SUMMARIZED COMMENTS AND RESPONSES – Myles Standish State Forest 10 Year Restoration Project Proposed November 1, 2018

NOTE: This is a collaborative project between the Department of Conservation and Recreation Bureau of Forestry (DCR – BOF) and the Department of Fish and Game, Division of Fish and Wildlife (MassWildlife) that is proposed to take place on DCR fee owned land, MassWildlife fee owned land and DCR/MassWildlife co-managed land. Thus the responses to the written comments (summarized below) have been prepared collaboratively by DCR – BOF and MassWildlife to reflect the combined effort on the project.

Individual or Organization	Public Comment Summary	DCR - BOF and MassWildlife Response
Southeastern Massachusetts Pine Barrens Alliance	Whole heartedly supports this project to restore globally rare pine barrens habitat as outlined in the project proposal. One deficiency: a public outreach component. The Alliance offers to provide as much assistance as possible interpreting and monitoring the project.	Thank you for your support of the project! The DCR – BOF on Myles Standish State Forest had intended, as with many of our forest management projects, have an interpretive component. We welcome the assistance from the Alliance and will utilize it as much as possible.
Glen Ayers	•Significantly concerned about climate change, and how forests, particularly those that DCR administers, play a role in mitigating the effects of climate change. •Notes that DCR took steps with the Forest Futures Visioning Process to approach forest management differently than in the past using an ecosystem services approach which acknowledges carbon sequestration as such. Concerned that the DCR has returned to business as usual with no accountability for carbon sequestration and climate change in forestry projects including the Myles Standish State Forest 10 Year Restoration Project. •DCR has a duty, consistent with the Paris Agreement, the GWSA, and the recommendations of the FFVP, to begin fully and seriously addressing the carbon and climate impacts of forest management.	The Department of Conservation and Recreation (DCR) and the Bureau of Forestry (BOF) have responded numerous times to similar comments received about forest management and carbon sequestration on DCR lands including in the winter/spring of 2016 and the winter/spring of 2017. We offer these responses focusing ultimately on the Myles Standish State Forest 10 Year Pine Barrens Restoration Project (MSSF). The DCR – BOF concurs strongly that global climate change is an issue of great concern. The DCR has long spoken of our mutual concern over climate change and has advocated for measures, including forest management strategies that help sequester and store carbon that will take steps toward ameliorating global climate change. The DCR recognizes that keeping forests as forests in a rapidly urbanizing Northeast is the most important contribution that can be made in relation to carbon storage, sequestration and mitigating climate change (Woodall et al 2015; Thompson et al 2014). The DCR continues to be the leader in Massachusetts and the country in forest conservation through the purchase and conservation of over 29,000 acres of forest from 2007 – 2016 that will keep forests as forests forever. The carbon sink that the DCR forests provide is

		evident in the Continuous Forest Inventory (CFI) that DCR – BOF has conducted for almost 60 years. The CFI data indicates that the current forests of the DCR State Forest, Parks and Reservation system have accumulated 8.8 million tons of live biomass in carbon in the time period 1960 - 2016[1]. The DCR – BOF appreciates the recognition that steps were taken to improve forest management approaches through the FFVP. The Landscape Designations for DCR Parks and Forests: Selection Criteria and Management Guidelines (LD) implemented the recommendations of the FFVP in 2012. The LD designated a significant portion of DCR land (≈111,000 acres) as Reserves where carbon storage and sequestration is the major ecosystem service provided. The LD has further implemented the FFVP recommendations directing that an ecosystem services approach is to be used on Woodlands listing carbon sequestration as a specific ecosystem service; and that uneven age forest management is emphasized (pages 37 and 38 of LD). The DCR believes that an important "land paradigm shift" has taken place. Uneven age or all age management has been emphasized in the vast majority of DCR forest management proposals since 2012. Of the 7718 acres proposed for management from 2012 to early 2018, 5339 acres or 69% have been slated for uneven age management and irregular shelterwood, a continuous forest cover management system. All projects, with the exception of the restoration and rehabilitation projects such as MSSF, will deliberately leave coarse woody debris on site and snags per the LD structural retention guidelines. Research indicates that actively managed forests that use low intensity forest management regimes, that provide for post-harvest structural retention, and produce permanent wood products (which happens in the vast majority DCR forest management projects) will sequester substantial amounts of carbon and should be considered as a part of a carbon stock portfolio (Fahey et al., 2009; Nunery and Keaton 2010).

