farm dwellings are being used in conjunction with farming and not as a means to evade residential development prohibitions in the agricultural zone.[110]

Still another approach, adaptable for use in the Bay states, was pioneered in Montana and Colorado. Small home sites can be subdivided from a larger rural tract, which is then subject to a conservation easement to keep the remainder in forestry or other active rural use. For example, Taylor Park in Colorado allowed the subdivision for development of 400 acres of a 20,000 acre ranch, with the rest subject to a conservation easement that allowed continued ranch use. Similarly, in Montana, ranches that could have been subdivided into 20 acre parcels under county zoning rules were instead authorized to subdivide a number of 1 acre home sites; these then received conservation easements on the remainder of the ranch. This allowed the ranch landowner to realize the substantial economic development value of the entire parcel, while preserving the ranching operation and allowing the home purchasers to receive the benefits of undeveloped rural land surrounding their properties.[111] Similar approaches could be used in the Bay region for forest lands subject to second home and other development.

Transferable development rights programs also may provide means of limiting the fragmentation of valuable forest lands while allowing landowners to realize some of the development value of their holdings. Such programs exist in all three states and could be expanded, particularly if TDRs could be used across county or municipal boundaries.

State and local governments should promote conservation development design, an approach to new development that conserves forested open space. Where new development occurs, it should be compact, minimize the need for construction of new infrastructure, and protect riparian areas and key forest areas. Conservation development clusters development on tracts of land in ways that recognize these other values, protecting larger areas of open space. While conservation development is feasible in most Bay region jurisdictions, zoning and subdivision requirements in many locations make it more difficult than conventional subdivision and development techniques. For example, conventional subdivision into 1 acre lots may be allowed by right, while conservation subdivisions (with quarter acre lots and more preserved open space) may require a special exception, legislative approval, or further justifications. State planning laws can be amended to make conservation development techniques easier to use. Local zoning and subdivision ordinances can be amended to promote this approach to greenfields development in those areas where development is to occur. And nonprofit organizations and educational institutions can demonstrate the advantages of this type of development in appropriate locations.

Maryland's smart growth legislation linking infrastructure funding to development planning could be emulated in Pennsylvania and Virginia. Public infrastructure funding does affect development feasibility and patterns. Such funding could be used to assure greater conservation of forest land and cost-effective development of urban, suburban, and exurban communities. The 2000 Bay Agreement pledges to "promote coordination of transportation and land use planning to encourage compact, mixed use development patterns, revitalization in existing communities, and transportation strategies that minimize adverse effects on the Bay and its tributaries."[112] In addition, the Agreement pledges "by 2003, [to] work with local governments and communities to develop land-use management and water resource

protection approaches that encourage the concentration of new residential development in areas supported by adequate water resources and infrastructure."[113] The Maryland approach to targeting state funding is one that can help meet these commitments. Currently, in Pennsylvania and Virginia, state infrastructure expenditures are not directly linked to locally identified growth areas. However, Pennsylvania has begun to take modest steps in this direction under executive order and through recent amendments to the Municipalities Planning Code. Both it and Virginia should evaluate the Maryland approach. Delaware offers another possible approach to infrastructure funding. Delaware's Quality of Life Act allows, but does not require, state agencies to deny state funding and infrastructure improvements where county land use and development approvals are not consistent with state planning goals (which include state resource areas).[114] Delaware has also developed an interagency "Investment and Resource Management Strategy Map," which identifies urban, transition, and preservation investment areas, to guide state infrastructure expenditures.[115]

Other approaches could include providing infrastructure funding incentives for areas with resource protection zoning, compact development and infill plans, forest protection funding, higher percentage of tree cover, and other factors. Access to highway and water and sewer infrastructure development funds could be done on a competitive basis with additional points awarded for these community characteristics.

