PROTECTING DELAWARE'S FORESTS FOR BIODIVERSITY

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Protecting Delaware's Forests for Biodiversity

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BACKGROUND

Forests provide critical habitat for myriad plant and animal species native to Delaware. In fact, more than 40 percent of Delaware's native flora are forest-dependent species. Therefore, forest conservation is a vital component of any effort to conserve biodiversity.

Biological diversity, or biodiversity, is "the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur."[1] A region once rich in native species and ecosystem types that now has only uniform landscapes with few species and little variation within species is biologically impoverished. Concern for biological diversity requires the conservation of many types of landscapes, native plant and animal species, and the protection of healthy and diverse genetic stocks within species. Delaware's biological diversity provides the state and its inhabitants with numerous economic, social, and environmental benefits.

While the importance of forest conservation and biodiversity is well-known, Delaware continues to lose valuable forestland each year. Estimates show that Delaware's original upland forest cover has been reduced by 75-80 percent, or nearly 800,000 acres. In addition, approximately 75 percent of the forests in the Piedmont region have been cleared for agriculture, pastureland, and development.[2] Habitat loss and fragmentation are two of the primary causes of biodiversity loss in Delaware forests. Habitat loss is the outright destruction of habitat from various development activities. Forest habitat loss in Delaware has been caused by the conversion of land for agricultural use and industrial, residential, and commercial development. Since the early 1980's, rapid growth in the state, particularly in suburban and rural areas, has had a profound effect on biological diversity and forest resources in particular. It is estimated that between 1984 and 1992, the state lost over 55,800 acres of forestland—a total loss of 13 percent of the state's forests.[3]

Habitat fragmentation is a process where large continuous areas of habitat are reduced in size and separated into discrete parcels. Once habitats are fragmented and disturbed, they become more susceptible to further degradation by non-native invasive species leading to further loss of natural biological diversity. While fragmentation often results from a dramatic reduction in the original habitat area, it also occurs when habitat is divided by roads, railroads, drainage ditches, dams, power lines, fences, or other barriers to the free movement and migration of plant and animal species.[4] Invasive species have taken a particular toll on the state's forest resources. Of the 115 tree species found in the state, only 60 are native.[5] Invasive species, such as mile-a-minute weed, kudzu, autumn olive, tree-of-heaven, Japanese honeysuckle, and multiflora rose "pose a very serious threat to forest growth, productivity, and native forest species."[6]

Although approximately 31 percent,[7] or 389,500 acres,[8] of Delaware is forested, 81 percent of the state's forested land is privately owned.[9] Changes in forest ownership pose a significant

[1] The Keystone Center. 1991. *Keystone Dialogue on Biological Diversity on Federal Lands.*

[2] DNREC. *Whole Basin Initiative: Piedmont Basin Preliminary Assessment Report.* DNREC: Dover, DE. 88.

[3] *Shaping Delaware's Future: The 1997 Annual Assessment Report to the Cabinet Committee on State Planning Issues.* July 1998. Office of State Planning and Coordination: Dover, DE. 4-5.

[4] Primack, Richard B. 1993. *Essentials of Conservation Biology.* Sinauer Associates, Inc. Publishers: Sunderland, MA; Robinson, Scott K. 1997. "The Case of the Missing Songbirds." *Consequences*. 3(1): 3-15.

[5] Short, E. Austin III. DDA Forest Service. Personal communication. Jan. 13, 1999.

[6] Delaware Department of Agriculture. 1997. *Forest Health in Delaware.* DDA: Dover, DE. 19.

[7] Delaware Department of Agriculture. 1998. *Delaware's Forests: A Vision for the Future.* DDA: Dover, DE. 4.

[8] Hess, G. K., R. L. West, M. V. Barnhill III, & L. M. Fleming. 1999. *Birds of Delaware.* Univ. of Pittsburgh Press: Pittsburgh, PA. 8.

[9] Delaware Department of Agriculture. 1997. *Forest Health in Delaware.* DDA: Dover, DE. 1,7.

threat to the state's forest resources. Although the number of non-industrial private forest landowners has increased in Delaware, the average size of woodland owned has dropped from 35 to 20 acres, and approximately 11,000 of Delaware's forest owners hold fewer than ten acres.[10]

At present, little protection is given to Delaware's upland forests and certain activities, such as highway construction and placement of stormwater ponds, are often directed to forested areas because they are less regulated. Delaware should consider modifying its current forestry statutes and regulations and adopting new forest protection tools to address the trend in forest loss and fragmentation.

This report highlights the current set of laws, regulations, and programs in Delaware that are designed to address the conservation and management of the state's forest resources. It considers the extent to which these policies can be used to stem the loss of the state's remaining forests and minimize the fragmentation of those forestlands. It also provides examples of forest conservation laws and incentive programs in other states that Delaware could use as models for strengthening its existing forest protection tools.

Since May 2000 when the state's Cabinet Committee on State Planning Issues endorsed the formation of the Biodiversity Implementation Strategy Work Group and the 2001 publication of *Our Natural Legacy: Delaware's Biodiversity Conservation Partnership*, the state has positioned itself as a national leader in biodiversity conservation. As the Biodiversity Partnership seeks to implement the actions outlined in *Our Natural Legacy*, those initiatives that relate to forest conservation should remain priorities. Indeed, if biodiversity conservation is to remain a priority in the state, the continued erosion of the state's forest resources must be addressed.

DELAWARE'S CURRENT FORESTRY LAWS AND REGULATIONS

Delaware currently has a variety of statutes and regulations that relate to forestry activities. While none focus on promoting forest conservation and biological diversity, some provisions from the various laws and regulations can be used to further this end.

[10] *Id.* at 5.

Delaware Forestry Law

Delaware's Forestry Law guides the administration of the state's forestry programs on public and private forestland. Currently, Delaware's Forestry Law does not contain a conservation element. Under the law, the Delaware Department of Agriculture (DDA) has authority over public forestry functions.[11] DDA may undertake educational lectures and conduct exhibits on forestry in the various colleges and schools of Delaware.[12] The department may enter into long-term leases or cooperative agreements with private persons for desirable lands.[13] The department may also acquire, sell, and lease forestlands, set aside unique groves or natural features, and issue permits for activities on state forestlands.[14]

Delaware Forestry Practices Erosion and Sedimentation Law

Delaware's Forestry Practices Erosion and Sedimentation Law is designed to protect surface waters from the adverse effects of pollution from sediment related to silvicultural activities.[15] The law was designed to address silvicultural activities on land that will remain in forested land use and is not designed for activities that will result in a conversion of forestland to another land use.[16] Under the law, if DDA finds that a forest owner is conducting silvicultural activities that cause pollution, the agency may provide advice on corrective measures or issue special orders following a hearing. The department can order the owner to cease immediately activities causing pollution and order the implementation of corrective measures.[17] The department can assess penalties if an owner fails or refuses to follow special orders issued by the department.[18] The law also authorizes the DDA Forest Service to develop sediment control and stormwater management techniques, provide tech-

[11] Del. Code Ann. tit. 3, § 1001.
[12] *Id.* § 1005.
[13] *Id.* § 1009.
[14] *Id.* § 1008.
[15] *Id.* § 1072(4).
[16] Del. Forestry Practices Erosion and Sediment Law Rules and Regulations, § 6.1.
[17] Del. Code Ann. tit. 3, § 1074.
[18] *Id.* § 1079.

nical assistance, administer education programs, and conduct studies to help owners comply with the law.[19]

Regulations were recently passed establishing a notification system for timber harvests and shearing and piling under the act. Operators must provide written notification to the DDA Forest Service prior to initiation of these silvicultural operations on areas of at least one acre.[20] The notification form includes a statement that the land will remain under forest management and requires signed statements stipulating the operators' intent to use forestry Best Management Practices to prevent pollution.[21] The notification form becomes the erosion and sediment permit once it is approved. The state forester is authorized to inspect the site during the proposed silvicultural activity.[22] The statute and regulations are designed to maintain long-term forest health and water quality.

