

January 31, 2013

To Whom It May Concern:

I read with considerable interest the main objectives and focus of Senate Bill 0078. I've necessarily worked with biodiversity (i.e., organisms—plants and animals) directly in all my courses and research during my career of 42 years as a faculty member of the University of Michigan School of Natural Resources, and since 1991 the School of Natural Resources and Environment (SNRE). These courses included: Woody Plants/Dendrology, Silviculture, Advanced Silviculture, Forest Biology, Forest Ecology, Advanced Forest Ecology, Intensive Culture, Biological Management, and Forest Genetics and Tree Improvement. There's nothing wrong, un-economic, or un-patriotic about understanding and working with plants and animals (i.e. biodiversity) that are integral parts of ecological systems. In fact, biodiversity has become a huge economic force and opportunity throughout the world. It is a vital and inseparable part of ecosystem services provided by the lands managed by the Michigan Department of Natural Resources (MDNR).

Biodiversity defined: The variety of organisms considered at all levels, from genetic variants of a single species through arrays of species to arrays of genera, families and still higher taxonomic levels; includes the variety of ecosystems, which comprise both the communities of organisms within particular habitats and the physical conditions under which they live; the totality of biological diversity (Lincoln et al., 1998. A Dictionary of Ecology, Evolution and Systematics).

What biodiversity is NOT is hunting around for the localities with the most species and conserving them to the exclusion of everything else. All individuals and organizations that focus on natural resources necessarily must consider the organisms occupying the lands for which they are responsible. Therefore, it is impossible to legislate biodiversity or its restoration out of the mission of any organization trying to address and solve human-caused problems of the world. Nature is biologically diverse—via the geology of continent formation and evolution or by God's word—and that can't be changed by legislation. Ecologists and the DNRs of the USA have inherited original Nature as changed by massive human intervention.

Biodiversity depends on ecological diversity—landscape ecosystem diversity. Organisms do not stand on their own; they evolve and exist in the context of ecological systems that confer those properties called life. The polar bear is a vital part of the Arctic marine ecosystem and will not survive without it. The Kirtland's Warbler is a vital part of the fire-prone, jack-pine-dominated, sand outwash plains of northern Lower Michigan and will not survive without this habitat. In the past, forest and land managers focused on stands; today we focus on ecological systems. Biodiversity depends on the diversity of ecological systems. The MDNR is managing ecosystems, of which one component is the biota of plants and animals. Some areas have have relatively low ecosystem diversity

and therefore relatively low biodiversity, whereas others have high ecosystem diversity and thus relatively high biodiversity. It is the job of DNR managers to understand ecosystems and manage their biodiversity appropriately for a balance of ecosystem goods and ecosystem services.

The cause of organismal diversity is physical diversity of climate, geology, landforms, parent materials, and the soils that developed therein. The ecosphere is extremely diverse due to its geological origins, and Michigan is especially fortunate to have enormous geological, climatic, landform, and soil diversity. Economically, as well as for intrinsic values, Michigan is extremely rich despite massive human disturbances, which dominate today's landscape. Today, the totality of God's-given-goodies on Earth available and used or appreciated by humans includes not only commodity goods but ecosystem services. It is in this context of diversity of goods and the many benefits of ecosystem services that MDNR, right-on-the-money, pursues its mission.

Included in the job of managing the diversity of plants and animals are special cases, due to enormous past and present human disturbances, that include species that have become grossly overabundant (e.g., white-tailed deer, zebra muscle) as well as those species that are rare or in danger of extinction (e.g., Kirtland's Warbler, Bald eagle—the national bird of the United States of America). Both aspects are integral parts of 21st century management, which includes commodity production, conservation, and restoration. The MDNR has been in the forefront, with the USDA Forest Service, the U. S. Army, the Fish and Wildlife Service, and major universities in the highly successful recovery of Michigan's most famous bird, the endangered Kirtland Warbler. Bill 0078 essentially requires the DNR to abandon to other agencies this remarkable recovery. Several communities and many citizens in northern Lower Michigan have markedly benefitted economically from the Warbler's recovery (i.e., restoration and conservation).