States should assist local governments in assessing the impacts of development approvals and infrastructure expenditures. The 2000 Bay Agreement includes a commitment to "by 2002, develop analytical tools that will allow local governments and communities to conduct watershed-based assessment of the impacts of growth, development and transportation decisions."[116] Maryland has elevated the Office of Planning to cabinet level. Pennsylvania has launched a new program of grants to local governments to assist in planning, and has also enacted a legislative requirement for statewide planning and growth management information to be assessed and updated every five years. These moves can be supplemented by the provision of analytic tools and data to assist local decision making. Fiscal impact analysis can help guide local decision makers considering alternative development approaches, and may lead to choices that favor retention of forested land uses.[117]

Local governments can generate incentives for tree cover by basing stormwater utility fees on impervious surfaces, by offering discounts for tree cover, by using utility funds to engage in tree planting and maintenance, and by offering advantages for green infrastructure rather than impervious stormwater collection and diversion facilities. Basing stormwater utility fees on impervious areas and discounts on tree cover provides an incentive for private actions beneficial to the Bay and its forested watersheds. At the same time, the district can engage in tree planting and the protection of key watershed parcels and riparian forest buffers using the moneys collected. Local governments can also provide incentives for use of green infrastructure – including trees and grassed waterways – by making the permitting easier for such facilities or by offering density bonuses or incentives.

Condemnation of intact forest lands should be more difficult. Particularly in key watersheds and in unfragmented forests important for biological diversity, condemnation should be made harder. Some of the protections that attach to agricultural protection areas are

appropriate for forest areas as well. Approaches to forest protection in this context might include requirements for additional assessments, specific findings of fact, and analysis of alternatives.

Pennsylvania and Virginia should consider adopting a land development conservation and mitigation program like Maryland's Forest Conservation Act. Conservation of forest land and partial mitigation for forest loss due to development is, with a few exceptions, a statewide requirement in Maryland. Pennsylvania and Virginian should consider adopting such a program, if not statewide, at least in those areas where land conversion is occurring at a rapid rate. Requiring development activities to inventory forest lands and avoid unnecessary conversion of such lands (and mitigate losses) can be an important part of a strategy to maintain and sustain forests and forest cover in the Bay region. Such a forest conservation and reforestation provision would not be novel. More than two centuries ago, Pennsylvania law required private landowners in Philadelphia and surrounding developing counties to plant trees on their lands "to the end that the same town may be well shaded from the violence of the sun in the heat of summer and thereby be rendered more healthy."[118] These colonial era requirements, imposed on rapidly developing areas even though substantial forests remained in other parts of the Commonwealth offer a reminder that stewardship of the region's forests is not a new concern.

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Chapter Nine
Urban Forestry

Urban forests provide an array of benefits to both the environment and local communities. Urban trees provide shade, capture and filter storm runoff, purify air, and sequester carbon. They also increase residential property values, increase the development of property equity, and draw people to commercial areas. Although there are many concerns regarding urban trees, including the costs of administering a program, and liabilities and hazards caused by poorly planned and managed tree programs, a well designed program can provide an array of environmental and social benefits.[1] Urban and community forestry programs can also contribute to protecting connections to and between intact forests – both those in urban parks as well as those in adjacent suburban and exurban areas – if so designed.

The 2000 Bay Agreement pledges to enhance funding for locally-based programs that pursue restoration and protection projects, and to assist local governments.[2] These commitments provide a basis for revamping and improving urban forestry programs and for launching such programs where they do not now exist.

Components of a Successful Urban & Community Tree Program

Several key components comprise a successful urban and community tree program:

- Establishment and administration by a municipal tree commission;
- Conducting a regular inventory of trees and resources;
- Establishment of a stable source of funding;
- Well-designed community involvement;
- Adoption of a street tree ordinance;
- Development of yearly work plans and budgets;
- Access to adequate information technologies; and
- Administration of a consistent tree maintenance program.[3]