Delaware Commercial Forest Plantation Act

Under Delaware's Commercial Forest Plantation Act, land defined as a commercial forest plantation is entitled to a 30-year exemption from county property taxes.[23] In order to qualify for this exemption, land must be at least 10 acres and carry sufficient forest growth as to give reasonable assurance that a stand of merchantable timber will develop. In addition, the forest must be maintained "to produce timber, pulpwood, poles, sawtimber or other wood products."[24] Commercial forest landowners who participate in the program must have a forest management plan that has been approved by the state forester.[25] Although this statute does provide incentives for the conservation of forestland, the law was not intended to provide incentives to forest landowners for protecting or restoring biodiversity on their property and the forest management plans it requires do not generally include provisions for protecting biodiversity.[26] Insofar as management for commercial wood product production is compatible with the protection of native species and species diversity, this law can be used to encourage behavior that helps conserve biodiversity.

Delaware Agricultural Lands Preservation Act

Delaware's Agricultural Lands Preservation Act does address forest conversion, by creating incentives for forest conservation. Under the act, agricultural land can be enrolled in an Agricultural Preservation District, making it exempt from property, school, and realty transfer taxes.[27] To be eligible for enrollment, farmland must consist of at least 200 acres.[28] Eligibility is also limited to land eligible under the Farmland Assessment Act. Land must be zoned for agriculture, may not be part of an existing subdivision plan, and must receive a certain minimum Land Evaluation and Site Assessment score.[29] Applications for enrollment are reviewed by the Delaware Agricultural Lands Preservation Foundation, the Farmland Preservation Advisory Board for the county, and the Planning and Zoning Commission of the county, and the district may be established if two of the three bodies approve the application.[30] When land is enrolled in an Agricultural Preservation District, the tax benefits and protections of the program are extended to non-agricultural areas of the farm, such as wetlands and forests.[31] Applications for inclusion in a district must include all the eligible land in the parcel.[32]

Lands enrolled in Agricultural Preservation Districts are not allowed to be rezoned or to undergo a major subdivision, and activities on the property are limited to agricultural and related uses. The program does not, however, require or encourage owners in Agricultural Preservation Districts to manage their land in an environmentally sensitive manner. Lands placed in a district must remain enrolled for at least 10 years and if the owner does not notify its intent to withdraw them from the

[19] *Id.* § 1080.
[20] Del. Forestry Practices Erosion and Sediment Law Rules and Regulations, § 5.0.
[21] *Id.*
[22] *Id.*
[23] Del. Code Ann. tit. 3, § 2601(b).
[24] *Id.*
[25] *Id.* § 2603.
[26] Short, E. Austin III. DDA Forest Service. Personal correspondence. May 27, 1999.
[27] Del. Code Ann. tit. 3, § 911.
[28] *Id.* § 907(a).
[29] *Id.* § 908(a).
[30] *Id.* § 907.
[31] DALPF. June 13, 1997. *Wetlands and Farm Preservation.*
[32] Del. Code Ann. tit. 3, § 908(a)(5).

district at least six months before the expiration of the period, the lands are automatically enrolled for additional five-year periods until the owner provides timely notice.[33] Lands in designated districts are also eligible for Delaware's purchase of development rights (PDR) program. Under the PDR program, farmland owners may apply to sell to the state the development rights to their land. When development rights are purchased by the state, lands in Agricultural Preservation Districts are permanently protected from development.[34]

Delaware Farmland Assessment Act

Delaware's Farmland Assessment Act may also encourage forest conservation. Under the act, owners of land actively devoted to agriculture, horticulture, or forestry may apply to have their land valued for property tax purposes according to the land's value for that use, rather than according to the land's most profitable use.[35] The State Farmland Evaluation Advisory Committee determines the range of values for classification of land.[36] If the land changes to a non-agricultural or non-forestry use, the owner is liable for rollback taxes on the full value of the land for the 10 previous years. Properties eligible for the tax break must be over 10 acres and must produce sales of agricultural, horticultural, or forestry production equal to at least $1,000 per year.[37] The income requirement excludes lands managed solely for conservation purposes. The usefulness of this law in promoting the conservation of forestland depends on the determination of the land's use value for forestry. If this determination is too high, the statute will not provide much incentive for retention of land in forest.

Delaware Land and Historic Resources Protection Incentives Act

Delaware's Land and Historic Resources Protection Incentives Act is a tax incentive program to encourage the donation of conservation easements.[38] Out of all of the state's forestry-related provisions, this act provides the most direct incentives for the conservation of biodiversity and forestland. The program authorizes an income tax credit of up to 40 percent of the fair market value of any land or interest in land that is conveyed for open space, natural resource and biodiversity conservation, or preservation purposes to a public or private conservation agency.[39] Under this act, the term biodiversity is not defined. The tax credit is capped at $50,000, but unused credit may be carried over for five years.[40] In order to be eligible for the tax credit, lands must meet the requirements of the Delaware Land Protection Act, consist of habitat for rare biological and natural features, or protect Delaware's important historic resources.[41] The program is designed to conserve open space, but forestland may be included in land that is donated for a conservation easement if the forestland protects the biological diversity of plants, animals, and habitat.

Local forest conservation provisions

In Delaware, county-level statutes and regulations may also promote forest conservation. New Castle County has issued provisions in its unified development code to regulate the cutting of trees. The code stipulates that mitigation must be provided for trees cut over a greater area than permitted in the code.[42] In addition, an increased protection level is given to older trees.[43] New Castle's provisions promote forest conservation of some forest cover and place an emphasis on protecting older trees.

Summary

Delaware has a wide array of forestry-related laws and regulations. The majority of these provisions are designed to regulate forestry activities or provide incentives for maintaining lands utilized for commercial forestry in forestland. With the exception of the Land and Historic Resources Protection Incentives Act, none of the programs explicitly seek to protect the biodiversity values of the state's forests, and none of the provisions address forest fragmentation.

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[33] *Id.* § 909.
[34] *Id.* § 913(a).
[35] Del. Code Ann. tit. 9, § 8329.
[36] *Id.* § 8337.
[37] *Id.* §§ 8333 - 8334.
[38] Del. Code Ann. tit. 30, §§ 1801 - 1807.
[39] *Id.* § 1804.
[40] *Id.*
[41] *Id.*
[42] New Castle County Unified Development Code § 40.10.350.
[43] *Id.*

Delaware Department of Agriculture

Approximately 5,000 acres of timber are harvested annually in Delaware, as illustrated by this timber harvest near Georgetown.

NEW FOREST CONSERVATION PROGRAMS IN DELAWARE

Under Delaware's current statutes and regulations, the state faces a continuation in the current trend of forest and biodiversity loss. It may be useful for the state to consider the forest conservation laws adopted in other states as possible examples for strengthening Delaware's statutes, regulations, and programs. Many of these approaches rely on regulations to promote the conservation of forestland, on voluntary incentives to encourage forest conservation, or on a combination of both. There are several regulatory and incentive programs that Delaware could adopt to discourage the conversion and fragmentation of forestland. Recommendations are provided for ways in which Delaware can strengthen its forestry laws and regulations to deter forest conversion and to improve biodiversity conservation. In addition, examples of similar provisions adopted in other states are also described. Appendix A provides state regulatory program examples in more detail, and Appendix B provides state incentive program examples in more detail.

REGULATORY APPROACHES

To address the conversion of forestland for development, Delaware could adopt a program that regulates the conversion of forests to other uses. To date, Maryland is the only state that has adopted a statute regulating the conversion of forestland for development purposes. Other states have forestry laws, but these are primarily designed to regulate logging activities on land that is already forested. These forest practice laws may, however, contain some provisions that could be applied to promote conversion and the conservation of biodiversity values. These individual statutes are discussed in more detail in Appendix A.

Delaware could enact a statewide program to regulate the conversion of forestland for development purposes.

Delaware could adopt a forest conservation law based on the Maryland Forest Conservation Act, which is described in more detail in Appendix A. Maryland's program requires the retention of a percentage of forest cover and mitigation in connection with development activities. Adopting a similar scheme would require Delaware to pass a new forestry statute. Although this may present a significant political challenge, it is the only direct way for the state to control the conversion of important forestland and to preserve intact forested parcels for biodiversity conservation purposes.

A Delaware forest conservation law could first require that the cutting or clearing of trees be minimized in the development plan. For example, Maryland's Forest Conservation Act requires that every reasonable effort to minimize the cutting or clearing of trees must first be exhausted in a development plan before allowing clearing to occur.[44] The inclusion of a sequencing requirement in Delaware law would ensure that development plans minimize tree clearing when possible, thus preserving more forest cover.

