

Easements and Conservation Policy in the North Maine Woods

By David J. Lewis



Recently Maine has embarked on a new policy direction in its use of conservation easements to protect large tracts of commercial timberland. In this article, David Lewis argues that the effectiveness of using easements as a long-term conservation policy depends on many factors that may not be fully considered in the decisionmaking process currently used in choosing easements for landscape-scale conservation. Lewis indicates that the root of the problem lies in the fact that the state lacks a comprehensive state policy describing the conservation goals desired in the north woods. Before progressing further, Lewis suggests that the ultimate goals of conservation need to be understood clearly. Is conservation addressing development? Recreation needs? Biodiversity protection? Forest fragmentation? Moreover, what are the costs and benefits associated with the state's various conservation options? 

INTRODUCTION

The state of Maine has no comprehensive land conservation policy. With tens of millions of dollars from public and private sources beginning to flow into various conservation initiatives in the state, this could pose a problem. Most of the money is targeted at the vast stretches of undeveloped forestland in the north Maine woods, an area that occupies a broad transition zone between temperate and boreal forests while supporting an unusually diverse natural ecosystem. These lands also support a large forest products industry and are in demand for recreation by local residents as well as the many millions of people who live in nearby urban areas. Over 94% of the land in Maine is in private ownership. As a result, many important public values are derived from privately owned land in Maine.

In recent years, some have concluded that natural forest diversity is not adequately represented or protected by public or private conservation ownership in Maine (Gawler et al., 1996). In addition to biodiversity needs, the demand for recreation and other non-commodity uses of Maine's forests has continued to grow over time. The convergence of these trends has triggered a variety of conservation proposals from private and public interests alike. The wide range of characteristics found in each proposal raises the question of the best way to "protect" the woods.

One of the most popular options in recent years has been conservation easements, which are commonly used to protect land from development in areas where there is a threat. In 1998, the New England Forestry Foundation announced an unprecedented 750,000-acre no-development easement bought from the Pingree Family for lands scattered throughout the remote timberland of northern Maine. This was followed by a publicly funded easement consisting of 20,268 acres on Niatous Lake in northern Hancock County. The most recent proposal is the West Branch project, which, when completed, will consist of mostly easements on over 650,000 acres in the region north of Moosehead Lake and west of Chesuncook Lake. Taken together, these projects sum to more than 1.4 million acres of land and potentially more than \$40 million of public

money. With so much at stake, one may naturally wonder if easements are indeed a good buy.

The shear scale of the West Branch project has brought up issues from many sides of the political spectrum. While both environmental and property rights groups have expressed various concerns over the project, a newly proposed legislative resolution uses the recent spate of easements to argue against the need for a national park in Maine. The resolution states that a park is not needed because "state agencies and nonprofit organizations are cooperating in an unprecedented effort to secure permanent rights of access to the north woods and keep valuable recreational property and natural habitat undeveloped through conservation easements." This paper will not address the politics of this debate. However, as someone who is a proponent of easements in urban areas but who is not clear of the proper usage of easements on remote forestland, my concern is over the decision-making process used in choosing easements for landscape-scale conservation.

Of primary importance is the lack of a comprehensive state policy describing the conservation goals desired in the north woods. For example, while conservation easements may address goals related to development concerns on lake shorefronts and urban forestland, the appropriateness of easements on remote backlands that have no shore frontage is unclear. There also may be desirable goals beyond development protection and public access for the north Maine woods. To the extent that biodiversity protection, forest fragmentation and backcountry recreation are conservation policy concerns for Maine, easements may not bring the desired benefits to the state.

There also are important cost considerations with tools such as easements. In particular, there has been no

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formal cost-benefit analysis performed comparing the usage of public funds on easements as opposed to other conservation policy tools, such as full-fee land purchases and regulation by a state agency. In order to truly evaluate the cost-effectiveness of easements, all long-term costs related to easement valuation, recreation management and monitoring must be taken into account. In addition to cost concerns, a thorough evaluation of the benefits provided by easements may be necessary to evaluate the appropriateness of easements as a landscape-scale conservation tool.