Municipal tree commissions are generally established through the enactment of a street tree ordinance. Tree boards, commissions, or departments are the entity with legal responsibility for the care and management of the community's trees. This may be a professional forester or arborist, an entire forestry department, or a volunteer tree board. Often, both a professional staff and advisory tree board are responsible for these duties. A tree board, or commission, is generally a group of concerned volunteer citizens charged by ordinance with developing and administering a comprehensive tree management program. Effective tree commissions or boards encompass broad-based community involvement.[4]

Tree inventories in a community or urban area are critical for collecting information for the planning, design, planting, maintenance, and removal of trees. Without periodic inventories, the progress of community tree programs cannot be monitored. It is recommended that a complete inventory is conducted every five to ten years.[5]

Municipal tree ordinances authorize and regulate community tree programs.[6] Ordinances can legalize a tree program; establish a municipal tree commission or board; guide the development and implementation of an annual community forestry work plan; establish a process and standards for tree removal, planting, and pruning; define tree work that requires a permit; establish landscaping requirements for development; and protect trees during development and construction.[7] Tree ordinances can also set requirements for mitigating loss or damage to trees during site development or construction. They may also require developers to meet a certain overall tree canopy cover or density standard.[8] Because tree care and maintenance practices change over time, tree ordinances should "facilitate rather than prescribe management."[9] Although tree ordinances can be developed to guide urban and community forestry programs, to be effective ordinances must be adequately enforced and the local government must have the financial resources to fulfill ordinance requirements.[10]

Securing a stable source of funding for a municipal or urban tree program can be a challenge. Possible sources from municipal governments include: general tax revenues; adding tree costs into the budgets for street repair or construction projects; assessing individual property owners and businesses for tree planting, permit, and development fees; fines from street tree ordinance enforcement; insurance settlements for public trees damaged in accidents; hotel/motel taxes; motor vehicle fuel tax revenues; tax return check-offs; check-offs on utility bills; specialty license plates; or revenues from community-owned concessions.[11]

Community involvement is key to the success of any urban or community forestry program. Research has shown that in urban areas with community and youth involvement, there is a 70 to 80 percent tree survival rate. In areas without these programs, there is a 70 to 80 percent tree mortality rate.[12] Successful community programs require dedicated staff and budgets.

Information technology – often in the form of Geographic Information Systems (GIS) – can aid municipalities in making informed decisions about planning their program and financial investments. GIS can help municipalities better manage their tree inventory data, as well as conduct analysis on ownership patterns of large contiguous forested areas in their municipality and surrounding areas. Successful use of GIS requires adequate staff and funding. Although not developed for planning purposes, the CITYgreen software program developed by American Forests, can help municipalities evaluate the economic value of their urban forest resources (see chapter 10).

Urban & Community Forestry Programs in the Bay States

The USDA Urban and Community Forestry program, authorized by the 1990 Farm Bill, provides funding to the state urban and community forestry programs. The funding must be matched by the state and may be administered to local programs through grants.

Maryland law establishes the state's Urban and Community Forestry Program to provide support for county or municipal governments seeking to implement an urban and community forestry program.[13] County or municipal governments are authorized to

implement an urban and community forestry program by adopting an appropriate resolution or ordinance, or by entering into a cooperative agreement with the Department of Natural Resources.[14]

Maryland's Urban and Community Forestry Program is charged with providing localities with technical assistance on how to conduct street tree inventories, evaluate site development plans, protect trees in the development process, work with local planning and zoning departments, and implement and conduct their own urban and community forestry program.[15]

The Maryland Forest Service also provides training and technical support to municipal urban and community forestry programs. It has provided GIS support and training to targeted communities and made the state's GIS layers available to communities. The Service hopes to expand this training program and facilitate the development of this technology at the local level for help in evaluating, planning, designing, and administering urban and community forestry programs.[16]

Pennsylvania law provides for the establishment of tree commissions.[17] Although Pennsylvania tree commissions generally have jurisdiction over trees within the public right-of-way, they can be given authority over other areas, such as other publicly owned trees in parks. This broader authority may help local commissions to more effectively manage large blocks of urban forests.[18] In 1991, it was estimated that only 28 percent of Pennsylvania boroughs and cities had a community tree program.[19]