A Delaware forest conversion law could curb the high rate of forestland in Delaware lost to de-

[44] Md. Code Ann., Nat. Res. § 5-1606.

velopment by prohibiting clear-cutting of forested areas for development through a requirement that a certain amount of trees be retained or restored on the parcel. Maryland's Forest Conservation Act sets thresholds for the amount of trees that must be retained or restored on parcels undergoing development. For example, developments in agriculture and resource areas or in areas zoned for medium residential density that have less than 20 percent of the net tract area in forest cover must be afforested up to 20 percent.[45] The Delaware forest conversion law should be adjusted to the specific forest conservation and development goals of Delaware. The implementation of Maryland's Forest Conservation Act from 1993 through 1997 has resulted in the retention of 22,508 acres of forest and the planting of 4,313 acres while 12,210 acres of existing forest have been cleared.[46] Although Maryland's program still allows large forest areas to be cleared for development, it mitigates the effects of development by assuring some retention or restoration of forest.

A Delaware forest conservation law could specify priority areas for the retention of forestland when land is being converted for development. Such an approach would help ensure that all ecological functions of the forests are not lost when forestland is converted for development and could help target areas where the largest conservation gains could be achieved through the program. For example, Maryland's law establishes priority criteria for the location where the required forest cover should be retained on development tracts. These include sensitive areas, areas of contiguous forests that provide connectivity with other tracts, larger trees, and trees that are rare, threatened, endangered, or associated with historic structures.[47] With Delaware's high rate of development, regulations similar to Maryland's would be useful in ensuring that key forested areas are retained. Delaware's law could address not only the net loss of forestland, but also the importance of protecting contiguous forests and rare forest types, and the creation of links between existing forest patches.

A Delaware forest conservation law could also include priority areas for reforestation and afforestation on areas being converted for development. Maryland's law establishes priorities for reforestation and afforestation areas. These include riparian buffers, forest corridors, floodplains, and contiguous forests.[48] Delaware's law could then address the importance of creating links between existing forest patches. All of these provisions strongly support the principles of sound biodiversity conservation.

Finally, a Delaware forest conservation law could allow mitigation to occur off-site or through payment to a mitigation fund if on-site mitigation is not feasible. For example, the Maryland Forest Conservation Act allows a developer to mitigate in the same watershed when no reasonable on-site alternative exists.[49] If mitigation is not feasible on-site or off-site, Maryland's Act then allows the developer to contribute to a forest conservation fund that will be used for reforestation.[50] These options will ensure that mitigation still occurs even if it is not feasible on-site. Delaware's program could identify in advance priority areas in the state for off-site mitigation where the greatest ecological gains would occur.

In order to be effective, a Delaware forest conservation act should borrow from the lessons learned in Maryland and other states. Delaware's forest conservation act could first require that every reasonable effort to minimize the cutting or clearing of trees is exhausted in the development plan. Delaware's forest conservation act could then require that a certain percentage of trees be retained when land is converted for development and trees must be cleared. The act could also set priority areas for the forest that should be retained to ensure that ecological functions of the forest are retained despite the development. The act could include priority areas for reforestation and afforestation, such as in riparian buffers, forest corridors, floodplains, and contiguous forests. Lastly, the act could allow off-site mitigation or allow a contribution to a mitigation fund as a last resort if the on-site mitigation is not feasible. Off-site mitigation could be encouraged in areas where the greatest ecological gains would be achieved.

[45] *Id.*

[46] Honeczy, Marian. 1998. *The Maryland Forest Conservation Act – A Five Year Review.*

[47] Md. Code Ann., Nat. Res. § 5-1607(c), (d).

[48] *Id.*

[49] *Id.* § 5-1607.

[50] *Id.* § 5-1610.

Delaware Department of Agriculture

Fishing pond and surrounding white pine forest planted years before in an old field at Blackbird State Forest

Delaware could modify its Forestry Practices Erosion and Sedimentation Law to require biodiversity conservation measures in silvicultural activities.

Delaware's silvicultural law does not deter land conversion, as it only addresses forest harvest practices and not clear-cutting for land conversion purposes. It could, however, be strengthened with respect to furthering biodiversity conservation. Delaware can draw from the lessons provided by the Oregon Forest Practices Act, which is described in Appendix A. The Oregon statute furthers biodiversity conservation by requiring the retention of some trees or logs for wildlife habitat when land is harvested. Delaware could add provisions to Delaware's Forestry Practices Erosion and Sedimentation Law to further biodiversity conservation in harvesting operations by requiring the conservation of certain trees.

Delaware could also improve upon Oregon's statute by requiring that operators follow a management plan requiring that certain trees must be retained for wildlife habitat when undertaking silvicultural activities. The management plan could also require that during silviculture activities specific trees and priority areas such as riparian buffers, forest corridors, and floodplains, be conserved to retain ecological functions and biodiversity.

Another modification that could strengthen Delaware's Forestry Practices Erosion and Sedimentation Law would be to require that if forestland is not converted in five years after a notice of intent is filed, the forestland must then be regenerated. For example, similar to Delaware, Maine has a notice system for land that is to be cleared for land conversion. However, in the Maine statute, if the intended land change does not occur within five years, reforestation standards then apply to the clear-cut area. Delaware could follow Maine's example and add regeneration standards to its Forestry Practices Erosion and Sedimentation Law if the intent to convert the land is not followed. This provision would contribute to biodiversity conservation by encouraging reforestation if land conversion does not occur with a five-year period. This provision would also ensure that the landowner is not escaping regeneration requirements by claiming to be converting the land.

Delaware could require management plans under the notification requirement of the Forestry Practices Erosion and Sedimentation Law.

Currently, the notification system under the Forestry Practices Erosion and Sedimentation Law simply allows the DDA Forest Service to track parcels of land that are being converted for development. It does not allow the agency to comment on or regulate these conversions. If Delaware had a forest conservation law, this notification could then trigger those requirements. However, without a forest conservation law, Delaware can still ensure that biodiversity conservation goals are furthered by requiring a management plan to accompany this notification requirement. Delaware's statute could be strengthened by requiring the development of a management plan to ensure that appropriate con-

servation provisions, such as maintaining forested riparian buffers, wildlife corridors, and a diversity of native tree species, are followed when land is being converted for development.

Conclusion

The regulatory approaches discussed above and in Appendix A generally apply only after the landowner has decided to develop his land, and then only address how forest harvests should be conducted and how land intended to remain in forestland must be replanted. None of the regulatory approaches discussed above prohibits the conversion of forestland to other uses, or, with the exception of the Maryland statute, requires mitigation for these conversions. These approaches can, however, play an important part in retaining key forestry functions, as in the Maryland program, but they still allow large areas of land to be converted to non-forest uses. Regulatory approaches work best in conjunction with voluntary incentive programs that strive to encourage landowners to retain the land as forest and, when they do conduct a harvest, to utilize good management practices and replant in an ecologically sustainable manner. These incentive programs are discussed next.

FOREST CONSERVATION INCENTIVE PROGRAMS

Voluntary incentive programs are used at the state level to encourage forest conservation and the management of forests for their biodiversity values. States authorize a wide range of incentive programs for conservation of forestland.[51] These incentive programs can be divided into five categories:

- Direct financial assistance
- Tax incentives and land conservation tools
- Education and technical support
- Regulatory relief
- Market-based incentives

Voluntary incentives should be included as part of a strategy to encourage forest and biodiversity conservation. Incentives act prospectively to influence the landowner before he or she has decided to develop the forestland and can lead to the protection of large patches of intact forest – a biodiversity conservation goal. Delaware should adopt one or more of the five types of incentive programs outlined in this report, or build upon the programs already available in the state to maximize the state's ability to promote forest conservation and minimize forest fragmentation. Delaware's incentive programs must be economically attractive to landowners or must provide the landowners a service in order to be successful. Specific examples of other state programs are described further in Appendix B.

Direct Financial Assistance

Direct financial assistance programs provide payments directly to landowners to undertake conservation projects or practices, including biodiversity conservation activities.[52] Direct assistance may take many forms, including cost share programs, grants, low-interest loans, and the provision of in-kind materials.

Delaware could focus existing cost share programs on land placed under a forest management plan that specifically promotes forest and biodiversity conservation practices.