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BACKGROUND

The land currently proposed for conservation protection in the Maine woods is owned privately and managed primarily for timber production. Despite private ownership, these lands have traditionally been open to public recreation and are widely used for hunting, fishing, snowmobiling, and canoeing. In recent years controversy has erupted over the management of these lands. While forestry concerns have dominated the headlines, there also have been controversies regarding recreation fees, gating and wildlife protection. Despite these concerns, there has been relatively little land purchased full-fee by the government for conservation protection in the last ten years.

Public conservation acreage in Maine amounts to a little less than one million acres, or just under 6% of the land base. The most well-known public lands are Baxter State Park in Piscataquis County and Acadia National Park in Hancock County. Both came into public ownership by philanthropic donation. While there is some land owned by the U.S. Forest Service

and the U.S. Fish & Wildlife Service, most of the remaining public lands are administered by the state's Bureau of Parks and Lands as either public reserved lands or state parks.

Public reserved lands total approximately 500,000 acres and are managed for "multiple uses." Timber is harvested from these lands with the income derived from timber sales going directly to support recreation, wildlife and timber management on public reserved lands. A system of ecological reserves also has been established recently on public reserved lands. These lands generally have a great deal of public support, as evidenced by several successful referendums designed to fund the purchase of land. The first referendum was in 1966, when the public voted to acquire land for the Allagash Wilderness Waterway in northern Maine. In 1976, voters decided to purchase approximately 40,000 acres around Bigelow Mountain in western Maine. In 1987—and again in 1999—voters approved a \$35 million bond and a \$50 million bond to purchase additional lands for public reserved lands, state parks, and other conservation lands.

The late 1990s have seen a huge increase in the activity of private land trusts in Maine. Among the largest deals is an approximately 200,000 acre full-fee land purchase by the Nature Conservancy in the upper St. John river watershed and a 750,000 acre conservation easement on lands scattered throughout the north woods by the New England Forestry Foundation (NEFF). Although the NEFF deal is mostly funded through private sources, there will be an estimated \$3.5 million in public funds included. In 1998, the state and federal governments paid \$3.75 million for a conservation easement around Nicasious Lake in northern Hancock County. In the spring of 2000, the state and federal governments announced the West Branch project, an acquisition featuring mostly conservation easements on over 650,000 acres of land north of Moosehead Lake and west of Chesuncook Lake. The West Branch project has been estimated in the \$35 million range and the ratio of public to private funds

is unknown as of now. In both the Nictaus Lake and West Branch deals, the state's Bureau of Parks and Lands will assume recreation management responsibilities on over 670,000 acres of land.

PUBLIC GOODS IN MAINE'S WILD AND MANAGED FORESTS

Before I discuss conservation policy goals and various tools such as easements, it's important to understand the nature of "public goods" and why private ownership of land may not always provide them. Forestland produces many goods and services to society, from commodities such as timber to non-market goods such as wildlife habitat. Products such as timber are traded in a market with a well-established price; therefore, these goods will be produced efficiently. However, not all forest-based products are produced efficiently. Services such as wildlife habitat, carbon sequestration and watershed controls are not traded in a market, and therefore have no established price. In this case the private market may under-provide the good because there is no price—and therefore no incentive—for the landowner to produce the good efficiently.

Goods that are under-provided by the market typically have characteristics known as "public goods." One characteristic of public goods is that it is difficult to exclude people from obtaining the good's benefits. Military protection is a good example here. Another characteristic of public goods is that the benefits received by one person do not affect the benefits received by someone else. This is called a "non-rival" characteristic, and clean air is a good example. Undeveloped forestland has many public-good characteristics related to recreational activities and environmental benefits. Recreational activities such as hunting, fishing, hiking and canoeing are not always practically excludable, and they also have non-rival characteristics.