Virginia state law authorizes local municipalities to adopt tree conservation ordinances "regulating the preservation and removal of heritage, specimen, memorial and street trees." Localities have the power to assign fees for the administration and enforcement of the ordinance. The tree ordinance may also "provide for the appointment by the local governing body of an administrator of the ordinance," or an urban and community forestry department. The program authorized by the tree ordinance does not extend power to the community over federal or state property, landscaping of individual homes, or commercial silvicultural or horticultural activities.[20]

Approximately 35 Virginia municipalities have an established urban and community forestry program. Most of these programs are funded through the municipal budget and have a professional arborist or urban forester on staff, often within a department of public works.

The Virginia Department of Forestry's Urban and Community Forestry Program administers two grant programs. The Urban and Community Forestry grant program provides programmatic support to municipalities for such activities as conducting tree inventories, purchasing equipment including computers, and securing training scholarships. This program is funded through the USDA Urban and Community Forestry program. The Department also administers a street tree planting grant program called "Tree Planting for Virginia's Communities." In 1999, $100,000 in grants were provided to 30 municipalities for tree planting. In 2000, the Department has $150,000 available for this program.[21]

Maryland is the only Chesapeake Bay state that has explicitly set a percent tree canopy cover goal for its urban and community forest programs. Maryland seeks to achieve 40 percent tree cover goal for urban areas.[22] This goal was developed by American Forests' CITYgreen program to ensure "ecological, environmental, and social sustainability."[23] Virginia hopes to adopt a 40 percent tree canopy goal for its program in the near future.[24]

Urban & Community Forestry Councils

The USDA Urban and Community Forestry program, authorized by the 1990 Farm Bill, authorized the formation of state urban and community forestry councils. These councils were established to provide support to programs, as well as mobilize non-profit organizations to support urban and community forestry programs.

Maryland Community Forestry Council

Maryland's Community Forestry Council is a non-profit organization dedicated to helping citizens become stewards of the state's urban and community forests. The Council seeks to increase public awareness of the importance of trees to communities, promotes local and state networks for tree planting and care, and other services.[25] The Council also co-sponsors the Maryland PLANT program (People Loving and Nurturing Trees), an awards program initiated in 1998. Participation in the program has grown to 119 communities across the state.[26]

Pennsylvania Urban and Community Forestry Council

The Pennsylvania Urban and Community Forestry Council is a non-profit organization that provides technical and financial assistance for communities and volunteer groups. Beginning in late 2000, the Council will be administering the Municipal Tree Restoration Program Electric Utility Grants (see below).

Virginia Urban Forest Council

The Virginia Urban Forest Council is a private, non-profit organization dedicated to "champion an improved community environment through forestry training education, program development and recognition." Established in 1990, the Council promotes an awareness of community forests and the value of trees.[27] The Council also sponsors the state's Tree Stewards program. This program seeks to enlist volunteers dedicated to improving the health of trees by providing educational programs, tree planning and tree care demonstration, and tree maintenance assistance throughout their communities. The program provides assistance to local municipalities in maintaining tree health. In 1996, with funding from the National Tree Trust and Wal Mart Foundation, 12 Virginia localities received Tree Steward training and established programs for their communities.

Other Urban Forestry Programs

Tree City USA Designation

Tree City USA is a program sponsored by The National Arbor Day Foundation, in cooperation with the USDA Forest Service and the National Association of State Foresters. The program provides direction, technical assistance, public attention, and national recognition for urban and community forestry programs in thousands of towns and cities across the country.[28] Tree City USA bestows many different benefits on a community, including providing direction for an urban or community forestry program, educational opportunities, advancing a positive public image of a community, generating pride for the community, and drawing financial assistance to the community's forestry program.[29]

To qualify for Tree City USA designation, a town or city must meet four standards established by The National Arbor Day Foundation and the National Association of State Foresters. Communities must establish a tree board or department; adopt a tree care ordinance; establish a community forestry program with an annual budget of at least $2 per capita; and observe Arbor Day.