		As the DCR-BOF has been conducting long term forest planning, carbon stock management has had a significant role. Modeling of carbon storage for the 2015 approved Western CT Valley Forest Resource Management Plan indicates carbon storage will steadily grow over time using the management regimes recommended (page 37). This is also emphasized through growth modeling of our forest management practices that indicates we will only be harvesting approximately 12% of the growth on Woodlands (page 111). The DCR-BOF and the MA Division of Fish and Wildlife (MassWildlife) who are cooperating on this project acknowledge that the MSSF 10 Year Restoration Project does not have a goal of directly sequestering significant amounts of carbon on site. This is due to the fact that the greatest ecosystem service value available from the MSSF site involves the restoration of globally rare, fire-adapted pitch pine/scrub oak barrens, which provide habitat for numerous state-listed species. DCR and MassWildlife want to be clear that our respective agencies simply will not sacrifice the opportunity to restore globally rare barrens communities and conserve associated endangered and threatened species for the sake of storing carbon in large trees that are ultimately highly likely to burn in a wildfire, such as happened multiple times in the past at the MSSF site in 1957 and 1964. DCR and MassWildlife want to categorically state that to knowingly and intentionally accrue carbon in large trees on fire-adapted sites like MSSF would be irresponsible from an ecological perspective, and dangerous from a public safety perspective. We also acknowledge that there will be a carbon release when trees are cut and prescribed fire is used to restore and maintain pitch pine/scrub oak barrens conditions in what is currently closed canopy pitch pine and white pine forest. Most importantly though, we recognize that the current structure of the forest in the proposed project area is at high risk for catastrophic wildfire and could release virtually all of the carbon currently stored in the live plant tissue in the event of a wildfire.

		Managing this fire-adapted ecosystem as proposed will release carbon in measured, controlled, and relatively low amounts that will be re-sequestered during the intervals between prescribed burns, and will provide a critical safeguard against large wildfires. This project, as with all of the forest management projects undertaken on DCR properties across all landscape designations, is designed to balance the ecosystem services that DCR provides such as biodiversity, safe recreational opportunities and rehabilitation of natural community types. The DCR – BOF believes with much of the scientific community that balanced forest management that provides for young forest habitat, the maintenance of reserves and large trees, and forest products production across the landscape is an appropriate approach to carbon stock management. In fact, increasing the use of wood in building construction (e.g., using cross-laminated timbers (CLT) for a 6-10 story apartment building) on average results in a 60% lower global warming potential (GWP) than constructing that same buildings with steel and concrete (Milaj et al. 2017). Responsible and sustainable forest management conducted by large landowners such as DCR is carried out on a landscape scale providing a variety of ecosystem services across that landscape. Therefore, the impacts to carbon stocks because of projects such as the 10 Year Pine Barrens Restoration in Myles Standish State Forest are considered against the entire portfolio of DCR and landholdings and the management approach taken there. [1]*The Massachusetts CFI is comprised of 1900 permanent plots, most of which were established in 1960. Every 10 years each tree on each plot is visited to determine its health, growth or mortality. The volume growth is calculated for each tree on each plot and extrapolated to all DCR forest land to determine tons of biomass growing and tons of carbon sequestered.* *References:* Fahey, TJ et al, 2009, Forest carbon storage: ecology, management, and policy, Frontiers