Hunting, fishing and snowmobiling are three of the most popular recreational activities in the north Maine woods and have been provided for years with the current private ownership structure of land. These activities are compatible with timber harvesting and the

current logging road network in the north Maine woods. Therefore, since most private landowners allow public access, these activities have been adequately provided for many years with Maine's managed forests. However, the secure long-term provision of public access remains a concern to many groups in the state.

An important distinction arises when comparing public goods provided by a forest managed for timber harvesting and a wild forest, which is essentially unmanaged. In the mid-1990s, the Maine Forest Biodiversity Project was formed to represent a diverse group of landowners, advocates, state agency representatives and scientists. They formed important clarifications regarding the type of forests required for biodiversity protection. They concluded that unmanaged areas (eco-reserves) were extremely valuable as ecological baselines or benchmarks, and as areas that help to maintain a complete array of native habitats (McMahon, 1998). The important distinction is that eco-reserves are, by definition, unmanaged by humans. This implies that timber harvesting is not compatible with the goals of eco-reserves. While timber harvesting may not be compatible with reserves that function as wild forests, many forms of recreation are, including hiking, fishing, hunting, canoeing and birding, among others. A wild forest also offers many environmental services consisting of wildlife habitat, carbon sequestration, watershed controls, biodiversity conservation of native species, and aesthetic beauty. While a managed forest may offer these environmental services as well, a wild forest differs in the degree to which each of these services is provided.

LANDSCAPE-SCALE CONSERVATION EASEMENTS

Since private ownership of land may underprovide certain public goods, it is sometimes desirable for the public to find ways to better allocate these goods. Historically, full public ownership has been the most common tool. An alternative tool is a conservation easement, or partial ownership of certain bundles of land-use rights. In the case of easements designed to prevent development, the landowner relinquishes the

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right to develop the land, but may retain the right to continue current land-use practices, such as timber harvesting. By acquiring the development rights, the conservator will ensure the continued provision of certain external public benefits from the land. The magnitude of public benefits provided depends on what is purchased in the easement.

Easements have been used effectively for many years as a conservation option in urban areas with high development pressures. A good example is the Orono Land Trust, which utilizes easements to preserve a valuable trail system for town residents. The application of

easements as a landscape-scale conservation tool for the north Maine woods requires a geographic context in terms of land types desirable for conservation protection. Most development pressure in the north Maine woods has been focused on scenic lakefronts with small camps and second home development. Another land type is backland. The extent of development pressure on remote backlands away from lakefronts is unclear. Typically development is driven by either urban amenities such as paved roads and electricity infrastructure, or natural scenic amenities such as shore frontage. While the Nictaus Lake easement is primarily focused on shoreline protection, the West Branch project includes hundreds of thousands of acres of backlands with relatively little development pressure.

Theoretically, easements may be written with any number of land-use restrictions. In terms of forestry practices, an easement may be written to completely restrict timber harvesting, to set strict sustainability standards, or with no forestry standards whatsoever. While the implementation of a no-cut easement on shore frontage is possible, a no-cut easement in the backlands of the north Maine woods is extremely

unlikely. This is due to the fact that most of the land is managed primarily for timber, oftentimes short-rotation pulpwood production. A large industrial landowner is unlikely to sell an easement with a no-development and no-cut provision because the land would essentially be worthless to them after the easement. It is this fact that makes the preservation of land for wild forests or eco-reserves difficult with easements in the north woods.

If easements are to be the preferred tool to protect large amounts of forestland from development in the long run, then it must be true that the cost-benefit ratio is lower for easements than for other tools, such as full public ownership. In order to compare the cost-benefit ratios of easements and tools such as full public ownership, all long-term costs and benefits of each conservation tool must be taken into account. If this cost-benefit condition does not hold, then easements will be an inefficient conservation policy tool.

ECONOMIC COSTS OF CONSERVATION EASEMENTS

Conservation easements are less expensive in the short-run than full-fee purchases; therefore, it is tempting to label them cost-effective. While easements have lower up-front costs than full-fee land purchases, there are additional long-term costs that must be taken into account in order to evaluate an easement's true cost-effectiveness. To obtain an accurate cost-benefit ratio for easements, short-term costs such as easement valuation must be combined with long-term costs associated with recreation management and monitoring. Given that the use of easements in landscape-scale conservation is a fairly new phenomenon and easements appear to be the tool of choice for Maine right now, I will focus solely on the costs of easements. It should be noted that tools such as full-fee purchases and regulation may have a different set of long-term costs, but this is beyond the scope of this article.

