

Senate Natural Resources and Energy Committee

Testimony of Dr. William Keeton, Professor of Forest Ecology and Forestry at the University of Vermont, in support of H.233

April 10, 2018

Thank you for the opportunity to testify today in support of H.233. I am testifying not as a representative of an institution or organization, but rather as a technical expert with more than 25 years of professional and academic experience related to forest management and policy, including 18 years at the University of Vermont as a Professor of Forest Ecology and Forestry. From 2010 to 2017 I directed the UVM Forestry Program. I am a Fellow in the Gund Institute for Environment and serve on the Board of Trustees for the Vermont Land Trust.

Giving testimony like this is tricky business for a scientist. Some scientists believe they should avoid involvement in public policy, fearing it would compromise the objectivity of their data. Others hold that scientists have a moral or ethical duty to work with policy makers when their research clearly points to a public risk or an opportunity. My PhD advisor once wrote there is middle road, in which scientists play a critical role by helping to inform society of options and of the consequences of those choices based on objective data. In my testimony this morning I will follow the middle road.

Conserving large intact blocks of forestland is consistent with the conditions needed for economically robust and sustainable forest management. This is why, in my professional opinion, the provisions of H.233 that very strategically and logically focus on reducing and mitigating development effects on forest blocks, makes sense from a forestry standpoint. Having read the bill carefully, I see nothing that would in any way impede forest operations, rather the opposite as those are deliberately and clearly exempted. My read is that H.233 is an investment in the kind of landscape needed to keep a thriving forest-based economy in place, and one that will encompass the full range of forest uses and benefits including timber, wildlife, water, sugaring, tourism, and recreation.

In 2010, a group of 20 scientists, led by Harvard Forest, published a report entitled “*Wildlands and Woodlands, a Vision for the New England Landscape*.” I was a member of that team. In the report we showed that for the first time in 150 years, all six New England states are losing forest cover, due almost entirely to sub-urban and rural sprawl. The southern New England states turned the corner much earlier, with forest cover trends reversing in the ‘70s and now far below their peak. The changes in Vermont have been more muted because of less population pressure here, with just under 1% forest loss in the 2000s, although this could easily change in the future. But a common trend throughout the region has been increasing rates of sub-division and parcelization, which this committee has heard much about in prior testimony.

In *Wildlands and Woodlands*, we outlined a number of reasons why parcelization and fragmentation from rural sprawl are harmful to working forests, and we presented evidence why working forests are so fundamental to the economy, ecology, and cultural fabric of the region. Reasons why sprawl is harmful to working forests include the increasing difficulty of managing

both timber and non-timber resources as property size diminishes. Though forest stewardship on small non-industrial private forests in Vermont is not only very important but often of exceptional quality, the fact remains that forest management on large properties often benefits from greater flexibility and efficiency. These include more flexible timber harvest scheduling, integration of a broader range of uses, and economic efficiencies gained through economies of scale. Commodity production on larger properties is able to compete more effectively in often challenging market conditions, particularly as the effects of globalization within the wood products industry continue to buffet the region.

For these reasons, the *Wildlands and Woodlands* report, representing the consensus view of some of the best forest scientists in the region, recommended that policy makers, such as this committee, consider a broad range of options to conserve large tracts of working forests. These included both market and incentive-based approaches, as well as the types of regulatory tools, particularly development review, outlined in H.233. Our view was that incentive-based and regulatory approaches, working together, would help maintain the viability of working forests if they contributed to landscapes dominated by forests, not rural sprawl. In Vermont we have clearly seen how the vast majority of rural subdivisions do not trigger Act 250 review because of the 6 and 10 lot thresholds – one has only to run a Google Earth overflight along the Route 100 corridor to see this very clearly.

In my professional opinion, Criterion 9(c) of Act 250 is less meaningful as applied to forestland because of the disconnect between the direct footprint of a housing development and the surrounding area on which soil productivity would be assessed, and the fact that the latter becomes essentially irrelevant once this kind of land use conversion has occurred. Clearly additional criteria are needed for development review to have a meaningful effect on safeguarding Vermont's last remaining unfragmented habitat blocks.

