



July 2, 2009

Rob Rizzo, Biomass Energy Program Manager
Massachusetts Department of Energy Resources (DOER)
100 Cambridge Street, Suite 1020
Boston, MA 02114

Via email: Robert.Rizzo@state.ma.us

Dear Mr. Rizzo:

On behalf of Mass Audubon, I submit the following comments on the Proposed *Scope of Work* for a study on *Biomass Energy and Sustainable Forest Management, Carbon Sequestration, and Carbon Neutrality*. Mass Audubon agrees that further study of the lifecycle greenhouse gas (GHG) emissions from biomass and related issues of forest sustainability and other environmental impacts is needed. We appreciate the fact that DOER is undertaking a review of these topics, and that you have provided the opportunity for comments on the draft Scope before the Request for Proposals (RFP) is issued.

Summary Comments

The proposed Scope is comprehensive in many respects. However, key assumptions implicit in the Scope may skew the results if not reexamined as part of the study, particularly assumptions related to the percentage of forestland that will actually be available for harvesting. In addition, several important topics warranting analysis to inform state policy on biomass and forestland management on public and private lands are not included (e.g. the roles forests play in climate change adaptation). Some of the proposed areas of analysis (e.g. effects of biomass harvesting on European forests) are less relevant than analysis of other available information would be (i.e. existing studies of the effects of various forest management practices on biodiversity and other functions of forests in the Northeastern US). Mass Audubon offers the following comments both in relation to the Scope for this particular study and in the broader context of biomass utilization policy in relation to the full range of ecosystem service values of Massachusetts forests.

Related State Initiatives

The commonwealth is simultaneously undertaking several other planning processes related to forestland management that should play important roles in informing biomass policy, including:

- Department of Conservation and Recreation (DCR) Forest Futures Vision¹ process,
- Executive Office of Energy and Environmental Affairs (EEA) Climate Change Adaptation Committee, and
- Department of Fish and Game's update of the Statewide Wildlife Action Plan (SWAP) which is incorporating climate change considerations.

¹ Secretary Bowles', April 24, 2009 MEPA Certificate on the Pioneer Renewable Energy project in Greenfield specifically stated that DOER will work "consider additional recommendations to address the role of biomass" based on the results of the DCR Forest Futures Vision process. <http://www.mass.gov/envir/mepa/pdf/certificates/042409/14388enf.pdf>

We recommend that Massachusetts' policy on biomass should take into account the recommendations of these initiatives when complete. The Department of Fish and Game and the Natural Heritage and Endangered Species Program should be added to Task 5. *State Agency Discussion and Public Outreach Sessions*.

Ecosystem Service Values of Massachusetts Forests

Mass Audubon's 2003 report *Losing Ground: At What Cost* estimated that the ecosystem services values of forests statewide is about \$2.9 billion annually. State policy on biomass needs to take into account the other important functions and values of forests including habitat and ecosystem resiliency in the face of unavoidable climate change impacts – the larger and more intact the forest the better able it is to adapt to a rapidly changing climate. The commonwealth's overall approach to forestland management on public and private lands should be driven by a goal to maximize, to the extent possible, all of the ecosystem service values of these lands. It should not be driven primarily by any particular use, e.g. biomass, out of the full range of potential uses and values.

Climate Change Mitigation and Adaptation

Forests in Massachusetts contribute significantly to the two main responses to climate change recommended by the International Panel on Climate Change (IPCC): Mitigation and Adaptation. Mitigation involves measures to reduce GHG emissions. Adaptation refers to measures that increase the resilience of natural and built systems to unavoidable effects of climate change that are already underway. The proposed Scope of work addresses the mitigation aspect in relation to lifecycle analysis of biomass emissions. However, the reduction in carbon sequestration rates of forests as a result of forest harvesting is not included in the proposed Scope and should be added. The adaptation implications of increased harvesting to meet biomass demand should also be included in the Scope, along with consideration of the adaptation benefits of limiting harvesting and unmanaged forest areas.

Forests in the northeastern U.S., including Massachusetts, annually capture approximately two to four tons of carbon per hectare per year. Taken together, the midlatitudinal forests of North America, from the Carolinas into Canada and across to the Midwest, are reducing the global increase in carbon by over 10%². Although most Massachusetts forests are relatively mature, many stands continue to increase their net carbon sequestration on an annual basis, as documented in studies by Harvard Forest and other researchers³. Recent studies have demonstrated that even old-growth forest systems function as carbon sinks, contrary to longstanding assumptions about the carbon sequestration benefits of managed vs. unmanaged forests⁴. Harvard Forest and other researchers have also found that even relatively light selective harvesting of mature forest stands in Massachusetts may reduce the rate of carbon sequestration in the stand for several years post-harvest. The Scope of work should include a review of the literature on this topic. The effects of harvesting on carbon sequestration should be factored into the overall lifecycle analysis in the study.

Large blocks of unfragmented forest are important for climate change adaptation. Large intact habitats are relatively resilient to a variety of stresses, support a wide range of species, and provide opportunities for plants and animals to migrate across the landscape in response to climate induced habitat changes. Protection of large blocks of forests in reserves is widely recognized as a means to secure biodiversity over the long term, and should be an important element of a comprehensive Climate Change Adaptation plan for the commonwealth. This is a topic that is under discussion in the other state initiatives mentioned above, and should be factored into state policy on biomass.

² Julian Hadley, Harvard Forest, as stated in *NY Times Magazine*, http://www.nytimes.com/2009/04/19/magazine/19Forest-t.html?_r=4&scp=2&sq=harvard%20forest&st=cse.

