FOREST SOCIETY of MAINE

MAINE FOREST CONSERVATION EASEMENTS

FOR THE 21ST CENTURY

by John M. Hagan

September 2024

About the Forest Society of Maine

The Forest Society of Maine, established in 1984, has helped landowners, families, and communities to conserve more than a million acres of forestland across the state for sustainable forest products, recreation, habitat for fish and wildlife, and historic and cultural values. More information about the Forest Society of Maine can be found at www.fsmaine.org.

About the Author

John Hagan is an ecologist and President of Our Climate Common, a nonprofit that builds bridges across our political and cultural divides so we can solve climate change together, as a citizenry. He received the Austin Wilkins Award from Governor John Baldacci for his work on the stewardship and conservation of Maine's forests and the Integrity in Conservation award from the New England Society of American Foresters. He has conducted applied research on Maine's forest and marine ecosystems for the past 33 years. He lives in Georgetown, Maine.

Acknowledgements

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Cover Photo

Foreground: The north peak of Big Spencer Mountain, looking north. Photo by J. Hagan.

Letter from FSM's President/CEO

This report makes a compelling scientific and socioeconomic case for re-doubling our conservation easement efforts. As Dr. John Hagan documents herein, the "tool" of conservation easements is a powerful mechanism for holding onto the globally significant features of the North Woods. He illustrates this with the results of two in-depth bird studies—one in the 1990s and a second, replicating study, completed in 2023. Instead of the broad declines found everywhere else in the United States, he and his team found mostly increases in bird populations. He postulates that the "place" of the North Woods is functioning like a ten-million-acre forested bird sanctuary for the nation. He writes, "The North Maine Woods alone cannot counter national-scaled declines, but it can help. What replicating the bird study taught me is that we should keep the North Maine Woods this way, *if we can.* Conservation easements are the only practical way to do this."

It isn't just birds that benefit from the increasingly rare intactness of the North Woods. It is also people—those in the forest products and outdoor recreation industries, and individuals who enjoy Maine's forests for hunting, fishing, hiking, and finding respite. The vast unfragmented forested landscapes of the North Woods also support water quality, carbon sequestration, and a vast array of fish, wildlife, and plant life that together form a diverse ecosystem.

Easements are the glue that can hold together this place called the North Woods and sustain its unique quality in a changing world facing increasing development. State and non-government organization acquisition can secure key areas of significant ecological and recreational importance but are not likely to secure 10-12 million acres of forests. Easements can, with willing landowners, and there are growing numbers of willing landowners.

FSM, which celebrates 40 years in 2024, now holds more than one million acres of conservation easements mostly in the North Woods and stands ready for the next 40 years. We continue to listen to suggestions for improvement in easement practices and integrate new science into their use. And after decades of experience with easements and now many having second or third generation landowners, easements are standing the test of time as a strong yet flexible tool, well-suited to the large, unfragmented, and mostly privately-owned forests of the North Woods. FSM is encouraged by the broad public support for easements and the growing scientific data, such as Dr. Hagan's reports, showing their vital role for fish, wildlife, and birds!

Karin Tilberg, President/CEO
Forest Society of Maine

FOREST SOCIETY *of* MAINE

The Forest Society of Maine conserves Maine forestlands to sustain their ecological, economic, cultural and recreational values with a particular focus on large working forest landscapes.

Executive Summary

Conservation easements are designed to protect public values on private lands—usually in perpetuity. This strategy of conservation is especially important and effective where there is relatively little public land to secure public values. Maine has a small percentage of public land (~7%), but the highest percentage of land area in conservation easements of any state in the U.S. (~15%). Conservation easements are legally binding instruments that purchase the right of private landowners to develop their land. Sometimes landowners donate this development restriction. To date, Maine still has the largest conservation easement in U.S. history—the 762,000-acre Pingree Easement. Easements are typically valued by a diverse cross-section of the public. For both historical and pre-historical reasons, conservation easements have been very successful in Maine.

Nearly half of Maine, some 10-million acres of "unorganized territories," is basically devoid of permanent human habitation, resulting in, at least for now, a lot of open space, albeit mostly privately owned. The last ice age, ending 12,500 years ago, was followed by occupation by Wabanaki ancestors, who traveled the streams and sustained themselves with the bounty of the new forested landscape. As European immigrants moved to the region, the rocks and rubble left by the glaciers made the interior of Maine difficult to till and settle permanently. In 1800, Maine was not Maine, but the "District of Maine," the northern part of Massachusetts at the end of the Revolutionary War. Massachusetts repaid its war debt in part by selling large swaths of its northern "District" to wealthy individuals intending to capitalize on the timber values. These events—one natural and one anthropogenic—conspired to leave the largest empty space in the eastern U.S.—a "hole in the map" that is now a place of *global* environmental and economic significance.

However, there are no guarantees it will remain this way. The conservation easement strategy, perfected in Maine by land trusts such as the Forest Society of Maine and others, involves purchasing development rights from willing private landowners, thus ensuring this area continues to provide an array of public benefits, in perpetuity.

This report outlines some of these benefits at risk if land trusts and landowners do not continue their work together on conservation easements. The genius of conservation easements is that they enjoy broad social support. Environmentalists understand that such a large, empty, unfragmented place accommodates healthy populations of plants and animals that do not fare well with the human infrastructure of developed areas. Maine's unorganized territories function like a 10-million-acre wildlife sanctuary for the nation—a place you can readily see a moose, and may, if lucky, catch a quick glimpse of a Canada lynx. Recreationists—hunters, fishermen, hikers, snowmobilers, river rafters, all enjoy this 10-million-acre landscape, most of which is privately owned but open to the public, at least for the moment. The $8.1 billion forest products economy of Maine also depends on these lands to continue to grow trees for as long as people need wood and forest products. When land becomes developed and populated, timber harvesting is often restricted or eliminated by the new landowners. It is easy to see why so many *different* people support conservation easements.

Having been implemented for over 40 years, conservation easements have been criticized too, for not protecting enough ecological value, or not recognizing the full array of societal needs—such as affordable housing that some rural communities desperately need. But now that the easement mechanism is up and running, we can make it even more effective for diverse public values.

If we are successful, in 2100 the interior of Maine will be much like it is today, and enjoyed by our great grandchildren in the same ways we enjoy it today. Nowhere else in the eastern U.S. is it possible to conserve such a large, intact, functioning ecosystem that serves humans and nature in so many ways.

INTRODUCTION

From Kokadjo, the options at Chesuncook Corner are left or right. No light. No stop sign. Nobody to stop for. 'Right' will take you back to the present—Millinocket. 'Left' will take you back in time. I had not been out here in three decades. What would it be like after being away so long?

I went left, *backwards* in time. My destination was the Ragmuff logging camps, normally occupied by logging crews but conveniently, for our research team, empty in late May—mud season. The potholes in the Golden Road alone told you the time of year.

This is a story about a place that has not changed when the rest of the world has. This did not happen by chance.

Thirty years ago, as a young ecologist, I studied birds in this remote part of Maine. Now, older, I was returning to do the study all over again with my old colleagues, and new younger ones who could actually hear the birds. Making the Chesuncook turn, how convenient, I thought, that mud season coincides so perfectly with the start of the breeding season for most North Woods birds. It can still freeze at night in late May, and a cold soaking rain is almost guaranteed, even a snow shower. But at the end of a cold, wet field day, a rustic logging camp with hot water is worth more than a four-star hotel. Comfort is relative.

The Golden Road looked exactly like it did thirty years ago. Hannibal's Crossing, the one-lane 250' wooden span across the West Branch of the Penobscot, was unchanged. Everything seemed oddly… *identical.* How could thirty years pass with no discernable change whatsoever?

This is a story about a place that has not changed when the rest of the world has. This did not happen by chance.

