on the threats presented by habitat loss and fragmentation, the alteration of natural hydrology by withdrawals and dams, the interruption of natural succession processes like wildfire, nutrient enrichment and other forms of water pollution, invasive species and pests, recreational activities, and climate change and sea level rise. In light of these threats, the assessment recommends ecoregional-scale conservation planning, particularly the protection of functional landscapes that encompass a wide range of natural communities and habitat types. Such functional landscapes are generally going to be bigger and more diverse than individual parks, making them more resilient to

future impacts. The assessment recognizes that effective planning does not just mean buying land but also requires management of the land to protect and restore its natural communities and public education to develop a broad appreciation for each distinctive ecoregion and win support for its conservation.

The Nature Conservancy is convinced that ecoregional conservation represents an efficient and effective strategy toward our mission of biodiversity conservation. In the northeastern United States, the Conservancy has completed ecoregion plans for all terrestrial ecoregions and is now embarking upon a marine ecoregional plan. The latest version of the North Atlantic coast ecoregion plan identified 352 matrix and large patch natural area blocks and 145 small patch ecosystems and species examples. With an agenda this ambitious, we expect both challenges and opportunities.



SAVING THE CHESAPEAKE BAY THROUGH REGIONAL LAND CONSERVATION

Rob Etgen

The Eastern Shore Land Conservancy (ESLC) is a regional nonprofit organization that serves six counties on Maryland's Eastern Shore of the Chesapeake Bay. Founded in 1990, ESLC's mission is to sustain the Eastern Shore's rich landscapes through strategic land conservation and sound land use planning. The organization's vision for 2050 is an Eastern Shore where towns are vibrant and well defined; farms, forests, and fisheries are thriving; and scenic, historic, natural, and riverine landscapes are maintained.

For over three centuries Maryland's Eastern Shore has been an idyllic landscape of farms and quaint small towns. Today, however, the area is rapidly losing its rural character and small town charm. Counties face development proposals on their rural lands, while towns face proposals along their edges that would double, triple, and even quadruple their current populations. Left unchecked, this unprecedented growth pressure will forever destroy the rural legacy that makes the region an exceptional place.

According to the Maryland Department of Planning, about 160,000 new residents will make the Eastern Shore their home by 2030—adding more than 70,000 new houses and consuming an additional 215,000 acres of farms and forests. This equals approximately 450,000 total acres of forest and farm land that will be forever lost to roads, subdivisions, malls, and parking lots. That's a loss of open space bigger than Queen Anne's county—equal to all the tillable farmland in Kent, Caroline, and Cecil counties combined.

STRATEGIC LAND CONSERVATION

ESLC's land conservation programs have been preserving land using conservation easements, its Land Rescue Revolving Fund, and other easement and estate planning programs. Through these strategies, 254 farms on over 50,000 acres have been permanently preserved directly by ESLC. The organization targets greenbelts around towns and significant resources, such as the Harriet Tubman Underground Railroad Corridor, the Chesapeake Country National Scenic Byway, and Blackwater National Wildlife Refuge. But land protection alone is not enough to save the Eastern Shore.

The second focus of ESLC is promoting sound land use planning. In 2000 ESLC began working in response to accelerating threats posed to the region by development pressure. ESLC launched a set of activities to build leadership and provide education to help communities make the best decisions on behalf of the Eastern Shore. The campaign included raising public awareness through newsletters, a website, research papers, and a planning awards program. Professional training was provided at an annual planning conference and local workshops. ESLC also supported local leaders and the public with research and pursued preservation and planning funding. The research included studies of downzoning impacts on landowner equity and transfer of development rights prescriptions for counties. Investments were made in the regional Rural Legacy preservation program and federal funds assisted the Delmarva Conservation Corridor. Economic development targeted farms, forests, and fisheries.

