To: Stephanie Cooper, Under Secretary for Environment
   Melissa Hoffer, Chief for Climate Change, Chief of Climate Innovation and Resilience
   Tom O’Shea, Commissioner, Massachusetts Department of Fish and Game

From: David Foster, PhD. Director Emeritus, Harvard Forest
      Richard Birdsey, PhD. Senior Scientist, Woodwell Climate Research Center
      William Moomaw. PhD. Professor Emeritus, Tufts University

Re: Clearing forests by DFW for early successional habitat is not appropriate for protecting biodiversity and is detrimental for meeting climate carbon net zero goals.

Date: May 22, 2024

We are writing out of concern that the Division of Fisheries and Wildlife is continuing to clear forests and advance mechanical treatments and prescribed fire to perpetuate early successional habitat based on faulty information and under false premises. [See https://www.mass.gov/news/winged-wanderers-migratory-birds-and-the-challenges-they-face. Also see articles in Massachusetts Wildlife: Entrup and Caljouw 2022 Burning for Wildlife; Entrup 2018 A Prescription for Fire. Also see many slide show presentations and outreach articles by Chris Buelow on management for early successional habitat using fire and mechanical methods]
For twenty years one of us (DF) has been writing peer-reviewed articles on this issue and opposing this kind of purported restoration activity based on historical, ecological, environmental, and biodiversity rationale. Collectively, the three of us served together on the EEA Committee on Climate Forestry where we underscored these long-standing concerns and the additional concern that these practices have a strongly negative impact on the global climate and ability of the Commonwealth to reach its carbon sequestration commitment. Given that DFW actively works through direct funding and extensive media and staff outreach to advance these practices on state-owned, municipal lands, and lands of private landowners and non-profits, the detrimental impacts of these efforts are much greater than the statistics pertaining to DFW holdings alone.

As you may recall, the Committee on Forests and Climate (CFC) raised strong concerns in its report and in discussions with agency heads over the practice of creating early successional habitat through artificial means that reduce forest area and prevent natural forest regrowth. The arguments behind this opposition are based on extensive peer-reviewed literature that shows that (1) early successional habitat of grasslands, shrublands, and young forests is an artifact of Colonial deforestation and environmental degradation; (2) the practices employed by DFW are completely inconsistent with the historical (colonial) practices that created extensive openlands and thus are creating a novel form of artificial habitat; and (3) the creation and maintenance of these habitats decreases the extent of natural forest cover thus harming native biodiversity and reducing the carbon storage and climate mitigation potential of the state.

For decades DFW has been creating early successional habitat for bird (and other) species that are declining in the state due to natural reforestation of former agricultural lands. In most cases these species are not endangered in their range. In Massachusetts and the rest of New England the natural habitat that is most rare is old-growth forest and the aspect of biodiversity that is most endangered is that of species that require older contiguous forests. The CFC report and discussions were clear in stating that the creation of early successional habitat is unnecessary and has major negative implications for climate change and species of interior old forests. The agency apparently rejects the findings of peer reviewed literature summarized below and the recommendations of the CFC. It has also failed to undertake two recommendations of the CFC: (1) to conduct a statewide assessment of the existing abundance of early successional habitat on farmland, energy transmission corridors, airfields, landfills, and other artificial habitats and (2) to make an accounting of the significant amount of unrealized carbon sequestration due to the lack of forest recovery and growth on early successional habitat occurring on DFW lands. To be comprehensive DFW should also evaluate the impacts on private lands managed with funding from DFW.

Implications for Climate
The CFC report cited scientific evidence that the removal of forest to create early successional habitat releases large amounts of carbon dioxide to the atmosphere. Similarly, the ongoing maintenance of early successional habitat using fire and mechanical treatments involves significant energy consumption and carbon dioxide releases from these intensively managed lands. Meanwhile, the lack of forest growth precludes carbon storage on all of these lands. Collectively, these factors have major implications the ability of the Commonwealth to meet established climate goals. The recent paper by Richard Birdsey Middle-aged forests in the Eastern U.S. have significant climate mitigation potential finds that our region’s forests have achieved just half the carbon potential that they can achieve in the coming decades. Cutting them now will make it more difficult to achieve stated forest carbon goals required by law.
Implications for Biodiversity
The arguments made by DFW are inconsistent with published studies on landscape history and biodiversity. Massachusetts is a naturally forested state. Colonial settlement was accompanied by widespread deforestation and expansive agriculture, which eliminated most mature and old growth forests and generated extensive grasslands and early successional habitat. Native birds and fauna associated with forests plummeted whereas many species of openlands migrated from other areas and thrived until the late nineteenth century when abandonment of farms and natural reforestation began a reversal of these dynamics. Today, species of early successional habitat can be maintained on remaining farms and other artificial habitats whereas woodland species that require contiguous mature and old-growth forests require significant support because so few forest areas meet these criterion.

Timeline of Wildlife Dynamics. The abundance of wildlife species has shifted immensely with changing land use in the past five centuries. Once heavily forested with mature and old-growth forests, the Massachusetts landscape was substantially deforested and converted to expansive farm fields and scattered young woodlot by colonial settlement, rapacious logging, and environmental degradation. Openland and early successional species increased dramatically and immigrated to the state whereas native and forest dwelling species were extirpated and greatly reduced. With farm abandonment and forest recovery this process has reversed and will continue if mature and older growth forests are supported. This graph was produced through a collaboration between the Harvard Forest and a retired DFW staff member.


