6/18/2014

To: Pat Jehlen, State Senator for Cambridge, Medford, Somerville and Winchester

From: Lesley University, Division of Natural Sciences and Mathematics

Dear Senator Jehlen,

We are writing to express our strong support for including language for placing the Silver Maple Forest (Belmont Uplands) into conservancy in the environmental bond bill. As a strong supporter of environmental causes, we hope you will share our concern for this forest and the unique resource it represents. As educators at Lesley University, we value the educational opportunity provided by having an intact, native forest ecosystem that is easily accessible by public transit, while as ecologists and local residents we value the vital ecosystem services provided by this forest to the surrounding urban communities.

A great challenge in teaching at an urban school such as Lesley is getting students involved and in touch with local natural history. Urban students at all levels, from preschool to college, spend a disturbingly small amount of time in natural ecosystems, which hampers their natural inclinations towards observation and discovery, and may even promote attention deficit disorders (Louv 2005). Despite the desire of many parents and teachers to combat this trend, it is logistically difficult to bring students out to such sites, particularly for the many urban residents lacking cars. For our students, especially in the natural sciences and environmental studies, the Alewife Reservation and contiguous Silver Maple Forest have provided the only such local field site that we can access using the subway. Through close collaboration with the Friends of the Alewife Reservation, we utilize this forest for many classes and educational outreach programs: from students in our Introductory Biology classes going to observe basic ecological interactions and develop service projects, to our Nature Writing course going for inspiration, to our advanced Environmental Field Studies students developing independent, semester long projects focused on the ecology and eco-chemistry of the area. In collaboration with the Urban Ecology Institute, we have also brought local high school and elementary school teachers out to the forest to practice and develop ecological activities for their classrooms.

All these educational activities would be compromised by the loss of the Silver Maple Forest. Removing this central piece of forest and replacing it with a condo development would greatly reduce the integrity of the ecosystem, resulting in the loss of many interior forest species of birds, plants, and insects (Dowd 1992, Gibb and Hochuli 2002, Alvey 2006). Water quality would likely be compromised by the development, and the additional noise and light pollution would further reduce diversity and abundance of many species (Francis et al 2009, Holker et al 2010). Larger mammal species currently present in the reserve, such as coyotes, mink and fox, would almost certainly be lost due to the reduced space and increased anthropogenic disturbances. Perhaps most importantly from an educational perspective, the wonderful and inspirational sense of being alone in the wilderness one currently feels when wandering the heart of the Alewife Reservation, a feeling most urban students rarely or never get to experience, will be lost with a hulking condo development intruding on the reserve. It will feel more like a visiting a park rather than investigating a wild place, affecting the quality and depth of its educational potential.

From a broader perspective, we also highly value the ecosystem services provided by the Alewife Reservation and the Silver Maple Forest to our local urban community. Conservationists and governmental officials often prefer to focus conservation on more rural ecosystems where larger tracks of land can be bought at lower costs. There is certainly logic to this perspective, however in terms of ecosystem services it is urban forests and green spaces that have the highest economic impacts. The Silver Maple Forest has an important role for the surrounding communities of Cambridge, Belmont and Arlington in flood protection, air quality and climate change mitigation, services that are desperately needed in urban locations. Though the multi-million dollar price tag for this property is high, the services it provides will more than pay back the surrounding communities over the long term.

We can make a few rough estimates based on research in similar environments. In terms of air quality, Nowak et al (2006) estimated trees in the Boston area reduce the amount of ozone, particulate matter, sulfur dioxide, nitrogen dioxide and carbon monoxide in the air to the amount of $1.47 million per year, or approximately 50 cents per year per m^2. The 15-hectare Silver Maple Forest would therefore save the surrounding towns over $30,000 per year in air quality improvements. Trees also help regulate the surrounding temperature by trapping moisture and cooling the ground surface. Concrete and other human produced surfaces trap heat, creating urban heat islands that accentuate hot temperatures in densely populated cities (Rizwan et al 2008). Urban forests are one of the major ways cities can mitigate the effects of increasing temperatures due to climate change; large forest reserves and their surrounding areas average 1 – 3° cooler than the rest of the city and the larger the forest the greater the effect (Tyrvainen et al 2005). While estimates for the energetic savings of these cooling effects vary by city and landscape, McPherson et al (2005) estimated a minimum savings of 44 kWhr/mature tree/year among five US cities. Using a conservative density of 182 mature trees/acre (USDA 1992) and a Massachusetts average cost of 17 cents per kWhr, we can estimate the Silver Maple Forest would save a minimum of $50,000/year in cooling costs.

Perhaps the most convincing is the role of the Silver Maple Forest in flood protection. Floodplain forests such as the Silver Maple Forest are vital to avoid massive flood damage during heavy rainstorms, as they act to absorb excess water and slow rising water levels. The value of such a service is of course highest in densely populated urban areas; the National Wildlife Federation valued such wetlands in the Boston area at $72,000/hectare/year based on flood mitigation alone (Myers 1996), meaning the Silver Maple Forest is saving surrounding communities upwards of $1,080,000 per year in flood damage avoidance! Extreme precipitation events are on the rise due to climate change, so the value of an intact, functioning floodplain forest will only increase over time.

Factoring in air quality, climate change mitigation and flood protection alone, we can therefore estimate that the Silver Maple Forest would more than pay back in purchase price within ten years. This does not include a wide range of other ecosystem services the forest performs, from water quality to pest control to pollination. Overall, the value of the Silver Maple Forest to Cambridge, Belmont and Arlington as an educational resource and an ecological system far exceeds the potential value any condo development on the property could have. We strongly urge you to take up the challenge of protecting this vital natural resource and offer any support we can give you during the process.

Sincerely,

Amy L. Mertl, Assistant Professor of Biology, Lesley University, Cambridge, MA

David Morimoto, Director of the Natural Science and Mathematics Division, Lesley University, Cambridge, MA

Jeffery Perrin, Assistant Professor of Psychology, Lesley University, Cambridge, MA

Albert Liau, Assistant Professor of Biology, Lesley University, Cambridge, MA

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