The MDNR must also deal with the new biodiversity of invasive species, a product of human commerce and global trade, which threaten native species. Valuable species are gone, dying out, or threatened due to these aliens: American chestnut, American elm, all ash species of Michigan, American beech, eastern hemlock, white walnut, the aspens, oaks. Who but the MDNR on state lands is going to address this important biodiversity decline and the loss of these ecologically and economically important species? Citizens and legislators should encourage the MDNR to continue its mission in addressing and solving the increasing array of so-called "environmental" problems, which are really people-problems.

An example of destruction and restoration/conservation in Michigan.

Logging companies and corporations (i.e., humans) rapidly destroyed the best of Michigan's forests from circa 1850- 1930s that were right in the heart of MDNR lands. The massive and recurrent fires following the logging caused loss of soil organic matter and degraded for centuries the productive capacity of sites where fires occurred. The

MDNR's remarkable efforts over decades in afforesting and reforesting these devastated sites, as well as abandoned farm lands, are among the best examples of "restoration" and "conservation" in the USA. Why should the DNR eliminate restoration of appropriate and economically valuable biodiversity from its mission as proposed in Bill 0078? Restoration of many of the species lost in the logging and fires has given new life to forest lands and communities wherever it has managed its lands. Hunters, fishermen, recreationists, and Eco-tourists now contribute considerably to the economic life of many communities. The work of the MDNR on the ground necessarily requires managing lands and the biodiversity of plants and animals, native or non-native, occurring on these lands. The only way to eliminate these activities is by eliminating the MDNR. One cannot legislate the elimination of "restoration of natural biological diversity" out of the definition of "conservation" that is understood and practiced around the world.

Earth Support System, Sustainability, and Ecosystem Services.

These are the new buzzwords of the 21st century. It is now well known by citizens and especially by the young professionally oriented people that Earth's support system of all organisms has been under attack and devastated around the world by humans. Evidence is everywhere and abundant, especially the destruction of forests that is systematically described, starting in Mesopotamia 4,700 years ago, by John Perlin in his book, *A Forest Journey*. Since there is no end in sight and no apparent legacy of nature for generations to come, the focus of interest and money has increasingly changed to sustainability of the state's and the country's natural resources and ecosystem services.

Inherent in human nature is the powerful basic trait of conservatism. Every human being is conservative. We save and conserve the most valuable things in our life—health, time, money, and priceless possessions. So too in land management, following natural or human disturbances, we seek to restore and conserve for future generations ecosystems and communities of unique and priceless value, which would otherwise be lost. Organizations such as The Nature Conservancy and the hundreds/thousands of land conservancies have joined the movement to conserve people's most treasured possessions—their woodlots, meadows, lands. Some areas are set aside because of their extremely low biodiversity, such as the Sleeping Bear Dunes. Other areas, the Great Smoky Mountain National Park for example, have enormous landform, ecosystem, and biotic diversity. The Park (>522,000 acres) was established in part due to its physical diversity thus its biodiversity. However, economic interests of chambers of commerce, companies, and individual business men played a major role as well as state and federal sources. It hosts over nine million visitors annually—attracted to physical and biological diversity. Just look at the huge wealth and economic concentration in cities like Gatlinburg, Pigeon Forge, Townsend, Cherokee, and Knoxville. The MDNR too is a conservative force in restoring devastated lands for commodity use, hunting, fishing, recreation, tourism and ecosystem services well as our system of State Parks. Their decades of work provide a variety of ecosystem goods and services, all of which have economic benefits and create jobs for the State.