I'll mention one other reason why large forest blocks are important from a forestry perspective. Much of my work these days focuses on how to help landowners gain access to rapidly developing domestic and international carbon markets, like the California compliance market and the international voluntary markets. These have great potential for providing an additional revenue stream for conserved and working forests in Vermont. However, in a 2015 paper published in the peer-reviewed journal *Forest Policy and Economics*, my co-author and I showed that properties larger than roughly 1,000 acres in size have a huge advantage over smaller properties in terms of making carbon projects financially viable. In addition, under voluntary markets, groups of medium sized properties (in the 100 to 500 acre range) can "aggregate" themselves into larger carbon projects, making them work financially that way. The take home message is that for carbon projects to work in Vermont – which represents a considerable opportunity to add value to working forests while also fighting climate change – we have to keep large blocks of forests intact, and best that this be on larger parcels.

To say there is scientific consensus that fragmentation poses significant risks to forest biodiversity and ecosystem services is a very large understatement. Almost 50 years of research in the fields of landscape ecology, conservation biology, and forestry have clearly documented these risks across a wide range of temperate forest ecosystems, like ours here in Vermont. The science is clear that as housing – and especially roads – perforate the forest and increase in

density, the viability of habitats for interior dwelling species declines. Roads, developments, and yards vector or facilitate the movement of invasive species, especially noxious exotic plants of which Vermont has many. Habitat generalists often increase with fragmentation, either out-competing or in some cases predated upon interior-dwelling species. That is why large unfragmented blocks of forest, connected by contiguous dispersal habitats, are essential to the survival of many species. I am sure all of know you that increasing development in headwater areas, like many of the forest blocks H.233 considers, can alter hydrologic functioning, potentially increasing the “flashiness” of peak flows during flood events. Road densities especially have been implicated in this regard by a large body of research. That’s why review and mitigation are so important in light of recent data that show a clear trend of increasingly intense precipitation events in Vermont.

According to well-known Colorado State University geographer David Theobald, sprawl and exurban development are now one of the greatest threats facing forest ecosystem integrity in the United States. In the 1990s, more than 80% of housing development was concentrated in rural areas. According to a report from the U.S. Forest Service, during the 2000s the U.S. lost a staggering 1.3 million acres of forestland every year to the “direct footprint” of development, and there is a much larger “indirect footprint” from fragmentation effects. These trends slowed after the collapse of the mortgage derivatives market, but will likely pick-up again as housing starts are on the uptick.

Vermont, I would argue, needs to view itself in this larger regional and national context. It is easy to take our beautiful, open, iconic landscapes for granted. These are the engines of our outdoor recreation and forest-based tourism industries, and a huge draw for people and businesses interested in relocating here. But can we count on our landscapes remaining this way? Should we be planning proactively, learning from what has happened elsewhere, to make sure we hold on to values of the forested landscape that are so important to our state? Should we explore a range of alternatives to promote compact development patterns and to conserve high priority forest blocks? These are important questions for you as legislators to consider as you debate H.233, and I encourage you to take the long-view and to consider the big picture of land-use trends nationally.

Though Vermont has seen its fair share of parcelization in the last 20 or 30 years, particularly from development of second home and vacation properties, we have yet to see the population pressures that led to the “build out” experienced in parts of our neighboring states to the south. In fact, some argue that we need increased population to stimulate economic growth in the state. In my view this presents a golden opportunity to be proactive. We can learn from other parts of the eastern U.S. that have lost significant areas of rural landscapes over the last 50 years, to avoid the kinds of incremental parcelization and fragmentation that slowly, cumulatively undermine the very qualities that draw people here in the first place.

I have participated in the Vermont Forest Roundtable since its inception more than a decade ago. Those at the table, while always collegial, don’t always see eye to eye. But one thing has been clear all along, as exemplified in the consensus reports the Roundtable has produced. That is, essentially every constituency with a stake in Vermont’s forests wants those forests to remain as forests. H. 233 would go a long way towards achieving that outcome. Working proactively while

being sensitive to issues of private property rights will require communities to work together and envision what they want their landscapes to look like in the future. Do communities want future generations to enjoy the same benefits from an open, unfragmented landscape that our generation has enjoyed? Or will that door slowly, incrementally close like it has in so many other areas of the eastern U.S.? H. 233 is a step towards leaving an intact landscape for future generations and I commend you for considering it.

A handwritten signature in black ink, appearing to read "William S. Keeton". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

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