³ Harvard Forest publications including extensive information on carbon sequestration, nutrient cycling, and effects of various management practices are available at: <http://harvardforest.fas.harvard.edu/publications.html>

⁴ Luyssaert, S.E. et.al. 2008. *Old-growth forests as global carbon sinks*. *Nature* 455:213-215

Biomass Availability Estimates and Harvesting Effects on Forests

The proposed Scope calls for a review of the MA Sustainable Forest Bioenergy report by Kelty, D'Amato and Barten (2008) as well as a more extensive review of the peer-reviewed scientific literature of the effects on biomass harvesting on nutrients, soils, and other forest conditions. This section should be expanded to include a review of the assumptions in the Kelty report and other Massachusetts biomass availability studies in regards to the percentage of public and private lands that are likely to be available for harvesting. The Kelty report assumes that more than 80% of the state-owned forestlands will be available for harvesting. These lands offer the best available opportunities to establish large forest reserves for forest resiliency to adapt to the impacts of climate change. The DCR Forest Futures Vision process is likely to include recommendations regarding the amount of DCR lands to be placed in reserves vs. managed, and the assumptions in the Kelty report may not be accurate.

The proposed Scope also calls for review of the cumulative effects of wide-scale harvesting. This is important, and should include estimates of current levels of harvesting vs. those required to meet biomass demand under various scenarios as outlined in Task 3 (electric only, combined heat and power, heat only, and advanced cellulosic biofuels).

Additional Specific Comments on the Scope:

Task 1 Sustainable Forest Management and Implications of Biomass Harvesting

Mass Audubon supports the overall goal that is stated regarding thorough analysis of the potential effects of biomass harvesting on forests, including effects on ecosystems and biodiversity. See additional comments above.

Review of role and effects of biomass harvesting in other states: Northeast states including Maine, New Hampshire and Vermont should be added.

Literature review of effects of intensive harvesting for biomass on nutrients, biodiversity, and other forest values: The proposed Scope calls for a review of literature from northern European countries. The final Scope should be refocused on review of literature on the effects of various forest harvesting regimes on forests in the Northeastern U.S. Northern European forests are quite different than North American forests. Because of the east/west barrier effect of the Alps, northern European forests have much lower native biodiversity than forests here in the Northeast. Plants and animals were able to recolonize the Northeast US following the retreat of the glaciers, whereas in northern Europe the Alps acted as a barrier to recolonization by many species. Furthermore, the longer and more intensive human land use history in Europe has affected forest there more intensively. Although much of Massachusetts was deforested by the early 1800s, our region is still relatively rich in native species. As forests grew back, plants and animals in pockets of forest that remained during the period of greatest deforestation have once again spread across the landscape. There is a substantial base of scientific literature on the biodiversity, nutrient cycling, and other natural processes of managed and unmanaged forests in the Northeast, and the focus of the study should be on that information rather than studies of European forests.

Cumulative effects of biomass harvesting: The Scope should more thoroughly address the biodiversity and Climate Change Adaptation implications of biomass harvesting as described above.

Review of existing policies and regulations: Mass Audubon supports analysis of the state Forest Cutting Practices regulations and recommendations for strengthening those regulations. This will not in itself be sufficient to prevent overharvesting, however, if biomass capacity is allowed to be overbuilt. Market forces are likely to overwhelm the regulatory system at that point. A cap on the maximum allowable amount of annual cutting would be one option to address this, although it is not a panacea.

Review existing Forest Resource Management Plans: It should be noted that DCR has made a commitment to the public to revisit these plans based on the outcome of the Forest Futures Vision process currently underway⁵.

Task 2 Carbon Sequestration with and without Forest Management

Mass Audubon supports DOER proceeding with a complete and thorough review of the literature on this subject including information from Hubbard Brook and Harvard Forest. Manomet Center for Conservation Science and The Nature Conservancy are other sources that should be consulted.

Task 3 Net Carbon Balance

The inclusion of lifecycle analysis in this study is beneficial. This should include analysis of the effects of harvesting on carbon sequestration, including the cumulative losses in overall forest carbon sequestration resulting from biomass harvesting under various scenarios. To the extent that some uses of biomass use the energy in the material more efficiently, resulting in greater energy value for the same output of carbon, this should be factored into DOER's policies on biomass.

Task 4 U.S. and International Policy on Biomass and Carbon Neutrality

This is an important topic. In addition to reviewing what other countries and states are doing, Massachusetts should review its policies on carbon emissions and renewable portfolio credits for biomass based on scientific analysis of the net carbon balance of biomass.

Task 5 State Agency Discussion and Public Outreach

Inclusion of outreach to other state agencies and the public in DOER's review of biomass policy is important. The Department of Fish and Game and Natural Heritage and Endangered Species Program should be added to the list of state agencies to be consulted.

The Scope is too narrow in defining Stakeholders to be consulted. The Advisory Group of Stakeholders in the DCR Forest Vision Process should be included, and there should be a well defined opportunity for the general public to review and comment on the draft report. Written comments should be accepted with a minimum of a 30 day comment period, and a response to comment document should be appended to the final report.

Conclusion

Mass Audubon supports DOER's initiative to review scientific literature and policy issues related to biomass, and offers the above recommendations for strengthening and clarifying the Scope of work for the study. This study is only one of several initiatives underway within state agencies that should inform and shape state policy in relation to forestland management, climate change mitigation and adaptation, and biomass harvesting and utilization.

Sincerely,



E. Heidi Ricci
Senior Policy Analyst

⁵ See pp.3-5 of the minutes of the DCR Stewardship Council meeting, November 2008, where three district level FRMPs were approved on an interim basis pending the Forest Futures Vision process:
http://www.mass.gov/dcr/documents/scminutes08_11.pdf