Value of Biodiversity. Biological diversity is typically rated by number of species and the particular species in an area or ecosystem. The value to the owner (public or private) may be high, whether absolute biodiversity is low or high. Landscapes providing the summer breeding grounds for the endangered Kirtland Warbler—the outwash plains of pine barrens and jack pine-dominated ecosystems—are very low in number of biota (low biodiversity), but they are highly valued because of warbler occurrence. Potential warbler habitat receives special attention from the MDNR in this case where the biodiversity is relatively low. Landscapes with a very high number of species are rare. They are typically wetlands or river floodplains. The rich diversity in these cases indicates sensitive areas and ecosystems of high value especially for water and also for hunting, fishing, and recreation (rivers). Thus high biodiversity may indicate high economic and non-economic values.

Areas rich in number, kind, and location of ecosystems, and hence high biodiversity, have been of increasing interest through the world. In 1996, I wrote a section for book *Forest Ecology* (published 1998) on the values and reasons for managing and conserving areas with a rich variety of organisms. I listed eight ecological reasons, besides the well known economic values of timber/fiber, wildlife, recreation, and water. My list:

- * Many species play key roles in the resiliency of ecosystems following normal disturbance events.
- * Diverse organisms, and especially their gene pools, provide a sound resource base as the best insurance for coping with rapidly changing and uncertain future environments.
- * Many species are important ecological indicators of site productivity.
- * Certain species indicate the integrity of ecosystem processes, whereas others act as warnings of critical stress thresholds of pesticides or atmospheric pollution that may endanger ecosystem function.
- * Many species play mutualistic roles in the regeneration and function of forest ecosystems.
- * Important products other than fiber may be derived from forest organisms, e.g., wild species for food and medicine.
- * The intrinsic value of the existence of life forms and ecosystems.
- * Aesthetic or anthropocentric values; nature preserves, wilderness, and biological diversity can all play a role in promoting human well-being.

An indication of the importance of the MDNR in continuing to focus unrestricted on commodities and ecosystem services, including both low and high biodiversity, is the pioneering work of Robert Constanza (Constanza et al. 1997). At that time, they estimated the market value of the world's ecosystem services (excluding timber, wildlife,

water values) to human welfare to average about US\$33 trillion. Global gross national product total is around US\$18 trillion. Forests contribute 14 percent of the \$33 trillion and wetlands (in part forests swamps and floodplains) contribute another 15 percent. This bottom line approach is important and provides a powerful incentive for conservation of the natural capital stock, which produces these services.

I have worked with many individuals of the Michigan Department of Natural Resources on resource management issues. Also many faculty members of diverse disciplines of our School have participated on joint projects with the MDNR since 1903 when Filibert Roth was hired by the State to reforest an area of 34,000 acres. Roth founded the Department of Forestry in 1903, which in time became the current School of Natural Resources and Environment. Rather than drastically constraining the mission of the MDNR, scientists, citizens of Michigan, and the Michigan Legislature should honor and commend with highest praise their tremendous success in bringing devastated lands into modern resource management of the 21st century. Even a more challenging mission lies ahead—calling for renewed dedication and vision.

In summary, every aspect of the DNR's mission concerning biological and ecological diversity, restoration, and conservation has both economic importance and essential values conferred by ecosystem services to Michigan citizens. The essence and main points of Bill 0078 are without merit and vision for the complex challenges of today and the future on State lands. The regressive multiple elements of the Bill apparently derive from a nostalgic longing for decades long past, sharply focused timber management and unencumbered with new terms and enormous challenges such as Biodiversity, Rare/Endangered Species, Ecosystem Management, Sustainability, Restoration Ecology, Climate Change, Assisted Migration, Old Growth, Invasive Species, Eco-Tourism, and Ecosystem Services. Federal and other state agencies are actively addressing these issues. All of these challenges and opportunities are directly or indirectly about economics—money and jobs for Michigan.

The Bill 0078 is lacking in common sense, ecologically literacy, and vision; it is divisive, counterproductive, mean-spirited; couldn't be worse. As Mark Twain said of a book he reviewed—it is a cemetery.

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