Currently, the DDA Forest Service, in cooperation with the U.S. Department of Agriculture, offers a limited amount of cost share funding to private landowners for tree planting and timber stand improvement.[53] In addition, the DDA Forest Service can help develop customized management plans. To improve upon this program, Delaware's cost share program could focus on those lands placed under a forestry management plan that includes practices to further forest and biodiversity conservation. For example, the cost share program in Illinois, described further in Appendix B, only applies to land under a forestry management plan. Illinois' program finances tree planting, fencing woodlands to exclude livestock, soil and water protection projects, windbreak establishment, wetland and riparian vegetation protection and improve-

[51] When forest conservation programs given as examples specifically mention protection of biodiversity, their definition of biodiversity is noted.

[52] Defenders of Wildlife. 2002. *Conservation in America: State Government Incentives for Habitat Conservation*. 4.

[53] DDA Forest Service website, *at* www.state.de.us/deptagri/forestry/conserv.htm (last visited Dec. 2, 2002).

ment, and other projects to improve wildlife or fisheries habitat on the land.[54] These practices encourage the retention of large parcels of forestland and minimize forest fragmentation. Delaware could simply focus its program on lands that have a plan in place that includes specific practices to further biodiversity conservation.

Delaware's program could also require that land be maintained in forest for a certain amount of time. For example, the Illinois program requires that eligible land be maintained in a forested condition for 10 years or until commercial harvest, whichever occurs last, as required by the plan.[55] This modification to Delaware's program would ensure that money spent in this program will have continued effects on the land in the future.

In addition, the Delaware program could provide penalties for landowners who receive the cost share money but do not retain the land in forest for the required amount of time. For example, Illinois' program states that upon a change in land use, the timber grower forfeits all rights to future payments and must refund all payments received during the previous 10 years.[56] Delaware could adopt a similar provision to provide an incentive for landowners to maintain their land as forest.

Finally, to expand Delaware's cost share program, Delaware could finance a part of the program through penalties collected for violations of forestry laws and regulations, supplemented by additional general revenue funding. For example, Kentucky's cost share program, which is described further in Appendix B, contains a forest stewardship incentives fund that is financed through penalties collected from violations of forestry statutes and regulations.[57]

To form a more effective cost share program, Delaware could borrow from these other state examples. Delaware's program could focus on lands operating under a forest management plan that specifically promotes forest and biodiversity conservation practices. The program could require land to be maintained in forest for a certain period of time and attach penalties for land that is converted before the required time. Finally, Delaware could expand its cost share program through funding from penalties collected from violations of forestry statutes and regulations.

[54] 525 Ill. Comp. Stat. 15/2.
[55] *Id.*
[56] 525 Ill. Comp. Stat. 15/5.
[57] Ky. Rev. Stat. Ann. § 149.348.

Tax Incentives and Land Conservation Tools

Tax incentives are tax credits or deductions and can include income tax relief, property tax relief, and other tax relief. Land conservation tools involve transferring a right in property. Tax incentives and land conservation tools often work together by combining a land conservation tool, such as the donation of a conservation easement, with a tax credit or deduction. These incentives often operate to discourage the conversion of forestland to more intensive uses as a result of economic pressures caused by property tax assessments at values incompatible with their preservation as forestland. A strong tax incentive program should include a management plan requirement, tax relief that is significant enough to make a difference, a strong disincentive for forest conversion, and incentives for maintaining intact blocks of forests and minimizing fragmentation. Delaware has several opportunities to strengthen and expand its tax incentive policies to deter forest conversion and promote biodiversity conservation.

Delaware could expand eligibility under the Commercial Forest Plantation Act to provide property tax relief for lands managed for wildlife, forest health, landscape connectivity, and biodiversity.

Delaware's Commercial Forest Plantation Act is currently designed to provide property tax relief for lands maintained for the production of timber and wood products. This act could encourage forest conservation and biodiversity purposes by adding eligibility provisions for lands managed for wildlife, forest health, landscape connectivity, and biodiversity. Delaware can consider the variety of management purposes authorized under Indiana's Classified Forest Program and Indiana's Classified Wildlife Habitat Program, which are discussed further in Appendix B.

Under Indiana's Classified Forest Program, landowners of "forest plantations" and "native forest lands" can have their property tax reduced to $1 per acre.[58] Under Indiana's Classified Wildlife Habitat Program, landowners of land classified as

[58] Ind. Code § 6-1.1-6-1.

Dot Abbott-Donnelly

Example of a biodiversity conservation practice: Wetland restoration in marginal agricultural field to increase wildlife habitat and diversity of forestland.

wildlife habitat can have their property tax reduced to $1 per acre.[59] Changes such as these to Delaware's Commercial Forest Plantation Act would provide property tax relief for lands managed for forest conservation or biodiversity conservation rather than only for lands managed for the production of timber and wood products. The act would then reduce the pressure on the owner of conservation land to convert the land from forest due to property taxes.

Delaware could also add penalties for land that is withdrawn from the program. For example, in Indiana, the landowner is liable for 10 years of foregone back taxes plus 10 percent interest upon leaving the program or for failure to follow a management plan.[60] This modification would provide an incentive for landowners to continue their participation in the program and retain their land in forest.

In addition, the Delaware Act requires management plans in order to participate in the program but does not include provisions to protect biodiversity in these plans. Under Indiana's Classified Wildlife Habitat Program, landowners must follow standards for wildlife management for their land to enter the program.[61] Delaware could encourage biodiversity conservation by specifically incorporating biodiversity conservation measures into these plans.

To improve Delaware's Commercial Forest Plantation Act, Delaware could expand eligibility to provide property tax relief for lands managed for wildlife, forest health, landscape connectivity, and biodiversity. It could require that land be placed under a management plan with biodiversity conservation measures in order to participate in the program. Finally, Delaware could impose penalties for land that is withdrawn from the program or for land that does not comply with its management plan.

Delaware could remove the requirement that land under the Farmland Assessment Act must generate sales of agricultural, horticultural, or forestry products of at least $1,000 per year, or it could allow an alternative showing that the land is important for forest health, biodiversity, or connectivity of habitat and is managed in accordance with an approved biodiversity management plan.

Another option Delaware has for using property taxes to deter forest conversion is through its Farmland Assessment Act. Currently this act allows forestland to be valued for property tax purposes according to the land's value for that use. However, in order for land to qualify for this act, it must produce income of at least $1,000 per year. To strengthen this act to deter land conversion, the income generation requirement could be removed so that land owned exclusively for conservation purposes can be included. In addition, the land's value for forestland, which is the basis for property tax under this act, must be low enough that it creates an incentive to retain land in forest.

The Farmland Assessment Act could also allow an alternative showing that the land is important for forest health, biodiversity, or connectivity of

[59] *Id.* § 6-1.1-6.5-8.
[60] *Id.* §§ 6-1.1-6-8-21, 6-1.1-6-24.
[61] *Id.* § 6-1.1-6.5-2.

habitat in order to participate in the program. To implement this change, Delaware can consider Oregon's Wildlife Habitat Conservation and Management Program, which is discussed further in Appendix B. Oregon's statute allows landowners to maintain special assessments on forestland used for wildlife habitat conservation and management, which includes a biodiversity component. Oregon's program deters land conversion by allowing landowners to maintain special assessments on forestland. Oregon has essentially taken a standard farmland assessment act, much like Delaware's Farmland Assessment Act, that provides incentives for working forests and chosen to recognize the other values that forests can provide, such as wildlife, water quality, and biodiversity benefits. Delaware could modify its Farmland Assessment Act to recognize these values.

Delaware could also modify its Farmland Assessment Act to require that land managed for biodiversity conservation must be managed in accordance with an approved biodiversity conservation plan. For example, Oregon's Wildlife Habitat Conservation and Management Program encourages biodiversity conservation through provisions in the required wildlife habitat conservation and management plan. Oregon's program provides an excellent example of how a state can create incentives for conserving multiple forestland values through a management plan. A similar modification in Delaware would provide incentives for landowners to maintain their forests and to implement biodiversity measures on this land. This change would allow the act to recognize all of the values that forests can provide, such as wildlife, water quality, and biodiversity benefits.

To make Delaware's Farmland Assessment Act a more effective biodiversity conservation tool, the state could eliminate the income generation requirement so that conservation land can be eligible for the program. The act could also allow an alternative showing that the land is important for forest health, biodiversity, or connectivity of habitat in order to participate in the program. The act could require that land in the program be managed under an approved biodiversity conservation plan. Finally, the land's value for forestland, which is the basis for property tax under this act, could be lowered to ensure that it creates an incentive to retain land in forest.

Delaware could create a tax relief program targeted at forest conservation of particularly important parcels of forestland, such as riparian buffers or the remaining white cedar swamps.