Hannibal's Crossing over the West Branch of the Penobscot River, Golden Road, looking south. (photo by J. Hagan)

The Golden Road is the widest, longest dirt road in Maine. It was built in the early 1970s, at great expense, to move timber out of the remote North Woods to paper mills east in Millinocket. In 1971, the Maine Legislature passed a law making it illegal to move logs out of the woods by floating them down the rivers, the way it had been done for 150 years. Now, this method was understood to cause too much damage to aquatic ecosystems. The log drives also displaced other legitimate uses of the rivers.[1]

Two stories persist for the name "Golden Road." It was either because it cost so much to build, or because it would save paper mills a lot of money to have a more timely and reliable overland flow of fiber.[2] No more waiting for spring runoff to move timber. Both explanations likely have merit.

With every westward mile on the Golden Road, time runs backwards. No cell phone service. No convenience stores. No gas. If it's not your first time in the unorganized territories, you know to bring two full-sized spares. Everyone who works out here learns this lesson the hard way. Experience has a lot of value here. Your modern "devices" will not save you. Iron tools, patch kits, and spares will.

The Golden Road just goes and goes. You know it eventually runs into Canada. But this place—the unorganized territories of Maine—has an *infinite* feel to it. No one is coming to save you. The Golden Road runs through the heart of some 10-million acres of unorganized territories, nearly half the state of Maine. There's nothing else like this place east of the Mississippi. This is a story about keeping it this way, and about why we all would want to.

Ragmuff Logging Camp foreground, right; Lobster Lake and Big Spencer Mountain, background left. (photo by J. Hagan)

What are Conservation Easements?

Conservation easements evolved out of a realization that public lands alone could not fulfill all of the public's diverse values for open space.[3] This is especially true in the eastern U.S. where there is relatively little public land (e.g., National Forests, National Parks).[4] For example, Maine has a very low percentage of public lands—only about 7% is federal, state, or municipal land.[5]

Conservation easements are voluntary but legally-binding agreements whereby a private landowner sells, or sometimes donates, some or all of their land development rights, usually in perpetuity. Extinguishing development rights reduces the monetary value of the land to the landowner. To secure this development restriction, easement buyers compensate the landowner for the lost financial opportunity of developing their land. However, the land still belongs to the owner.

Landowners willingly enter into easement agreements. Often landowners have a personal connection to the land and share the desire that the land never be developed.[6] Sometimes landowners will donate the easement (a sort of self-imposed development restriction) and can generate a tax credit for the landowner equivalent to the estimated value of the lost development opportunity.

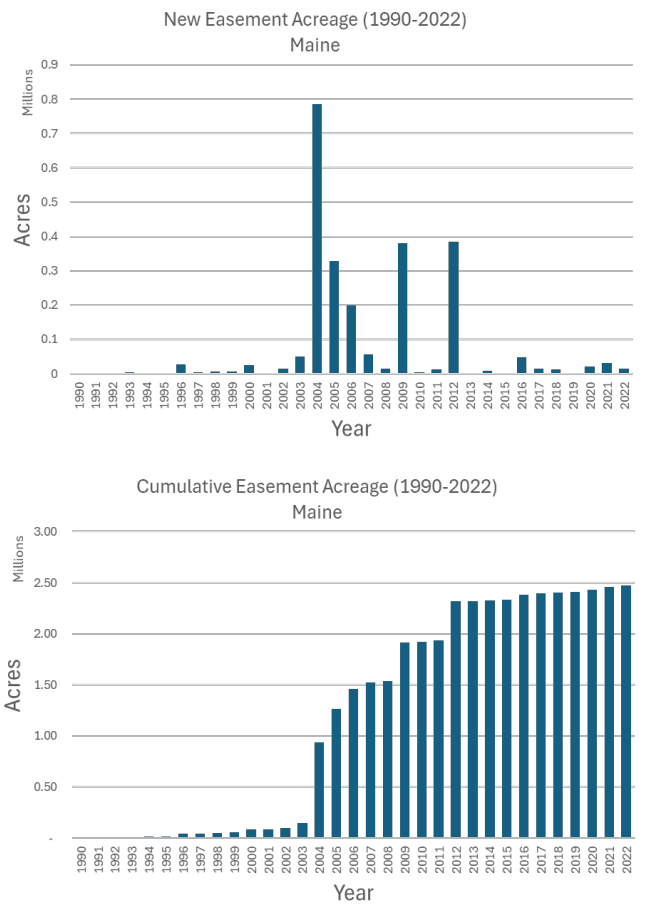


Figure 1. Top: Number of acres of new easements by year in Maine (1990-2023). Bottom: cumulative number of acres in easements, 1990-2022.

The easement *holder* is the organization responsible for ensuring that the terms of the easement are fulfilled. Monitoring of easement compliance is required, also in perpetuity. Therefore, long-term monitoring costs are built into the funding goal for most easements, and the easement holder retains these funds, often in an endowment, to pay for future monitoring.

Most easements are forever—in perpetuity. The land will never be developed. However, at times "term" easements have been used to protect land from development for a limited time, say 40 years.[7] After that, the option to develop reverts to the landowner, or the landowners (of the future) may choose to renew the easement if there is an interested buyer. In the case of term easements, the financial constraint to the landowner is not permanent, so the cost of the easement is less than an in-perpetuity easement. Only in perpetuity easements afford a tax deduction for the seller.[8] Usually easements, regardless of duration, are written into land deeds to make sure heirs or any subsequent owners will remain obligated to the requirements of the easement.

Conservation easements have become an enormously effective way of conserving public values on private lands over the past 35 years (Fig. 1).[9] In the U.S., the development rights have been "extinguished" on over 87,871 ownerships, comprising over 37 million acres (1.63x the area of the state of Maine).[10] Maine is 1.1% of the total contiguous U.S. land area but holds 7% of all eased lands in the U.S.

Conservation easements evolved out of a realization that public lands alone could not fulfill all of the public's diverse values for open space.

In January 2021, the Biden Administration issued Executive Order (EO) 14008 titled "Tackling the Climate Crisis at Home and Abroad."[11] Section 216 of the EO, "Conserving & Protecting our Nation's Lands & Waters," set a goal of protecting 30% of the nation's lands and waters by 2030. Section 216 recognized that multiple uses of these lands and waters would be key to conserving them. Presently, about 12% of the nation's land is conserved, either publicly or privately. The only practical way to reach the 30% goal by 2030 will be by ramping up the conservation easement strategy with willing landowners.[12]

Conservation Easements in Maine

In the 1980s, British financier Sir James Goldsmith bought, and then sold, one million acres of timberland in the 26-million-acre Northern Forest region of New England.[13] The land was split apart. Ninety thousand acres in Vermont and New Hampshire were sold to a land developer, Rancourt Associates. At about the same time, thousands of acres of Maine timberlands were also being sold.

Large tracts of timberland in New England had been sold before, but always to other forest industry buyers. That timberlands were being broken up and sold to developers suggested a change in land use. This set off alarm bells with conservationists and the timber industry.[14] What if million-acre tracts of the Northern Forest were converted to house lots, threatening the timber-based economy and access to private timberlands for hunting and recreation, upending the rural way of life across northern New England? Neither loggers nor Appalachian Trail hikers liked this scenario.

In 1990, the governors of the Northern Forest states (New York, Vermont, New Hampshire, and Maine), with the support of the U.S. Congress, formed The Northern Forest Lands Council to determine whether the threat to traditional values was real, and if so, what could be done about it. Specifically, the Council was asked to make recommendations on how to:

> *"Enhance the quality of life for local residents through the promotion of economic stability for the people and communities of the area and through the maintenance of large forest areas; [and] encourage the production of a sustainable yield of forest products; and protect recreational, wildlife, scenic, and wildland resources."*

The Council concluded its work in 1994 with The Northern Forest Lands Study.[15] The Council's report explicitly recognized that conservation easements with willing landowners would be critical to conserving these traditional values far into the future. This was especially true for Maine, with so little public land and a lot of privately owned natural assets. This, in combination with Maine's land history (see next section) made Maine the perfect place to pioneer conservation easements. Fortunately, organizations like the Forest Society of Maine, founded in 1984, were ready to go.

