



What is a forest worth? Priceless when it comes to climate, biodiversity crises

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Reducing carbon emissions has been a primary focus of governmental action in addressing the climate crisis. Transportation planning, renewable energy siting, promotion of electric vehicles, and home energy audits, all aimed at reducing the amount of carbon released into the atmosphere. Conversely, there has been little attention paid to the other side of the atmospheric carbon equation, removing the carbon that has already been released.

The U.N.'s Intergovernmental Panel on Climate Change has analyzed various climate-change mitigation pathways that are consistent with limiting warming to 1.5 degrees Celsius. To meet this goal, all of the assessed pathways needed to include the use of carbon dioxide removal (CDR). Several technologies have been suggested that could provide various degrees of CDR, but the simplest and least expensive way is by increasing the amount of carbon sequestered naturally by trees.

It is doubtful that President Trump was thinking about enhancing CDR when he pledged to join the campaign to plant a trillion trees. (Rather, when making the announcement, he said, "we're committed to conserving the majesty of God's creation and the natural beauty of the world").

But planting trees is a worthwhile step to achieving greater CDR — except for one small detail. A trillion new trees (seedlings) will not grow fast enough in the next decade to sequester enough carbon to make even a dent in the CDR side of the equation.

Furthermore, the CDR conducted by new seedlings and saplings will not be enough to offset the amount of potential CDR that is lost when mature trees are cut down. This means that a policy of "no net loss of forest," which has been adopted in Maryland and other states, doesn't really work to increase CDR because the quid pro quo replacement of mature trees with seedlings is a step backwards.

The only way tree planting (afforestation) can be truly effective is if the trillion trees are planted in areas that are currently unforested, while at the same time the number of trees being harvested is dramatically reduced.

Ecologists have long understood that mature forests, be they tropical rain forests or eastern North American temperate forests, are the most complex and biodiverse ecosystems on the planet. Forests have been sequestering carbon for millennia, and the trees conducting this process do it their entire lives, which can be 200-300 years.

According to the International Union for the Conservation of Nature (IUCN), "halting the loss and degradation of natural systems and promoting their restoration have the potential to contribute over one-third of the total climate change mitigation scientists say is required by 2030."

This recognition has focused increased attention on proforestation — e.g., the purposeful growing of existing forests to their full ecological potential. It is a nature-based solution whereby existing forests are protected as intact ecosystems to foster continuous growth and maximize CDR.

Proforestation was introduced to the public by William Moomaw of Tufts University and his colleagues in a now classic 2019 paper published in the online journal *Frontiers in Forests and Global Change*. In their words: "Based on a growing body of scientific research, we conclude that protecting and stewarding intact diverse forests and practicing proforestation as a purposeful public policy on a large scale is a highly effective strategy for mitigating the dual crises in climate and biodiversity and ultimately serving the greatest good in the United States and the rest of the world."

The authors concluded that proforestation "is the only practical, rapid, economical, and effective means for atmospheric CDR among the multiple options that have been proposed because it removes more atmospheric carbon dioxide in the immediate future and continues to sequester it long-term."

The greatest good, and an idea we would expect government to embrace. But government has a big problem with proforestation because trees are considered a natural resource, part of gross domestic product (GDP), and meant to be exploited for economic gain. Trees are commodities, and the quicker they grow to a harvestable size, the better.

This viewpoint underlies the 2020 Rhode Island Forest Action Plan (RIFAP), prepared by the Rhode Island Department of Environmental Management and the U.S. Forest Service, that purports to be the guide to how the state's forest ecosystems will be managed for the next decade. In the opening pages there is this conclusive statement: "Rhode Island's forests are considered second growth and approximately 96% is classified as timberland, forest land that exceeds the minimum level of productivity and is available to harvest."

The RIFAP estimates that 75 percent of the state's trees are 40-80 years old — only 1 percent is older than 100 years. But, in the presettlement Rhode Island landscape, when about 95 percent of the state was forested, trees normally reached maturity at 200 or more years. This means that most of Rhode Island's current forests are in their teenage years, far short of their full potential.

Apparently, the authors of the RIFAP have little interest in maximizing CDR and stewarding the people's forests for the ecological services they provide; rather, the goal is to maximize the economic value of forests by harvesting trees as soon as possible.