In order to establish a conservation program targeted at particularly important forestlands, Delaware could amend its Farmland Assessment Act to reduce the property tax on particularly important forestland areas, such as forested buffers, forest corridors, or endangered species habitat. For example, Texas' program, which is described in more detail in Appendix B, encourages forest conservation by granting property tax relief for lands in an aesthetic management zone, in a critical wildlife habitat zone, or in a streamside management zone that are maintained in forest.[62] Reducing the property tax in these areas eases the economic pressure on these landowners and encourages them to retain the land as forest. If amended to reflect some of the Texas provisions, Delaware's act would further biodiversity goals by encouraging the retention of these important forested areas.

Delaware could also modify its Farmland Assessment Act to require that lands in these important areas are managed in accordance with an approved forestry management plan. These plans can ensure that land is maintained properly and biodiversity conservation is encouraged.

Delaware could also create a new income tax relief program targeted at riparian buffers. This program could be modeled after Virginia's, which offers an income tax credit for landowners who forego timber harvests along rivers and streams. Virginia's program is discussed further in Appendix B. The strength of Virginia's riparian buffer program is its focus on conservation of particularly important forested areas for the health of the ecosystem.

Delaware could also require that land be maintained in forest for a certain amount of time in order to participate in the program. For example, under the Virginia program the minimum duration that the buffer must be retained is 15 years.[63] Penalties could also attach if the land is not maintained for the required time. For example, under the Virginia program, if the landowner harvests the

[62] Tex. Tax Code §§ 23.9801, 23.9803

[63] Va. Code Ann. § 58.1-339.10.

Delaware Department of Agriculture

Forested multi-use park trail - White Clay State Park

land within the protection timeframe, they must immediately pay the past claimed tax credit.[64] This addition to Delaware's law would ensure that these important forested areas are maintained for a certain length of time.

In addition, Delaware could ensure that the protected areas are maintained through periodic inspections. For example, under Virginia's program, the state forester inspects the buffers each year to ensure their proper maintenance.[65] Currently, there are only 25 forest buffers under Virginia's program. The state agency believes that this is due to the requirement that mapping information of the buffers be submitted in a digital format. This format allows the agency to monitor sites more easily, but it is more difficult for the landowner to obtain.[66] While the inspection requirement is important to ensure compliance with the program, Delaware may not want to require that information be provided in a digital format that may hinder the number of landowners who can participate.

Finally, Delaware could also require stewardship plans for these protected areas. Under the Virginia program, the individual must comply with a certified individualized Forest Stewardship Plan in order to participate.[67] By requiring these plans, Delaware can ensure that these important areas are managed properly and that biodiversity conservation measures are incorporated.

To create a new income tax relief program targeted at riparian buffers, Delaware could offer an income tax credit for landowners who forego timber harvests along rivers and streams. Delaware could require that the land be maintained for a certain period of time and attach penalties for land that is harvested during this time. Delaware could establish a monitoring requirement to ensure compliance with the program. Finally, Delaware could require that land in the program be placed under a stewardship plan.

Delaware could expand its Land and Historic Resources Protection Incentives Act to include income tax relief for conservation easements on a broader range of forestland and allow excess income tax credit to be transferred to other Delaware taxpayers.

Delaware's Land and Historic Resources Protection Incentives Act is targeted specifically at conservation easements for open space and only includes forestland if it conserves biological diversity within the requirements of the Delaware Land Protection Act. Delaware could expand this program to include income tax credit eligibility specifically for conservation easements that protect various kinds or areas of forestland, similar to Virginia's Land Conservation Incentives Act, discussed in more detail in Appendix B. Virginia's act offers a unique approach to the use of income tax credits to promote the donation of forestland for conservation and preservation. Virginia's act allows forestland to be donated for biodiversity conservation purposes.

In addition, Delaware could require that land under this program be placed under a forest stewardship plan. These plans could then incorporate measures to promote biodiversity conservation.

Delaware could enhance the attractiveness of its program by allowing available tax credits to be marketed. For example, Virginia's act allows the landowner to transfer unused credit to another landowner. Therefore, a person who does not have a high income could transfer this excess income tax credit to another Virginia taxpayer and receive cash for the transfer. This enhancement to the income tax credit makes forestland donations very attractive to those landowners with low incomes who did not previously feel that this credit would benefit them.

To improve the effectiveness of Delaware's Land and Historic Resources Protection Incentives Act, Delaware could first amend the act to specifically grant income tax credit for conservation easements

[64] *Id.*
[65] *Id.*
[66] Foreman, Mike. Virginia Department of Forestry. Personal correspondence. Mike Foreman. Nov. 26, 2002.
[67] Va. Code Ann. § 58.1-339.10.

on forestland. Second, Delaware could use the program to target those lands particularly important for biodiversity conservation. Third, Delaware could require that lands under this program be managed under a management plan. Finally, Delaware could authorize these tax credits to be transferred to another Delaware tax payer to encourage the use of this credit by those with low incomes, who would otherwise be unable to take full advantage of the program.

Education and Technical Support

Under technical assistance programs, state agency staff provide expertise to landowners on forest conservation issues. Some technical support programs may also provide some limited cost-share, grant, or in-kind materials to landowners.[68] Technical support and outreach programs are generally geared toward reaching forestland owners who seek to maintain their property in forestland, rather than those who seek to convert their forestland to other uses. However, if the programs are geared toward teaching landowners to maximize the value of their property, while protecting or enhancing the biodiversity values, they can serve to create incentives for maintaining forestland as such.

Delaware could expand its current technical support and outreach programs to reach all forestry stakeholders and include information on the importance and value of biodiversity in all education and technical support programs.

Currently, the DDA Forest Service can supervise reforestation and timber stand improvement projects.[69] Delaware could expand this program to explicitly offer technical assistance on biodiversity conservation practices to increase the implementation of biodiversity conservation practices in Delaware. For example, in Illinois, the state's Department of Conservation provides technical assistance to landowners on forest conservation practices, including biodiversity practices. Assistance includes management advice for the protection, enhancement, and utilization of existing forestlands and reforestation.[70] By explicitly offering technical assistance on biodiversity conservation practices, the Delaware program could provide the agency an opportunity to encourage reforestation and forest retention in a manner that minimizes fragmentation and links existing forest patches with those on adjacent lands.

Currently, the DDA Forest Service can assist loggers and landowners through site visits and educational programs to help ensure that they are following best management practices.[71] Education programs to promote the importance of forest and biodiversity conservation, and sound management practices could also target the public, loggers, industry, landowners, and public agencies. These programs provide an excellent opportunity to teach landowners about the benefits of their land—particularly intact forests that are minimally fragmented—for biodiversity conservation values.

For example, Kentucky's program,discussed in Appendix B, includes improving the public's awareness of the importance of the state's forests, promoting forest stewardship and sound forest utilization practices of private woodland owners and the forest industry, and coordinating with other agencies and organizations to assure effective long-term forest conservation programs.[72] Kentucky's program encourages forest conservation and prevention of land conversion through education and emphasizes to landowners the importance of forest conservation by providing them with information on how to implement sound forest conservation practices. Similarly, Delaware could expand its program to reach all forest stakeholders to emphasize the importance of forest and biodiversity conservation.

Delaware has the authority to operate educational programs and technical assistance programs under the Forestry Law and the Forestry Practices Erosion and Sedimentation Law.[73] To improve Delaware's education and technical support program, the program could include information on the importance and value of biodiversity, as well as the full array of values provided by retaining intact forestland, in an effort to discourage forestland conversion. These programs could also strive to reach all forest stakeholders.

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[68] Defenders of Wildlife. 2002. *Conservation in America: State Government Incentives for Habitat Conservation*. 3.

[69] DDA Forest Service website, *at* www.state.de.us/deptagri/forestry/conser.htm (last visited Dec. 2, 2002).

[70] Ill. Admin. Code tit. 8, § 700. App. D, Ex. A.

[71] DDA Forest Service website, *at* www.state.de.us/deptagri/forestry/protec.htm (last visited Dec. 2, 2002).

[72] Ky. Rev. Stat. Ann. § 149.334.

[73] Del. Code Ann. tit. 3, §§ 1001 - 1008, 1072 - 1080.

Regulatory Relief

If a state chooses to adopt a regulatory approach to promote forest conservation, regulatory relief can then become an incentive to encourage increased forest conservation. With regulatory relief programs, the landowner is exempt from regulations or is allowed to follow a streamlined, or less stringent, regulatory process in exchange for agreeing to implement certain practices.