EASTERN SHORE 2010—A REGIONAL VISION

The flagship of ESLC's planning work is Eastern Shore 2010: A Regional Vision. Eastern Shore 2010 is an intercounty land use agreement that sets the highest expectations for the care of the Eastern Shore landscape proposed in spring 2002 by ESLC with the guidance of a steering committee chaired by congressman Wayne Gilchrest and former governor Harry Hughes. Following extensive regional discussion about the agreement, the six Middle and Upper Shore counties passed resolutions of support for Eastern Shore 2010 and agreed to work cooperatively toward its goals. The four important land use goals of Eastern Shore 2010 are preserving land, encouraging resource-based economic development, curbing sprawl, and improving regional transportation choices.

The effort began in 2002 with a public opinion poll and drafting of the agreement by ESLC and an advisory committee. That spring, briefings were presented to individual boards of county commissioners. That summer, a public dialogue was conducted to obtain individual endorsements of the agreement.

Polling revealed support for the concept of Eastern Shore 2010 by 82 percent of the public; 88 percent supported their county entering into Eastern Shore 2010; and 78 percent supported "reasonable investments" of tax dollars to achieve the goals outlined in Eastern Shore 2010. Presentations were made to a regional association of

county governments, farm bureaus, community groups, and towns. County meetings were held that fall to review and revise the program. County signatures were collected in the winter, and the ESLC launched implementation in spring 2003.

Implementation involved forming a set of regional task forces to seek innovative strategies and resources. Each task force developed a white paper of implementation options for each goal, including the review of literature, recommendations for action, and an analysis of costs and resources. ESLC coordinated the task force issue of land protection; American Farmland Trust coordinated working landscapes; and a local consultant coordinated growth areas and sprawl control. The issue of transportation was coordinated by ESLC with support from a local consultant and an Advisory Committee of regional experts.

In 2006, facing only modest progress toward the goals and even worsening development pressure throughout the region, ESLC proposed an upgrade to Eastern Shore 2010. The updated agreement revises the four original goals to make them more aggressive and more finely tuned to practical realities of facing development pressure on the Eastern Shore. Five of the six counties eventually endorsed the updated agreement.

The following is a summary of each goal from the 2002 version of Eastern Shore 2010, progress to date on that goal, and a summary of the changes made in 2007.

Goal 1: Protecting Land

Goal 1 of the original Eastern Shore 2010 called on county governments to protect half of all open space outside areas specifically designated for growth by 2010. Meeting that goal would permanently preserve from development 578,277 acres from Cecil to Dorchester. That is 900 square miles, nearly equal to all of Kent, Queen Anne's, and Talbot counties.

By 2007 the six counties were halfway to the goal, with more than 283,000 rural acres protected. But none is on track to hit its 2010 target, and shortfalls in each will likely range from 15,000 to 25,000 acres. Collectively, the shortfall amounts to 113,740 acres, or 178 square miles. That's like a mile-wide swath of potentially developable farm and forestland, running virtually the full length of the Delmarva Peninsula.

To help meet the goal of protecting 578,277 acres by 2010, ESLC proposed counties dedicate an amount equivalent to at least 1.5 percent of their annual budgets to preserving land. Caroline County proves it can be done by a rural Eastern Shore county. In Fiscal Year 2007, Caroline budgeted \$1,140,000 for land preservation, an amount equivalent to 2.5 percent of its budget. A variety of revenue sources are available to counties, including impact fees, excise taxes, transfer taxes, bond funds, and funds from the county budget. Some 78 percent of voters say they would support "reasonable investments of public funds" to attain such a goal—and this support ranged from 69 to 82 percent across the six counties.

Goal 2: Maintaining a Working Landscape

Goal 2 called for promoting the Eastern Shore's traditional occupations—agriculture, forestry, and fishing—by incorporating them into county economic development

plans by 2005. The counties have achieved this goal, and many other private and public efforts are under way to add economic value to these traditional ways of making a living. Two of the Upper Shore counties, Cecil and Queen Anne's, have gone beyond the Eastern Shore 2010 commitment by dedicating full-time staff to marketing and promoting agriculture and other natural resource-based industries.

The updated goal calls for implementing the economic development incentives called for in the original goal. This is already happening in some counties, including Queen Anne's, which recently created an office of agriculture and economic development. Caroline, Dorchester, and Talbot are working jointly through the Mid-Shore Regional Council to, among other things, create a full-time position to focus solely on the economic development of resource-based industries in the three counties and investigate the feasibility of a barley-based ethanol plant.