Not long after the Northern Forest Lands Study was published, an avalanche of timberland sales ensued. The Goldsmith sale was the beginning, not the end. The sales were precipitated by changes in U.S. tax law during the Reagan administration of the 1980s.[16] New legislation made it financially beneficial for vertically integrated paper manufacturers to carve off their timberlands as a separate and distinct asset from their mills. Long-term timber supply agreements were integrated into the sale contract to ensure mills' future access to fiber. Almost 6 million acres of Maine timberland was sold to Timberland Investment Management Organizations (TIMOs) or Real Estate Investment Trusts (REITs) in the 1990s and early 2000s.[17] This new "species" of landowner intended to profit from the timberland alone. It made perfect financial sense.

Unexpectedly, these new owners presented a conservation opportunity rather than a risk.

There are two main motivations for timberland owners to sell their development rights through a conservation easement. First, some old-line family owners want their land to remain forestland forever—as a sort of enduring family legacy. With each new generation the number of family decision makers can grow exponentially (two becomes four becomes eight very fast on a decade's timescale). There is a risk that some members of future generations will prefer to sell the land for development. Conservation easements ensure this will never occur.

In contrast to many family forest landowners, TIMOs and REITs are laser-focused on monetizing their timber assets. If they can generate a better ROI (return on investment) for their shareholders by selling development rights, they will. The former paper company owners focused mostly on manufacturing revenue and did not view timberland as a separate profit-making opportunity.

By the early 2000s, with so much of Maine's timberland owned by financial investors seeking to monetize their new investment in every way possible, new conservation easement opportunities emerged.[18] The Forest Society of Maine (FSM) was established in 1984 to accept a 20,000-acre working forest easement in Attean Township. This was the largest easement in the United States at the time and remained so for 16 years until FSM completed the 21,790-acre Nicatous easement, which is held by the state of Maine. In 2001, the 762,000-acre Pingree easement held by the New England Forestry Foundation was completed on lands in Maine, and remains to this day the largest conservation easement in the U.S.[19] In this case, the Pingree family heirs wanted to keep most of their forest as forest, forever. The $28-million sale of development rights cost $37 on a per-acre basis. Outright purchase of timberland at the time was $300-$500 per acre, so many viewed purchasing development rights as a far more cost-effective way to achieve the vision articulated by the Northern Forest Lands Council.

Maine, like no place else, embraced conservation easements as a way to secure public values—*forever*.

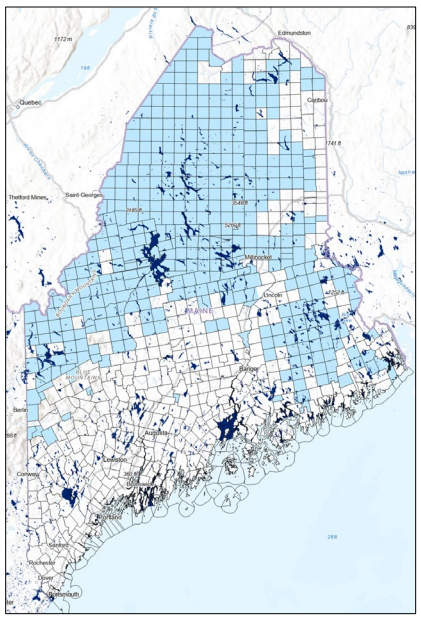
Today, Maine has the highest percentage (13.2%) of land in conservation easements of any state in the U.S, with a total of 2.6 million acres in easements.[10]. Between public lands and private easements, 22% of Maine's land area is considered "conserved" (see Fig. 2). Of the 10 largest conservation easements in the U.S., four occur in Maine (Pingree, Moosehead Region, West Branch, Downeast Lakes). See Table 1 for a list of Maine conservation easements greater than 10,000 acres.[10]

The Pingree easement proved this new conservation strategy could work on a mega-scale. The Pingree easement was followed by a cascade of other easements, most notably the 358,000-acre Moosehead Region Conservation Easement transferred by Plum Creek Timber Company (a REIT) to the Forest Society of Maine, the 311,000-acres Downeast Lakes Project sold by Typhoon, LLC to the New England Forestry Foundation, and the 282,000-acre West Branch Project sold by Merriweather, LLC to the Forest Society of Maine (Table 1).

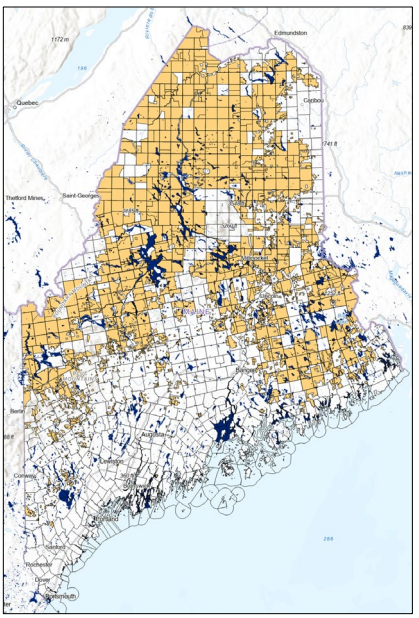
Maine, like no place else, embraced conservation easements as a way to secure public values—*forever*.

How did this place come to be this way?

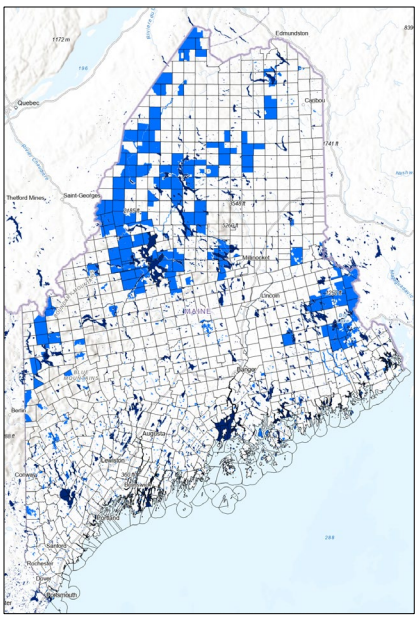
It's instructive to understand why such large conservation easements are possible in Maine today. Nature, and the Revolutionary War, conspired to lay the groundwork for our conservation work in the early 21st century.