In Maryland, 33 out of Maryland's 170 local governments, as well as two counties and several military installations, have received Tree City USA designation. Approximately 2.9 million Maryland residents, or 59 percent of the population, live in areas that have received this designation. The National Arbor Day Foundation prefers to designate communities, rather than counties as Tree Cities USA. However, because much of Maryland is in unincorporated areas, a significant portion of the state is not as readily eligible for the program.[30] In 1999, 70 of Pennsylvania's 2,567 communities had received Tree City USA designation.[31] Virginia has approximately 30 communities, as well as several military installations, enrolled in the program.[32]

Municipal Tree Restoration Program

The Municipal Tree Restoration Program (MTRP) is a program run by Pennsylvania investor-owned electric utilities. The program provides financial support for plantings in the communities they serve. The program offers a "Single Tree Replacement Program" whereby the utility offers property owners the option to remove trees that are incompatible with power line maintenance with trees that are more compatible. The utility pays for the removal cost of the problem tree, and purchases and plants a replacement tree selected by the owner.[33] The program was started in 1987 in Pennsylvania and is now available in other states. The program is available in Maryland through the participation of Baltimore Gas & Electric Company.[34] More than 72 communities have participated in the tree planting part of MTRP to date.[35]

In 2000, the MTRP will be launching a grants program for communities in Pennsylvania. The Pennsylvania Urban & Community Forest Council will administer the program, called MTRP Electric Utility Grants. Announcements of program eligibility will be distributed to communities in late 2000 with the first round of grants being made in 2001. Utility foresters will be involved in the administration of the program at the

community level and Extension Urban Foresters will help communities apply for the grants and determine site and species suitability.[36]

Fairfax ReLeaf

Fairfax ReLeaf is a non-profit organization based in Fairfax, Virginia. Fairfax ReLeaf is dedicated to planting trees along roadsides, in public parks, at schools, retirement homes, day-care centers, libraries and old solid-waste landfills. The organization aims to beautify and restore derelict space in urban settings. ReLeaf volunteers planted 36,000 trees and seedlings during 1993-7. National Tree Trust, Union Camp Corporation, Virginia Department of Forestry, and private donors donate native trees and seedlings. Fairfax ReLeaf also sponsors reforestation and restoration of landscape in County parks. ReLeaf also has a program to provide homeowners with assistance and advise on reforestation of their own neighborhoods.

Parks and People Foundation

The Parks and People Foundation, based in Baltimore, Maryland, has several urban forestry projects designed to increase tree cover and revitalize the city of Baltimore. "Revitalizing Baltimore," now in its seventh year, is a community forestry and watershed restoration project. The program, a broad coalition of supporting organizations and agencies, assists over 30 Baltimore communities in improving their environmental health by spearheading greening projects and restoring local watersheds, streams, and urban forests.[37]

The Foundation's Community Forestry Program is designed to help Baltimore residents green their neighborhoods through education, streetscaping, and the creation of gardens on vacant lots. Parks & People supports the planning, organization, and implementation of greening projects in partnership with residents, city agencies, community associations, and other private and non-profit groups. Since 1993, the program has led to the planting of 4,000 trees in 45 Baltimore communities and over 30 vacant lots have been transformed into community-managed gardens or parks.[38]

The Foundation also administers a small grants program for greening communities.[39] The Community Grants Program funds community groups to conduct neighborhood restoration projects that include activities such as tree planting and the establishment of community gardens. The Neighborhood Greening grants award up to $1,000 for tools, planting materials, equipment, and other needed supplies.[40]

Northeast Pennsylvania Urban & Community Forestry Demonstration Program

The Northeastern Pennsylvania Urban & Community Forestry Program is managed by the Center for Urban Forestry, Morris Arboretum of the University of Pennsylvania, in collaboration with the USDA Forest Service, and Pennsylvania Department of Conservation and Natural Resources Bureau of Forestry. Started in 1995, the program seeks to integrate ecological restoration with regional, social, and economic development by

supporting partnership building activities, stewardship, and environmental awareness in the post-industrial metropolitan areas of Northeastern Pennsylvania.