Goal 3: Curbing Sprawl

Goal 3 committed county governments by 2005 to guide at least half of new growth into areas already planned to accommodate it—where communities already exist and where state and local money is directed for public water, sewer, roads, and schools. All six counties met this goal starting in 2004. Across the Upper Shore, however, it is a qualified success, achieved largely by more development *inside* growth centers. The problem is that large building lots are the norm outside growth centers—more than five times the size of lots inside, on average, across the Shore. In Upper Shore counties, less than half of new homes—those outside growth centers—are consuming close to 90 percent of all open space lost.

In 2006 this goal was significantly upgraded. This portion of the agreement calls for counties to annually guide at least 80 percent of growth into designated growth areas; establish a maximum annual residential growth rate, and include a workforce housing element in the county comprehensive plan. Polling showed 87 percent of voters are concerned about sprawl and 85 percent agree with promoting and investing in existing communities.

The updated Eastern Shore 2010 agreement raises the goal for directing growth to growth areas from 50 to 80 percent. This will save tens of thousands of acres, because development outside growth areas consumes four to nine times the land per household (depending on the county) as development in higher-growth zones. Zoning is critical: both to accommodate growth where it is planned and to restrict it where rural landscapes are desired. Rapid population growth can undermine the best county programs for preserving their rural nature. The Eastern Shore, which took from 1607 to the 1980s to reach 300,000 people, is on a pace to nearly double that by 2030.

Goal 3 includes an objective for setting an upper limit to annual growth. The precise growth rate is left up to the counties. Making growth pay its full costs, planning for the population that current residents want versus what is forecast, and requiring that adequate schools, sewers, and roads be in place first are ways to slow growth. To ensure people can afford homes in counties where they work, this goal commits local governments to make such housing a part of their development

plans. Currently, only Queen Anne's County requires new subdivisions to include a certain percentage of modestly priced homes.

Maryland ranks as the nation's fourth least affordable state for housing, according to a League of Women Voters report. Marylanders now endure the second longest commute times in the nation—thirty minutes one way on average—and one cause is workers driving farther from their jobs to afford the home they want. The state last year passed HB 1160, creating up to \$10 million a year in grants for counties and towns. To qualify, local jurisdictions must commit to creating a workforce housing element in their comprehensive plan in state-approved growth areas.

Goal 4: Planning for Transportation as a Region

Goal 4 proposed development of a regional transportation plan, including alternatives to the automobile. This is critical because automobile use continues rising three times faster than population throughout the Chesapeake region. The impacts of this go beyond congestion and strains on county budgets. Transportation and land use are inseparable issues. A constantly expanding road network, especially one responding to piecemeal, county-by-county pressures, inevitably sets the stage for more sprawl development, which in turn raises demand for more roads.

The Upper Shore counties have made little progress toward the kind of regional planning needed to break this cycle. A few laudable transportation alternatives exist, such as Upper Shore Take a Ride, County Ride, and the Dorchester Developmental Unit Specialized Transportation. Other efforts include a Delmarva bike map of quiet back roads connecting Shore communities and Vienna's plan to ensure walkable, bikeable connections between new development and the existing community.

Goal 4 repeats the call for Upper Shore governments to develop a regional transportation plan by 2010 and adds a call for devising alternatives to a third bay bridge. With continuation of current driving trends, linked closely with current development trends, a third bay bridge becomes all but inevitable. By 2025, an average day's traffic on the existing twin spans will be nearly as bad as on a weekend day now—and twelve-hour delays at peak weekend times would be common, according to a recent state Bay Crossing Task Force report. Another span would bring irreparable changes to the farms, historic communities, and rural way of life on the Shore, with major impacts on presently undeveloped tidal shorelines.

Combined with this would be automotive impacts beyond the obvious traffic congestion and smog. Paved surfaces in the Bay region are growing five times faster than the population, and the roads, driveways, garages, and parking lots account for more than half of it. Small wonder that stormwater runoff, which is worst where large areas are paved over, is the Shore's fastest-increasing source of water pollution and a major force degrading streams throughout Maryland.

