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Via email: david.golden@dep.nj.gov

RE: Sparta Mountain Wildlife Management Area Forest Stewardship Plan

Dear Mr. Golden,

As you know, the New Jersey Highlands Coalition and many of its individual and organizational members have significant concerns regarding the proposed Forest Stewardship Plan ("the Plan") for the Sparta Mountain Wildlife Management Area ("SMWMA"). Please see our comments below:

The SMWMA, 3,461 acres of public preserved land, lies within one of the most significant areas of mature, contiguous, and unfragmented forest in northern New Jersey. It is the core of the "Sparta Mountain Greenway" in Sussex and Morris counties, deemed in the 1990's a "Critical Treasure" of the Highlands region by the Highlands Coalition and the Regional Plan Association, and a place that should remain undeveloped and be preserved for posterity.

The Sparta Mountains, the westernmost ridge of the New Jersey Highlands, extends from the New York border southwest to beyond Interstate 80. From Hamburg Mountain WMA on the north, the range is now home to SMWMA, Mt. Paul State Park, Morris County's Mahlon Dickerson Reservation, and Weldon Brook WMA, with Allamuchy State Park at its southern terminus. Adjacent to the east, public protected lands include Newark's Pequannock Watershed, Rockaway River WMA, Wildcat Ridge WMA, Farny State Park, Split Rock Reservoir, Buck Mountain, and Pyramid Mountain.

The majority of these lands, except for Newark's Pequannock Watershed, have been preserved over the past 25 years through the passionate dedication of the state, local governments, nonprofit land trusts, and citizens, and purchased with funding from the state's Green Acres Program, local dedicated open-space taxes, the federal Forest Legacy and Highlands Act Programs, foundation grants, and private donations.

One of our greatest concerns with the Plan is its failure to recognize that economic considerations should have no place in the management of land preserved for recreational and ecological values. In Section 3 on page 18 the Plan states that New Jersey must find ways "to utilize New Jersey's renewable forest resource as a way to offset costs associated with stewardship." Deciding *a priori* that intensive commercial forestry is the only way to manage for

a subjectively chosen subset of species is a perversion of the Public Trust. A proposed management activity for any habitat, forest or otherwise, must be designed based on what action (or inaction) is best to accomplish a desired outcome, and then funding to accomplish those actions should be sought. Constraining the intellectual design of a proposed stewardship activity only to intensive forestry operations that pay for themselves through the generation of products cannot result in optimal design, and places economic interests before scientific values. The result is a vicious cycle, with the outcome being driven by economics instead of science. Forestry, like agriculture, is an economic enterprise—it is not an ecological science. A forestry practice can be a useful tool, when science shows that it can or should be utilized to accomplish a desired result. But in this instance, the Plan sets the stewardship of SMWMA down the path of an economics-driven, agricultural system based on deriving income to pay for activities. This is not a "10-year Plan," but rather the first installment of a multi-decade, economic enterprise.

This Plan is driven by an assumption that the people of New Jersey want natural-resource stewardship to both pay for itself and stimulate private enterprise. Nothing could be further from the truth. Rather, the people of New Jersey have spent billions of dollars to preserve natural resources in the last 50 years, and continue to support the Green Acres program ideals. We deserve stewardship proposals that do not undermine the Public Trust. New Jersey is a small place with many people—we have one of the highest population densities in the world—and with heavy pressures on the land. We do not need to adopt a *modus operandi* in which we cut down our forests so that we can make enough money (in a state with no "viable market for forest products") to stimulate a market for forest products. The Plan is so bold as to attempt to invent public policy, positing that it is a "violation of the public trust" not to use money derived from lands that have been preserved for the protection of water and wildlife resources in order to steward those very same lands!

NJDFW, in presenting this plan, has made an about-face from our recent history concerning natural resources. Imagine if, for the last 50 years of land preservation efforts, New Jersey had taken the easy path of acquiring only conservation lands that were inexpensive, such as wetlands, due to regulatory impacts on land values. To the contrary, the SMWMA was acquired through a massive public effort involving education, outreach, advocacy, and innovative fundraising. The NJDFW has been extremely short-sighted, deciding *a priori* that the option of inviting commercial forestry throughout the entirety of the SMWMA landscape is the only means to accomplish stewardship. It is almost certain that the public, whose money bought this land, trusted that they were preserving it forever from attempts to use it for economic gain.

Twenty years ago, all New Jersey citizens won an immense battle to protect Sparta Mountain from development. Recently, much of the conservation community supported minor forest-clearing actions in an attempt to rescue a declining, rare bird. Now, this Plan has morphed into the precursor to long-term commercial logging of an entire landscape. *The Plan's grandiose claims that virtually all species in every habitat on SMWMA will benefit from widespread forestry operations of varying intensity cannot be supported by science.* The Plan cherry-picks scientific arguments that support widespread forestry initiatives, but ignores or misinterprets scientific literature that speaks to the many risks regarding rare plant and animal species, future forest integrity, water quality, and other natural resources. After having won the huge fight to save the land from residential development, the people of New Jersey must again mount a campaign to save Sparta Mountain from a Plan that strongly appears to cloak income generation for the private sector under a leafy, green guise of "forest stewardship" on Public Trust lands.

The SMWMA Plan proposes actions that would cause serious harm to forest health, forest resilience, and wildlife by fragmenting and impairing unusually intact and biodiverse mature forests. The Plan to log large areas of SMWMA would cause serious harm to the forests and the region. Continuing the practice of carving up invaluable unbroken acreages of mature forests—already deployed on SMWMA and other state lands nearby—cannot promote healthy or resilient forests as the Plan claims. On the contrary, such forest fragmentation and edge creation are highly destructive both in this biome and globally, as demonstrated by an overwhelming body of science.

Sparta Mountain guards the critical edge of a forest biome recovering from statewide deforestation in the 19th and early 20th centuries. To the east of the Highlands Region lies a vast fragmented landscape where development and edge effects have degraded surviving patches of woods. Between the Highlands ridges and the Hudson River, these forest fragments are missing understory layers and a future forest generation, are filled with invasive plants including vines and herbs that kill tree seedlings and saplings, and are lacking almost all native vegetation upon which pollinators and other insects rely. These conditions do and will continue to spread westward into more intact forest ecosystems. More appropriate stewardship would hold the line and protect zones of unbroken forests—not carve them up. Amidst understandable concern for the Golden-winged Warbler, other justifications for the proposed Plan are problematic, based on management for forest products rather than for native species conservation and forest integrity. Within such invaluably large tracts of forest, logging (seed tree, shelterwood, and otherwise) would come at great cost to northern New Jersey's wildlife and forest health.

The underlying problem is disagreement about what makes for a healthy forest. There are two perspectives. The traditional forestry view of "healthy" deploys thinning and landscape-level clearing to promote faster growth of straighter trees, usually focusing on one or two valuable species. Such practices make sense only when the goal is to maximize timber products. The other, ecological, view of healthy forests focuses on diversity, complexity, intact food webs, viable populations of native plants and animals, and rare species. Forest-interior conditions are protected and edges are minimized. Dead and dying trees are retained as wildlife habitat, and fallen trees are retained for nutrient retention and structural habitat value. *In temperate deciduous forests like ours in northern New Jersey, such stewardship for ecosystem health and resilience does not create large clearings but instead aims to enlarge the undisturbed area and to protect forests from invasive species and excessive herbivory and fragmentation.*

Logging on the scale proposed in the Plan could maximize timber production but in other respects would impair ecological health, even if deployed as seed tree or shelterwood cuts. The Plan's worthy goal to "maintain ecosystem health, diversity and integrity" would not be furthered by the proposal to "establish up to 10% of the property as young forest stands." The proposed Stewardship Plan would cause far more harm than good to the ecosystem, its wildlife, its native diversity, and its natural integrity.

Devastation caused by forest fragmentation is clearly documented in a large and growing body of research. An early view that "edges" are valuable to forests and wildlife was rejected in the 1990's by science (Alverson et al. 1994). For example, forest edges in northern New Jersey concentrated lichen-damaging air pollutants (Glenn et al. 1998). Just recently, global analysis stunned the public with the finding that 70% of the world's forests are within 1 kilometer of a road (Haddad et al. 2015) and with a damning meta-analysis of the consequences.

In contrast, science has widely accepted for many decades the species-area relationship:

larger areas of habitat hold more species. In fragmented New Jersey, openings and edges are especially dangerous as nodes for invasive species, which are taking over even in small openings caused by recent hurricane blowdowns. Additional threats are posed by mechanized tree harvesting: soil compaction, erosion, degradation of streams, and threats to associated wildlife. Roads for equipment access become invasive-species highways, a major problem with the proposed Plan.

There are serious ecological problems with two other stated purposes of the Plan. One is the mistaken idea that clearings within the existing forest will help to promote old-growth forest conditions. Structural complexity develops naturally as forests mature. Creating openings as large as an acre or more, as proposed by the Stewardship Plan, delays rather than accelerates old-forest development. Many stands proposed for silvicultural action at SMWMA have the structure and species composition of forests now well on the way to old growth conditions without interference.

The other problem is the idea that we have too little young forest. The Plan aims to replace some 10% of maturing forests with clearings that ideally will become young forests. Amid controversy, other states with more-extensive forest coverage have established "young forest initiatives." Carving up old forest for this purpose would be particularly unwise in New Jersey with our high population density, paucity of mature forest, and abundance of invasive species, in addition to the absence of economic pressure to support a timber industry.

New Jersey does not need young successional forest as much as we urgently need more buffering, protection, and expansion of forest that has managed to return, survive, and mature over the past century. Moreover, for resilience in an age of climate change, the need is urgent for intact forest expanses to avert extinctions, allowing not only birds but also less-mobile plant, insect, and small-animal populations to migrate poleward as the climate warms (Dunwiddie et al. 2009). New Jersey has abundant lands not covered with maturing forest where young forest could instead be nurtured and developed, including old fields and lands, both private and public, where deer and invasive shrubs and vines are currently preventing forest establishment.

Creating large forest openings within SMWMA will cause much more ecological harm than good. These are priceless forests whose unbroken extent is fundamental to their health, resilience, value to native species, and landscape- and state-level importance. Instead of carving these forests apart, the Plan should move away from inappropriate practices originally developed to maximize timber production and instead adopt stewardship actions that focus on protection from such incursions.

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A. Conservation Goals for the Highlands

The Plan fails to support historic and recent conservation goals for the Highlands, as detailed below, and thus fails to reflect and sustain the values for which Sparta Mountain Wildlife Management Area was preserved.

The prime conservation imperatives for the New Jersey Highlands from the 1990's to the present have been the preservation of the existing large tracts of contiguous forest, maximization of forest canopy cover, and prevention of forest fragmentation, in order to protect critical water supplies and water quality, and to preserve interior forest habitat, especially for neotropical migratory bird species. These goals were strongly advocated throughout the 1990's and beyond by the bi-state Skylands Greenway Task Force (1992), the USDA Forest Service (1992 and 2002), the US Fish and Wildlife Service (1997), the NJ State Planning Commission (2001), the United States Congress (2004), the New Jersey Legislature (2004), the New Jersey Department of Environmental Protection (2004), and the New Jersey Highlands Water Protection and Planning Council (2008), as summarized below.