Ecological complexity and species richness increase as ecosystems mature. In a forest much of this richness is hidden since we tend to focus on large, easily visible species such as trees, birds, and mammals. But in the soil and tree canopy, bacteria, fungi, and invertebrates dramatically increase their numbers through time. At 200 years of age, forests in this region attain their highest levels of complexity, efficiency, and resilience to perturbations.

Foresters and other natural-resource managers understand the ecological values of forests. They understand the role trees play in carbon sequestration. Trees are the resource harvested to provide lumber and other wood products that are essential societal needs. Foresters and forest scientists throughout the region are studying ways to sustainably harvest trees without causing undo climate and biodiversity impacts. But trees are also cut down to support a resource that is not considered essential and is consumed by a small number of people: wildlife.

As used by government, the term "wildlife" refers to a small subset of animals that provide economic benefits. "Wildlife" are the animals we hunt, the birds we feed, the species we check off life lists. In short, wildlife are the animals that people spend money to "consume." Hunting licenses, guns and ammunition, bird seed, binoculars, field guides, entrance fees, etc. Government interest in wildlife is heavily focused on hunting, because license sales and taxes on guns and ammunition are what keep state fish and wildlife agencies afloat. It also means that land management performed by these agencies is exclusively focused on providing habitat for hunted animals, or game species.

Wildlife managers have long been active in creating the non-forested habitats that are favored by game species. Known by a variety of names — edges, old fields, grasslands, shrublands, thickets, young forests — they are grouped under the term "early successional habitat" (ESH). In the precolonial forested landscape, these open habitats were only rarely created by a wind storm, fire, or other catastrophic events that temporarily reverted an impacted forest tract back to an earlier successional stage.

When North America was colonized, early successional habitats came to dominate the landscape as natural catastrophes were replaced by farmers and loggers. By 1825, only 25 percent of Rhode Island was forested. In the early 1900s, as agriculture steadily declined, much of the land reverted back to forest, and by the mid-1960s Rhode Island had regrown to nearly 75 percent forestland. Today, that figure has fallen to about 50 percent.

But wildlife managers do not welcome the returning forest. As stated on the website of The Young Forest Project, a new U.S. Fish & Wildlife Service initiative, "forests have grown beyond the stage of providing homes for a host of wild creatures from tiny songbirds to large mammals. ... Here's what will happen if we fail to actively create and renew young forest: Many songbirds will rarely be seen or heard."

This tugging-at-the-heartstrings message, that songbirds will disappear if we fail to cut down trees, is a relatively new tactic used to downplay the real reason why wildlife managers want to "create and

renew” ESH, which is to increase populations of game species. But hunting is a rapidly declining recreational activity, especially in highly urbanized places such as Rhode Island where people are less interested in having their lands managed for hunting. It is also difficult for wildlife managers to justify creating more habitat that will benefit white-tailed deer, which has essentially become an invasive species.

The new messaging as it is done in Rhode Island can be found in a December 2018 *ecoRI News* article entitled *Changes in Forest Habitat Impact Funky Timberdoodle*. Contributed by a University of Rhode Island graduate student, the article describes how URI is working to understand the habitat needs of an upland game bird, the American woodcock.

The article begins with a description of ESH, the desired habitat for woodcock, which according to one URI researcher is, “an area that has only very young trees and lots of shrubs but would be mature forest if left alone.” Once again, the point is made. Forests have grown too old and we need to do something about it. No longer do we just blame humans for the loss of wildlife habitat, now it is nature’s fault.

This new messaging begins by not mentioning that the woodcock is a game species — the estimated U.S. harvest during the 2018-19 season was 180,200 birds. Instead we are told, “the woodcock is in trouble ... for the past four decades, the woodcock population has been decreasing range-wide at roughly 1.2 percent annually.” But the tale of the declining woodcock is supported by just one poorly designed survey. Other projects have shown the woodcock to be an adaptable species that is not overly selective in habitat, and may in fact be increasing.

In Rhode Island, during the first breeding bird atlas conducted in the mid-1980s, woodcock were found throughout the state, including in the urban communities of Providence, Pawtucket, Central Falls, Woonsocket, Cranston, and Warwick. They were found displaying on recreational fields, old dump and gravel pit sites, pipeline rights of way, and other similar degraded areas adjacent to wetlands.

In 1999, the woodcock was selected by the Army Corps of Engineers as the target species for the Lonsdale drive-in restoration project in Lincoln, where 30-plus acres of asphalt were transformed into grass and shrubland habitat.

