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Dear Mr. Golden:

I am a professor of Biology and Environmental Science at Drew University where I also serve as director of the Drew Forest Preserve. As a forest ecologist I have been teaching and doing restoration and research in New Jersey forests for 30 years, in addition to projects in Oregon and Minnesota forests. Alongside my Ph.D. in Ecology I hold the M.S. in Ecology with a minor in Forest Resources. Thus I have a high level of expertise about forest management, conservation, and New Jersey ecosystems.

I write here in opposition to the proposed Stewardship Plan for the Sparta Mountain Wildlife Management Area. I am compelled to speak to the big picture and to strongly recommend a very different approach to forest stewardship. Serious environmental harm is threatened not only by the Sparta Mountain plan but also by similar activities on state lands. In addition to withdrawing the current plan, the DEP should consider **major changes to take an ecological rather than a forestry approach** to stewarding New Jersey's invaluable, maturing forests.

There is a vast **disconnect between the plan's logging activities and its stated goals of "ecosystem health, diversity, and integrity."** This plan calls for very extensive canopy clearing and fragmentation from within. This would gravely damage forest health in many ways, if we define health by ecological criteria rather than production of forest products. This plan is absolutely **the opposite of how best to care for and steward our New Jersey forests.** I hope major objections from the scientific and conservation communities will be taken very seriously.

Everyone seems to agree that the Sparta Mountain WMA and adjacent forests are invaluable for their unbroken extent, size, and native plants and animals. Why in the world should we open up this diverse, maturing canopy? One rationale is to help the Golden-winged Warbler, a worthy goal that I take very seriously. However its rescue is far better pursued on other state lands to avoid the large-scale collateral damage to high-quality Highlands forests. Other justifications about forest health and integrity do not match the actual plan, which is at odds with both scientific and practical knowledge about conservation biology and our particular northern New Jersey forests.

It is a reasonable question why New Jersey Audubon and others expect this plan to benefit forest health. The underlying problem is two different perspectives about **what makes for a healthy forest.** The traditional forestry view of "healthy" deploys thinning and landscape-level clearing to promote faster growth of straighter trees, focusing on one or two valuable species. Such practices make sense only when the goal is to maximize timber products. Forestry is an important endeavor, of course, and I understand the different perspective of forestry professionals who have submitted comments in favor of the Sparta Mountain plan. But the practices developed to grow healthy individual trees are very different from steps toward a healthy, ecologically functional forest. **Applying practices designed for forestry to achieve conservation goals is ill-advised here.** The early view that edges and openings enhance ecological integrity and resilience has long been refuted by science (see "Wild Forests: Conservation Biology and Public Policy" by Alvenson et al., 1994).

The other view of healthy forests considers the whole ecosystem and all of its pieces and interactions. It focuses on diversity, interactions, functional food webs, viable populations of native plants and animals, soil health, water. Forest interior conditions are protected and edges are minimized. Dead and dying trees are valued as wildlife habitat, and fallen trees are retained for soil nutrients and structural habitat value. In temperate deciduous forests like ours in northern New Jersey, stewardship for ecosystem health and resilience does not create large clearings but aims to enlarge the undisturbed area.

Forest health does not require active forestry management. The belief that good stewardship requires logging has somehow spread widely in New Jersey, but forests can take care of themselves. Sparta Mountain forests are not in terrible condition, as the Plan claims, but protect a wide diversity of native plants and animals, intricate food webs, top predators, clean streams, mossy logs, and hollow trees for wildlife habitat. Extensive logging is a prescription for ecological damage, not stewardship. It is entirely untrue that the proposed program of logging would improve the forest. On the contrary, such fragmentation, mechanical traffic, and incursions into deep forest are well known to damage intact ecosystems. These forestry activities would disrupt and set back the maturation and recovery of the invaluable intact Sparta Mountain forest complex.

Logging, including seed tree and shelterwood cutting, causes damage to forest health and integrity in temperate deciduous forests like those of northern New Jersey. Water resources that supply 70% of New Jersey residents are also at risk. The specific logging plans proposed do not emulate natural processes or disturbance regimes; Hurricanes Sandy and Irene produced plenty of natural canopy openings, much smaller than what the plan calls for. Carving out such sizable openings and removing felled tree trunks would not mimic natural patch dynamics in scale or consequences. (Conservation logging should always leave fallen logs behind in the forest ecosystem). Water quality would suffer catastrophic, long-lasting impacts: nutrient and sediment pollution, loss of sensitive stream invertebrates and fish, and dramatic fluctuations in stream flows.