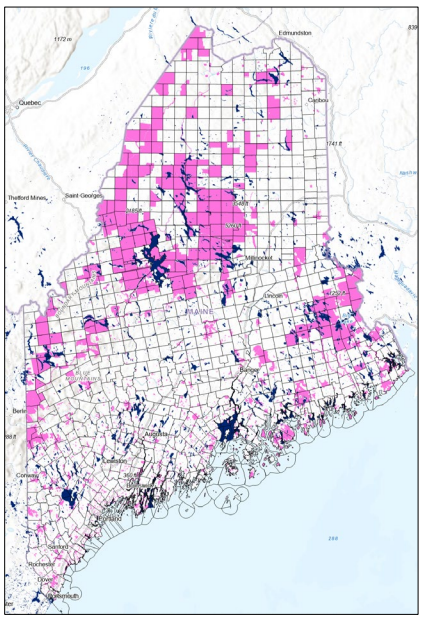
(a) unorganized townships



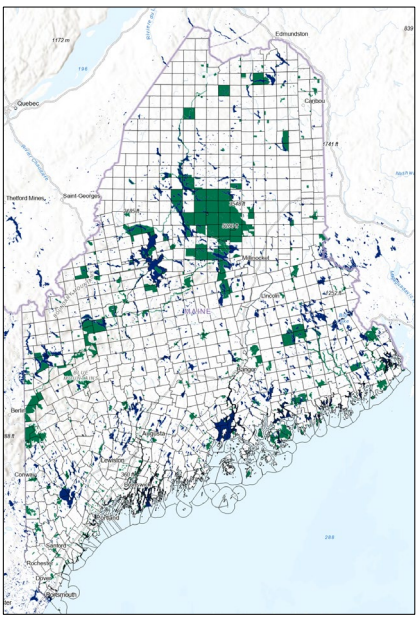
(b) commercial timberland



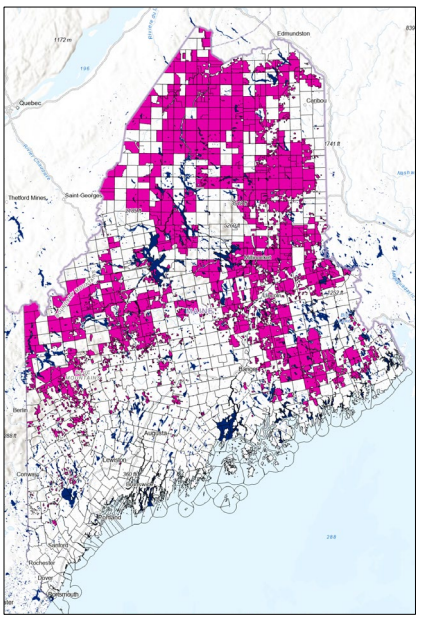
(c) current conservation easements



(d) public and private conserved lands



(e) public lands



(f) potential for new easements

Figure 2. Maps of Maine for different land ownerships and conservation categories. Note that the unorganized (unpopulated) townships (a) make up about 50% of Maine's land area, and private commercial timberlands (b) make up most of the unorganized townships. Current conservation easements (c) make up about 15% of the unorganized townships. (d) Public *and* conserved (eased + private conservation) lands, together. Public lands (e) make up only about 7% of the unorganized territories. Finally, (f) shows the huge potential for future easements in the unorganized territories.

First, the nature part of the story. At the end of the last ice age, 12,500 years ago, much of "Maine" was the unfortunate beneficiary of the rock and rubble plowed up by the glaciers. This made much of Maine poorly suited for agriculture, and thus poorly suited for colonial settlement.[20,21]

Second, at the end of the Revolutionary War, Maine was not Maine but rather the "District of Maine," a part of the Commonwealth of Massachusetts.[22] It's important to remember this land called "Maine" was essentially stolen from the Indigenous Wabanaki who inhabited much of Maine's forested areas. In 1800, the precise borders of the

Table 1. Conservation easements in Maine greater than 10,000 acres. Listed from smallest to largest in acreage.

#	Easement Name	Acres	County[1]	Easement Holder	Completed[2]
1	Crooked River Headwaters	12,000	Oxford	Mahoosuc Land Trust	2021
2	Lower Penobscot Forest	13,000	Penobscot	The Nature Conservancy	2007
3	Farm Cove	13,000	Washington	New England Forestry Foundation	2005
4	Grafton Forest	15,000	Oxford	Forest Society of Maine	2022
5	Fish River Chain of Lakes	17,000	Aroostook	Forest Society of Maine	2021
6	Upper St. John Lands	18,000	Aroostook	The Nature Conservancy	2012
7	Machias River Corridor	18,000	Washington	Maine Bureau of Parks and Lands	2004
8	Attean Pond	20,000	Somerset	Forest Society of Maine	1984
9	Nicatous Lake	22,000	Hancock	Maine Bureau of Parks and Lands	2000
10	Boundary Headwaters	22,000	Franklin	Forest Society of Maine	2004
11	West Grand Lake	23,000	Washington	Maine Bureau of Parks and Lands	2012
12	The Roaches	28,000	Piscataquis	Maine Bureau of Parks and Lands	2009
13	Reed Forest	32,000	Aroostook	Forest Society of Maine	2016
14	Katahdin Iron Works	37,000	Piscataquis	Maine Bureau of Parks and Lands	2007
15	Debsconeag Lakes	36,000	Piscataquis	Forest Society of Maine	2007
16	Katahdin Forest	189,000	Piscataquis	Maine Bureau of Parks and Lands	2002
17	West Branch	282,000	Somerset	Forest Society of Maine	2003
18	Sunrise	311,000	Washington	New England Forestry Foundation	2005
19	Moosehead Region	358,000	Somerset	Forest Society of Maine	2009
20	Pingree	762,000	Somerset	New England Forestry Foundation	2001

[1] Lands may lie in several counties. The county with most of the easement is listed.

[2] Conservation easements sometimes take several years to complete. The year of completion is listed.

District of Maine were as unclear as what financial opportunity might lie in this vast *terra incognita*—yet to be "assessed" by the new European settlers.

In an effort to simplify Massachusetts' jurisdiction and to encourage settlement of "the District," Maine became a separate state in 1820. Part of the deal was that Massachusetts retained ownership of some 7 million acres of the "unorganized territories" of the fledging state. Another 7 million was granted to Maine.[22] The remaining 7 million acres was "organized" and settled already (i.e., had an established, permanent local population). Two hundred years later, in 2024, a map of Maine's populated area does not look much different from the 1815 map made by Moses Greenleaf[23] (see Fig. 3). Why did human settlement never take hold in, say, T4 R14, one of our bird study townships near the Ragmuff logging camp? T4 R14 has the same population today as it did in 1815—*zero*.

It was not supposed to turn out this way. Both Maine and Massachusetts wanted the entire state settled so that people could flourish in the new nation. More practically, from Maine's perspective, if people prospered the state would receive more revenue in taxes and the state could invest even more in its growth and development.[22] Between its fisheries and its forests, Maine was a blessed place in 1820. And still is today.

But encouraging and then cajoling settlement never worked. Nothing either Massachusetts or Maine did to incentivize settlement succeeded. "We'll *give* you the land, if you will clear it, grow crops, and build a school and a church." Even that didn't work, and both states were left only with "Plan B"—sell large blocks, or multiple "townships," to wealthy entrepreneurs who could capitalize on the timber value.