Since the program's inception, 58 projects have been funded in six counties throughout Northeastern Pennsylvania. Between 1995 and 1998, 350 partners joined to complete 58 demonstration projects. The 1999 funding cycle has provided additional grants. Projects funded include 25 Large Community Demonstration projects, 16 Small Community Demonstration projects, and 16 Tree Liability and Assessment projects.[41]

Recommended Actions

Municipalities in the Chesapeake Bay should seek to adopt a tree canopy cover goal, supported by state technical assistance. Establishing a goal provides a basis for evaluating progress and program success. Goals may vary based on landscape and development characteristics, but establishing a goal is important for funding, outreach, continuity, and for achieving water quality results. Maryland's 40 percent tree cover goal provides a potential benchmark for urban and community forestry programs. Locally targeted goals are also meaningful. Montgomery County's (Maryland) Forest Preservation Task Force has established goals of increasing the urban/suburban crown cover by 15 percent and the upland forest area on publicly owned lands by 15 percent by 2005, for example.[42]

Urban tree programs should extend beyond street tree maintenance and replacement to address urban forest cover and to assist landowners. Most urban and community tree commissions established at the local level have jurisdiction over only those trees in the public right-of-way, or street trees. However, only 10 percent of urban trees are street trees.[43] In Pennsylvania, tree commissions can have authority over other areas, such as other publicly owned trees in parks. This broadened authority creates much greater potential for urban forestry programs to provide comprehensive forest management and establish connections between urban street trees, urban parks, and possibly adjacent suburban forestland, creating meaningful blocks of forest coverage. Forests contained in urban areas are often under the jurisdiction of many different municipal agencies, including departments of education, public works, and parks and recreation. Chesapeake Bay states should be encouraged to increase coordination between urban and community forestry commissions and other departments who own, but may not necessarily manage, their forest base for conservation purposes.

Municipalities in the Chesapeake Bay should work with municipal agencies, school districts, and water and sewer authorities with significant forest holdings or land areas to ensure that these tracts have adequate forest management plans in place. These management plans should seek to accomplish broader goals of providing connections to and between adjacent forested tracts on institutional grounds, corporate facilities, and large parks in neighboring suburban areas. Park lands, city maintenance areas, and school grounds should also be included in forest planting and maintenance programs.

Reliable sources of funding for urban forest programs should be established and supported. Funding for urban tree and forestry programs can come from general revenues or from dedicated funding sources. Adequate and assured funding is essential because of the

extensive maintenance often required for urban trees. Stormwater utility fees provide one possible source of income; dedicated portions of property taxes, utility fees, sales taxes, or licensing fees may provide other sources of funding. Business improvement districts and other voluntary programs can also generate revenue for tree planting, maintenance, and replacement activities.

State departments of forestry should enhance their ability to provide GIS and other information technology training and technical assistance to urban and community forestry programs. This will better enable localities more effectively to plan their tree maintenance programs, set goals that include properties outside their immediate properties, and enhance cooperation with other municipal agencies and private entities with significant forest resources.

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Chapter Ten
Targeting Forest Conservation

Strategic targeting efforts can help state agencies, local governments, and conservation organizations design specific and effective programs for forest conservation. Recognition of this lies behind the commitment in the 2000 Bay Agreement to "complete an assessment of the Bay's resource lands including forests and farms, emphasizing their role in the protection of water quality and critical habitats, as well as cultural and economic viability."[1] Detailed analysis will help decision makers identify and use the appropriate policy tools in the region's rural, exurban, suburban, and urban areas.