We advocate for a cessation of DFW policies and management activities that seek to maintain or expand early successional habitat on public and private lands.

We also identify a number of specific questions that DFW has not addressed in support of its existing policies.

1. How much early successional habitat is currently available throughout the Commonwealth?
2. What impact will forest clearing and the maintenance of early successional habitat have on the forest carbon cycle, carbon sink, reservoir and climate?
3. Are the consequences of current policies consistent with state climate legislation?
4. What are the consequences of forest loss and fragmentation for other species of birds, animals, soil fungi and other organisms that require large intact areas of middle aged and older forests?
Supporting Literature

The following peer reviewed research papers makes clear that there is much evidence that creating early successional habitat is misguided based on historical, biodiversity, and climate research


A campaign is underway to clear established forests and expand early-successional habitats—also called young forest, pre-forest, early seral, or open habitats—with the intention of benefitting specific species. Coordinated by federal and state wildlife agencies, and funded with public money, public land managers work closely with hunting and forestry interests, conservation organizations, land trusts, and private landowners toward this goal. While forest-clearing has become a major focus in the Northeast and Upper Great Lakes regions of the U.S., far less attention is given to protecting and recovering old-forest ecosystems, the dominant land cover in these regions before European settlement. Herein we provide a discussion of early-successional habitat programs and policies in terms of their origins, in the context of historical baselines, with respect to species’ ranges and abundance, and as they relate to carbon accumulation and ecosystem integrity. Taken together, and in the face of urgent global crises in climate, biodiversity, and human health, we conclude that public land forest and wildlife management programs must be reevaluated to balance the prioritization and funding of early-successional habitat with strong and lasting protection for old-growth and mature forests, and, going forward, must ensure far more robust, unbiased, and ongoing monitoring and evaluation.


Maintenance and restoration of grasslands, heathlands, and shrublands are high priorities for conservation due to their diversity of uncommon species and assemblages and their ongoing decline resulting from invasion by shrubs and trees. Much of the literature and management concerning openlands emphasizes burning to control woody growth, based on the interpretation that these habitats and their species assemblages were widespread during the pre-European period because of natural disturbance and Native American land use. By focusing on the coastal region of New England–New York, which harbors excellent examples of these habitats, is characterized by many natural disturbances (e.g. hurricanes, fire, salt spray), and supported relatively dense Native American populations, we assess the paleoecological, archaeological, historical, and modern ecological evidence supporting this perspective.
We conclude that: (1) pre-European uplands, including coastal areas, were predominantly forested and that openland habitats were uncommon because natural and human disturbance was infrequent and local; (2) extensive openland vegetation developed only with widespread European forest clearance and land use; (3) assemblages occupying grasslands, shrublands, and heathlands apparently have no lengthy history and are comprised of species that combined opportunistically over recent centuries; (4) the decline of grasslands, heathlands, and shrublands is a century-old phenomena related to a decline in agricultural land use, especially grazing, mowing, plowing and burning; (5) effectively all conservation areas supporting these openland assemblages experienced intensive historical land use; and (6) the modern distribution, composition, and structure of these habitats are largely determined by European land use.

Conservationists should recognize that most of these landscapes have cultural origins and are inherently dynamic; that some vegetation structures and communities cannot be maintained continuously on a given site; and that management is most effective when based on historical and ecological studies leading to clearly defined objectives and rigorous long-term measurement and re-evaluation.
Historical Changes in Grassland Bird Species. Open land species increasing with forest clearance and agriculture. Forest clearance and the creation of open land habitat favoured many native species that were uncommon in the forested landscape (Askins, 1993; Motzkin & Foster, 2002). This land cover transformation may also have enabled grassland and shrubland species from regions including the Midwest to immigrate to New England (Askins, 2000; Foster et al., 2002). Species including reptiles, amphibians, diverse birds and mammals like the red fox, striped skunk, New England cottontail, and woodchuck peaked in abundance with maximum agriculture or during the early period of farm abandonment and forest recovery (Fisher, 1933; Litvaitis, 1993, 2001; Porter & Hill, 1998; Braile, 2000). Although exhibiting diverse population trajectories according to their habitat preferences, e.g. grass height and density, or abundance of woody vegetation, most of these species are continuing to decline as forests mature and remaining open and successional habitat becomes woody or is developed for human uses (McAuley & Clugston, 1998).


An increasingly accepted paradigm in conservation attributes valued modern ecological conditions to past human activities. Disturbances, including prescribed fire, are therefore used by land managers to impede forest development in many potentially wooded landscapes under the interpretation that openland habitats were created and sustained by human-set fire for millennia. We test this paradigm using palaeoenvironmental and archaeological data from New England.

Despite the region’s dense indigenous population, anthropogenic impacts on the landscape before European contact were limited, and fire activity was independent of changes in human populations. Whereas human populations reached maxima during the Late Archaic (5,000–3,000 yr bp) and Middle–Late Woodland (1,500–500 yr bp) periods, lake-sediment charcoal records indicate elevated fire activity only during the dry early Holocene (10,000–8,000 yr bp) and after European colonization. Pollen data indicate closed forests from 8,000 yr bp to the onset of European deforestation, and archaeological evidence of pre-contact horticultural activity is sparse. Climate largely controlled fire severity in New England during the postglacial interval, and widespread openlands developed only after deforestation for European agriculture. Land managers seeking to emulate pre-contact conditions should de-emphasize human disturbance and focus on developing mature forests; those seeking to maintain openlands should apply the agricultural approaches that initiated them four centuries ago.