Essentially, the woodcock — along with many other species of early successional habitats — is an opportunist that can use a variety of open habitats. But, the declining woodcock narrative is far more compelling when you are trying to enlist support for a “collaborative effort between government and non-governmental organizations to address the need for more early successional forest in Rhode Island by getting private landowners involved in forest management.”

To become involved, the landowner must first be convinced that their land needs to be managed for wildlife habitat. “The biggest challenge,” according to another URI researcher, “is communicating with landowners who aren’t easily convinced that clear-cutting is beneficial for wildlife. A clear-cut is ugly for a couple of years ... it looks like a bomb went off.”

An apt analogy. The landowner is told that within two years the vegetation will be lush and the wildlife abundant, with species “they have never seen.” But what is disingenuously left out of this scenario is any accounting of the forest species that will be lost. Habitat cannot be created without destroying habitat. The few species that may be gained by creating an early successional habitat will not make up for the myriad species lost when the trees are cut down.

I doubt that landowners are also told that among the new species they can expect to see on their cleared land will be invasive plants that are capable of quickly colonizing disturbed sites. When the invasives become “lush,” continual management will be needed to control these plants. The federal government will give the affected landowner more money to do the control projects, as long as you use glyphosate to do it.

The vegetation of this region evolved through millennia, from the time of the last glaciation, to be forest and barring catastrophic disturbance, to remain forest. What is this forest worth? The values of an ecosystem are difficult to explain in human terms. The forest does what it does. Supporting diverse biotas and complex natural processes, forests do the things necessary to keep the planet habitable. It is in our best interest to let forests continue to do that.

Government considers the value of forests in a very different terminology. Maximum sustained yield, commodity, harvest, habitat, resource, and management, all terms based in economics. Renewable natural resources — trees, food crops, game animals — attain greatest value when the time between harvest is short. How fast can the trees grow, how quick can the deer herd replenish? Wildlife management became necessary when government became the regulatory authority over hunting, identifying which species could be hunted, seasons and bag limits, license and permit fees, and legal consequences for breaking the rules. Government also assumed the role of manager to ensure that license-buying hunters had plenty of animals to hunt. Land was acquired for wildlife management areas and programs were established to assist private landowners in managing their land for wildlife.

The message was presented in publications such as *Making Land Produce Useful Wildlife* (the cover is pictured on the right), first published by the U.S. Department of Agriculture in 1955. Creation of early successional habitats was considered an acceptable approach before we got smart enough to realize that the exploitation of natural resources, and the abuse of land to obtain them, was contributing to both the climate and biodiversity crises.

Today we know better. It is not a difficult concept to grasp. It takes several hundred years for forests to reach their full ecological potential, with highest species diversity and storing considerable amounts of carbon. It is a concept that can only be supported by letting forests grow.

The recently passed Rhode Island Forest Conservation Act (RIFCA) may offer some hope in changing how forests are managed. One of the objectives of the law is to “encourage forest conservation as a means to sequester carbon and mitigate climate change and maintain the numerous other benefits provided by forests.” A policy of proforestation on state-owned land, and incentives for private landowners to not cut their forests, would be appropriate for achieving this objective.

How much comes from the RIFCA will depend on the membership of the Forest Conservation Commission created by the act, which will include nine public members appointed by the director of DEM — one of the agencies responsible for the 2020 RIFAP. There will also likely be much input from “stakeholders” who traditionally have been the groups and individuals that benefit most from the way forests are managed.

It is important that the new commission understand that in the era of climate change and biodiversity loss, everyone is a stakeholder. Every effort should be made to hear from forest ecologists and climate scientists, but not necessarily those with the U.S. Forest Service, the agency ultimately responsible for Rhode Island’s most recent Forest Action Plan. The commission should make a special effort to hear from those who traditionally have not been included in forest management discussions. Every person has a stake in seeing that Rhode Island’s forests are stewarded effectively to address the dual crises of climate change and loss of biodiversity.

What is a forest worth? That should be the first question the Forest Conservation Commission asks. Everyone should hope the answer will reflect what Aldo Leopold called an “ecological conscience” and provide for the greatest good.

Source:<https://www.ecori.org/green-opinions/2021/10/21/what-is-a-priceless-forest-worth-in-rhode-island-not-as-much-as-hunting-habitat>