1. ***Skylands Greenway Task Force Report,*** 1992:

The report of the bi-state *Skylands Greenway Task Force*, established by New Jersey Governor Tom Kean, stated:

> "The framework of the Action Plan recommended by the Task Force rests on two major conclusions from the public forums: first, that nothing short of a comprehensive regional approach to planning and coordinated efforts by federal, state, local and private groups will be effective in the face of current trends; and secondly, that *there is a significant planning and regulatory gap with regard to the protection of contiguous forest lands and the resources they support, including water supply, air quality and habitat values."*

2. ***NY–NJ Highlands Regional Study***, USDA/Forest Service, 1992:

The USDA/Forest Service *New York–New Jersey Highlands Regional Study*, identified "Important Large Forested Areas," based on "relatively undeveloped contiguous forested lands greater than 5,000 acres; key water resources such as public water surface supplies, watersheds and wetlands, key wildlife habitat and recreational and cultural opportunities."

3. ***Significant Habitats and Habitat Complexes of the New York Bight Watershed,*** US Fish and Wildlife Service, 1997*:*

This large, comprehensive study inventoried the New York–New Jersey Highlands as "COMPLEX #25", stating:

> "The entire physiographic province of the New York–New Jersey Highlands...is noteworthy as a relatively undeveloped corridor of forests, wetlands and grasslands of regional importance to breeding and migratory birds, resident amphibians and reptiles, and rare plants and communities within close proximity to the New York City metropolitan area. The principal significant habitat is the core area of unfragmented forest and wetlands within the Highlands…extending from the glacial moraine (at about the location of Interstate 80 in New Jersey northeast across the Hudson River). *This core habitat area has the highest concentration within the Highlands of species and communities of special regional emphasis dependent on large, unfragmented forest and wetland habitats. The focus of this narrative is on the core habitat area…"*

The study noted that "The New Jersey Natural Heritage Program recognizes several Priority Sites for Biodiversity within the Highlands," including five that are located on or adjacent to Sparta Mountain WMA: **Sparta Pine Swamp (B3), Edison Bog (B4), Morris Lake (B4), Morris Lake Woods (B4), and Sparta Glen (B4).** The narrative continues: "The *core habitat area* contains continuous and relatively unfragmented forests, higher elevation ridges, and networks of relatively undisturbed wetlands in the valleys." It describes the types of forests, with dominant trees and shrubs, as follows:

> "VI. Ecological Significance/Uniqueness of Site: ***The ecological significance of this area relates to its large, contiguous forest and wetland habitats and the disturbance-sensitive species dependent on these habitats, as well as the diversity of plants, communities, and animals unique to this region.***…The Highlands Regional Study conducted by the U.S. Forest Service estimated that roughly 50% of the area between the Delaware and Hudson Rivers, or about 500,000 acres, is important habitat based on the presence of species that are endangered, threatened, or of special concern…. There are 312 species of special emphasis occurring in the highlands, incorporating 147 species of birds and 123 species of plants, and including the following federally listed species…. For thousands of years, the ridges of the Highlands have been used as a visual guideline for songbirds and raptors during spring and fall migrations, with the forest and wetlands providing food and resting places for the migrants…about 150 species of breeding birds. *Many of these species are generally associated with relatively unfragmented, undisturbed forest interior habitats.*" (Emphasis added.)

The document notes and describes Rare Communities and Plants, including rocky-summit grasslands, the pitch pine–oak–heath rocky-summit community, talus communities, chestnut oak forest, Appalachian oak-hickory forest, Atlantic white cedar swamps, dwarf shrub bogs (including Edison Bog, "a northern bog with historical occurrences of several rare plant species"), black spruce swamps, aquatic communities, and hemlock ravines (including Sparta Glen, "a hemlock ravine.

The Fish and Wildlife study observes that ***"The most significant threat to the Highlands is the continued loss and fragmentation of the area's forest and wetlands…. Loss of forest habitat will reduce the suitability of this area for forest interior species, degrade water quality, and likely increase flooding of downstream areas.*** Loss of habitat will also fragment the mostly unbroken forested corridors connecting the Highlands from the Taconics and New England on the north to the Appalachian Ridges and Pennsylvania to the south…. Because many of the habitat values of the Highlands are based on its large tracts of unfragmented forests and wetlands, these large areas must be preserved intact. Protecting only the small and localized rare communities will not be sufficient."

4. ***The New Jersey State Development and Redevelopment Plan***, New Jersey State Planning Commission, Adopted March 1, 2001:

The State Plan identified the New Jersey Highlands as its first Special Resource Area, "an area or region with unique characteristics or resources of statewide importance which are essential to the sustained well-being and function of its own region and other regions or systems— environmental, economic, and social—and to the quality of life for future generations (page 171)."

Recommended "Planning and Implementation Strategies" include: *"Establish an intergovernmental planning initiative…to secure the protection of water quality and water supply,*

natural resources, open space, unique landscape and community character;" and ***"Establish sound planning, development and water use practices to maintain and enhance the quality and function of the water ecology—including the ground water, aquifer recharge areas, headwater streams, rivers, lakes, reservoirs and the forested areas that support system functions—****and the sustainable management of water resources for both local and extra-regional use (page 173).*"

5. NY-NJ Highlands Regional Study, 2002 Update, USDA/Forest Service:

Regional forest management objectives were espoused by the USDA/Forest Service in both its 1992 *New York–New Jersey Highlands Regional Study*, and the "*2002 Update."* The "*2002 Update"* was supported by mapping prepared by the Rutgers University Center for Remote Sensing and Spatial Analysis (CRSSA), ***which identified large, contiguous areas of forest in the New Jersey and New York Highlands as prime focus areas for conservation.*** (http://crssa.rutgers.edu)

- The Highlands serve as a major migratory flyway for numerous neotropical bird species, many populations of which are in decline. *Of particular concern to ornithologists are the 70 to 75 species of forest-interior-nesting neotropical migrants* such as Red-eyed Vireo, American Redstart, and Eastern Pewee. These species require large undisturbed forest patches.
- Fragmentation and alteration of habitat continue to pose the greatest threat to the biological communities in the Highlands…. Degradation of habitat by direct destruction or indirectly through pollution, erosion, introduction of invasive species, or fragmentation threatens the existence of species, diminishes natural communities, and reduces genetic variability.
- ***The "2002 Update" identified Sparta Mountain/Lubber's Run as one of six "Conservation Focal Areas" in New Jersey.*** "The Highlands Regional study provides information on the regions' resources that can help guide conservation strategies. The 'conservation focal areas' have high resource values as well as major clusters or large continuous tracts of unprotected land, which makes them a high priority for conservation." *New York and New Jersey Highlands—An Endangered Landscape*, Regional Plan Association brochure, USDA Forest Service, Northeastern Area State and Private Forestry, 2002.

6. New Jersey Highlands Water Protection and Planning Act, P.L 2004, c.120*:*

From the legislative findings and declarations:

> The Legislature further finds and declares that the New Jersey Highlands is an essential source of drinking water, providing clean and plentiful drinking water for one-half of the State's population, including communities beyond the New Jersey Highlands…;
>
> That the New Jersey Highlands contains other exceptional natural resources such as clean air, contiguous forest lands, wetlands, pristine watersheds, and habitat for fauna and flora, many sites of historic significance, and provides abundant recreational opportunities for the citizens of the State;
>
> The Legislature further finds and declares that the protection of the New Jersey Highlands, because of its vital link to the future of the State's drinking water supplies and other key natural resources, is an issue of State level importance that cannot be left to the uncoordinated land use decisions of 88 municipalities, seven counties, and a myriad of private landowners;
>
> The Legislature therefore determines, in the light of these findings set forth hereinabove, that it is in the public interest of all the citizens of the State of New Jersey to

enact legislation setting forth a comprehensive approach to the protection of the water and other natural resources of the New Jersey Highlands;

That this comprehensive approach should consist of the identification of a preservation area of the New Jersey Highlands that would be subjected to stringent water and natural resource protection standards, policies, planning, and regulation;

That this comprehensive approach should also consist of the establishment of a Highlands Water Protection and Planning Council charged with the preparation of a regional master plan for the preservation area in the New Jersey Highlands as well as for the region in general;

And that ***all such aforementioned measures should be guided, in heart, mind, and spirit, by an abiding and generously given commitment to protecting the incomparable water resources and natural beauty of the New Jersey Highlands so as to preserve them intact, in trust, forever for the pleasure, enjoyment, and use of future generations.***

7. ***Federal Highlands Conservation Act, 2004,*** Public Law 108-421:

The intent of the Act was "to assist the States of Connecticut, New Jersey, New York, and Pennsylvania in conserving priority lands and natural resources in the Highlands region…."

Purposes of the Act included (1) "to recognize the importance of the water, forest, agricultural, wildlife, recreational, and cultural resources of the Highlands region, and the national significance of the Highlands region to the United States; and (2) to authorize the Secretary of the Interior to work in partnership with the Secretary of Agriculture to provide financial assistance to the Highlands States to preserve and protect high priority conservation land in the Highlands region."

Land conservation partnership projects must be "consistent with areas identified as having high conservation value" in the Important Areas portion of the 1992 USDA/Forest Service '*NY-NJ Highlands Regional Study*,' or the Conservation Focal Areas, Conservation Priorities, or Conservation Values Assessment portions of the '*2002 Update*.'

B. Green Acres Funding Encumbers Preserved Public Land

All SMWMA tracts were purchased with Green Acres funding or monies funneled through the Green Acres Program, and are thus "encumbered," with restrictions on diversion to purposes other than public conservation and recreation. As described below, pages 9-10, the Plan fails to substantively address Green Acres goals for the "public use and enjoyment" of the SMWMA.

The commercial scale and intensity of the logging proposed for SMWMA amount to a diversion from the public conservation and recreation purposes for which the acquisition by the State was constitutionally dedicated. Although the Division of Fish and Wildlife has in some cases employed special funding derived from hunting and fishing licenses to purchase, in their entirety or in part, some of the state wildlife management areas, none of the parcels included in SMWMA were purchased with this Fish & Wildlife funding. Instead, all parcels in SMWMA were obtained with either New Jersey Green Acres bond funds (approved by the public in statewide constitutional ballot questions), or other monies funneled through the Green Acres Program, including federal Forest Legacy Program appropriations, charitable foundation grants, and private donations. As such, SMWMA consists of "encumbered lands."

According to Green Acres, "encumbered lands" are those lands purchased by the State with Green Acres funds, as well as local and nonprofit lands funded with Green Acres assistance, ***which are subject to restrictions on diversion from public conservation and outdoor recreation purposes.*** Diversion from public conservation and recreation uses requires the State, or local government or nonprofit, to go through the State House Commission process, which includes public hearings and Commission approval**.**

The Plan proposes logging at a scale and intensity that diverts encumbered public lands from their public conservation and recreation purposes. The Plan clearly suggests that support of commercial-scale logging is one of the Plan's long-term expectations and objectives. For example, the Plan looks into major transportation infrastructure capabilities, which would not be relevant if only small, non-commercial minor cuts were the goal:

> "The NYSW freight rail lines that bound northern portions of SMWMA connect Bergen County, NJ to Syracuse, NY. The feasibility of utilizing a train as an effective means of transporting logs and/or milled lumber will be explored as an option. New Jersey Transit has been working on restoring the historic Lackawanna Cut-Off railroad between metropolitan New York and northeastern Pennsylvania. The Lake Hopatcong and Andover section is only twelve miles from SMWMA, and might also be a possible way to transport forest products in the future (Plan, page 12)."