Cost of Purchasing Easements

Conservation easements are not bought and sold in a competitive market; therefore, efficiency in pricing may not be guaranteed. If a parcel of land is currently

undeveloped, then the value of the easement is the difference between the land's value before and after the imposition of development restrictions (Boyd et al., 1999). One method of land appraisal is the income approach, which involves discounting expected income flows from the land over time. Another method is the comparable sales approach, which estimates land prices based on market data for parcels with similar characteristics (Wiebe et al., 1996). Neither method is easily applied to the valuation of easement acquisitions (Plantinga and Miller, 2001).

The income approach is difficult because the appraiser knows neither the time of land development nor the future income from development. The comparable sales approach is effective to the extent that a valid market exists for conservation easements. The lack of a well-defined market price is problematic because of the possibility of over-compensation. Over-compensation is usually not a problem for self-interested buyers operating in a free market because they are typically motivated to minimize costs. However, in some situations involving government agencies or large firms, the employees who make purchasing decisions may be insufficiently motivated to minimize costs. For instance, this might be due to inappropriate employee incentives (e.g. rewards for "completing a deal" rather than minimizing costs) (Boyd et al., 1999). The fact that easement valuation is not necessarily determined in a competitive market should not preclude the use of easements; rather, it should call attention to a potential problem associated with costly negotiations.

Cost of Managing Recreation

Recreation management on Naticous Lake will be under the authority of Maine's Bureau of Parks and Lands (BPL). The West Branch project also includes the proposal to transfer recreation management to the BPL. This means BPL will have to fund recreation management. In a recent *Maine Times* story (11/9/00) BPL's Ralph Knoll summed up the problem with state control over recreation management on these lands by stating, "conservation easements don't generate revenue." Income generated from timber harvesting on public reserved lands is used to finance recreation, wildlife and

timber management on these lands. The major difference between easements and public reserved lands in terms of management costs is that easements will not be able to fund their own recreation and wildlife management in the way that public reserved lands do. Timber harvesting has been a reliable source of income for BPL recreation management while harvesting a modest amount of land. Since 1984, BPL has averaged approximately \$1.5 million per year in revenue from timber sales on public lands, while harvesting modestly (less than one-half of annual growth) on approximately 7,300 acres per year.

The Naticous Lake and West Branch lands will add approximately 670,000 acres to BPL management, increasing the amount of recreation land BPL will be responsible for managing from 570,951 acres to more than 1,240,000 acres. By not acquiring the timber rights to the West Branch lands, the state will not have timber revenues to pay for recreation management. To cover the costs, BPL has three obvious choices for increased revenues:

- Obtain funding from the legislature/general fund;
- Increase timber harvesting on existing public reserved lands;
- Institute recreation fees.

Given recent controversies regarding gate fees in the private forests of northern Maine, the last option would be quite controversial on lands that just received millions of dollars in public funds. This leaves the first and second options as the most likely scenarios. The first option will require the taxpayers to foot the bill for recreation management and will be subject to the political whims of changing administrations. This is not a one-time cost, as BPL controlled recreation management will continue indefinitely.

The other potential option is to fund recreation management through timber sales on existing public lands. By more than doubling the amount of land BPL is responsible for managing, it is not an unlikely scenario to double timber harvesting on existing public lands. In a recent *Maine Times* story (2/22/01), BPL's

Tom Morrison suggested that timber harvests on public reserved lands are proposed to double from half the year's growth to just under the full year's growth, or just under what would be considered unsustainable. This potential increase in timber harvesting may decrease ecological benefits and will likely increase conflicts between recreational and timber interests on public reserved lands. This could be quite costly to BPL both financially and politically.