Fortunately, the grim Bay Crossing task force projections show only what will happen if nothing is done to reshape growth and transportation. Alternatives exist to stretch the capacity of the existing bridges. The Upper Shore counties must immediately engage state government in discussing beach-oriented rapid transit buses, variable tolls to smooth congestion peaks on the bridges, ride-sharing,

telecommuting, and other alternatives. Better balancing jobs and housing on both sides of the bridge could reduce commuter traffic. This could avoid gridlock on the current bridges and major change to the Shore from another car crossing, and provide time for exploration of a mass-transit bay crossing by ferry or rail.

THE FATE OF THE EASTERN SHORE?

The sobering projections of runaway development overwhelming the Eastern Shore are not destiny. They are based on assumptions that trends of the recent past will continue. Our lands and waters are under assault, but far more remains than has been lost. Eastern Shore counties possess the knowledge and the tools to do better. And by broad and solid margins, their citizens demand it. Of all the generations in all of human time here, this one uniquely has the power to alter irrevocably—or sustain—the Shore as an island amid the sea of East Coast development. On our watch it will be largely decided whether or not our “Eden” gets sliced and diced by development, served up with a steaming side of asphalt. Swift and strong action is needed to manage growth on the Shore that maintains our heritage and quality of life. We are all responsible for what will or will not happen.



CREATING SYNERGY WITH REGIONAL PLANNING AND CONSERVATION EASEMENTS

John Bernstein

Conservation easements have become one of the premier conservation strategies in America. In a 2005 report the Land Trust Alliance and Trust for Public Land estimated that over 5 million acres of land had been placed under conservation easement in the United States, with the State of Maine alone having well over one million acres under easement. As experience with easements has grown, so has our understanding of how easements can be deployed most effectively in achieving conservation goals. The most important insight we have gained is that conservation easements can and should be used as part of an integrated, regional conservation strategy that combines land use planning, regulation, and easements. Without such a comprehensive scheme, easements may create only a patchwork of protected lands amidst a sea of development.

While they vary in terms and details, all conservation easements are legal restrictions recorded on real property in order to protect natural, scenic, agricultural, or cultural resources by specifying permitted and forbidden activities on the land—especially with respect to subdivision and development. They are usually permanent and are generally donated, sold, or given in exchange for some form of government land use permit. Conservation easements are usually granted to a public agency or private nonprofit whose mission is conservation, while the land itself may be owned by anyone and may be freely sold or given to others—but the legal restrictions of the easement are attached to the land and survive to bind all successors in ownership. In many cases, a public agency contributes money toward the acquisition of land by another agency or a nonprofit and receives the right to enforce the easement in exchange. In farmland preservation easements, private landowners retain and use their land while selling or donating an easement that restricts future uses to farming or ranching. The easement gives the public or

private conservation organization the right (and indeed the obligation) to enforce its terms. The restrictions embodied in an easement need not be static: Easements often include management plans specifying allowable uses on the protected property that are reviewed and updated every few years; other easements permit the landowner to make changes to protected land or structures after review and approval of the easement holder.

There are three basic ways of looking at the use of conservation easements: What can and can't be done with conservation easements alone, what can and can't be done using regulation alone, and what can be done using a synergy of both techniques.

Utilizing conservation easements alone or in isolation from planning and regulation almost always results in a patchwork landscape. Such patterns are acceptable only where there is little pressure for land conversion. As there is no way to ensure that all communities and landowners will participate, the use of easements alone can lead to a "free rider problem." Easements can be an expensive tool when they are used over large areas, and it is difficult to plan a pattern of easement acquisition on a large scale. Easements also entail ongoing costs for perpetual monitoring and enforcement.

On the other hand, the use of regulation can get a lot done at once, but regulation has its own disadvantages. Politically, stringent land use regulations are usually difficult to achieve. Municipal zoning rules suffer from the same problems as easements when different towns take different, conflicting approaches to nearby lands. Given constitutional and societal views of individual property rights, traditional land use regulation may not be able to protect all resources and address unique features of properties. And, of course, regulations may change as time goes on and political winds shift.