In addition, in Section 3, Socioeconomic Impacts of Forestry, the Plan regrets the decline of "local industries associated with the harvesting and processing of forest products…. Management activities in this plan…also create opportunities to generate revenue by capturing some of the inevitable mortality of trees…. Public land management that does not consider the monetary value of natural resources within the long term stewardship framework…***should be considered a violation of the public trust (Plan, page 18)."*** This statement badly misconstrues and turns on its head the meaning of the words "public trust."

The Plan fails to reflect and prioritize the multiple values cited by the Green Acres Mission, which include the preservation of open spaces, natural resources, and "historic, scenic, and recreational resources for public use and enjoyment."

The proposed Plan fails to address Green Acres' multiple goals for "public use and enjoyment" in any comprehensive, meaningful manner, and fails to adequately consider and plan purposefully for preservation and enhancement of the diverse natural, cultural, historic, scenic, and recreational resources and other public benefits of the Sparta Mountain Wildlife Management Area. For example, the proposed Plan addresses "Recreation and Aesthetics" in a single paragraph 19 lines in length. In contrast, the "STAND DESCRIPTIONS AND PRESCRIPTIONS, TEN YEAR MANAGEMENT SCHEDULE, AND FOREST INVENTORY STATISTICS" run from page 36 to 83—a total of 47 pages, well over half the document's length. Other important considerations, such as combatting global warming through carbon sequestration, or the degradation of the recreational experience due to the noise impacts of logging on humans (as well as noise effects on wildlife), receive minimal attention or none at all.

C. Cultural and Scenic Resources

The SMWMA is culturally rich, while largely under-inventoried, though the Plan fails to recognize and record the cultural remnants on the site and provides no process for doing so.

In Section 2.12, the Plan correctly consulted with public records and with stakeholders to determine that the Edison site is a Register-listed resource. At the same time, though, their site inspections showed that "there are old stone foundations and rock walls on the property." The consultants' lack of familiarity with the interpretation of above-ground archaeological remains led them to add that "there were no areas of archaeological significance identified," although they did add that "any such structures in the vicinity of stewardship will be identified and preserved."

These findings indicate that the area was once a settlement, with all of the ancillary structures and other artifacts of farming life. Also, because of the proximity to the mine, it is reasonable to assume that the settlement provided residences for mine laborers and their families. Therefore, every sign of occupancy on the complete site should be photographed, mapped, and described in context. Items such as cisterns should be marked for future professional excavation. Remember that a pattern of tree plantings may be all that remains to indicate the placement of a former house. A search of public records should be carried out in an attempt to identify the former residents. It is crucial to remember that no one artifact is significant in itself, without interpretation in the widest possible context. It is also important to realize that modern local residents themselves may not have an accurate understanding of the significance of such remnants, though their reports may be extremely helpful in locating them.

The documentation acquired from these area-wide investigations should be deposited with the NJ State Historic Preservation Office, where future researchers will expect to find them. Copies should also be given to the respective county historical societies, and to any local municipal historic preservation commissions and historical societies. In this case, the Sussex county library and the Morristown municipal library local history departments would be appropriate depositories. Some town engineering offices would be interested to have the maps.

A full cultural assessment should be always be included in a management plan. We recommend that it be inserted in the plan in an early section, perhaps as a revision of sections 2.10, 2.11, and 2.12.

1. Scenic Resources: The proposed Plan fails to recognize and respond appropriately to the fact that SMWMA is identified as a scenic resource in both the DEP Highlands Rules and the Highlands Regional Master Plan, as described below.

2. NJDEP Highlands rules identify, and prohibit degradation to, "existing public scenic attributes" in the Highlands Preservation Area as follows:
   N.J.A.C. 7:38-3.12 Unique or irreplaceable land types and existing scenic attributes
   (c) ***"Existing public scenic attributes" are any Federal, State, county or municipal parks, forests, wildlife management areas and natural areas,*** any areas acquired for recreation and conservation purposes with Green Acres funding, program or a non-profit conservation organization, any lands preserved as open space by a non-profit conservation organization and other areas as identified by the Highlands Council.
   (d) The Department shall not issue a Highlands Preservation Area Approval (HPAA) unless the proposed activity would result in the minimum practicable degradation to a unique or irreplaceable land type or existing scenic attributes on the site or within the immediate area of the proposed project."

3. The Highlands Regional Master Plan (RMP) includes an inventory of Regional Scenic Resources. SMWMA is a Regional Scenic Resource. The Highlands RMP Scenic Resource Protection Overview states:

> ***"Protecting scenic resources and maintaining the visual integrity and scenic beauty of noteworthy viewsheds and natural and cultural features of significance in the Highlands Region is a goal of the Highlands Act and the RMP.*** The essential character of the Highlands is intrinsically tied to the physical environment and how one element relates to another. The scenic character of the Highlands will be a major contributor to the Region's success as a recreation and tourism destination, and its ability to generate economic activity in the form of agri-tourism, eco-tourism and heritage tourism. Preservation of that essential character can best be accomplished through a comprehensive approach to scenic resource protection (page 294)."
>
> ***RMP Policy 4B3: "To ensure that human development does not adversely affect the character or value of resources which are listed on the Highlands Scenic Resources Inventory."***

The proposed Plan includes no substantive proposals or planning measures that would prevent the degradation of the scenic values of the Sparta Mountain Wildlife Management Area by the proposed logging.

D. Highlands Water Resources

As the only organization in New Jersey whose sole mission is to protect and enhance the resources—specifically the water resources—of the Highlands region, the New Jersey Highlands Coalition is especially concerned that the SMWMA Plan does not avoid major impacts on water and soil quality, which have been consistently observed in scientific studies on the effects of clearcutting on forest soils and hydrology, and are described below.

The Plan fails to meaningfully address water-quality and water-supply issues of critical statewide importance. A December 2015 report by the New Jersey Geological and Water Survey, "Potable Water Supplied in 2011 by New Jersey's Highlands," found that "The New Jersey Highlands are a vital source of potable water for the State…. The region supplied 136 billion gallons…to 332 municipalities in 16 counties in northern, central and southwestern New Jersey. These municipalities are home to about 70% of New Jersey's population"—[over 6 million people]—who rely on the Highlands for all or part of their water supply."

SMWMA contains headwaters of the Wallkill, Raritan, and Passaic Rivers, as well as the Town of Newton's surface water supply—the Morris Lake Reservoir located in Sparta Township. Groundwater infiltrated in the Sparta Mountain WMA feeds wells within, adjacent to, or near SMWMA, as well as supporting the base flow of streams and surface waters. Specifically, SMWMA comprises significant headwaters of the Rockaway River Watershed, part of the Passaic, which supplies Jersey City's Boonton Reservoir. The waters begin their journey high on Sparta Mountain, in its many lakes, ponds, wetlands, and tributaries, among them Ryker Lake, Collins Pond, and Russia Brook. The proposed Plan fails to address or respond adequately to the critical statewide importance of SMWMA as a public-water-supply watershed.

1. Impacts of Logging on Hydrology and Soils: *Scientific studies, summarized below, document severe effects of clearcutting and logging on forested watersheds at Coweeta (NC), Hubbard Brook (NH), and the Catskills.*

What scientific evidence is there that 50' buffers, as proposed in the Plan, are sufficient to avoid impacts to soil and stream water quality? How will the proposed activities avoid soil disturbances without eliminating the use of heavy machinery? How will the proposed activities avoid the added effects of deer herbivory on water quality after clearcuts, or impacts to trout and aquatic invertebrates? In Section 2.9 on Hydrology, the Plan appropriately acknowledges research on the effects of clearcutting on forest hydrology (Hornbeck et al. 2014), which provides "reasonable comparisons" to conditions at SMWMA that may be used to obtain a "conservative estimate" of the expected effects of clearcutting there. ***However, the plan does not provide appropriate perspective or detailed accounting of what those studies and others like them found*** (e.g., McHale et al. 2007 in the Catskills, Likens et al. 1970), or include other concerns for the combined effects of deer following logging and impacts to aquatic-invertebrate and fish communities (McHale et al. 2008).

Specific effects observed on water and soil quality following clearcuts in forested watersheds at Coweeta, Hubbard Brook, and the Catskills included the following:

a. Effects on Water Yield and Peak Flow Rates: At Hubbard Brook, clearfelling (where no roads were created, no logs were removed, and herbicides were applied) produced a "dramatic response," causing annual water yields to increase by an average of 32% for the 3-year period immediately after cutting (Hornbeck et al. 2014). In a similar clearcut (where roads were created and logs were removed), 23% increases in stream flow occurred, followed by 5-8% increases in the 13 years afterwards, and decreases in stream flow from year 13 to year 34 due to increased transpiration from regeneration. Similarly, shelterwood stripcutting caused increased yields of 4-9% for seven years, then decades of decreased water flow. Minor increases or decreases in water flow followed. At Coweeta, increases to water yield persisted for 5-6 years, followed by decreases in water yield after years 16-17 resulting from increased regeneration (Hornbeck et al. 2014).

In addition to overall water yield, peak flow rates at Coweeta increased by an average of 15% during first 4 years after clearcutting, and 29% at the Hubbard Brook clearcut. However, "Depending upon antecedent soil moisture, peak-flow rates during the growing season can be increased by up to 60% in the first 1-2 years after harvest" (Hornbeck et al. 2014).

b. Soil Disturbance and Sediment Yield: Although logging adhered to best management practices at Hubbard Brook, "considerable soil disturbance still occurred" (Hornbeck et al. 2014). Surveys after stripcutting and clearcutting showed that 70% and 67% of the respective watershed areas had soil disturbances of varying degrees. Disturbance in the clearcut ranged from nearly 4% of the entire watershed having the forest floor intact but depressed by one pass of logging equipment, to 18% covered with wheel or track ruts into mineral soil. Logging disturbed the forest-floor soil horizons to the point where nearly 28% of the clearcut exhibited bare mineral soil (including scalped mineral mounds, mineral ruts, and bare rocks). At Hubbard Brook, soil disturbances from logging led to increases in sediment yield for decades. In control watersheds (where no cutting occurred) sediment yield was from 1-95kg/ha (average=25kg/ha) depending upon watershed and year. In the stripcutting it was 3-146kg/ha, and 3-208 kg/ha in the clearcut. At Coweeta, 50% increases in sediment yield were observed in the 5-15 year period after cutting. (Hornbeck et al. 2014)

c. Soil Chemical Status: Soil nutrient losses following clearcuts are dramatic. Average losses of nitrates in the Catskills in the 3 years following clearcuts were 256% in the O horizon and 744% in the B horizon, with peaks as high as 1405% and 3812% (O and B horizons, respectively) (McHale et al. 2007). For other nutrients, losses in the B horizon averaged 120% for calcium, 126% for magnesium, and 284% for potassium, along with 39% increases in sulfates. Changes of similar scales were observed at Hubbard Brook (McHale et al. 2008). Likens (1978) estimated it would take 100 years to recover the nitrogen lost in the 3 years following clearcuts.