Delaware could consider regulatory relief to ease the regulatory burden in exchange for enhanced conservation practices.

Delaware currently has a notification provision under its Forestry Practices Erosion and Sedimentation Act, which allows the DDA Forest Service to track the conversion of forestland. Delaware's notification provisions are linked to inspection requirements. Delaware could establish a self-inspection program under its Forestry Practices Erosion and Sedimentation Act to ease the inspection burden. For example, Virginia also has these notification and inspection provisions, but it has implemented a self-inspection program, which is discussed further in Appendix B. Under Virginia's program, the Department of Forestry allows forest operators to submit a self-inspection form if the operator is participating in the Sustainable Forestry Initiative, or if the operator negotiates an agreement with the State Forester to conduct inspections on his own land. Otherwise, the department may conduct inspections on all non-industrial private landowner harvesting operations. Delaware could draw from this example and create a self-inspection program to ease its inspection requirements.

Delaware could also build on Virginia's program to require that those participating in the self-inspection program are first implementing biodiversity conservation practices and best management practices before being allowed to participate in the self-inspection program. This self-inspection program would thus encourage the use of biodiversity conservation practices while easing the regulatory burden on landowners.

Another option for Delaware to provide regulatory relief is by offering stewardship agreements under its Forestry Practices Erosion and Sedimentation Act as a means to reduce the regulatory burden on operators. Delaware could draw from Oregon's Forest Practices Act, which is discussed further in Appendix B, to establish the stewardship agreement option. Under Oregon's Act, the Board of Forestry may enter into stewardship agreements with landowners, in lieu of the traditional mechanisms of operation planning and review, inspections, and enforcement.[74] These agreements reward knowledgeable forest landowners for implementing forest management strategies with reduced oversight from the State Forestry Department. They also provide an incentive for forest landowners to enhance and restore fish and wildlife habitat, water quality, and other forest resources.[75] Therefore, Delaware's stewardship agreements could require that operators undertake specific biodiversity conservation practices in exchange for easing some of the oversight of the state agency.

Market-Based Incentives

Market-based incentives are programs that are driven by the market. Examples of market-based incentives include certification and eco-labeling, competitive bidding for wildlife habitat, and habitat trading or banking. These incentives have not been broadly adopted by states to address biodiversity concerns, but they remain an option.

Delaware could consider implementing a market-based incentive program.

Delaware could consider implementing a market-based incentive program, such as creating a certification program for wood harvested from land managed under an approved forestry management plan, to encourage landowners to adopt and follow these plans.

RECOMMENDATIONS

Delaware can improve the ability of its current laws and programs to require or create incentives for retaining forestland and minimizing forest fragmentation. In addition, the state could consider additional regulatory and incentive programs to address the ongoing trend in forestland conversion. Below is a summary of the recommendations offered throughout this report:

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[74] Or. Rev. Stat. § 527.662.

[75] *Id.*

Delaware Department of Agriculture

Riparian habitat along White Clay Creek - White Clay Creek State Park

Regulatory Approaches

- Enact a statewide program to regulate the conversion of forestland for development purposes.
- Modify the Forestry Practices Erosion and Sedimentation Law to require biodiversity conservation measures in silvicultural activities.
- Require management plans under the notification requirement of the Forestry Practices Erosion and Sedimentation Law.

Incentive Approaches

Direct Financial Assistance

- Focus existing cost share programs on land placed under a forest management plan that specifically promotes forest and biodiversity conservation practices.

Tax Incentives and Land Conservation Tools

- Expand eligibility under the Commercial Forest Plantation Act to provide property tax relief for lands managed for wildlife, forest health, landscape connectivity, and biodiversity.
- Remove the requirement that land under the Farmland Assessment Act must generate sales of agricultural, horticultural, or forestry products of at least $1,000 per year, or allow an alternative showing that the land is important for forest health, biodiversity, or connectivity of habitat and is managed in accordance with an approved biodiversity management plan.
- Create a tax relief program targeted at forest conservation of particularly important parcels of forestland, such as riparian buffers or the remaining white cedar swamps.
- Expand the Land and Historic Resources Protection Incentives Act to include income tax relief for conservation easements on a broader range of forestland and allow excess income tax credit to be transferred to another Delaware taxpayer.

Education and Technical Support

- Expand current technical support and outreach programs to reach all forestry stakeholders and include information on the importance and value of biodiversity in all education and technical support programs.

Regulatory Relief

- Consider regulatory relief to ease the regulatory burden in exchange for enhanced conservation practices.

Market-Based Incentives

- Consider implementing a market-based incentive program.

CONCLUSION

Delaware's remaining forestland provides a variety of benefits to the state's citizens. Its forest and forest products industry is an important component of the state's economy. Approximately 5,000 acres of forestland in Delaware are harvested every year. This activity provides jobs to 3,700 individuals with total annual wages estimated at $98 million.[76] The state's forest resources also provide ample opportunity for wildlife viewing, hunting, and an escape from increasingly urban lives—values that are much appreciated by the state's residents. Finally, Delaware's forest resources are indispensable for maintaining the biological richness of the state. However, as more of the state's existing forestland is lost and existing parcels continue to shrink and become fragmented, the less its forestlands are able to support the plants, animals, and natural communities that make it unique.

Since early 2000, the state's leaders in both the public and private sectors have demonstrated a commitment to conserving its natural heritage for future generations. Establishing sound policies and programs to discourage the conversion of existing forestland to other uses and the fragmentation of forests into smaller patches should be a central component of any biodiversity conservation strategy. This report provides the state's leaders with several examples of how Delaware can build upon its existing forest conservation tools to demonstrate its commitment to forest and biodiversity conservation statewide.

[76] Delaware Department of Agriculture. 1998. *Delaware's Forests: A Vision for the Future*. DDA: Dover, DE. 6.

APPENDIX A: STATE REGULATORY PROGRAMS

Below are more detailed summaries of the state regulatory programs mentioned in the report.

MARYLAND FOREST CONSERVATION ACT

In general, under Maryland's Forest Conservation Act, the clearing of forests for subdivision or grading or sediment control must be mitigated. The mitigation can occur either on-site, off-site, or if mitigation cannot be achieved through these first two methods, then through payment of funds to the Forest Conservation Fund.

The act does not apply to construction of highways, to areas governed by the Chesapeake Bay Critical Area Protection Law where land is already regulated to protect water quality, agricultural activities that do not result in a change in land use, or to commercial timber harvesting if it is not the subject of a grading permit for development within five years after the harvest.[77]

This act requires that a person applying for a subdivision or grading or sediment control permit on an area greater than 40,000 square feet must submit a forest stand delineation for the entire site.[78] The forest stand delineation is used during the preliminary review process to determine the most suitable areas for forest conservation.[79] Once the forest stand delineation is complete, the developer must then submit a proposed conservation plan for the site to the local government and conservation district (or to the state if the local government chooses not to administer the program).[80] The plan must provide for forest retention and reforestation, and, in certain cases, for afforestation of previously non-forested areas. The law establishes priority criteria for where the required forest cover should be retained on development tracts. These include sensitive areas, areas of contiguous forests that provide connectivity with other tracts, larger trees, as well as trees that are rare, threatened, endangered, or associated with historic structures. The law also establishes priorities for reforestation and afforestation areas, such as riparian buffers, forest corridors, floodplains, and contiguous forests.[81]

Developments in agriculture and resource areas or in areas zoned for medium residential density that have less than 20 percent of the net tract area in forest cover must be afforested up to 20 percent; and commercial or industrial properties and high density residential areas with less than 15 percent must afforest up to 15 percent.[82] In order to assure that forested areas remain in forest to some extent, areas that are deforested by the development activity must be partially reforested. The reforestation requirement is linked to a conservation threshold, which is the percentage of the net tract area at which the reforestation requirement changes from a ratio of ¼ acre planted for every 1 acre removed to a ratio of 2 acres planted for every 1 acre removed.[83] There is a forest conservation threshold established for all land use categories.[84]

For all existing forest cover cleared on the tract above the applicable forest conservation threshold, the area of forest removed must be reforested at a ratio of ¼ acre planted for every acre removed.[85] Each acre of forest retained on the tract above the applicable forest conservation threshold is credited against the total number of acres required to be reforested.[86] For all existing forest cover cleared on the tract below the applicable forest conservation threshold, the area of forest removed must be reforested at a ratio of 2 acres planted for every acre removed.[87]