Synergy is a form of hybrid planning, an impure technique that combines features of both acquisition and regulation. It is important to recognize that such hybrid systems do not necessarily come about as a single plan or government program. Hybrid systems can evolve as government imposes growth management restrictions and the private and public sectors develop land acquisition programs over time, often in parallel. A typical program of hybrid planning uses effective rural zoning, funding for the purchase of conservation easements, transfer of development rights (TDR) and incentives such as tax credits and property tax rebates for donating conservation easements. The funding for the purchase of easements need not be sufficient to buy them on all land zoned for low density: Bond funding typically looks to buy easements over 30–50 percent of the land over twenty to thirty years. Private land trusts play a key role in leveraging public funding from state and local government for easement purchases. In practice, the use of low-density rural zoning has not reduced the value of donated or purchased easements excessively. Most landowners retain enough development opportunities that their remaining rights in the land are very valuable.

A hybrid system makes regulation more palatable because the funding for easement purchases provides some compensation for the (real or perceived) lost equity of affected landowners. The hybrid approach increases the rate of easement

donation in the short run when landowners see land use is stabilized through regulation, and government is supporting land conservation with effective zoning. The system also stabilizes land use in the long run as a group of landowners with land in easement is developed. These landowners have a vested interest in the continuance of effective zoning to control what can happen on non-eased land in their neighborhood; later up-zoning could destroy the economic value of their restricted land, both by making it difficult to farm and by degrading the scenic value of a rural area. The hybrid system has led to the creation of massive blocks of easement-protected land.

WHERE HYBRID PLANNING WORKS

Regions and communities can look to excellent examples of successful hybrid planning using conservation easements and regulation on the state and county levels.

The Adirondack Park

In the Adirondack Park, early and rigorous state land use regulations are now reinforced by extensive use of conservation easements, which now protect more than 750,000 acres. The regulations are administered by the state's Adirondack Park Agency under the authority of the state's Adirondack Park Agency Act, and these regulations impose highly restrictive rural zoning across large portions of the park. This framework has stabilized the pattern of land use so effectively that The Nature Conservancy, the Adirondack Land Trust, and the State of New York have all purchased or received significant conservation easements; many easements have been donated, and many have been very large.

California Coastal Commission and Coastal Conservancy

Another example of hybrid planning has been used by the California Coastal Commission, a state agency created by voter initiative in 1972 to manage development and other human uses of California's coastal zone (excepting San Francisco Bay, which has its own coastal zone management agency). The commission has broad regulatory powers, and it has integrated easement programs into its overall regulatory structure. Development in the coastal zone requires a coastal permit from the commission or local government pursuant to detailed regulatory standards. Counties and municipalities are required to create land use plans in the form of local coastal plans (LCPs) for their coastal areas. Once an LCP is approved by the Coastal Commission, individual permit decisions generally fall to the local government. Even where permitting decisions are made at the local level in the first instance, many county and municipal permit decisions can be appealed to the Coastal Commission. Coastal zoning in high value resource areas can vary from one unit per 60 acres to one unit per 640 acres.

Within this overall land use management structure, easements play an important role. The Coastal Commission has created two distinct easement programs: public access and agricultural easements. Further, many nonprofit partners, such as the Trust for Public Land and the Peninsula Open Space Trust, have taken

advantage of the conservation-oriented coastal zoning to engineer major private conservation transactions. As part of the approvals for many developments, the Coastal Commission requires developers or landowners to provide an offer to dedicate a public access easement (OTD). The justification for this requirement is that such OTDs compensate the public for the impact of private developments on public rights and values, such as the blocking of paths, harming viewsheds, and increasing traffic. The Coastal Commission program is unusual in that the OTD means nothing until some public agency or nonprofit land trust agrees to accept the easement. While the program has succeeded in creating many OTDs, the commission reported that as of 2007 only 19 percent of 1,269 OTDs had been accepted, and some of this 19 percent had not yet been opened for public access. Most OTDs expire after twenty-one years, unless they are accepted and recorded.