The Sparta Mountain plan promises that FSC principles and Best Management Practices would be adhered to. However, this is irrelevant to **the key question of whether or not logging is appropriate at all in public forests** of New Jersey, the nation's most populous state, with our highly fragmented forests, precarious native species and vulnerable but essential surface water supplies. We have no need to harvest forests maintain local or state-wide economies. Biodiversity protection and headwater stream quality are far more urgent necessities.

Basic principles of conservation biology are unheeded by the plan: the species-area relationship (larger areas hold more species); the edge effect (forest edges admit invaders and nest predators, dry out amphibian and fish habitat, expose trees to windthrow); the global crisis of forest fragmentation (including fragmentation from within the forest). Globally 70% of all forests are within 1 km of the forest edge, with impaired nutrient cycles and other ecosystem damage (recommended reading: "Habitat Fragmentation and its Lasting Impact on Earth's Ecosystems" by Haddad et al. in Science Advances, 2015).

More than anywhere else, in New Jersey every clearing is destined for hostile takeover by damaging invasive plant species, carried by birds and wind: garlic mustard kills tree seedlings, bittersweet vines strangle tall trees and block succession, and Japanese barberry immobilizes nitrogen where it spreads through most north Jersey valleys. Although controlling invasive species is listed as a plan goal, details are not provided and indeed this would require heavy investment of time and herbicides over many decades.

New Jersey does not need more young forests but instead needs more rigorous protection of maturing forests. I worry about the plan to convert at least 10% of Sparta Mountain's old forests to young -- a massive conversion. Young forests are important habitat for some birds such as the wonderful Golden-winged Warbler, which in the plan is a major rationale for logging. But northern New Jersey has far more young forest habitat than the Plan claims, and yet more young forest could be developed on our abundant unforested lands, including old fields and abundant degraded former woodlands where deer and bittersweet vines now prevent forest

establishment. We have plenty of young forest and open land already. Meanwhile, many other bird species and other special-concern wildlife species require extensive forest habitat with large trees that form a closed shady canopy. Across New Jersey, birds of young forests are far more abundant than birds of the forest interior.

Other more heavily forested states are considering young forest initiatives. But in New Jersey we lack sufficient intact, mature forest to spare for such a sacrifice. Rather than more clearings, New Jersey needs more buffering, protection, and expansion of what forest has managed to return, survive, and mature over the past century. It is incredibly short-sighted to create young forest by carving up precious maturing forests!

Logging will not promote old growth forest. This mistaken concept is seriously problematic in many regions and makes no sense in New Jersey. Forest openings create structural diversity, and virgin forests have structural diversity. Does this mean forest openings build virgin forest? The critically important feature of old growth forest is old trees. The Plan would sacrifice old and maturing trees for open clearings. In fact, the Sparta Mountain forests already possess multiple layers and a wonderful diversity of native trees. Structural complexity is developing naturally as these forests mature, without our help. Creating openings as enormous as an acre or more, as in the Stewardship Plan, delays rather than accelerates old growth forest development. I note that many stands proposed for clearing at Sparta Mountain have the structure and species composition of forests well on the way to old growth conditions.

In conclusion, this plan to log out hundreds of acres from Sparta Mountain WMA **would cause serious harm to forest health, wildlife, and water quality across the region.** For true forest integrity rather than timber products, and for science-based conservation, a very different approach is imperative. I oppose the plan to apply inappropriate if well-intentioned forestry activities within these critical, maturing, wildlife-rich forests, on Sparta Mountain and statewide. In addition, I have contributed to and agree with comments about a wider range of concerns, as submitted by other biologists and ecologists through the New Jersey Highlands Coalition (http://www.njhighlandscoalition.org/HTML/res_comments.html).

I hope the DEP will take a step back and reconsider this troubling management approach which has already been deployed nearby in Sparta Mountain WMA and Weldon Brook WMA. To clear yet more of this unbroken complex of mature forests cannot promote healthy or resilient forests as the plan claims. On the contrary, such forest clearance and fragmentation are highly destructive in this biome as in most forest types, as shown by a large body of science. Proper stewardship for water, wildlife, and forest health would exclude logging except to remove invasive species, and would maximize the size, continuity, and ecological integrity of New Jersey's priceless public preserves.

Sincerely,

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