After every reasonable effort to minimize the cutting or clearing of trees and other woody plants

[77] Md. Code Ann., Nat. Res. § 5-1602.
[78] *Id.* § 5-1604.
[79] *Id.*
[80] *Id.* § 5-1605.
[81] *Id.* § 5-1607(c), (d).
[82] *Id.* § 5-1606.
[83] *Id.*
[84] The forest conservation thresholds for agricultural and resource areas are 50 percent of net tract areas, medium density residential areas are 25 percent of net tract area, institutional development areas are 20 percent of net tract area, high density residential areas are 20 percent of net tract area, mixed use and planned unit development areas are 15 percent of net tract area, and commercial and industrial use areas are 15 percent of net tract area. *Id.*
[85] *Id.*
[86] *Id.*
[87] *Id.*

is exhausted in the development plan, the forest conservation plan must provide for reforestation or payment into the Forest Conservation Fund.[88] Off-site afforestation or reforestation in the same watershed, or in accordance with an approved master plan, may be utilized where the applicant has demonstrated that no reasonable on-site alternative exists. Off-site mitigation may also be allowed in cases where any on-site priority areas have been planted in accordance with prescribed requirements and the applicant has proven that the environmental benefits associated with off-site mitigation would exceed those derived from on-site planting.[89] Off-site mitigation may include the use of designated forest mitigation banks.[90]

The reforestation requirements must be accomplished within one year or two growing seasons after completion of the development project.[91] For projects that cannot meet their obligations on-site or off-site, the project sponsor must contribute 10 cents per square foot of the required planting area to the Forest Conservation Fund.[92] The Department of Natural Resources must accomplish the reforestation or afforestation within two years or three growing seasons after receipt of the funds.[93]

Finally, under the act all units of government with planning and zoning authority must operate under an approved forest conservation program.[94] The forest conservation program must include provisions for preservation of priority areas; retention as forest of all land forested, afforested, or reforested under the act; and a limitation of uses of forest to those that are not inconsistent with forest conservation.[95]

Enforcement of the act includes a penalty of 30 cents per square foot of the area found to be in noncompliance, plan revocation, a stop work order by the state or local authority, injunctive relief, and a civil penalty of up to $1,000 per day.[96]

[88] *Id.*
[89] *Id.* § 5-1607.
[90] *Id.*
[91] *Id.* § 5-1606.
[92] *Id.* § 5-1610.
[93] *Id.*
[94] *Id.* § 5-1603.
[95] *Id.* § 5-1607.
[96] *Id.* §§ 5-1608, 5-1612.

OREGON FOREST PRACTICES ACT

Oregon's Forest Practices Act is a regulatory program addressing silvicultural activities. This act is primarily targeted at ongoing harvest operations.[97] The Oregon statute defines three types of harvest operations, and certain operations require a written plan to be approved by the State Forester.[98] The State Forester may condition the approval of plans by controlling the method, timing, and extent of harvest if he determines a potential threat to resources exists.[99] The Forestry Board establishes standards for forest practices in each region or subregion.[100] The board also establishes best management practices to prevent or reduce water pollution.[101]

In order to contribute to the overall maintenance of wildlife, nutrient cycling, moisture retention, and other benefits provided by intact forests, when certain harvests exceeding 25 acres are proposed, the operator must leave a specified number of snags, live trees, or downed logs to ensure the provision of wildlife habitat.[102] The board also requires reforestation for certain harvest types.[103] However, permanent changes in land use from forest uses are exempted from these reforestation requirements.[104]

The State Forester enforces requirements through inspection, citations, and issuance of administrative orders, such as cease and desist or reparation orders.[105] The act provides for general criminal and civil penalties, including potential civil sanctions of up to $5,000 per violation.[106]

MAINE FOREST PRACTICES ACT

Similar to the Oregon statute, the Maine statute is designed to primarily address forest practices. Under Maine's Forest Practices Act, the commissioner must adopt rules to ensure adequate regeneration of commercial tree species on a site within

[97] ELI. June 2000. *Putting the Pieces Together: State Nonpoint Source Enforceable Mechanisms in Context.* 100.
[98] Or. Rev. Stat. § 527.670.
[99] *Id.* § 527.710.
[100] *Id.*
[101] *Id.* § 527.765.
[102] *Id.* § 527.676.
[103] *Id.* § 527.745.
[104] *Id.* § 527.760.
[105] *Id.* § 527.680.
[106] *Id.* §§ 527.683, .990, .992.

five years of completion of any timber harvest.[107] The commissioner must establish performance standards for clear-cuts, including limitations on size, and a clear-cut must be separated by another clear-cut by at least 250 feet.[108] For a clear-cut of at least 20 acres, the landowner must develop, prior to harvest, a forest management plan for the clear-cut signed by a professional forester.[109]

The regeneration standards do not apply if there is a change in land use, such as conversion from forestland to residential development, and the change is completed by the end of the fifth year after the timber harvest and the intent to change is submitted to the Bureau of Forestry.[110] The Maine statute creates a notice requirement for landowners who are clearing forestland for conversion for development. The requirement to notify the bureau is simply a notice requirement and the bureau does not then have the authority to review the intent or comment on it.

[107] Me. Rev. Stat. Ann. § 8869.
[108] *Id.*
[109] *Id.*
[110] Code Me. R. § 04-058-020.

APPENDIX B: VOLUNTARY INCENTIVE PROGRAMS

Below are more detailed summaries of the state incentive programs mentioned in the report.

DIRECT FINANCIAL ASSISTANCE

Illinois Forestry Development Act

Illinois' Forestry Development Act[111] establishes a forestry cost share program administered by the Department of Natural Resources.[112] To be eligible for the program, a landowner must own at least five acres of timberland and must devise a forestry management plan that is approved by the department.[113] Eligible land must be maintained in a forested condition for 10 years or until commercial harvest—whichever occurs last—as required by the plan.[114] The department enters into agreements under which it agrees to pay a share of up to 80 percent of the total cost of acceptable forestry management plans and practices implemented under the plan.[115]

Eligible practices under the program include preparation of a forestry management plan, tree planting, fencing woodlands to exclude livestock, soil and water protection projects, windbreak establishment, wetland and riparian vegetation protection and improvement, and other projects to improve wildlife or fisheries habitat.[116] Upon a change in land use, the timber grower forfeits all rights to future payments and must refund all payments received during the previous 10 years.[117] Cost share funds are paid to the department from appropriation funds issued by the General Assembly.[118]

Although the program does not provide direct incentives for landowners to retain their forestland as such, it can be used to encourage landowners to maximize the biodiversity values of their land. How the program is applied, i.e., which specific practices are encouraged under the program, is up to the discretion of the Illinois forestry agency. For example, the program could be used to encourage landowners to retain intact blocks of unfragmented forests, and to link existing forestland with those on adjacent properties.

Kentucky Forest Conservation Act

Kentucky's forest stewardship incentives fund is a cost share program that provides financial assistance to landowners for the development of stewardship plans and practices, such as reforestation and afforestation, forest improvement, soil and water protection and improvement, riparian and wetland protection and improvement, wildlife habitat improvement, and permanent wildlife planting.[119] The forest stewardship incentives fund is funded through penalties collected from violations of forestry statutes and regulations.[120]

TAX INCENTIVES AND LAND CONSERVATION TOOLS

Indiana Classified Forest Program

Under Indiana's Classified Forest Program, landowners of 10 or more acres who operate their lands under forest management plans can have their land valued at a nominal $1 per acre for property tax purposes, essentially eliminating property taxation on such forestlands.[121] The program is available statewide and includes both "forest plantations" and "native forest lands."[122] The landowner must follow a management program created by a forester.[123] The landowner also must submit an annual report on the condition of the land and on

[111] 525 Ill. Comp. Stat. 15/1 - 15/7.
[112] 525 Ill. Comp. Stat. 15/5.
[113] *Id.*
[114] *Id.*
[115] *Id.*
[116] 525 Ill. Comp. Stat. 15/2.
[117] 525 Ill. Comp. Stat. 15/5.
[118] *Id.*

[119] Ky. Rev. Stat. Ann. § 149.340.
[120] *Id.* § 149.348.
[121] Ind. Code §§ 6-1-1-6-2 through 6-1.1-6-27.
[122] *Id.* § 6-1.1-6-1.
[123] *Id.* § 6-1.1-6-16.