The Coastal Commission actively seeks private land trusts to take on easements, and some coastal land trusts have been created to accept OTDs. Other groups, as noted earlier, are very active in private land conservation transactions. Strict regulation stabilizes land use and allows the trusts to compete in areas of intense development pressure. There is strong popular support for the easement holding groups. The state has created the California Coastal Conservancy to provide funding for easements, and significant financial contributions have also been made by coastal jurisdictions, especially Santa Cruz, San Mateo, Marin, and Sonoma Counties, which all enjoy dedicated sources of conservation funding. Total state and local funding for easements is in the hundreds of millions of dollars.

New Jersey Pinelands

In New Jersey the hybrid system has operated to conserve both agricultural and natural lands. Through the state's Pinelands Protection Act and Comprehensive Management Plan (CMP), the New Jersey Pinelands Commission places severe restrictions on development over several hundred thousand acres by designating large management areas with specific use and intensity limits. Two agricultural zones, totaling 106,000 acres, permit only farming and farm-related structures, while forest and wetland conservation zones restrict development in another 540,000 acres. The Pinelands CMP includes a large-scale TDR program that gives landowners in the most heavily regulated agricultural and preservation zones transferable rights that developers must purchase for many activities in the Pinelands regional growth zones. When a landowner severs such a Pinelands Development Credit, the land is automatically and permanently deed restricted, and the state receives an easement to enforce these development restrictions. As of the end of 2007, this program had resulted in deed restrictions on 50,000 acres.

In addition to the TDR program, the State of New Jersey and private land trusts like the New Jersey Conservation Foundation have obtained easements through purchase and donation on tens of thousands of conservation acres. The most notable recent example was the purchase by the New Jersey Conservation Foundation of the former DeMarco family cranberry farm to create a 9,400-acre nature preserve in the heart of the New Jersey Pine Barrens. The State of

New Jersey contributed \$3.5 million toward the \$12 million purchase price, receiving both an undivided 30 percent interest in the property and a conservation easement that enables the public to ensure the land is preserved in perpetuity. In many cases, developers are required by the Pinelands Commission to place easements on land, such as threatened or endangered species habitats, as a condition of gaining approval for development projects. Although the total number of acres deed restricted through regulatory processes, purchases, and donations has not been compiled, it surely numbers in the tens of thousands.

Baltimore County, Maryland

In Maryland, most undeveloped and farmed lands are not incorporated, so counties, rather than municipalities, play the leading role in land use planning and regulation. In Baltimore County, Maryland, early planning was conducted by the firm of Wallace and McHarg Associates for the Valleys Planning Council, a pioneering land trust in the area. Ian McHarg's Plan for the Valleys, created in 1963, was one of the very first to call for agricultural preservation on prime soils. The county recognizes the smart-growth benefits of combining land use planning and regulation with acquisition of land and easements. The county sees this comprehensive approach as not only preserving agricultural landscapes and natural resources, but also as helping sustain Baltimore and other existing communities while promoting more efficient land use and community design.

By 2000 the county had created several resource conservation zones designed to protect both natural areas and farmland from sprawl development. In agricultural areas, residential development was permitted only at densities of one unit per twenty or fifty acres (depending on the zone), and other forms of new development restricted to certain agricultural and recreational activities. State and private land trusts have simultaneously pursued the acquisition of conservation easements. There are now five land trusts operating in the county and over 40,000 acres in easement.

LESSONS LEARNED

In areas where conservation easements and land use regulation have been used in a synergistic approach, the following effects have been observed:

- Easement purchase has increased the political acceptance of needed regulations.
- Effective rural zoning has increased the rate of easement donation by providing landscape-level stability and may lower the cost of acquisition.
- When a critical mass of easements is attained, the zoning is stabilized, because a large number of landowners benefit from retention of existing regulations.

Conversely, where effective zoning is not in force, the following may be true:

- Easements may be less effective and more subject to legal challenges.
- Easement-protected lands may become surrounded by development, and the easements may no longer serve their original function.
- Fewer easements are donated, and those that are sold are often expensive.