Cost of Monitoring Easements

In addition to long-term recreation management costs, conservation easements have monitoring costs for each bundle of land rights purchased. For example, if the state purchases development rights plus certain timber harvesting restrictions, then this must be monitored periodically. While it may be easy to monitor the construction of new roads or houses, it is considerably more difficult to monitor timber harvesting techniques or changes in land cover (Boyd et al. 1999). The Naticous Lake project has some limited timber harvest stipulations written into the easement, while timber restrictions are in the process of being proposed for the West Branch project. Monitoring costs also could include any legal expenses incurred at penalizing violations. The costs of monitoring easements will be incurred indefinitely, and while the extent of the cost is yet unknown, the extra cost should still be considered in evaluating the long-term cost-effectiveness of easements. The New England Forestry Foundation is allocating as much as a \$2 million endowment fund for monitoring on their 750,000-acre, no-development easement, which does not include timber harvest restrictions. The West Branch project may have comparable costs. However, if timber harvest provisions are included, then the cost may be substantially more.

Opportunity Costs of Conservation Easements

The true cost of any action can be measured by the value of the best alternative that must be foregone when the action is taken (Nicholson, 1999). This is what economists refer to as an opportunity cost. Boyd et al. (1999) define the opportunity cost of conservation as the value of whatever other economically useful activities are foregone in order to preserve the habitat

in its current state. There is also an opportunity cost in allocating scarce conservation dollars to a particular conservation tool. For example, the opportunity cost of spending \$35 million from a limited conservation budget on easements in the West Branch area would be whatever alternative conservation project could have received the money instead. One option would be a full-fee land purchase.

Recent timberland transactions (full-fee) in Maine have been in the range of \$200 per acre. Therefore, a conservation budget in the vicinity of that proposed for the West Branch easements could purchase roughly 175,000 acres of land, which is nearly the size of Baxter State Park. In the case of the West Branch project, a public land system the size of Baxter State Park could be considered a foregone action not undertaken with those conservation dollars. So the question is, "Are the public benefits from a 650,000-acre timberland easement more than a 175,000-acre public land purchase?"

Another opportunity cost of the big north woods easements would be urban conservation. In a recent report titled "The Cost of Sprawl," the Maine State Planning Office has declared that urban sprawl is a major policy concern for the state. Would \$35 million targeted toward protection from development be better spent in towns and cities attempting to preserve smaller parcels of open-space from urban sprawl? How much land could be conserved with this money and what would the public benefits be in comparison to large-scale north woods easements? This may depend on the amount of shoreline and backlands being proposed for easement acquisition in the north woods. The ratio of shoreline to backlands will determine the total development threat on the land as a whole, which can then be compared relative to the development threats in more urban areas. Development is much more imminent in southern Maine than in most of the north Maine woods backland slated for development protection from easements. Much of southern Maine's forestland and wildlife habitat is succumbing to suburban sprawl, and the efficiency of allocating scarce conservation dollars to easements in the north woods should be considered in light of not allocating those dollars to other areas that may have relatively higher development pressures.

BENEFITS OF PUBLIC CONSERVATION EASEMENTS

There are numerous public benefits that can be afforded by conservation easements. The extent of benefits offered will vary by individual easement and will depend on the rights acquired by the conservator. While any number of benefits may be acquired by easements, the most visible benefit is the protection against unwanted development, which is appropriate in areas where development threats have a potential of damaging important public values. In the case of development protection, easements may be particularly useful in the context of protecting the scenic qualities of undeveloped shorelines. This may be beneficial to activities such as fishing and canoeing. An anonymous reviewer also pointed out that development protection might also lower fishing pressures on remote bodies of water, thus leading to enhanced fish stocks. Conservation easements also maintain an option of purchasing additional rights in the future to provide more widespread public benefits. This option is dependent on the terms of the easement and may be useful if budgets are constrained or if landowners are unwilling to sell the land at full-price at the time of purchase.