Geographic Information Systems

A geographic information system (GIS) is a computer-based tool for mapping and analyzing conditions. GIS technology integrates powerful database capabilities with the unique visualization and geographic analysis benefits offered by maps. Its analyses can be used in a wide range of public and private settings, helping in planning, cost reduction, and better-informed decision-making.[2]

GIS has many forestry applications that can help states, localities, agencies, or citizen groups assess their forest resources and use that information to plan. For example, GIS can be used in a forest inventory to organize and display information on current timber stands, satellite imagery displaying different land uses, topographical information, soil erodibility, water bodies, and roads. These can be used to assess harvest options, to identify habitat corridors, or to project impacts to water quality or other environmental resources. GIS can be used to assist in strategic management planning. Decision-makers can use the program to determine how much timber can be harvested by modeling silviculture considerations, wildlife habitat, visual quality, and access to timber.[3]

The 2000 Bay Agreement commits the signatories "in cooperation with local governments, [to] develop and maintain in each jurisdiction a strong GIS system to track the preservation of resource lands and support the implementation of sound land use practices."[4]

Efforts in the Bay States

A number of projects are already underway to assess the status of the region's forest and forest lands. These projects have different objectives, and may need to be supplemented or tailored further to target forest conservation strategies toward appropriate lands in the watershed.

Maryland Integrated Natural Resource Assessment

The Maryland Department of Natural Resources (DNR) has established an Integrated Natural Resource Assessment. This GIS-based effort has several projects underway that relate to forest fragmentation. These include the Green Infrastructure Assessment and the Strategic Forest Lands Assessment.

The Strategic Forest Lands Assessment, launched in early 2000, will not be releasing final results until fall 2001. This project seeks to identify "strategic forest lands, or those parts of the state where forest conservation efforts would make the greatest contribution toward achieving a sustainable (ecologically and economically) forest resource land base."[5] The project will assess the distribution of the ecological characteristics of Maryland's forested land base; assess the distribution of the socioeconomic characteristics of the state's forest resources (including distribution of forest ownership and the infrastructure of the forest products industry); characterize the state's forest lands based on their vulnerability to conversion; and characterize the spatial distribution of existing forest conservation efforts, or where the Maryland Department of Natural Resources is currently utilizing the tools available to the agency to address forest conservation. The project will utilize this information to identify "Strategic Forest Lands" that could form the basis of a long-term, sustainable forest land base[6].

The Green Infrastructure Assessment (GIA) is a tool developed by the Maryland DNR to identify and prioritize areas in the state for conservation and restoration. Using GIS technology, the assessment seeks to identify large, ecologically valuable areas and a system of connecting corridors. These areas are also ranked according to their relative ecological importance and their potential risk to loss from development.[7] The goal of the project is to created a coordinated statewide to land conservation and restoration that will, among other things "address problems of forest fragmentation, habitat degradation and water quality," "maximize the influence and effectiveness of public and private land conservation investment," and "guide and encourage compatible uses and land management practices."[8]

Pennsylvania Forest Inventory and Analysis

The U.S. Forest Service's Northeastern Research Station's Forest Inventory and Analysis Unit is assessing the condition and distribution of Pennsylvania's forests over a five-year cycle. This study, conducted in collaboration with the state Bureau of Forestry, also includes questionnaires for individual and industrial forest landowners to assess their holdings, their reasons for owning forest lands, and their plans for future uses of the lands.[9]

Virginia Forest Resource Assessment

In 1992, the Virginia Department of Forestry (DOF) began a long-term assessment of Virginia's forest resources. The assessment emphasized the effects of population growth and land use changes on forest resources. A report on the initial phase, which focused on timber supply, was completed in 1995. GIS technology was used in the project to overlay population density patterns with forestland cover and land use data. The DOF separated

forest lands into two categories: "rural" forestland, which is likely to remain available for long term timber production and "urban" forestland, which is likely to become unavailable for timber production through residential or other development.