		in Ecology Environ 2009, doi:10.1890/080169, Ecological Society of America Nunery, J. S. & Keeton, W. S. Forest carbon storage in the northeastern United States: Net effects of harvesting frequency, post-harvest retention, and wood products. Forest Ecology and Management. 259, 1363–1375 (2010). Milaj, K., A. Sinha, T.H. Miller, and J.A. Tokarczyk. 2017. Environmental utility of wood substitution in commercial buildings using life-cycle analysis. Wood Fiber Sci. 49(3):338-358. https://www.swst.org/wp/wp-content/uploads/2017/06/WFS2600.pdf
Margaret E. Sheehan	**1**. Has there been an environmental impact assessment of the greenhouse gas and climate change impacts of the forestry project and any proposed fire management? This should be done under the Global Warming Solutions Act. **2**. How much wood is being removed, whether it is being sold and if so to whom, and for what price and purpose?	**1**. a) Both DCR and MassWildlife have assessed climate change impacts of both forest harvesting and prescribed fire management. The DCR Continuous Forest Inventory (CFI) data indicates that the current forests of the DCR State Forest, Parks and Reservation system have accumulated 8.8 million tons of live biomass in carbon in the time period 1960 - 2016[1]. MassWildlife has completed an initial carbon budget for all forested state wildlife lands (about 128,000 forested acres on 168,000 total acres that MassWildlife owns and has management control over) partly in response to Executive Order No. 569, which established an integrated climate change strategy for the Commonwealth to meet the carbon emissions targets set by the **Global Warming Solutions Act** (25% below 1990 level by 2020, 80% below 1990 level by 2050) (see: https://www.mass.gov/service-details/global-warming-solutions-act-background). b) It should be clearly understood that biogenic emissions and sequestrations from forested lands are *not* used to calculate compliance

		with **Global Warming Solutions Act**, and that DCR and MassWildlife are not required to report greenhouse gas (GHG) emissions under this Act (see: https://www.mass.gov/guides/massdep-greenhouse-gas-emissions-reporting-program). Nevertheless, DCR and MassWildlife track carbon emissions from forest management and habitat restoration practices as part of agency efforts to mitigate impacts of climate change on state forest and state wildlife lands. Executive Order 569 (https://www.mass.gov/executive-orders/no-569-establishing-an-integrated-climate-change-strategy-for-the-commonwealth) requires state agencies to "…conserve and sustainably employ the natural resources of the Commonwealth to enhance climate adaptation, build resilience, and mitigate climate change" (EO 569, 3-1(vi)). MassWildlife employs sustainable habitat restoration and management practices (including mechanical fuel reduction and prescribed burning in fire-adapted plant communities) to conserve rare and declining species throughout the Commonwealth, while building resilience and enhancing climate adaptation. c) The MassWildlife carbon budget analysis used 2006 as the baseline year because that is when the agency completed its first systematic forest inventory across all state wildlife lands. Estimates of both above and below ground carbon were made using U.S. Forest Service publication GTO WO-59 (https://www.fs.usda.gov/treesearch/pubs/15215). Between 2006 and

		2018, both land acquisition and forest growth rates were tracked to provide annual estimates of total carbon stocks on forested state wildlife lands, and MassWildlife harvest data were used to estimate annual carbon release. Forest carbon stocks were grown forward using U.S. Forest Service Forest Inventory and Analysis (FIA) data for tree growth by species in Massachusetts (https://www.fia.fs.fed.us/). In this initial analysis, all forest products removed were assumed to represent carbon releases, even though about 50% of the carbon in timber removals will likely go into long-lived products such as buildings and furniture. d) MassWildlife has determined that forested state wildlife lands have a net positive carbon sequestration balance for each year from 2006-2018 *after* accounting for carbon release from active habitat restoration and management practices that benefit rare and declining species (e.g., wood products harvesting, mowing/mulching/ prescribed burning), and that this net positive carbon sequestration will continue into the future. Actual carbon releases from these activities represent a very small percentage of carbon sequestration from growth across MassWildlife lands. MassWildlife is currently conducting companion analyses for grassland and shrubland habitats on state wildlife lands. e) As of 2006, total carbon stocks on MassWildlife lands were estimated at