At Coweeta, exchangeable Mg and K remained above pretreatment levels at 17 and 20 years after harvest. Total soil N and C in the upper soil horizons increased in the first 3 years by ≥50%. Soil N and C pools at Hubbard Brook were decreased by 17% and 27% at the 8th year due to reductions in mass of the forest floor.

d. Stream Water Nutrients/Nutrient Budgets: All three experimental treatments at Hubbard Brook caused stream water levels of calcium, potassium, hydrogen ions, and nitrates to increase, and sulfates to decrease dramatically. In the clearfelling at Hubbard Brook, calcium and potassium levels increased by several hundred percent and nitrates by several thousand percent in the first four years after cutting, followed by additional elevated levels for the 14 years studied (Hornbeck et al. 2014). Nitrate levels in stream water increased 3985% to 5528% in the first and second year after cutting, calcium 256% and 317%, magnesium 265% and 308%, and potassium 911% and 1458% (Likens 1970). Over 14 years, there was a cumulative increase of 54% in calcium output (relative to controls), 172% for potassium, 375% for nitrates, and 9% for sulfates (Hornbeck et al. 2014). Changes to stream nutrients were still measurable several decades after the clearcut took place (Likens 2004).

Major increases in hydrogen ion concentrations also led to significant increases in stream acidity in both the Catskills and Hubbard Brook. At Hubbard Brook a 5-fold increase in hydrogen ions resulted in a decrease in stream water pH from 5.1 to 4.3 in the first two years after clearfelling (Likens et al. 1970). A similar drop in stream pH occurred in the Catskills, from 6.0 to 5.6 (McHale et al. 2007).

e. Stream Invertebrates and Brook Trout: A recent study in the Catskills found major increases in mortality of brook trout following clearcuts (McHale et al. 2008), with 100% mortality in the first 7 days after logging, and 85% mortality the following year, compared to 0-15% mortality before clearcuts, and almost none in the controls. Mortality likely resulted from increased stream acidity and mobilization of Aluminum, which is toxic to the fish.

Three indices of stream invertebrate communities were also altered sufficiently in the Catskills to exceed the threshold for "slight impairment" of the site (McHale et al. 2008). These included total species richness, EPT richness (i.e., clear-water invertebrates such as mayflies, caddisflies, and stoneflies) and HBI (a measure of the tolerance of organisms to stream pollutants). There were also observed shifts in the species composition of stream invertebrates, including a decline in the gatherer feeding groups and an increase in the shredder feeding groups.

At Hubbard Brook, clearcutting reduced the species diversity of stream invertebrates, but increased their abundance (Hornbeck et al. 2014). At Coweeta, clearcutting was accompanied by a greater sediment load than at Hubbard Brook and impacted all aspects of the invertebrate habitat and community. By 16 years after clearcutting, benthic invertebrate abundance was still 3 times higher and invertebrate biomass and production was two times higher than in controls.

f. Combined Effects of Deer: In addition to the direct effects of clearcutting in the Catskills, indirect effects were also observed from deer herbivory, which suppressed vegetation

regeneration and the uptake of nutrients by plants (McHale et al. 2008), leading to nutrient increases in soil and stream water. Four years after the clearcutting, nitrogen uptake by vegetation in the open clearcut (with no deer exclosure) was only one-fifth of uptake by plants within the area of the clearcut protected by a deer exclosure.

Given just these brief summaries, the interpretation in the Plan of previous research and the assessment of potential impacts to hydrology are inadequate. All of the studies referenced found major and lasting impacts to water and soil quality to varying degrees, despite the adherence of logging activities to best management practices (BMPs) (Hornbeck et al. 2014). As in New Jersey, the best management practices for forestry activities in these other states (e.g. New Hampshire) call for buffers of 50' or more from streams depending upon slope and other considerations**.** ***However, given the known impacts of vegetation removal to water quality, buffers of 300' are required by New Jersey DEP regulations throughout the Highlands Preservation Area and along C1 streams.*** While the forestry BMPs are supposedly designed to reduce impacts to water quality, no evidence was provided to confirm that they are actually effective in doing so, and the sum of existing research suggests that major impacts are likely to result.

The Plan notes that the proposed clearcuts are generally smaller than the studies previously conducted, but this is not necessarily the case. The studies mentioned involved clearcuts ranging from approximately 100-300 acres, but the Plan's proposed acreages of lands to be clearcut and/or selectively logged range from a minimum of 15-60 acres per year to a maximum of 40-120 acres logged per year over the next ten years (for a total range of 361 acres to 891 acres impacted). In seven of the ten years in the plan, up to 90-120 acres may be logged per year. Whatever the size of the individual clearcuts, proportionate effects may be expected to impact stream and soil quality, and similar or greater cumulative effects as the previous studies may in fact be expected to occur at SMWMA, depending upon how many acres of land are logged over the ten-year period.

The many effects that were described in these studies were not caused solely by poorly maintained logging roads, as the Plan seems to suggest, but were the results of heavy machinery used throughout the sites to conduct the logging. How is it possible to avoid the documented impacts to soils, soil-water and stream-water quality without eliminating the use of heavy machinery? Are logging activities constantly supervised by state personnel to ensure compliance with the BMPs? What happens if an activity is discovered that was *not* done in accordance with the BMP manual? What penalties are imposed? Again, while the forestry BMPs are designed to reduce these types of impacts, there is no evidence that they are actually effective at doing so, and seem more suited to merely avoid the worst-case scenarios.

E. Management of Public Preserved Lands Must be Held to the Highest Standards.

The Plan fails to recognize that management of our public preserved lands must be held to the highest standards, in order to protect the natural and other resources (including cultural, scenic, historic, and recreational) for which these lands, through the expenditure of dedicated public monies, were preserved. As public preserved land located in the stringently protected Highlands Preservation Area, the Sparta Mountain WMA should be subject to the highest standards.

Public lands management must be exemplary. However, the Plan instead relies on BMP standards that are substantially less protective than the State's existing NJDEP rules that protect water and other resources in the Highlands region and elsewhere. The Plan not only disregards existing NJDEP Highlands Rules for the Highlands Preservation Area, it also ignores NJDEP rules for Stormwater Management, Stream Encroachment, Category 1 Streams, and Freshwater Wetlands that apply throughout the State. Although SMWMA is located in the Highlands region, the Highlands Regional Master Plan goals, policies, objectives, comprehensive set of technical supporting documents, and implementing ordinances recommended for municipalities are unrecognized and ignored by the Plan.

Private applicants are required to comply with the NJDEP rules on their private lands. However, the Plan makes no attempt to satisfy existing regulatory standards. How can the NJDFW be excused from complying with rules that apply to everyone else on their private lands—when it should be setting the highest standards?

F. Highlands Policies to Protect Critical Water Supply

Below are New Jersey DEP rules and Highlands Regional Master Plan policies that protect water quality and water supply. The Plan fails to comply with these rules:

1. New Jersey Highlands Water Protection and Planning Act: Includes statutory buffers on all Highlands waters in the Preservation Area.

> b. The Highlands Preservation Area approval shall also require:
> (1) a prohibition on major Highlands development within 300 feet of any Highlands open waters, and a 300-foot buffer adjacent to all Highlands open waters; provided, however, that this buffer shall not extend into the planning area. (http://www.nj.gov/dep/highlands/docs/highlands_bill.pdf)

2. Highlands Act NJDEP regulations:

(a) There shall be a 300-foot buffer adjacent to Highlands open waters in which no disturbance is permitted, except as provided in this chapter.

7:38-1.4 Definitions: "Highlands open waters" means all springs, streams including intermittent streams, wetlands, and bodies of surface water, whether natural or artificial, located wholly or partially within the boundaries of the Highlands Region, but shall not mean swimming pools.

"Highlands resource areas" means those features of the Highlands that merit special protection pursuant to N.J.S.A. 13:20-32b such as Highlands open waters; flood hazard areas; steep slopes; forested areas; rare, threatened or endangered species habitat; rare or threatened plant habitat; areas with historic or archaeological features; and unique or irreplaceable land types.

"Impervious surface" means any structure, surface, or improvement that reduces or prevents absorption of stormwater into land, and includes porous paving, paver blocks, gravel, crushed stone, decks, patios, elevated structures, and other similar structures, surfaces, or improvements.

"Major Highlands Development" means… 3. Any activity undertaken or engaged in the preservation area that is *not* a development but results in the ultimate disturbance of one-quarter acre or more of forested area or that results in a cumulative increase in

impervious surface by one-quarter acre or more on a lot; or 5. Any capital or other project of a State entity or local government unit in the Preservation Area that requires an environmental land use or water permit or that results in the ultimate disturbance of one acre or more of land or a cumulative increase in impervious surface by one-quarter acre or more. <http://www.nj.gov/dep/rules/rules/njac7_38.pdf>

3. Highlands Regional Master Plan – Goals, Policies and Objectives:

RMP Policy 1D4 – Highlands Open Waters buffers:

> "Highlands Open Waters shall include a protection buffer of 300 feet from the edge of the discernable bank of Highlands Open Waters feature, or from the centerline where no discernable bank exists. With respect to wetlands and other Highlands Open Waters features (e.g., seeps, springs, etc.), the feature shall include a protection buffer of 300 feet from the delineated Letter of Interpretation (LOI) line issued by the NJDEP for wetlands, or from a field- delineated boundary for other features. In areas where existing development or land uses within the protection buffers have reduced or impaired the functional values of the buffers, the Council will seek opportunities to restore the buffer and its functions. Any proposed disturbance shall, through local development review and Highlands Project Review, comply with Highlands Open Waters buffer standards (page 142)."

4. NJDEP Stormwater Management Rules—C1 300-foot buffers (NJAC 7:8-5.5):

Category-1 waters in the Sparta Mountain WMA area include Franklin Pond Creek in Hardyston, Sparta Glen Brook, and Russia Brook tributaries.

(h***) Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC 14 drainage.*** These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:

1. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:

i. A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of bank outwards or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession is provided. (http://www.highlands.state.nj.us/njhighlands/master/rmp/final/highlands_rmp_112008.pdf)

5. NJDEP Flood Hazard Rules —300-foot buffers for C1 riparian zones (NJAC 7:13-4.1):

(c) The width of the riparian zone along each regulated water described in (a) above is as follows:

1. The riparian zone is 300 feet wide along both sides of any Category One water, and all upstream tributaries situated within the same HUC-14 watershed;

(d) The riparian zones established by this chapter are separate from and in addition to similar zones or buffers established to protect surface waters. For example, the Stormwater

Management rules at N.J.A.C. 7:8 and the Highlands Water Protection and Planning Act rules at N.J.A.C. 7:38 establish 300-foot Special Water Resource Protection Areas and buffers, respectively, along certain waters. Furthermore, the Freshwater Wetlands Protection Act rules at N.J.A.C. 7:7A establish 50-foot and 150-foot transition areas along freshwater wetlands and other features that are also regulated under this chapter. Compliance with the riparian zone requirements of this chapter does not constitute compliance with the requirements imposed under any other Federal, State or local statute, regulation or ordinance. (http://www.nj.gov/dep/rules/rules/njac7_13.pdf)

6. NJDEP Freshwater Wetlands Regulations—Exceptional Resource Value Wetlands 150-foot transition areas (7:7A-7.5):

- General provisions for individual permits
- Additional requirements for a non-water dependent activity in a wetland or special aquatic site
- Additional requirements for a non-water-dependent activity in exceptional resource value wetlands or trout production waters

(d) The standard width of a transition area adjacent to a freshwater wetland of exceptional resource value shall be 150 feet. This standard width shall only be modified through the issuance of a transition area waiver. The types of transition area waivers are listed at N.J.A.C. 7:7A-6.1(a). (http://www.nj.gov/dep/rules/rules/njac7_7a.pdf)

7. Vernal Pool Protection: RMP Policy 1F1.3, Critical Habitat shall be: Vernal pools, defined as NJDEP-certified vernal pools plus a 1000-foot protection buffer.