In the case of the Naticus Lake project, public access is another right purchased in the easement. Public access is not included in the Pingree family's easement, but access is proposed for the West Branch project. If access is not directly purchased and guaranteed in easements, then public benefits derived from access will be no different on these lands before or after the easement. The benefits from public access will be particularly valuable if the threat of reduced access is present. However, loss of public access has yet to happen to any sizable degree in the north Maine woods, mostly because it is costly and difficult for landowners to exclude people from such large stretches of land. Nevertheless, recreation activities compatible with timber harvesting and managed forests will be assured from north woods conservation easements that

purchase public access. As mentioned before, this can include activities such as hunting, fishing, snowmobiling and canoeing.

Certain ecological benefits may also be provided by easements. While the extent of these benefits will vary with the easement, the protection against undesirable development will automatically offer some ecological benefits. If restrictions related to forestry practices are stipulated in the easement, the ability of the conservator to monitor ecological restrictions will be the key factor in whether these benefits are provided. It is generally much easier for the government to monitor ecological conditions on publicly owned land. If there are no ecological benefits purchased by the easement, then there will be no difference between private lands and easement lands in terms of ecological benefits provided.

Another benefit of conservation easements is the ability for the land to remain on the tax rolls. By the government not purchasing the land full-price, the

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continued partial private ownership of the land will require the landowner to continue paying taxes to local governments. The extent of taxes paid will be dependent on whether the land is enrolled under the Tree Growth Tax program. Tax fees under Tree Growth are heavily dependent on the value of the wood being grown, with a wood inventory of low-value and/or low-growth rates translating to equal values of tax revenues.

ALTERNATIVE CONSERVATION POLICY GOALS

In thinking about the viability of easements as a long-term policy option for the north Maine woods, the ultimate goal of conservation needs to be understood clearly. Is conservation addressing development?

Recreation needs? Biodiversity protection? Forest fragmentation? As discussed above, easements may be an effective tool if the policy goal is protection against unwanted development or the guarantee of public access. However, if the policy goal is something above and beyond development protection or public access, then easements may need to be compared with tools

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such as full-fee land purchases and regulation by a government agency. In this section I will focus on three policy goals that may not be adequately addressed with conservation easements.

Biodiversity Protection as a Policy Goal

Ecology has greatly increased our understanding of the interaction of natural processes. Biodiversity can be thought of as the variety of native organisms in a region along with all of their interconnections. Loss of biodiversity is currently one of the most important global environmental issues, as most scientists estimate that we are on the verge of the greatest mass extinction of species in 65 million years. In Maine's forests, native organisms can consist of wildlife such as salamanders, songbirds and moose along with plants such as red spruce, trillium and lady's slippers. While some species thrive in managed forests, not all species prefer a habitat managed by humans. This proves problematic given that over 98% of Maine's land is manipulated by human usage. The small percentage of unmanaged land in Maine is found mostly in public conservation lands such as Baxter State Park.

The Maine Forest Biodiversity Project (MFBP) stated that unmanaged areas (eco-reserves) are particularly valuable in Maine, because they function as controls allowing comparison with managed landscapes (McMahon, 1998). MFBP identified sixty-nine potential reserve sites on existing conservation land in Maine. Only 26% of potential reserve sites were of MFBP's recommended size, only 23% of the potential sites are "self-contained" and only 46% of Maine's ecosystems are represented at least once in each biophysical region by conservation lands. Existing public lands and private conservation lands are not adequate to fully encompass the full range of Maine's ecosystem types (McMahon, 1998). As mentioned earlier, easements may protect land against development, but in the north woods they will not provide natural wild forests for reserves. In northern Maine, consequences to biodiversity from development are certainly less extensive than those from timber-harvesting operations (Gawler et al., 1996). Therefore, easements may not be an adequate tool for biodiversity protection in the north Maine woods.