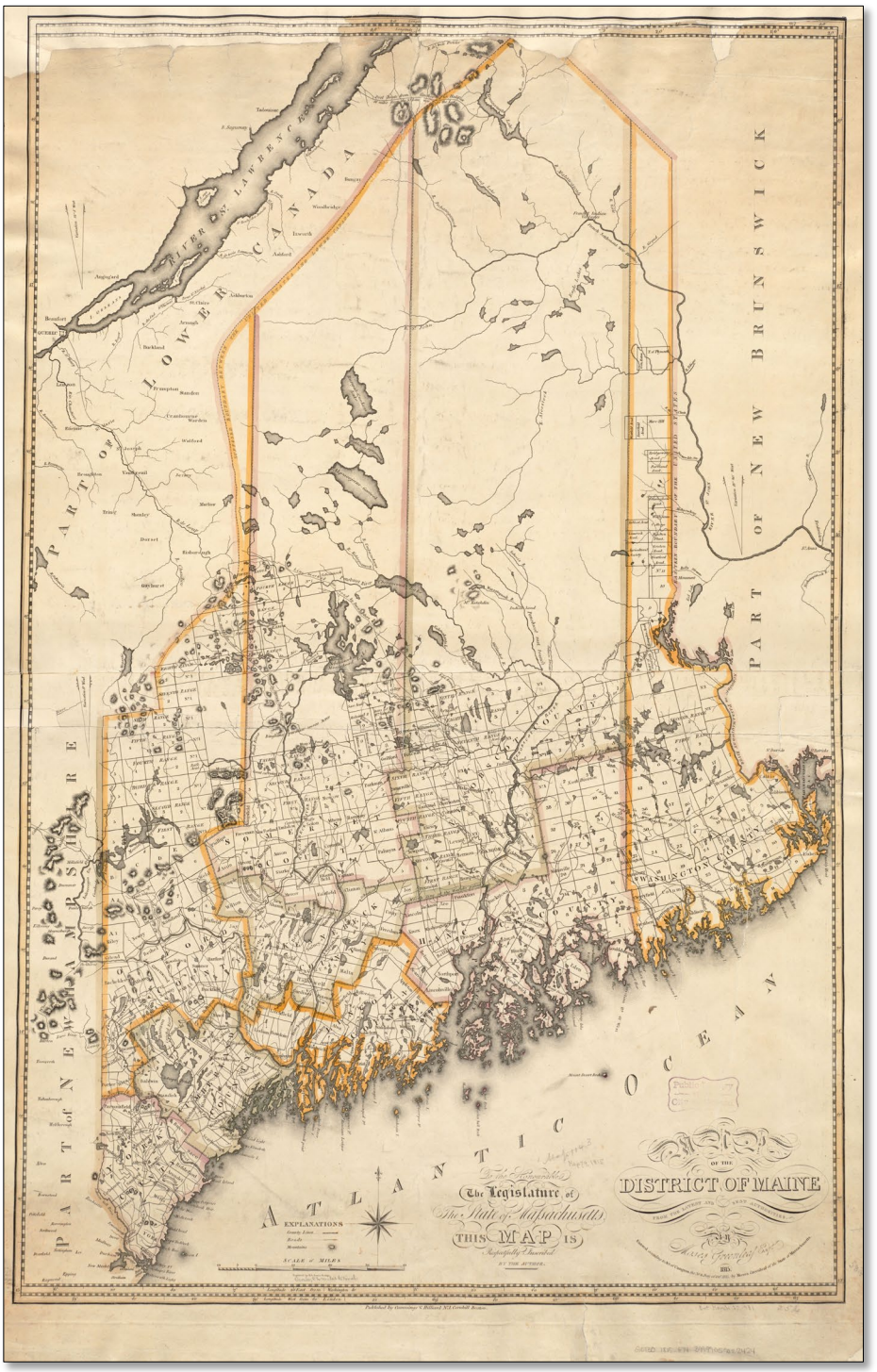


Figure 3. 1815 map of Maine by Moses Greenleaf. The large unmapped area of northern Maine is still largely unpopulated to this day. (Osher Map Library, Accession Number FL-1815-5).

By the 1840s, all the unorganized territories had been surveyed into roughly 25,000-acre blocks called townships—6 miles on a side. Sometimes townships didn't line up quite right because of the curvature of the earth, and slivers of townships, called "gores," were created to fix the problem, such as Misery Gore west of Moosehead Lake.

To make matters worse for Massachusetts and Maine, the great American West opened up in the mid-1800s with a vision of "manifest destiny." Between the lure of gold, deep fertile soils, and treeless plains, there was even less interest in grubbing rocks out of the glacial rubble of interior Maine. Where there was glacial outwash, decent soils could be found, like Aroostook's potato country. But for agriculture, a prerequisite for permanent settlement in the 1800s, the interior of Maine was too much trouble.

So, the land was sold to willing buyers, such as David Pingree, a shipping magnate from Salem, Massachusetts, and William Bingham, a millionaire from Philadelphia, perhaps the wealthiest person in the new nation. These entrepreneurs bought the land as a timber investment. They had no interest in settlement. Settlement would only complicate their plans. Though their interests were in opposition to the goals of Maine and Massachusetts, the states simply had no "market" of settlers to lure. Although most of this early timberland has not stayed with the original owners, the Pingree family being one exception, the original large blocks have remained remarkably intact—leaving Maine today with a conservation opportunity of global significance.

What was considered a failure in the mid-1800s has become the essential ingredient to a conservation success story 150 years later.

It's interesting how the "lemons" of the mid-1800s have been turned into "lemonade" in the 21st century. This serendipitous story set the stage for today's easement projects, some of the largest land conservation projects in the nation. Eased timberlands will never be developed; they will never become "organized." While timber can still be harvested, conversion to other land uses is off the table—in perpetuity. What was considered a failure in the mid-1800s has become the essential ingredient to a conservation success story 150 years later. And huge potential still remains (see Fig. 2f).

The Bird Story

The 1990s was a contentious time for environmentalists and industrial timberland owners. Coming off of the massive spruce budworm outbreak of the 1970s and 1980s, clearcutting was the predominant harvesting method, often for salvaging the wood before it succumbed to the pesky insect. The dinosaur-sized K220 Feller Forwarder—now obsolete—ran 24/7, *for a decade*, trying to keep ahead of the ravages of the budworm. The spruce budworm is a natural, cyclic forest pest that irrupts every 30 to 50 years in the Acadian Forest.[24,25]

About the same time, but on a continental scale, concerns for migratory bird populations were growing. By the late 1980s, the visionary citizen-science program developed by USFWS biologist Chandler Robbins in 1968—the North American Breeding Bird Survey[26]—had accumulated just enough years of data to hint at long-term bird population trends.[27] The trends were alarming. For the first time, we could see, with data, that many migratory species—warblers, thrushes, flycatchers—were decreasing on a continental scale. At first the Neotropical migrants were of greatest concern—birds that migrate to Central and South America during our winter, and then migrate back to breed in our insect-rich North Woods in the summer. Later, we realized that short-distance migrants that wintered in the southeastern U.S. were showing declines too.[28]

As a fledgling scientist at the time, I wondered what role Maine's "big empty place" played in the national bird conservation story. I also figured I only needed to talk to 10 people to gain access to 10 million acres. Rarely in ecology do we enjoy access to such an enormous geographic scale to study.

To commercial forest landowners' credit, they wanted the answer to bird population declines as much as I did. Without data, they were likely to be accused of causing bird declines. "We might as well know the truth," was the reaction I got from Bowater and

Conducting early morning bird survey. Ryan Andrews (left), Kelsi Anderson (right) (photo by J. Hagan)

Scott Paper Company, two of the biggest landowners at that time. I was impressed. I liked the candor.

My young field assistants and I spent three years surveying birds in every forest type and age class on the landscape, from the massive 15,000-acre Ragmuff clearcut north of the Golden Road to the magnificent late-successional forest on the slopes of Big Spencer Mountain, since protected as an ecological reserve by the Forest Society of Maine.

What we found was simple. Every forest type and age class provided useful habitat for birds, including the big Ragmuff clearcut (Fig. 4.). Clearcuts were not the "biological desert" purported to be by many in the environmental community.[29] Indeed, clearcuts were unsightly to me too, but as we discovered, not to Lincoln's Sparrows and Mourning Warblers. We concluded that the commercial forests of northern Maine were a vast "shifting mosaic" of bird habitat. Over the decades, young forest and mature forest changed places in the landscape. The key for bird conservation would be to make sure landowners kept some of everything at each point in time.

I left my role as a researcher for a long while to do "highly important" administrative work as President of Manomet, the organization I worked for during the 1990s bird study. In 2019, I decided I wanted to go back to science—my passion—while I still could. But, what to study?

Pete McKinley, my young enthusiastic field coordinator in 1992 and later conservation planner with the Forest Society of Maine, reached out. "Why don't we do our 1990s bird study all over again?" I said "No. It's too expensive. We're old and overweight. And we can't even hear the birds anymore." (Surveying birds in the Northern Forest depends on hearing bird song more than *seeing* birds.)

Figure 4. Examples for migratory songbirds that thrive in the unorganized townships of Maine: from top left, clockwise, American Redstart, Scarlet Tanager, Black-throated Blue Warbler, and White-throated Sparrow. (photos courtesy of David Krauss).