The inventory estimated timber volume, growth, and removal rates for rural forest land. The analysis concentrated on "suitable rural forestland," those lands that are expected to support future commercial timber production in Virginia. Those lands in rural areas that had steep slopes, small acreage, or were distributed in narrow strips were not considered suitable for forestry. The assessment found that although Virginia has 15.4 million acres of forest land, only 8.5 million acres are likely to remain available for timber production. About 3.1 million acres of forestlands were classified as "urban," and another 3.9 million acres were classified as unsuitable. The report found that if only "suitable rural forestland" is considered, the Commonwealth's forest base is inadequate to support the current rate of harvest on a long term, sustainable basis. Therefore, protecting the suitable forest land base from further fragmentation will be essential to the future of Virginia's forest products industry.[10]

American Forests

American Forests, a national non-profit organization based in Washington, DC, provides many different services to those interested in assessing their forest resources.

American Forests conducts Regional Ecosystem Analyses (REAs) of major metropolitan areas to gauge the extent of tree loss and provide communities with solid information for decision-making. To date, REAs have been completed in Atlanta, the Puget Sound region, the Chesapeake Bay watershed, the Canton-Akron metro area, and other areas across America.[11] The REA studies in the Chesapeake region included 11.4 million acres in the southeast portion of the Bay watershed and a more detailed study of 1.5 million acres in the Baltimore-Washington metropolitan area. The studies concluded that substantial declines in tree cover had occurred and that substantial economic and ecosystem losses could be attributed to these declines.[12]

CITYgreen 3.0, GIS software developed by American Forests, uses aerial photographs and on-the-ground measurements of trees to calculate the dollar value of environmental services. The program is designed to help localities meet the organization's recommended goal of 40 percent tree canopy cover to ensure ecological, environmental, and social sustainability.[13] It is available for use by local governments on a fee basis.

Recommended Actions

The states should develop consistent, accessible, assessment methodologies intended to support strategic targeting of forest conservation efforts. The Chesapeake Bay states should promote the development and use of tools designed to target their forestry activities and incentives. Such analysis is critical to guide where cost-share and incentive programs, tax programs, acquisition programs, land use regulation, and other programs should be targeted to ensure that they promote the conservation and sustainability of large blocks of forests meaningful

for water quality, habitat, forest products, and other values. Such analysis and priority setting can also guide management decision-making on publicly owned lands.

The states and federal agencies should work in close cooperation with local governments and urban and community forestry programs to provide technical assistance and training on the use of GIS and other technologies for targeting their programs. Local governments have an essential role to play, but frequently lack the tools to take forests into account in their development decisions. Others need assistance in designing and implementing effective urban and community forestry programs. State governments can provide critically needed assistance.

State agencies should engage with community watershed organizations, including conservation districts, to establish local priorities and implement strategies. There are a great many community watershed groups throughout the Bay region.[14] If good data can be provided and a strategic plan developed for conservation of the Bay's forest landscapes, many of these groups can play very effective roles in educating the public, finding necessary funding, influencing local government decisions, and carrying out on-the-ground conservation activities. Many of these can be further strengthened through governmental assistance such as grants under Pennsylvania's Growing Greener program. These organizations can help in the implementation of targeted strategies and can provide data and monitoring useful in identifying target areas and assessing the success of efforts. Conservation districts too can play an important role, as they deal regularly with landowners that account for a significant portion of the region's forested lands. Their involvement in local priority setting and implementation may be increased if a statewide strategy has been developed to target forest conservation efforts.

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For three decades, the Environmental Law Institute has played a pivotal role in shaping the fields of environmental law, policy, and management, domestically and abroad. Today, ELI is an internationally recognized, independent research and education center. Through its information services, training courses and seminars, research programs, and policy recommendations, the Institute activates a broad constituency of environmental professionals in government, industry, the private bar, public interest groups, and academia. Central to ELI's mission is convening this diverse constituency to work cooperatively in developing effective solutions to pressing environmental problems. The Institute is governed by a board of directors who represent a balanced mix of leaders within the environmental profession. Support for the Institute comes from individuals, foundations, government, corporations, law firms, and other sources.

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