Maine currently has twenty-five forest community types, eight of which are uncommon. Of the common forest types, high-quality natural (wild) examples are notably rare (Gawler et al., 1996). Of particular concern in the north Maine woods is the fact that older forests of all types are becoming scarce. There are many species of birds that prefer older forests (Hagan and Grove, 1999; Askins, 2000), along with amphibians (Pough et al., 1987; deMaynadier and Hunter, 1998), as well as many species of shade-loving plants (Gawler et al., 1996). In addition, Maine's Department of Inland Fisheries & Wildlife (IFW) notes that mature coniferous forests provide critical deer wintering areas in the north Maine woods. These are but a few examples of species that may benefit from an increased provision of mature wild forests; a thorough scientific review of all species that may benefit from provision of these forest types is beyond the scope of this article.

Full-fee public ownership of land is an obvious option to provide mature, wild forests that may serve as

eco-reserves. In terms of the public's preference for full public ownership of forestland in Maine, Boyle and Teisl (1999) found that the public's willingness to pay for the state to purchase (full-fee ownership) commercial timberland exceeds the cost of purchasing this type of land. This study used a hypothetical public purchase of timberland northwest of Baxter State Park, which is in the vicinity of the West Branch project. They also found a strong preference to set publicly purchased land aside from timber harvesting to provide wild forests or ecological reserves. If the public benefits from wild forests are significant compared to protecting large parcels of timberland from development, then the efficiency of easements will not be assured.

Backcountry Recreation as a Policy Goal

Recreational benefits found in the Maine woods include activities such as hunting, fishing, canoeing, snowmobiling, and hiking. Policy tools designed to enhance recreation may vary in terms of the type of recreation provided from the chosen tool. In the north Maine woods, tools such as easements protect against development, but they do not provide wild forests. Therefore, the recreational activities supplied by easements will consist mostly of those activities compatible with timber harvesting. Wilderness-based backcountry recreation such as backpacking will not be provided on easement lands to the same degree as they are on public lands. Public lands in Maine supply recreational activities related to backcountry wilderness and non-wilderness oriented uses. If the policy goal is to protect land against development and provide public access for recreational activities compatible with timber harvesting, then easements may be effective. Activities most likely to benefit include hunting, fishing and snowmobiling.

Policy tools may need to be analyzed in regards to the additional recreation activities supplied by the policy that are not already found in the area. Most of the Maine woods are currently available for recreation compatible with timber harvesting, such as hunting, fishing and snowmobiling. Therefore, if the goal of easements is to provide recreation, it is not clear what additional benefits are being provided that are not already there. In terms of scarcity of recreational activities, wilder-

ness-based activities such as those found in Baxter State Park seem to be in short order. One only has to witness the immense demand on the campgrounds of Baxter or the Appalachian Trail to realize the true scarcity of lands to supply the ever-growing demand for wilderness-based recreation in Maine.

Preventing Forest Fragmentation as a Policy Goal

One of the most often cited "threats" to the woods from the development of small camps and second homes is forest fragmentation. However, forest fragmentation is caused by development subdivisions and forest practices (Maine Forest Service, 1999). One very important cause of fragmentation in Maine's north woods is the construction of a vast network of logging roads in the unorganized territories (Gawler et al., 1996). According to the Maine Audubon Society, this network now consists of over 25,000 miles of roads, not including skid roads (Bryan, 2000). In addition, the well-documented problem of clearcuts continues to contribute mightily to fragmentation. While clearcuts may not cause permanent fragmentation, it is the intensity and frequency of short-rotation forestry that continues the problem. The degree to which easements can address fragmentation caused by logging roads and forest practices is unclear. Additional rights would have to be purchased in the easement, and the landowner will retain any rights not specifically purchased in the easement, including those related to road construction and intensive forestry. Unless restrictions are specifically purchased in the easement, there will be no difference between private lands and easement lands in terms of timber harvesting.