any commercial harvest, and the state forester must inspect the land every five years.[124] A forest owner is liable for 10 years of foregone back taxes with a 10 percent interest upon leaving the program, and the state forester may terminate an owner's participation for failure to follow a management plan.[125]

Indiana Classified Wildlife Habitat Program

Indiana's Classified Wildlife Habitat Program[126] operates similarly to Indiana's Classified Forest Program. In order for land to qualify as wildlife habitat, the land must be at least 15 acres, with no more than 10 acres of woodland.[127] In addition, the landowner must enter into an agreement with the Department of Natural Resources to establish standards for wildlife management for the land.[128] As under the classified forest program, land classified as wildlife habitat will be assessed $1 per acre for property taxes.[129] Indiana's wildlife classification program works well in conjunction with the classified forest program to capture land areas that do not qualify under the classified forest program, such as a five acre wood lot on a parcel that is mostly open space. The landowner must file a report on the land every year, while at least every five years, the department will inspect the land and note any needed improvements.[130] If land is withdrawn from the program, the landowner must pay the smaller of either of the total property taxes that would have been assessed on the land during the period of classification or for ten years with 10 percent interest on the property taxes.[131]

Texas Reforestation and Conservation Act

Texas' Reforestation and Conservation Act provides property tax breaks for areas protected from harvesting for specific purposes. [132] Under the law, a property tax appraisal is reduced by 50 percent for timber land where harvesting is restricted because it is located in a protected zone including: an aesthetic management zone (such as a designated roadside or forest area that is unique due to the area's natural beauty, topography, or historical significance); a critical wildlife habitat zone (to protect listed endangered or threatened species); or a streamside management zone (a buffer in which there is a management plan to use best management practices to protect water quality or preserve a waterway).[133] The property tax appraisal on forestland is reduced by 50 percent from the current use value for the first 10 years after a harvest if the forestland has been regenerated for the purpose of commercial timber production to the intensity generally accepted in the region for commercial timber.[134] If the use of the land changes to an ineligible use, rollback taxes are collected for five years plus 7 percent annual interest.[135]

Virginia Land Conservation Incentives Act

Virginia's Land Conservation Incentives Act is an incentive program that provides income tax relief, rather than property tax relief, for donations of land or interests in land.[136] The program offers an income tax credit for a conveyance of forestland or an interest in forestland in perpetuity for natural resource, watershed, biodiversity conservation, or historic preservation purposes.[137] The income tax credit is equal to 50 percent of the fair market value of any land, or interest in land, conveyed to a public or private conservation agency for conservation or preservation purposes.[138] The amount of the credit that may be claimed is up to $100,000.[139] In 2002, the Virginia legislature expanded this act to authorize any taxpayer who receives an income tax credit under the act to transfer unused credit to another taxpayer for use on another Virginia income tax return.[140]

Virginia Riparian Forest Buffer Protection Credit

Virginia has also enacted a law establishing an income tax credit for owners of forestland who har-

[124] *Id.* §§ 6-1.1-6-19, 6-1.1-6-27.
[125] *Id.* §§ 6-1.1-6-21, 6-1.1-6-24.
[126] *Id.* §§ 6-1.1-6.5-1 through 6-1.1-6.5-25.
[127] *Id.* § 6-1.1-6.5-2.
[128] *Id.*
[129] *Id.* § 6-1.1-6.5-8.
[130] *Id.* §§ 6-1.1-6.5-13, 6-1.1-6.5-21.
[131] *Id.* § 6-1.1-6.5-18.
[132] Tex. Tax Code § 23.9801 *et seq.*
[133] *Id.* §§ 23.9801, 23.9803.
[134] *Id.* § 23.9802.
[135] *Id.* § 23.9807.
[136] Va. Code Ann. §§ 58.1-510 through -513.
[137] *Id.* § 58.1-512.
[138] *Id.*
[139] *Id.*
[140] *Id.* § 58.1-513.

vest their land but forego timber harvesting along rivers and streams.[141] To qualify for the credit, the individual must comply with a certified individualized Forest Stewardship Plan.[142] The retained buffer area must be between 35 and 300 feet in width, measured from the waterway.[143] An individual or corporation may take an income tax credit equal to 25 percent of the value of the timber in the area retained as a buffer, with a cap of $17,500.[144] Excess credit may be carried over for the next five years.[145] The minimum duration for the buffer is 15 years, and if the landowner harvests the protected land within this timeframe, he must immediately pay the past claimed tax credit.[146] The State Forester will inspect the certified buffers each year to ensure their proper maintenance.[147]

Oregon Wildlife Habitat Conservation and Management Program

Oregon's Wildlife Habitat Conservation and Management Program[148] allows landowners in mixed farm and forest zones and on forestlands, who qualify for special assessments to keep those assessments if they choose to manage the land for habitat instead of, or in addition to, farming or growing trees.[149] In order to qualify for the program, landowners must complete a wildlife habitat conservation and management plan and have it approved by the Oregon Department of Fish and Wildlife.[150] Wildlife habitat conservation and management plans may include "those efforts that improve water quality, protect and restore fish and wildlife habitats, recover threatened or endangered species, enhance stream flows and maintain or restore long-term ecological health, diversity and productivity on a broad geographic scale."[151]

[141] *Id.* § 58.1-339.10.
[142] *Id.*
[143] *Id.*
[144] *Id.*
[145] *Id.*
[146] *Id.*
[147] *Id.*
[148] Or. Rev. Stat. §§ 215.800 - 215.808.
[149] *Id.* § 215.808.
[150] *Id.*
[151] *Id.* § 215.806.

EDUCATION AND TECHNICAL SUPPORT

Illinois Technical Assistance Program

The Illinois Department of Conservation provides technical assistance to landowners on forest conservation practices. Assistance includes management advice for the protection, enhancement, and utilization of existing forestlands and reforestation. The agricultural benefits of the program include soil erosion control, production of forest resources, windbreaks, and soil and water conservation.[152]

Kentucky Outreach Program

Kentucky's Natural Resources and Environmental Protection Cabinet provides educational opportunities to increase landowner, logger, and public appreciation, awareness, and knowledge of Kentucky's forests.[153] Kentucky also has an information and education program to develop public awareness of the importance of Kentucky's forests, to promote forest stewardship and sound forest utilization practices of private woodland owners and the forest industry, and to coordinate with other agencies and organizations to assure effective long-term forest conservation programs.[154]

The education program emphasizes sustainable forests and the full range of economic, ecological, and social opportunities provided by privately owned forests by sponsoring field days that enable woodland owners to resolve the problems they encounter in dealing with their woodland resources; by developing demonstration programs on the management of forest ecosystems; by developing programs that give special attention to educational needs of small, private, nonindustrial forest landowners; and by supporting the Kentucky Cooperative Extension Service in promoting and conducting technology transfer education programs specifically for woodland owners.[155]

[152] Ill. Admin. Code tit. 8, § 700. App. D, Ex. A.
[153] Ky. Rev. Stat. Ann. § 149.334.
[154] *Id.* § 149.336.
[155] *Id.*

REGULATORY RELIEF

Oregon Forest Practices Act

Oregon heavily regulates silvicultural activities. Oregon also provides some regulatory relief from its requirements in exchange for landowner participation in designated activities. The Board of Forestry may enter into stewardship agreements with landowners, in lieu of the traditional mechanisms of operation planning and review, inspections, and enforcement.[156] These agreements reward knowledgeable forest landowners for implementing forest management strategies with reduced oversight from the State Forestry Department. They also provide an incentive for forest landowners to enhance and restore fish and wildlife habitat, water quality, and other forest resources.[157]

[156] Or. Rev. Stat. § 527.662.
[157] *Id.*

Virginia Self-Inspection

Virginia's water quality law requires an owner or operator of forestland to notify the Department of Forestry of initiation of a commercial timber harvest.[158] The notice provides assurance that water quality is protected during forest harvests. The Department of Forestry allows forest operators to submit a self-inspection form if the operator is participating in the Sustainable Forestry Initiative or if the operator negotiates an agreement with the state forester to conduct inspections on its own land. Otherwise, the department may conduct inspections on all non-industrial private landowner harvesting operations. The inspection form helps to assure the operator's awareness of best management practices, compliance with the Virginia Seed Tree Law, and protection of the streamside management zone.

[158] Va. Code § 10.1-1181.2(H).