		4.6 million tons across 104,000 forested acres (out of a total land ownership of 137,000 acres), or about 43.9 tons per acre. An additional 77,000 tons of carbon were sequestered by tree growth in 2006, and another 64,000 tons of forest carbon were protected through land acquisition. Habitat restoration and management activities removed about 1,300 tons of carbon in 2006, yielding a net carbon stock after management, growth, and new additions of about 44.6tons per acre. After 12 years of habitat restoration and management activities, forest growth and additional land protection, by 2018, total carbon stocks on MassWildlife lands were estimated at 6.7 million tons across 128,000 forested acres, or about 52.8 tons per acre. Over this 12 year period, habitat restoration and management activities removed about 23,691 tons of carbon (an average of 1,974 tons/year), yet approximately 1.1 million tons of carbon were sequestered by forest growth, and an additional 1.2 million tons of forest carbon were added to MassWildlife stocks by land protection. Net carbon sequestration per acre is increasing annually on MassWildlife lands *after* accounting for carbon release from active habitat restoration and management activities that benefit rare and declining species (Table 1). f) Although prescribed fire in treated pitch pine and scrub oak barrens results in a modest amount of carbon loss during a prescribed burn, these woodlands recover most of the carbon lost during a carefully planned and executed prescribed burn after

		only two or three growing seasons (Clark et al. 2018, Hurteau and North 2010). Therefore, over the course of decades, prescribed burning is expected to be carbon neutral. g) Prescribed fire reduces the risk of wildfire, the intensity and severity of fire, and affords land managers some control over emissions and smoke drift. The proposed mechanical and prescribed fire treatments move the woodland structure toward a more fire resistant condition and a more resilient landscape. In wildfire prone ecosystems, tree based carbon stocks are best protected by fuel treatments that produce low density stand structure dominated by widely spaced fire resistant pines (Hurteau and North 2010). The widely spaced pines are also more resistant to damage from insects such as the Southern Pine Beetle that have recently caused extensive mortality in Northeastern pitch pine forests on Long Island, New York (Dodds et al. 2018). h) Given the current high fuel loads in the Myles Standish/Camp Cachalot project area and the extensive history of large wildfires over the past century (most notably in 1900, 1957, and 1964), it is reasonable to expect that without implementation of this project, forest resources would be damaged and carbon would ultimately be released into the atmosphere as a result of severe stand replacement wildfires. The impacts of wildfire on air quality would be substantial, and far greater than any impacts associated with

		prescribed fire, which is only implemented under favorable weather and fuel conditions. Furthermore, a failure to actively manage the area through a combination of mechanical thinning and prescribed fire would result in an unacceptable risk to public and firefighter safety, and property. i) It's also important to note that although fire-suppressed pitch pine forests may sequester more carbon for a period of time, those increases in carbon often come at the expense of biodiversity (Martin et al, 2015). The pitch pine and scrub oak barrens of this region of southeastern Massachusetts are considered one of the most biologically diverse and important conservation areas in Massachusetts. The open vegetation structure of the woodlands, barrens, and heathlands provide habitat for numerous rare and declining plants and animals, which have evolved with fire and rely on the open character of the landscape. **2**. a) No wood is being removed under the current 500 acre contract because tree sizes/volumes are not high enough to facilitate a wood products sale. Trees are generally smaller (1-9" dbh) across these 500 acres, and will be mulched in place to reduce fuel loads and facilitate prescribed burning. Forest inventory conducted by DCR and MassWildlife staff in 2018 across the 500 acres included in the current contract for mowing/mulching determined that about 25 tons of wood (primarily white pine) will be mulched per acre. The mulch will remain in place until

		the first post-treatment prescribed burn 2-5 years down the line. b) In 2019-2022, DCR and MassWildlife will undertake wood products sales on those portions of the 2,300 acre project area that contain enough larger trees (10-20" dbh) to enable habitat restoration and management activities to be partially implemented through a sale. Harvested wood products will include white pine sawlogs and chips. Wood products sales will be carried through public, competitive bids and will be awarded to the highest bidder. Wood product value will likely be put into in-kind services for road repairs to support future prescribed fire access, and for control of off-road vehicle trespass.