Fragmentation has been condemned by many as reducing ecosystem stability and as a threat to species extinction (Perry, 1994). Fragmentation caused by logging roads may act as a barrier to dispersal for small mammals, amphibians and reptiles. For example, deMaynadier and Hunter (2000) concluded that logging roads in Maine negatively impact amphibian populations. Amphibians are an important part of a forest ecosystem and any practice that affects their populations may affect decomposition and nutrient cycling rates in a forest along with animals that may prey on



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them (deMaynadier and Hunter, 1995). In a separate study, deMaynadier and Hunter (1998) found that the abundance of amphibians was significantly lower in clear cuts, plantations and forest edges than in non-fragmented interior forests. Fragmentation may also affect the reproductive success of birds (Gawler et al., 1996; Askins, 2000). Again, these are but a few examples of problems related to fragmentation; a thorough review of the scientific literature regarding forest fragmentation is beyond the scope of this article.

The degree to which forest practice standards related to roads, clearcuts and plantation forests can be written into easements is unclear. While any forestry standard can be theoretically incorporated into an easement, the current easements on Nicatous Lake and the Pingree lands have very limited forest practice stipulations that will not deal comprehensively with fragmentation or forest

sustainability issues. If forestry standards are included, they will also have to be monitored, with monitoring costs increasing with each additional standard. The willingness of the landowner to agree to standards will be the key component as to whether they are included, and landowner willingness to agree to forestry restrictions should not be assumed as a given. This is especially true if the landowner will have to change their practices significantly. If specific forestry standards are not included, easements will only partially address problems related to forest fragmentation. Fragmentation problems associated with development may be solved, but the problem still persists to the

degree that forest practices including road construction continue to fragment the forest. Forest fragmentation is a problem that covers the whole state and presents a challenging policy issue that may require a variety of conservation options.

CONCLUSION

Conservation easements have been utilized extensively in small land conservation deals in urban areas and scenic shorelines in rural areas. However, the use of easements to protect large sections of commercial timberland from development is new and unique to Maine. Projects such as the West Branch project have committed the state and federal governments to spend millions of dollars in purchasing easements and managing the recreational and monitoring components on hundreds of thousands of acres. The primary benefits provided by these easements are protection of land from development as well as the provision of public access. To ensure cost-effectiveness, the long-term costs and benefits of these big easements should be compared to the long-term costs and benefits of alternative conservation tools, such as full-fee purchases.

The effectiveness of easements as a long-run conservation policy depends on what values the public wants from the north woods, and what it costs to obtain those values. If protection of land from development is the most valuable policy goal, then easements may provide all the required benefits. However, if scarcity implies value, then a state with just over 1% of its land in an unmanaged condition may also significantly benefit from an increased provision of wild forests or eco-reserves. As discussed in this paper, the current emphasis of the north Maine woods landowners on timber production implies that easements will be an ineffective tool at providing wild forests associated with no timber harvesting. Therefore, if biodiversity protection is a policy goal, easements may not be the most efficient tool at providing these benefits. Likewise, backcountry recreation associated with wild forests may also be underprovided by easements in the north woods. If protection from forest fragmentation is a policy goal, then the ability of easements to address

fragmentation from development and forest practices needs to be thoroughly examined.

In crafting an appropriate conservation policy for the north woods, it is important to understand what benefits are afforded from particular conservation tools and what it costs to obtain those benefits. Benefits associated with sustainable forestry practices may or may not be provided by easements. The New England Forestry Foundation's easement on the Pingree lands makes sense to many because the owner's forest practices are currently under certification from the Forest Stewardship Council. However, not all land in the north woods is managed in such a way. The degree to which easements address conservation policy goals related to fragmentation and sustainability from forestry practices is unclear in most cases. What is clear is that easements will most likely be ineffective in addressing policy goals related to biodiversity protection. Rather, the Maine Forest Biodiversity Project claims that only a comprehensive eco-reserve system covering all major ecosystem types in each biophysical region of the state will address full protection of all native species to the state. Many people consider biodiversity protection a critical long-range goal that may reduce future costs related to endangered species protection.

The efficiency of allocating scarce public funds to easements will be unknown until a comprehensive conservation policy is established for Maine. The proposed West Branch project has made conservation protection at the landscape level a public policy goal for the north Maine woods. The next step is to determine what specific conservation values are desirable from the north woods and to what degree the public desires them. Only then will we know what conservation tools are most effective. 🐼

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