In 2019, the year before I put my coat and tie and highly important work aside for good, a seminal study was published in the world's most prestigious journal—*Science*—titled "Decline of the North American Avifauna." [30] The study reported some three billion birds lost, or almost 30% of all birds, since the early 1970s, right after Chandler Robbin's Breeding Bird Survey began.

Now, I thought, we have a compelling reason to do the bird study again. We could always find young, physically fit, budding scientists with keen hearing to do the necessary field work. And with a compelling reason, we could raise the money we would need.

Much had changed in Maine's commercial forests since the 1990s study. First, clearcutting was no longer the dominant harvesting strategy for lots of reasons, including the fact that the public despised them. Landowners "got the memo" from a mid-1990s ban-clearcutting referendum, which failed to pass but came too close for landowner comfort.[31] Secondly, paper mills had figured out how to make quality paper out of hardwood. Softwood, especially red spruce, was the desired species for papermaking in the 1990s because of its long, strong fiber. But with the new demand for hardwood, forest types important to bird conservation could have changed on the

landscape. Just as some birds prefer young forest and some prefer old forest, some prefer softwood forest and others prefer hardwood forest.[29]

We replicated the entire 1990s study between 2021 and 2023.[32] The results were exactly the opposite of what we were expecting. Instead of bird declines like everywhere else in the country, we found mostly increases. Some species, like the American Redstart, had tripled in abundance. The Black-and-White Warbler doubled. We were so surprised that we had two team members analyze the data independently of each other to doublecheck. We did not want to make an analysis mistake. The results from both analysts came out identical, to the decimal, for every species.

Seldom do we get "good-news" biodiversity stories on a large scale. But this is one. We should celebrate. But 'WHY did we get this result?' is the next question for our science team. What is it about this particular place on the planet that it has such a good-news bird story to tell?

It's going to take more research to know for sure, but this is our hypothesis. We often talk about the Maine North Woods as being "the largest unfragmented tract of forest east of the Mississippi." It's the most worn-out opening line to every grant proposal having anything to do with the North Woods. But the birds are telling us, "You've got the story right—stick with it."

Seldom do we get "good-news" biodiversity stories on a large scale. But this bird story is one.

Birds tend to come back to breed near where they were raised—often within a hundred miles, but sometimes within a few acres.[33,34] And birds tend to settle where they hear other birds of their species singing.[35] It's called conspecific attraction. Because of an array of possible mechanisms, we think this "place" is functioning like a 10-million-acre bird sanctuary for the nation. It could be the food (mostly insects). It could be that it's dark at night. It could be the absence of human habitation. It could be all of the above working together.

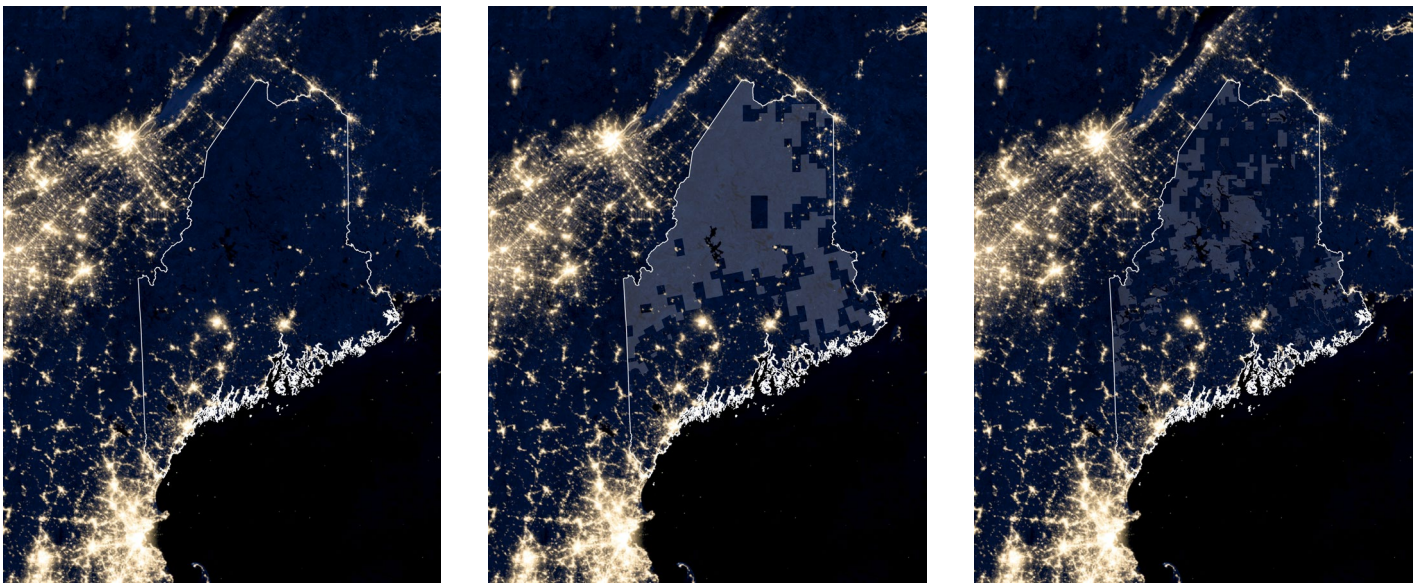
The debacle of Maine's futile efforts to settle its interior hinterlands in the 1800s turns out to be the key to this bird conservation success story today. The North Maine Woods alone cannot counter national-scaled declines, but it can help. What replicating the bird study taught me is this—*we should keep it this way if we can.* I had not appreciated this point with the 1990s study. Now I do. Conservation easements are the only practical way to keep it this way.

The Dark Sky Story

A classic scientific study was conducted by ornithologist Steve Emlen in the 1960s.[36] At the time, ornithologists had a sense that birds might use the stars for navigation during migration. Many birds migrate at night when it's cooler and more efficient to fly. They forage during the day to fuel up for the next leg of the flight. During migration, sleep is less important than getting where you need to be, on time.

Emlen's genius was the use of a planetarium. He put Indigo Buntings in a cage in a planetarium, simulated the night sky, and observed whether the birds oriented in any particular direction that night. The birds showed a clear pattern, wanting to go north in the spring. Emlen turned the projected planetarium sky around 180 degrees the next night, with the North Star on the south side of the planetarium dome above. The birds wanted to go south that night because they thought it was north. Clearly, Indigo Buntings were deciding which way to go based on the simulated stars above.

Emlen went on to show that it was the concentric rotation of the stars around the North Star that mattered to the birds. He "fabricated" a sky in the planetarium that rotated



(a) (b) (c)

Figure 5 a,b,c. (a) Light pollution map for the northeastern U.S. (b) with an overlay of the unorganized territories of Maine; (c) with an overlay of current conservation easements.

around a different star. The birds then thought *that* star was north. It was the pattern of rotation that mattered, not the star itself! Beautiful, simple, elegant science.

Indirectly, this very cool, albeit obscure, science story is yet another reason large conservation easements in Maine are so important. We know light pollution can disorient birds during migration.[37,38,39] Some bird species are attracted to light and others are photophobic (light fearing), and we don't know why this difference exists. But what we do know is that darkness matters for bird migration. A successful migration means you get where you're going and raise young this year. We don't have a good sense of what role light pollution might be playing in continental bird declines, but we can, again, thank the bungled efforts to settle Maine in the 1800s for what is also the biggest, darkest place east of the Mississippi (Fig. 5).