The level of protection of vernal pools proposed in the Plan is both indefinite and unacceptable. By relying on a Vermont NRCS document* that is directed towards management of *private forestlands and suggests flexible levels of protection*, the Plan fails to utilize the 1000-foot buffer standard set forth in the Highlands Regional Master Plan, Policy 1F1.3, page 147-148.

Highlands Regional Master Plan: PART 1, NATURAL RESOURCES, SUBPART D, CRITICAL HABITAT:

> "…There are three categories of Critical Habitat in the Highlands Region: 1) Critical Wildlife Habitat (habitat for rare, threatened, or endangered species); 2) Significant Natural Areas (regionally significant ecological communities, including habitat for documented threatened and endangered plant species); and ***3) Vernal pools (confined, ephemeral wet depressions that support distinctive, and often endangered, species that are specially adapted to periodic extremes in water pool levels).*** Critical Wildlife Habitat and Significant Natural Areas are designated based on the presence of, and associated habitat required for the survival and propagation of, species of concern***. Vernal pools are certified by the NJDEP, and to protect and promote the biodiversity of vernal pools, the Highlands Council has determined that a terrestrial habitat protection buffer of 1,000 feet around vernal pools will generally address the habitat requirements of vernal pool-breeding wildlife."*** Further discussion of vernal pools can be found on page 27 of the RMP.

*The Vermont NRCS *(Vermont Biology Technical Note 1, Vernal Pool Habitat in Conservation Planning, Vermont NRCS, Updated 2010)*)

G. Birds and Wildlife

1. Birds: With regard to birds and other wildlife, the Plan fails to present scientific evidence to justify its goals to "create greater balance among the stages of forest succession throughout the property" and "establish up to 10% of property as young forest stands" (as stated in Sec. 1.1 of the Plan). Other than vaguely stated goals of improving forest "health" and "resiliency" (terms that are never defined), one of the few specifically discussed justifications for the logging proposed in the Plan is the enhancement of habitat for the State Endangered Golden-winged Warbler (GWWA) and other bird species that share its "young forest" habitat. In this regard:

The Plan fails to recognize that habitat for GWWA is *not* a limiting factor in NJ, since many sites that this species formerly occupied are no longer used, even though they still appear to be suitable. An analysis of land use/land cover data for the region indicates that potential habitat for GWWA and other early successional/young-forest bird species (indicated in the plan to be <3% on public land "within relative proximity" to SMWMA) is *not* limiting regionally—considerably more habitat is available than the plan indicates:

Percentages of Habitats in SMWMA Region:

Habitat Type	Sparta Mtn. WMA	Morris Co.	Sussex Co.	Highlands	Northern NJ
FOREST >50% canopy	92.7	87.6	84.6	84.2	84.1
FOREST 10-50% canopy	1.8	5.7	6.0	7.2	7.3
FOREST BRUSHLAND	0.0	3.1	5.7	3.0	5.3
OLD FIELD (<25% BRUSH)	0.6	1.7	3.0	2.0	0.6
UNDEVELOPED RIGHT-OF-WAY	5.0	1.9	0.7	1.3	1.1
Total % Early Successional/Young Forest Habitat	**7.4**	**12.4**	**15.4**	**13.5**	**14.3**

The Plan also fails to recognize that SMWMA itself is unsuitable for the management of GWWA habitat. To minimize completion and hybridization with Blue-winged Warbler, the *Golden-winged Warbler Status Review and Conservation Plan* describes appropriate landscape conditions for GWWA as "generally *above 1300 ft.*…avoid[ing] valleys and…lower elevations with areas of known co-occurrence with Blue-winged Warbler." The *Conservation Plan* further indicates that its management guidelines should NOT be applied in "places where Blue-winged Warbler [BWWA] populations co-occur and management for GWWA might hasten BWWA invasion of GWWA territories, increasing the probability of hybridization." Because the highest elevations on SMWMA barely exceed 1300 feet (on mountaintops presumably too steep for logging) and because Blue-winged Warblers are *already breeding* on SMWMA, the SMFSP's proposed attempt to establish a successful, long-term, breeding population of GWWAs within artificially created habitats on SMWMA would very likely fail.

The Plan fails to include any baseline data for onsite wildlife populations and thus precludes any ability to evaluate the results of any of its treatments, in terms either of "forest

health" or of the responses of GWWA and other wildlife to those treatments. It is irresponsible to propose such drastic impacts to a publicly owned forest ecosystem without also planning to carefully monitor the results in order to intelligently guide future adaptive management.

The Plan fails to present any evidence that ongoing habitat management for GWWA on surrounding properties since 2009 (Sec. 2.11, p. 17) or in the entire Appalachian Region—following the same silvicultural techniques prescribed here—has been successful by any measurement. Since improvement of the status of GWWA in NJ (as well as that of other bird species for which the plan describes GWWA as an "umbrella") is presented as the reason "we need to purposefully create" early successional habitat (ESH) by logging (p. 28), the lack of any evidence that this approach actually works is a glaring omission. Publicly owned forest that is mature and healthy enough to support New Jersey's full suite of forest-interior birds, mammals, reptiles, amphibians, and invertebrates, as well as the headwaters of our most pristine streams, should not be subjected to the severe impacts of commercial logging in a feckless attempt to retain a species whose future unfortunately does not appear to lie in New Jersey.

The Plan fails to assess the current status of forest-breeding birds on the SMWMA and does not discuss potential impacts to them. The extensive forests of northwestern NJ are critical habitat for many area-sensitive species of both resident and migrant forest-breeding bird species. Their populations on SMWMA should have been surveyed and the potential impacts to them should have been calculated to determine whether the purported gains for bird species of early successional habitats could reasonably be said to adequately compensate for the direct loss of nesting habitat for forest-breeding birds.

The Plan fails to acknowledge that SMWMA is home to numerous forest-breeding raptors (eagles, hawks, vultures, and owls). Preposterously, on page 22 of the Plan it is stated that no documented records exist of raptors currently nesting on SMWMA. This statement is refuted by information from DEP that is provided elsewhere in the plan itself. The NJ Natural Heritage Program Report in the Plan (Appendix 17.1, summarized in Table 2) lists 6 species of rare raptors that have been documented from the site. Furthermore, the NJDEP GeoWeb map lists 7 species of rare raptors from SMWMA, and New Jersey Audubon's own website states that "The combined State and NJA wildlife sanctuary is a haven for a number of State-listed wildlife species including Northern Goshawk, Red-shouldered Hawk, [and] Barred Owl…" and also mentions breeding Cooper's Hawk and Broad-winged Hawk. And of course the commoner species of raptors (Great Horned Owl, Screech Owl, Turkey and Black vultures, and Red-tailed Hawk), certainly nest there. A comprehensive survey of raptor nests should have been conducted by experienced ornithologists at the appropriate time of year (February to June) prior to development of the plan, so that the proposed treatment of any stand found to contain one or more nests could have been modified ***to avoid all disturbance for as long as the nest is active.*** The plan only proposes to temporarily stop work if a raptor nest or territorial behavior is observed (by whom—the loggers?); however even if they are not disturbed in their current nesting season, raptors are likely to abandon a nest site if they return the following season only to find that the forest around the nest tree has been cleared. E.g., Penteriani and Faivre (2001) found that Northern Goshawks abandoned nest sites when the original forest stand structure was altered by >30%. Since at least some raptors may be nest-site-limited (e.g., Barred Owl by the need for large cavities, large hawks by the need for trees with suitable branch configurations), those that are displaced by forest clearing may experience difficulty in finding new nest sites nearby, so that their breeding populations on the SMWMA may be reduced.

The Plan fails to note that at least 2 species of birds that are State-listed as Special Concern (Hooded Warbler and Black-throated Blue Warbler) and that are documented as breeding on SMWMA (NJDEP, GeoWeb map) are known to nest in areas dominated by Mountain Laurel. The SMFSP states (p. 40, Stand 2 description/prescription) that "interfering understory plants" (likely the Mountain Laurel mentioned in the Operability section of the stand description) will be removed because they "inhibit the development of more diverse vegetation." Before a prescription was developed for this stand, the Mountain Laurel thickets should have been surveyed to determine whether they support SC bird species. And since this is the ***only*** stand where Mountain Laurel is mentioned as growing, this species itself apparently represents a unique element of vegetation diversity on SMWMA that should have been slated for preservation.

Although the Plan declares (p. 19) "It is clear that in regard to NJDFW, the best opportunity to manipulate or curtail population declines reside within the wildlife management areas that they control," the plan fails to acknowledge that management of *open* habitats (i.e., hunting fields) on DFW lands would be at least equally effective in managing for "young-forest" or ESH bird species and would not involve the extensive impacts involved in cutting mature forests. Simply by letting some fields undergo succession, the proposed results could be obtained with *no* adverse impacts to water quality, forest soils, forest-interior vertebrate and invertebrate wildlife, rare plants, and neighboring human communities. The *GWWA Status Review and Conservation Plan* identifies "management of old fields" as a management technique that should be investigated in addition to commercial forestry (Table 2-1). Although it is doubtful that enough such open habitat exists at the current elevation required for GWWA, the other ESH bird species that the plan's developers are targeting would certainly benefit from more structural diversity in the fields and forest edges of NJDFW's other WMAs.

The Plan proposes to create a total of 110-310 acres of "Early Successional Habitat" and to manage 140-335 acres "for the development of "Old Growth" conditions, or in some cases, "Climax Forest" conditions" over 10 years, claiming that this "will ensure the longevity of species breeding in mature forests while allowing for the eventual recovery of species breeding in young forests" (p. 21). The plan fails to provide any evidence from the scientific literature to support these two claims. Certainly the comparatively paltry acreage of ESH would hardly be enough to "recover" these species in NJ, much less in the entire Appalachian Region, in which the Plan's developers claim these species are declining. And since the SMWMA forest is *already* supporting the full suite of New Jersey's forest-breeding birds, including the top predators (whose presence is an excellent indicator of the health of the ecosystem)**,** it does not need human intervention to improve its condition.

One of the "species breeding in mature forests" that would supposedly benefit from the Plan—highlighted in NJDFW Senior Zoologist, Sharon Petzinger's background presentation to the Highlands Coalition Natural Heritage Committee—was Wood Thrush. However, Rosenberg, et al. (2003) cite the findings of other authors, which are decidedly unsupportive: Robinson and Wilcove (1994) state that for Wood Thrush management "low-volume selective logging is preferable to clear-cutting" (the "seed-tree harvests" of this plan amount to clear-cutting), and Annand and Thompson (1997) found that "Wood Thrushes were most abundant in mature forest stands when compared with forest stands harvested by clearcut, shelterwood, group selection, and single-tree selection forest regeneration methods," adding that "[c]lear cutting and heavy selective cutting are not recommended for thrush management."