But what about humans and the night sky? The starry night has inspired poets, authors, artists, composers, and anyone who has ever looked up at night.[40] About 3000 BCE, the Egyptians may have been the first to look up at the night sky and conclude that's the place we go in the afterlife.[41] "Heaven," they concluded, was … up. The night sky was mysterious, not understood, and yet routine, appearing every night. Only a deity could create such a spectacle. The Sumerians studied the night sky in order to better understand the will of the gods.[42] Astrophysicists today still don't know exactly how the universe came to exist.[43]

In 1596, the famous German astronomer and composer, Johannes Kepler wrote "The diversity of the phenomena of Nature is so great, and the treasures hidden in the heavens so rich, that the human mind shall never be lacking in fresh nourishment."[44] Think of Van Gogh's "The Starry Night" (1889) or Gustav Holst's "The Planets" (1917). Nothing captures us like the night sky.

Yet today only one-third of us can see the Milky Way from our backyards at night.[45] Most people have never seen a truly dark sky or even a shooting star. How are we supposed to make wishes anymore? Nothing like the night sky makes us ponder why we are here, as individuals.[40] We all need to consider this question from time to time.

In 2022, the Appalachian Mountain Club's (AMC) Maine Woods tract east of Moosehead Lake earned its official designation as an International Dark Sky Park, the first in New England.[46] If you need to ponder your purpose, go to AMC's Little Lyford Camps or Medawisla and look up at about midnight. Conservation easements in Maine guarantee there will forever be a place without human development and all the light pollution that comes with it. Easements guarantee there will be a place we can go to reflect on our purpose… a place to take our grandchildren so they'll be able to see the same dark sky the Wabanaki saw a thousand years ago. Easements allow us to *time travel*. Conservation easements ensure we will always be able to make a wish upon a falling star.

Room to Move

Some animals need big spaces to thrive, especially two of our most charismatic megafauna—American moose and Canada lynx. Big spaces can become fragmented in two ways: (1) fragmentation of land use, such as human development encroaching into wildlands, open spaces, or managed forests,[47] and (2) fragmentation of forest age classes that results from timber harvesting.[48]

Conservation easements generally address the first type of fragmentation by purchasing development rights from landowners. Conservation easements have the potential to address the second type of fragmentation with "affirmative clauses"[12] that seek to achieve more "surgical" habitat goals, such as retention of large mature forest blocks preferred by the American pine marten.[49] Affirmative clauses seek to create something new rather than just eliminate something, such as development rights.

Although the small migratory songbirds mentioned above seem to benefit from the large open space of the unorganized territories of Maine, the large charismatic mammals, and even mid-sized mammals such as the pine marten, *require* a lot of space. One breeding pair of Canada lynx might need half of a township (12,500 acres).[50]

Canada lynx (photo courtesy of Maine Department of Inland Fisheries and Wildlife)

Left: Bull Moose, Maine. Top: American marten (photos courtesy of Forest Society of Maine)

Home ranges of moose vary by sex and time of year, but typically range over 15-30 km^2 (7-15 mi^2, or 3,500-7,500 acres).[51]

For both the moose and the lynx, young regenerating forest that follows timber harvesting, including clearcutting, is beneficial.[52,53] The main prey of the Canada lynx is the snowshoe hare, and snowshoe hares thrive in young, thickly regenerating spruce and fir that often fill in after a clearcut. Lynx populations fluctuate in synchrony with hare populations.[54] Yet lynx also need some older forest structures, such as big trees and logs for den sites.[55]

Moose are herbivores, so they depend on the thick foliage of regenerating forest for forage. Like the white-tailed deer near the northern edge of their range, moose also benefit from tall mature spruce stands that provide shelter from deep winter snow.[56]

Although we are a thousand times more likely to see a moose than a secretive lynx, Maine's unorganized townships have healthy populations of both species.[57] Moreover, having such large areas to roam maintains genetic diversity.[58] When individuals become restricted in movement or isolated from others of their species, population genetic diversity can deteriorate, making the species vulnerable to rapid changes in habitat or climate change.[59] Having large areas to roam helps ensure resilience to future environmental change. Conservation easements are a practical, immediate way to ensure such large areas remain for these species far into the future. Public lands alone cannot meet the needs of these iconic, large-area species.

The Socioeconomic Importance of Conservation Easements

The name "conservation easement" prominently contains the word "conservation." Early on, the primary purpose of conservation easements, and motivation of conservationists and funders, was conservation of the natural world. Easement projects, usually spearheaded by environmental organizations, reinforce the perception. However, if we

want to maintain broad social support for conservation easements and expand the use of the easement strategy, we need to conserve more than just the natural world.

The fear that many rural people have is that the Biden "30x30" Executive Order (30% of the land conserved by 2030) will cause them to lose their jobs or their way of life or both.[60] Where there is exceptional ecological value, it may make sense to set aside the land from timber harvesting or other activities that could compromise the ecological or biodiversity value. But an estimated 31,822 livelihoods are connected to the forest products economy in Maine—one out of every 25 jobs.[61] By proportion (88.8%), Maine is the most forested state in the U.S. Lumber and paper produced in Maine support the daily needs of people far beyond Maine. Whereas Maine must import orange juice and coffee, it exports what it's good at producing—in Maine's case, lumber, paper, popsicle sticks, baseball bats, wood pellets for heating, and a lot more.

It happens that Maine's recreation economy employs a similar number of people as the forest products economy, an estimated 32,274 people, and is growing rapidly.[62] The forest products economy complements the recreation economy because most of Maine's private commercial forest is open to public recreation.

Conservation easements that ensure a healthy forest economy, and therefore healthy rural communities, are supported by a much larger section of society than just the traditional environmental community.

Our largest Maine easements have been careful to make sure sustainable timber harvesting and public access are a part of the easement agreement. Snowmobiling, hunting, fishing, and hiking, are typically permitted uses written into the easement contract. Timber harvesting is allowed if done in accordance with easement standards in a forest management plan. Sometimes being enrolled in a sustainable forestry certification program is written into the easement, but most large timberland owners are already enrolled in such programs. Moreover, restricting timber harvesting in Maine would mean someplace else would need to generate the same amount of wood fiber. Humans need wood, and they'll get it from one place or another. It would be classic "not in my backyard" hypocrisy to curtail timber harvesting in one place only to be taken up elsewhere. Biodiversity conservation, writ large globally, would be only an illusion.[63]

Conservation easements that ensure a healthy forest economy, and therefore healthy rural communities, are supported by a much larger section of society than just the traditional environmental community. Conservation easements enhance the probability that forest products will be a part of Maine's future, because development is no longer an option. At the same time, conservation easements typically ensure that this privately owned land will not be gated and restricted from pedestrian public use. There is something good in conservation easements for everyone, except perhaps developers. Developers are meeting human needs too, but can we meet those needs without compromising one of the last great places on the planet?

Some Criticisms of Conservation Easements

Despite the explosive growth of easements as a land conservation mechanism, they are not without critics.[64] It's important to understand criticisms because they can help easements become even more effective instruments for securing a diversity of public values far into the future.

One criticism comes from the scientific community. A recent study by researchers at the Harvard Forest showed that non-eased timberlands in Maine were no more likely to be developed than were eased timberlands, thus questioning the spending of money on a risk that appeared to be near zero.[65] Additionally, the authors found similar harvest rates on eased and non-eased timberlands. They concluded that future easements would be more effective if they included provisions restricting timber harvest. But effective for whose values?

Regarding the first criticism, just because little development has occurred in the last 20 years does not mean development will not occur in the future. As explained in the bird story above, the benefits of conservation easements implemented today accrue *at the century scale*. What has happened, or not happened, in the last 20 years is no guarantee for the future. Conservation easements provide that guarantee. Conservation easements today may be the best strategy for ensuring healthy bird populations in the year 2100. It's not the past that matters, it's the future. We need to look forward, not backward, when we think about evaluating the significance of conservation easements.