Page 21 of the Plan states that the proposed silvicultural treatment schedule "will ensure the longevity of species breeding in mature forests while allowing for the eventual recovery of species breeding in young forests"; however, the Plan does not mention whether/how bird populations will be monitored following the proposed treatments to forest stands. Nor does it provide baseline data (i.e., before treatments) identifying the bird species inhabiting SMWMA and their abundance. The Plan therefore has no way to evaluate the "success" of its treatments with regard to bird species breeding in mature forests.

Page 24 of the Plan asserts that a mosaic of habitats is important for the success of "old growth" bird species and that

> "Management emphasizing these needs will benefit numerous other species, including those not generally considered dependent on Early Successional Habitat (ESH). Studies are now finding that many forest interior species utilize ESH during post-fledging periods because of the increased insect and forage diversity found there (Stoleson 2013) (page 28)."

However, there are no published studies that have analyzed whether populations of mature forest bird species ***benefit*** from such ESH patches (only that they **use** them)—that is to say, no evidence exists that populations have increased due to the creation of ESH patches (above what they would be in the absence of such patches). In determining the importance of such ESH patches to mature forest birds, has the Plan accounted for existing ESH patches within the landscape-at-large (e.g., at the edges of the forest along the maintained Rights-of-Way, at the forest edges, and in isolated patches beyond the forest, both within and outside SMWMA)? The ultimate ecological question is: What is the optimal proportion of ESH to mature forest within the larger landscape for mature forest birds? Creation of additional ESH within SMWMA may not significantly increase populations of mature forest birds, as the Plan asserts, at least not to the point of offsetting any potential detriments that creation of ESH may have on the nesting success of mature forest birds during the breeding/nesting portion of their life cycle.

In addressing this question, it would be helpful to have data on the size and frequency of existing canopy gaps within SMWMA. Yet the Plan does not provide this information. Small canopy gaps form as trees of lesser dominance die in the face of competition and the forest "self-thins." Large canopy gaps form when larger canopy trees are snapped off mid-way up the trunk or when root-mass upheavals occur during storms. A variety of natural gaps already exist in the SMWMA forest, and the rate of formation of those gaps appears to be increasing, as in Stand 21. The background presentations given by NJDFW attest that nearly all the forest stands in SMWMA are between 60-99 years old, with no forest stand older than this age class. There are significant problems with this conclusion.

First, there are legacy trees in almost every forest stand within SMWMA that are well over 100 years old, and these trees may occupy ecologically-important portions of the forest canopy. The sampling techniques that are used to collect data on forest age measure far too few trees to present an accurate picture of the forest age, especially from an ecological point of view. Evidently, as few as 3 trees are actually aged over many dozens of acres. This method is skewed toward encountering the more frequent, younger canopy trees and missing the less frequent, older trees. These techniques may be helpful toward determining economic considerations about wood productivity in the forest, but they have far less relevance ecologically. The forest at SMWMA has trees distributed throughout most of its habitat patches that are much older than 100 years, and the claim that the entire forest is middle-aged is very misleading.

Second, even if the forest stand ages were depicted accurately, subjectively grouping forest stand ages into one, large, 40-year interval between 60 and 99 years is also misleading. There is an enormous ecological difference between a 60-year-old forest and a 100-year-old forest, as a forest approaching 100 years of age does not require any manipulation in order to rapidly acquire old-growth characteristics and an uneven age distribution. This 40-year category conceals the heterogeneity that already exists at SMWMA.

Third, and most disturbing, this subjective and simplified categorization of forest stand age relies on little data, conceals the ecological heterogeneity of the forest stands, and yet is used as the major justification for the need to manipulate the forest using logging techniques. No ***ecological*** thesis regarding forest succession and maturation, the complex relationships between tree canopy, forest gaps, patch dynamics, age structure of the forest, and foraging patterns of rare birds should ever be based on such a simplistic model that takes into account nothing but the age of a few trees. Next, we discuss a detailed analysis of the bird species presented as in need of the proposed forestry measures at SMWMA.

We strongly disagree with the NJ Division of Fish and Wildlife assertion that 23 species of birds will be beneficiaries of the proposed management activities (creation of young, early successional forest habitat and forest thinning) at Sparta Mountain Wildlife Management Area. Here we present a detailed discussion of the merits of that argument. Our conclusion is that of those 23 species, only 5 species may benefit. For 18 species, SMWMA is either completely inappropriate as a site to manage for those species, they do *not* occur there, or they are of no conservation concern in New Jersey. Yet 14 forest bird species that will be negatively impacted by logging, all of which are defined as rare by the NJ Endangered and Nongame Species Program, are not considered in the Plan or in the background documentation for the Plan, and most likely will be harmed by the proposed Plan.

These species (tables 1 and 2 below from the background and basis presentation entitled "Forest Management on Sparta Mountain) were listed as additional justifications for the need to create "young forest" and "thinned, uneven-age class forest," out of the existing mature and maturing forests of SMWMA. These species are listed as declining species in Appalachian Mountain Region 28 of the North American Breeding Bird Survey. The background and basis presentation was given to the New Jersey Highlands Coalition Natural Heritage Committee on January 29th, 2016, in support of the Forest Stewardship Plan developed by New Jersey Audubon Society, for SMWMA, owned by the NJ Division of Fish and Wildlife. Tables 1 and 2 are reproduced here, and following each table is a discussion of whether there is a need to consider management for those species at SMWMA.

TABLE 1:

Early Successional or Scrub bird species declining according to the Breeding Bird Survey

Appalachian Mountains (BCR 28)

North American Breeding Bird Survey Species Group Summary Results
Successional or Scrub Breeding
Period: 1966 - 2011

Golden-winged warbler (Sharon Petzinger)

Field Sparrow (Blaine Rothauser)

Brown Thrasher (NWTF)

Species	Trend	N routes
Golden-winged Warbler	-8.1	165
Prairie Warbler	-3.7	282
Nashville Warbler	-3.1	51
Field Sparrow	-3.0	351
Indigo Bunting	-1.4	352
Common Yellowthroat	-1.0	352
Eastern Towhee	-1.0	352
House Wren	-0.8	306
American Goldfinch	-0.7	351
Yellow Warbler	-0.6	330
Brown Thrasher	-0.5	351

Significant declining trends P<0.05

Prairie Warbler (Sharon Petzinger)

Indigo Bunting (Kristin Mylecraine)

Eastern Towhee (Blaine Rothauser)

Nashville Warbler: Special Concern in NJ based on NJ ENSP Delphi Review

Nashville Warbler is not likely to occur at SMWMA; its documented breeding occurrences in NJ are farther north (Benzinger, J. and S. Angus. 1992. Breeding birds of the northern New Jersey Highlands. *New Jersey Audubon Society Records of New Jersey Birds* 28(2): 22-41). Nashville Warbler is a northern species, at the extreme southern end of its breeding range in northern NJ. This species is probably in decline in NJ, but SMWMA is the wrong place to attempt to create habitat for this species. In the face of global warming, it is virtually impossible that Nashville Warbler would be capable of expanding its breeding range to the south in NJ.

Field Sparrow: Stable in NJ based on NJ ENSP Delphi

The Field Sparrow requires fields and clearings, *not* overgrown with thickets of regenerating young forest, and it is widespread and uncommon/common throughout the NJ Highlands (Benzinger, J. and S. Angus. 1992. Breeding birds of the northern New Jersey Highlands. *New Jersey Audubon Society Records of New Jersey Birds* 28(2): 22-41.).

Field Sparrow is common in NJ. If it is actually declining here, which it probably is not, there is no reason to create habitat for Field Sparrow at SMWMA. Forests would have to be converted to non-forest, as is done in the frequently-herbicided transmission line Rights-of-Way that have become widespread throughout NJ. The place to manage for Field Sparrow in NJ is throughout the large patches of preserved agricultural lands, or on agricultural lands leased to farmers by the NJ Division of Fish and Wildlife. Creation and maintenance of Field Sparrow

habitat is in direct conflict with the creation of early successional forest habitat. The Field Sparrow cannot be used as justification for clear-cuts in the maturing forests of Sparta WMA.

Prairie Warbler, Eastern Towhee: Stable in NJ based on NJ ENSP Delphi
Brown Thrasher: Special Concern in NJ based on NJ ENSP Delphi

The strongholds for these three species in New Jersey are in southern NJ's Pine Barrens. Eastern Towhee is abundant throughout, Prairie Warbler is abundant to common in the vast Pitch Pine /Shrub Oak community, and Brown Thrasher is locally abundant, as in the Pygmy Pines and any area rebounding from wildfire. Forest management for these species in the NJ Highlands is not warranted at this time. In the absence of wildfires, all three species, especially the Prairie Warbler and Brown Thrasher, can be increased in the Pine Barrens by ***ecological*** burning, which will also benefit scores of rare plant and animal species, with virtually no risk of unintended effects on rare species of interior forest plants and animals. To imply that the maturing, closed-canopy forests of the New Jersey Highlands should undergo seed tree harvests (clear-cuts) to benefit these 3 species, while risking impacts to dozens of forest-interior plant and animal species in the process, does not make ecological sense. In northern New Jersey, conducting prescribed fires on the hundreds of state-owned acres of post-agricultural, weedy forests, filled with invasive shrubs such as Autumn Olive, Multiflora Rose, various Asian Honeysuckle species, and many other invasive shrubs and vines would result in vast increases of these three species, with virtually no chance of collateral damage to rare forest species.

Common Yellowthroat, House Wren, American Goldfinch, Yellow Warbler, Indigo Bunting: All Stable in NJ based on NJ ENSP Delphi

These 5 species are abundant or common throughout New Jersey. They breed in a wide variety of upland and wetland habitats, including in suburbia, and along the edges of the vast majority of forest fragments throughout the preserved agricultural landscape of New Jersey. They are also fairly common even within large patches of contiguous forest throughout New Jersey. For the NJ Division of Fish and Wildlife to have included these 5 common, generalist species in the background rationale for the need to create early successional habitat out of mature forest, within the vast forests of the NJ Highlands, is unjustifiable. These species require no active management anywhere in New Jersey. Thus, outside of the special case of the state-endangered Golden-Winged Warbler, there is no reason to consider the other 10 species of birds presented in Table 1 for forest management in SMWMA.

Our other area of concern is related to the forest-dwelling species that are listed by the Breeding Bird Survey (BBS) as in decline in the Appalachian Region 28. These species are alluded to as benefitting from somewhat selective logging regimes in the Plan. In these methods, known to foresters as Shelterwood and Single-Tree Harvest, patches of mature trees, single trees of varying ages, or patches of middle-aged trees are removed from the forest to create large, sunny gaps in the canopy, stimulating changes in forest composition near the forest floor.

Table 2 lists 13 species supposedly in decline and in need of benefits from the abovementioned logging practices.

TABLE 2:

Woodland species declining according to the Breeding Bird Survey

Appalachian Mountains (BCR 28)

North American Breeding Bird Survey Species Group Summary Results

Woodland Breeding

Period: 1966 - 2011

Cerulean Warbler (Blaine Rothauser)

Least Flycatcher (Anonymous)

Ruffed Grouse (NWTF)

Species	Trend	N routes
Cerulean Warbler	-2.9	201
Eastern Wood-pewee	-2.8	351
Least Flycatcher	-2.1	206
Wood Thrush	-1.8	352
Black-billed Cuckoo	-1.8	260
Kentucky Warbler	-1.4	253
Eastern Screech-owl	-1.4	144
Black-and-white Warbler	-1.3	312
Ruffed Grouse	-1.2	156
Acadian Flycatcher	-1.0	300
Great Crested Flycatcher	-0.9	350
Yellow-billed Cuckoo	-0.9	349
Blue-gray Gnatcatcher	-0.8	325

Significant declining trends P<0.05

Eastern Wood-pewee (Anonymous)

Wood Thrush (Anonymous)

Black-and-white Warbler (Blaine Rothauser)

Blue-gray Gnatcatcher, Yellow-billed Cuckoo, Great Crested Flycatcher, Acadian Flycatcher, Black-and-white Warbler, Eastern Screech Owl, and Eastern Wood Pewee are listed as Stable by the NJDEP, and therefore require no management activities at this time in the core forests of the NJ Highlands. Kentucky Warbler very rarely breeds this far north in NJ.

The 5 remaining species in the above table might benefit from some of the forest thinning that has been proposed: Cerulean Warbler, Wood Thrush, Black-billed Cuckoo, Least Flycatcher, and Ruffed Grouse. The warbler, thrush, and cuckoo are listed as Special Concern species by the NJDEP Endangered and Nongame Species Program. Ruffed Grouse has no status, because it is a game species. All 5 species, if present, already benefit from the miles of maintained powerline edge that bisects SMWMA for high-light-intensity forest-understory conditions that are the proposed benefit of further canopy openings. Conducting aggressive forestry away from the powerline Rights-of-Way is far too risky an undertaking, given that the 13 species listed in the following paragraph will suffer negative impacts.

Missing from the NJDEP justification for this proposal are the following 13 species of New Jersey's Endangered, Threatened, and Special Concern bird species, all known to dwell in and near SMWMA, and to require closed-canopy forest (or nearly closed, with small gaps from fallen trees). 11 of these species would be negatively impacted by proposed forestry:

Barred Owl (Threatened)
Red-Shouldered Hawk (Endangered),
Parula Warbler (Special Concern)
Worm-eating warbler (Special Concern)
Canada Warbler (Special Concern)
Blue-headed Vireo (Special Concern)
Black-throated Green Warbler (Special Concern)
Black-throated Blue Warbler (Special Concern)
Blackburnian Warbler (Special Concern)
Hooded Warbler (Special Concern)
Winter Wren (Special Concern).

Another approach to this analysis is as follows, using the USGS Breeding Bird Survey data for *New Jersey only* to test some of the claims made by NJDFW in their public presentations regarding this topic. We investigated whether the NJDFW claim that early-successional bird species are declining more than forest-interior birds was true for NJ in particular (not for the Appalachians as a whole), and whether the long-term trends presented (1966-2011) were also true for short term (the past decade). On average, the trends for NJ were consistent with the Appalachian region prediction, (i.e., forest birds are increasing 0.85-2.3%/yr and the early-successional birds are declining -0.97-1.0%/yr from 1966-2013, and 2.1-4.4%/yr and -5.1-5.5 %/yr (respectively) from 2003-2013).

However, important information from the same survey data was left out of the NJDFW presentation: specifically, that early-successional bird species are the most abundant of any group in the State. Depending upon how you classify the species by habitat (some also occur in forests), an average of 18-19 individual birds per species of early-successional species were found in each survey, compared to 2.3-2.8 individual birds per species of forest-interior birds (forest birds tolerant of edges were at 3.3-15 birds/species). The early-successional birds were even far more abundant than generalist birds that are not habitat-specific (8.6 birds/species). By contrast, forest-interior birds were the *least* abundant in the State, except for grassland birds (0.59 birds/species) which are all rare, Threatened, or Endangered (Chandler 2012) (Dunford 2004) (Ontario Ministry 2000) (Rittenhouse 2010).

Based on these survey results, we are proposing to destroy with clearcuts, or degrade with less-aggressive forestry harvests, the key habitats for the rarest forest species in the State, in the interest of benefiting a suite of early-successional species that are already the most abundant. Yes, there are small negative trends for early-successional species, but largely for birds that are far more abundant (e.g., Field Sparrows and Eastern Towhees) than the forest-interior birds. It is highly questionable that these minor, usually statistically insignificant, trends in New Jersey warrant widespread logging to create habitat for relatively common species, at the expense of much rarer forest-interior species.

2. Other Wildlife

a. Rare Plants: The Plan fails to adequately protect rare plants. Although a rare-plant survey was conducted, the stand descriptions do not indicate which stands include rare plants. This is critical information needed to evaluate the feasibility of logging a given stand. A buffer of 50 feet is proposed between rare plants and "intense management activities" (p. 22, point 2a). However, a 50-foot buffer is extremely unlikely to retain the microclimate required by rare plants growing in forested areas; therefore these

plants would probably be lost. On pp. 26-27 the "considerations" proposed to be given to rare plants include the establishment, maintenance, and documentation of a Representative Sample Area (RSA) "preserved in a fixed location, within the eco-region [or Forest Management Unit], of similar size, distribution and abundance..." What this process entails is not made clear: Does "establish" mean that they will transplant the rare plant(s) to another location not subject to logging? Transplantation of wild plants has an extremely low success rate. Will they find another stand of the same plant elsewhere and preserve that? What if the RSA is already on preserved land? What if no other occurrence of the same plant can be found? Who will pay for the search for other occurrences of rare plants? Who will buy property needed to "establish" RSAs? For how long will the responsibility to maintain and document the RSA run, and who will be responsible? Can an example be provided of where a rare plant has been "preserved" this way in NJ?

b. Herpetological Review: Although numerous species of listed reptiles and amphibians are mentioned in the Plan, very minor avoidance and mitigation for impacts to these species appear to be proposed. Similarly to rare plant species, reptiles and amphibians (herptiles) cannot run or fly out of harm's way. Some herptiles can move short distances to get out of immediate danger (frogs, snakes, lizards and some turtles) but generally their main defense is camouflage and cryptic placement in the landscape. Including the species listed, nearly 50 herptile species are likely to inhabit SMWMA. These animals occur in both upland (terrestrial) and wetland (aquatic/semi-aquatic) habitats. Some herptiles use niche habitats that occur on Sparta Mountain (e.g. federally threatened Bog Turtle, State Threatened Longtail Salamander). These niche habitats are easily impacted temporarily *and* permanently. The habitats and the herptile species that utilize them will be disturbed both directly and indirectly during the implementation of this Plan. Temporary, indirect disturbance to a niche habitat can also eliminate a population of a specialized herptile.

In regard to other wildlife and ecological features in Section 2.9, on page 15: The plan fails to indicate (1) which stands include or are near vernal ponds, and (2) which of the buffer zones recommended in Vermont Biology Technical Note 1 will be implemented to protect vernal ponds. The referenced Technical Note mentions both 400-foot and 600-foot zones, 600 feet obviously being more protective -- but still not fully protective -- of salamanders and frogs that can spend most of the year 1000 feet or more from their breeding ponds. On page 39 the plan does mention 900-foot buffers from vernal pools, but these are to be observed only between March 1 and August 31, even though vernal-pool amphibians are permanent residents in this zone. These amphibians -- and the invertebrates they feed on -- would be severely impacted by the movement of heavy machinery and logs over the forest floor, and by the disruption of the forest microclimate caused by timber removal. Given that the NJ GeoWeb maps "vernal habitats" as 1000-foot-radius circles from each vernal pond, the Plan should have specifically declared that similar areas would be completely off-limits to timber-harvest activities and any associated movement of heavy machinery.

NJ State Listed Species of Concern: Reptiles
Timber rattlesnake (*Crotalus horridus horridus*) – Endangered
Northern Copperhead (*Agkistrodin contortrix mokasen*) – Threatened**
Wood Turtle (*Glyptemys insculpta*) – Threatened (petitioned to be federally listed)
Bog Turtle (*Glyptemys muhlenbergii*) – Endangered (Threatened Federally)
Spotted Turtle (*Clemmys guttata*) – Special Concern

Eastern Box Turtles (*Terrapene carolina carolina*) – Special Concern
Smooth Greensnake (Opheodrys vernalis) – Special Concern**
Amphibians
Longtail Salamander (*Eurycea longicauda longicauda*) – Threatened (1)
Blue-spotted Salamander (*Ambystoma laterale*) – Endangered*
Spotted Salamander (*Ambystoma maculatum*) – Special Concern**
Jefferson Salamander (*Ambystoma jeffersonianum*) – Special Concern**
Marbled Salamander (*Ambystoma opacum*) – Special Concern**
Northern Spring Salamander (*Gyrinophilus porphyriticus porphyriticus*) – Special Concern**
Atlantic Coast Leopard Frog (*Lithobates (Rana) kaufffeldi*) – Undetermined**
Northern Cricket Frog (*Acris crepitans*) – Endangered in NY State (Warwick, Orange County) Declining NJ
(1) Not on FMP list, on NJ Audubon's list of species occurring on Sparta Mountain (http://www.njaudubon.org/SectionConservation?NJAUstaffedWildlifeSanctuaries/SpartaMountain.aspx)
** occurs within Wallkill River Watershed*
***recent status change through Delphi process (12/15/15) and accepted by ENSP Advisory Committee 1/7/16*

The Plan fails to discuss potential impacts to the rare species of reptiles and amphibians documented from SMWMA. Listed in Table 2 of the Plan are Bog Turtle (E) (T federal), Wood Turtle (T), Eastern Box Turtle (SC), Longtail Salamander (T), Jefferson Salamander (SC), Timber Rattlesnake (E), and Northern Copperhead (SC). These are ground-dwelling, slow-moving species that are extremely vulnerable to direct mortality from logging activities and to indirect impacts from clearing of forest habitat. Other than proposing logging in wetlands to improve basking habitat for Bog Turtle (with no mention of whether this was approved by USFWS), and claiming that loggers will use caution to avoid hitting basking snakes, the plan generally ignores potentially severe impacts to reptiles and amphibians.

i. Bog Turtle: Bog Turtle was listed by the US Fish and Wildlife Service (USFWS) as a Threatened Species in 1996 under the US Endangered Species Act of 1973 (ESA) (16 USC 1531-1544) and is listed as Endangered in NJ under the statutes of the NJ Endangered and Nongame Species Conservation Act (ENSCA) (NJ ST 23:2A-1 to 23:2A-1:15). Once a species is listed under the ESA, Section 9 makes it unlawful for any person—including private and *public* entities —to "take" individuals of an endangered species and, by regulation, a threatened species 16 USC 1538(a) id 1533(d). The phrase "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct."