The second criticism highlighted by the Harvard Forest paper, that eased timberlands have had basically the same harvest rates as non-eased timberlands, should not be a surprise. Easement buyers were not "buying" harvest levels. They were buying the landowner's right to convert the forest to other land uses, which they successfully secured. If the desired social value of an easement project is to reduce harvesting, the easement buyer, and the funders and donors who support the project, will need to be ready to pay a higher price per acre for the easement, because the landowner would not only be forgoing the value of development opportunity, but also revenue from timber sales. If we want more, we'll need to pay more, *if* landowners are willing to sell. Most landowners wish to retain their options for timber harvesting.

We need to be careful what we wish for. Having noted in the previous section the importance of Maine's forest economy to jobs and rural communities, we could anticipate losing public support of the easement strategy if it begins to threaten people's livelihoods. So, it's important that easements not exclude timber harvesting unless the area has exceptional ecological, scenic, or recreational qualities that can only be protected by eliminating harvesting.

Furthermore, not typically captured in easement statistics is the fact that lands with exceptional ecological value are often carved out as a separate "fee purchase" by private conservation NGOs or by state government during easement negotiations. This has happened many times in association with Maine easement projects (Table 2). For six large easement projects in Maine representing 877,000 acres, 166,000 acres were

Table 2. Examples of lands that were mostly taken out of timber production as a result of an easement project. While the easement itself might not limit timber harvest, the ecological set-asides likely would not have happened had the easement project not occurred.

Easement Developer(s)	Project Name	Total Easement Area (ac)	Protected Area (ac)	Description
The Nature Conservancy	Katahdin Forest	189,000	50,000	Debsconeags/Trout Mountain
Forest Society of Maine/Maine Bureau of Parks and Lands	West Branch	282,000	60,000	Seboomook/St. John Ponds/Baker Lake/Big Spencer Mountain
Forest Society of Maine/Northeast Wilderness Trust	Grafton	15,000	6,000	Ecologically significant higher and lower elevation lands
Forest Society of Maine/The Nature Conservancy/ Appalachian Moutain Club	Moosehead Region	358,000	45,000	Moose River, Baker Mountain, Roach Ponds, #5 Mountain
Forest Society of Maine	Attean Pond	18,000	2,000	#5 Bog, Jack Pine Stand, Attean Islands
Forest Society of Maine/The Nature Conservancy	Meddybemps	4,000	3,000	Meddybemps Heath, culturally and ecologically significant
	TOTAL	866,000	166,000	

permanently set aside, most of which are off limits to harvesting. That's equivalent to over six townships. While harvest rates might not have been reduced on eased timberlands, harvesting was reduced or eliminated in the new reserves. The opportunity to purchase and set aside these exceptional lands would not have been possible without the easement negotiation process. All the ancillary set-asides spinning off of easement projects need to be considered when comparing eased to non-eased lands.

Another suite of criticisms pertains to who benefits from easements and who gets to decide what lands are eased and conserved.[66,67] First and foremost, in the easement model, the landowner ultimately decides what they do or do not want to sell. It belongs to them at the outset. But the buyer then gets to decide what they want to buy and how much they are willing to pay for it. Usually, easements involve a lot of back-and-forth negotiation.

For example, some easements do not ensure public access.[68] Therefore, hunters, fishermen, canoers, hikers, etc. may not be allowed to enjoy the easement lands directly. Not all landowners are able to make a commitment to public access, *forever*. With public access comes an obligation to "people management," and perhaps landowner liability. When there is no guaranteed public access, easements are typically funded by private philanthropy.

But even private philanthropy easement donations are generally tax deductible, meaning that the rest of us, in effect, are subsidizing the easement through *our* taxes. In short, all easements, even if completely privately funded (or donated), are subsidized by the public to some degree.[67]

Canoeing on Desolation Pond, Township T8R16 (photo by J. Hagan)

Fortunately, Maine has a long history of public access to private land, irrespective of whether it is in a conservation easement. Still, most Maine easements assure pedestrian public access, especially if public funding has been involved. Even when the public does not have access to eased lands, values provided by the easement often accrue to the broader public anyway. For example, the easement might secure clean drinking water for a town downstream, or provide critical habitat for a species of concern. Access is not necessary to protect some important public values, but it should be a consideration in all easements, given the public's investment.

A different kind of justice issue related to economic equity can emerge if an easement unwittingly constrains the present or future needs of local communities.[69,70,71] If not careful, easements can widen the divide between the haves and the have-nots. A no-development easement today may preclude the possibility of much needed affordable housing in the future—one of the most pressing social issues right now. If a large number of easement acres are not contributing to town property taxes, that can also burden residents. Mechanisms such as payments in lieu of taxes can reduce these economic impacts. In the author's view, easement projects should always be evaluated for potential social justice impacts, because we can expect a backlash if we shut down harvesting, thus threatening the livelihoods of loggers or mill workers, or if we close off lands to public access for recreation. In Maine, care is also being taken to ensure that easements will not prevent cultural uses of the land by Wabanaki Tribes.

Societal values evolve over time. Conservation easements can adapt, and deliver, even *more* value to society in the future.

These criticisms beg an important and legitimate question for all of us—what exactly do we want to conserve with easements, and who gets to have a say?[67] What are we (society) buying in an easement transaction, since "we society" are almost always subsidizing the easement in one way or another? Exactly *how* will the public benefit from the easement? Will anyone's livelihood be harmed? Since easements are subsidized by the public, is there a mechanism for the public to have input into the terms of the easement before they are finalized? Ultimately, a landowner can refuse any offer, and public engagement could lead to unrealistic "wants" from the landowner, scuttling an otherwise viable project. These are not easy questions, but if we want to continue to use easements as a conservation instrument—and we should—we must ask and answer them openly.

We have learned a lot from testing and practicing conservation easements over the last 40 years. Now that we know the method works, we can improve it. Societal values evolve over time. Adopting an open, learning ethic allows land trusts and the conservation easement strategy to deliver even more value to society in the future.

The Future of Maine Conservation Easements

This report explains why conservation easements are so important in Maine. There is no place so devoid of human habitation in the eastern U.S. as the unorganized townships of Maine. Natural and historical events conspired to make it so empty of people today. But just because these townships are empty does not mean they will be a century from now. We live on a planet with 8.1 billion people on our way to 10 billion before, hopefully, we reach "peak people" in the 2080s.[72] The pressures for development will be intense. Should we grow into a place with such exceptional value for so many, which, once lost, will never be recovered?

Ten million acres is big by any standard. As this report is written, 22% of the unorganized townships are in a no-development conservation easement. A broad cross-section of society cares about one or more of the ecological, social, or economic values outlined in this report. While I'm an ecologist with a concern especially for late-successional and old-growth forest, it's important to understand that a viable forest

products economy will likely be key to conserving “this place.” If wood markets disappeared, the economics of private land tenure would change dramatically. In time, the land-use “market” that would fill the void would most likely be development. The cost of conservation easements would then become impossibly expensive. This is another reason continued timber harvesting is typically permitted in conservation easements in Maine—eliminating harvesting could effectively undermine the potential of the easement strategy in this particular region, and someplace else would have to fill the shortfall in wood supply anyway.

We can’t know how people might want to use Maine’s unorganized territories in the year 2100. Future generations may seek this land for development as the climate warms and humans move northward. However, who today regrets the vision of the National Park system established over a century ago? Who regrets Percival Baxter’s vision for a state park centered on Mt. Katahdin? Some places are so special they need to be “secure” forever, no matter what. In my opinion, this place is one of them.

Do we want our children, grandchildren, and even great grandchildren to have a place to see the Milky Way, to see a 150’ tall, 300-year-old white pine, to catch a glimpse of a lynx chasing a snowshoe hare along the Golden Road? It’s possible, if we keep up the great work on conservation easements in Maine.

Quiet early morning Maine lake (photo by J. Hagan)

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