In May 2001, after the species was listed, the *Bog Turtle (*Clemmys [now Glyptemys] muhlenbergii*) Northern Population Recovery Plan* (Recovery Plan) was developed. Appendix A of the Recovery Plan includes the "Bog Turtle Conservation Zones." When development and other land disturbance activities are proposed within Townships with known Bog Turtle populations, including Sparta Township, consultation with the NJ Endangered and Nongame Species Program (ENSP) and the USFWS is required to determine if these activities will directly or indirectly impact the Bog Turtle Conservation Zones.

Each of the three Bog Turtle Conservation Zones requires certain conservation measures to avoid "take."

Zone 1 includes the wetlands that contain the Bog Turtle population(s), and encompasses any springs or tributaries that contribute to these wetlands. In this zone, use of herbicides, motorized machinery, and cutting of vegetation is not considered to be compatible with the protection of the species. There is a known Bog Turtle population within SMWMA. On page 22, Section 2 of the Plan, Wetlands (a) states "motorized equipment will only be used in wetlands (not vernal pools or wood turtle streams) between November 1 and March 31." Based upon the information in the FMP, there have been no studies of the Bog Turtle's utilization of the wetlands within the FMP areas. Even though these activities are proposed in the winter, without consultation with the USFWS, this activity will be a violation of the ESA and could impact Bog Turtles and their habitat, both directly and indirectly.

Zone 2 as defined in Appendix A of the *Recovery Plan* includes a *minimum* 300-foot buffer around Zone 1. This includes upland areas surrounding the wetlands and, because of the specialized and fragile habitat Bog Turtles utilize, is protected to avoid direct and indirect impacts. Within Zone 2 the USFWS states "Careful evaluation of proposed activities on a case-by-case basis will reveal the manner in which, and the degree to which activities in this zone would affect bog turtles and their habitat. Assuming impacts within Zone 1 have been avoided, evaluation of proposed activities within Zone 2 will often require an assessment of anticipated impacts on wetland hydrology, water quality, and habitat continuity. Activities that are likely to be compatible with bog turtle conservation but that should be evaluated on a case-by-case basis within this zone include:

- light to moderate grazing
- non-motorized recreational use (e.g., hiking, hunting, fishing)
- mowing or cutting of vegetation"

On page 22, Section 2 Wetlands (a)(iii) the Plan states that "If forest management is to be done near bog turtle habitat, temporary flagging will be used to mark a ***100-foot buffer*** from the habitat during forestry activities and removed when completed."

On page 22, Section 2 Wetlands (a)(iv) the Plan states, "No heavy machinery will be used within ***100 feet*** of bog turtle habitat, including the creation of logging roads or skid trails."

On page 22, Section 2 Wetlands (a)(v) the Plan states "Only hand application of glyphosate and other wetland approved herbicide to control invasive plant species will be used within ***100 feet*** of bog turtle habitat, if need."

Although "cutting of vegetation" is listed as potentially compatible activities within Zone 2, without the evaluation on the case-by-case basis as stated above, all three of these items are not consistent with the minimum 300-foot buffer of Zone 2 and could result in a take of Bog Turtles under the ESA.

This Plan violates the requirements of the ESA and the Bog Turtle Recovery Plan *by failing to consult with the USFWS regarding the Plan.* The Plan needs to be consistent with the requirements imposed on other projects that have occurred in the vicinity of the listed herptile species. This includes consultation with the USFWS, the use of exclusion fences to keep the species out of harm's way, and soil erosion and sediment controls to avoid impacts to wetlands and streams. Construction monitors should be employed from the NJDEP pre-approved list of Venomous Snake Monitors and Spotters to protect the Timber Rattlesnake and Northern Copperhead; from the USFWS Recognized Qualified Bog Turtle Surveyors list, to protect the Bog Turtle; and should include biologists with extensive experience with Wood Turtles to assure the

protection of that Threatened species. *All of these requirements are imposed on utility companies, transportation authorities, municipalities, and private individuals when dealing with these species— and this project should be no different.*

The Plan fails to provide adequate protection for the Federally-Threatened Bog Turtle (page 22). It is highly unlikely that the USFWS would consider the proposed buffers and other protections for Bog Turtle to be sufficient. In Appendix A of the *Bog Turtle* (Clemmys muhlenbergii) *Northern Population Recovery Plan* the USFWS indicates that in wetlands occupied by Bog Turtles "…cutting of vegetation" is "likely to result in habitat destruction or degradation and should be avoided." However, this plan proposes to remove trees in a known Bog Turtle wetland in order to provide basking places—a management method not mentioned in the *Recovery Plan*. USFWS also states that cutting of vegetation within 300 feet of a Bog Turtle wetland "should be evaluated on a case-by-case basis." However, this plan proposes only 100-foot buffers. USFWS also recommends that various activities—particularly those affecting wetlands or streams connected to or contiguous with Bog Turtle wetlands—*within the same drainage basin or extending at least one-half mile beyond the 300-foot buffer* "be carefully assessed in consultation with the Fish and Wildlife Service and/or appropriate State wildlife agency to determine their potential for adverse effects to bog turtles and their habitat." The plan presents no evidence that any such consultations have been held. Given that this is a State-sponsored Plan, DFW should not be the agency to approve this Plan; consultation with USFWS should be imperative.

H. Forest Health and Ecology

On page 31 the Plan states: "Forest type conversion is a threat to the overall ecosystem health at SMWMA," based on a concern that lack of fire disturbance is promoting conversion of the SMWMA forest from oak-hickory to shade-tolerant maple-beech-birch, However, the plan fails to explain how or why a birch-beech-maple forest would be less healthy than an oak-hickory forest.

Page 32 of the Plan states: "If it becomes necessary during the term of this plan, NJDEP will ensure the SMWMA's deer herd has not exceeded its ecological carrying capacity or has become detrimental to forest regeneration." The plan fails to explain how NJDEP would "ensure" deer control—probably the most pervasive and difficult wildlife management issue in NJ.

1. Comments in regard to construction of new roads and "temporary" access lanes (Section 2.5):
In the Freshwater Wetlands Protection Act (FWPA) rules, NJDEP defines "temporary" as a disturbance that is permanently discontinued after 6 months. Since it appears that these roads will be in place for more than 6 months, they should properly be classified and regulated as permanent disturbances. The NJDEP regulates temporary and permanent disturbances differently. The Plan does not indicate what will happen to these new roads after they are no longer needed for logging. In its *Best Management Practices for GWWA Habitat in Deciduous Forests of the Appalachians,* the GWWA Working Group (which the Plan references) recommends that logging roads be seeded with a mix of native annuals and perennials soon after the roads have been retired. This will provide additional edge habitat for wildlife. The Plan gives no indication that it will follow this recommendation.

Further, the Plan states that timber stands 5 and 6 are accessible only through the private Lake Stockholm community, that the private road to the Lake Hawthorne community could be used to access 3 different timber stands, that Beaver Lake Road could be used to access stands 31 and 32, and that other roads in the Beaver Lake community could be used to access 4 different timber stands. However, the Plan fails to indicate the damage that is anticipated to these roads by

the repeated use of heavy equipment and what restitution will be made to the residents of these communities should the roads suffer damage. Contracts including performance bonds should be entered into with the affected lake communities and all other residents who may suffer damages from the implementation of the Plan.

I. Hydrology (Section 2.9)

Page 14 of the Plan states that Russia Brook is classified by the NJDEP as Trout Production, but fails to point out in this section that Russia Brook and all of its tributaries on and near Sparta Mountain are also classified by the NJDEP as Category One (C1). Waters classified as C1 receive the highest regulatory protection—including 300-foot riparian zones—from the NJDEP. To implement the Plan would require major disturbances (many of them permanent as defined by NJDEP) well within these buffer zones. Under the FWPA and Flood Hazard Area Protection Act rules the NJDEP believed that 150-foot transition areas adjacent to wetlands that drained into Trout Production waters or areas that provide habitat for certain E&T species of wildlife (both true on SMWMA), as well as 300-foot riparian zones to C1 streams, provided adequate protection to these features. It is disconcerting and disappointing to find that NJDEP is not holding itself to its own standards of protection.

Page 14 of the Plan states that forestry activities can be exempt from having to obtain individual permits from the NJ Division of Land Use Regulation provided that several criteria are met. One of the 5 listed criteria is that potential impacts to Endangered and Threatened species are addressed. While the Plan does "address" E&T species, it does not do so in a way that will maximize protection for these species, which should be the standard on any project supported and promoted by the NJDEP.

J. Landscape Level Considerations (Section 2.11)

In this section and elsewhere (e.g., 5.1 Wildlife) in the Plan, the only method of creating habitat for many species of birds, including GWWA, is to create young forest, which it proposes to do, paradoxically, by cutting down hundreds of acres of mature forest.

If one of the goals of the Plan is to create habitat for species of birds that use young forest, other alternatives to cutting down large swaths of mature forest in the interior of SMWMA should be considered. Some of the same forestry methods in the Plan could be employed immediately adjacent to utility easements rather than in the forest interior. This would greatly lessen the risk of unintended negative impacts to the environment by reducing road construction, reducing impacts (including compromising water quality) to the Exceptional Resource Value wetlands and C1 streams, lessen impacts to vernal habitats, reduce the risk of disturbing sensitive nesting species (including raptors), and reduce the risk of introducing invasive plants into the interior of the forest.

Furthermore, the NJDEP could improve and create new habitat for many young-forest species of birds by removing alien shrubs such as Autumn Olive, Multiflora Rose, and honeysuckles from the many hundreds of acres of fields on state land that have negligently been allowed to become overrun by these and other invasive plants. Before the rampant spread of these incredibly fast-growing alien species, fields that were left fallow grew up in slower-growing native plants such as Eastern Red Cedar, a variety of shrubs such as dogwoods and viburnums,

and a diverse assemblage of herbaceous plants such as grasses, sedges, and forbs. The declining number of fields in northern NJ that still support these native plants and others still support many of the same young-forest species of birds that the Plan aims to benefit. The combined efforts of creating young forest adjacent to the existing power easements, the proper management of existing fields on State land for young forest species, and perhaps creating smaller openings in the forest by hand-girdling trees, would result in creating much young-forest habitat but without many of the risks and impacts associated with the removal of hundreds of acres of mature forest near Exceptional Resource wetlands and C1 streams.

The Plan makes numerous statements that it will minimize environmental impacts to Exceptional Resource Value wetlands, C1 streams, vernal ponds, other sensitive habitats, raptor nesting areas, and the locations of E&T species of wildlife and plants. It also promises postharvest monitoring and treatment of invasive species, control of deer numbers, etc. In many places the Plan reads like an EIS prepared on behalf of a developer***. It is apparent that to assure that all of the promises made in the Plan are fulfilled and that all of the BMPs are being strictly followed will require the supervisory and monitoring services of many people with different areas of expertise.*** The names and qualifications of these persons should be provided to all stakeholders in advance of the work. In addition, these people should be required to keep detailed logs of all of their monitoring visits and these logs should be posted online within 24 hours of the visit for review by stakeholders and any other interested parties. Violations of BMP should require the ***immediate*** cessation of activities until the offense is corrected satisfactorily. Furthermore, the loggers should have to post performance bonds. How would NJDFW be able to conduct effective monitoring of wetlands and E&T species issues? The Division of Fish and Wildlife is short-staffed and would likely find it difficult to assign personnel to adequately monitor a project of this size and duration.

K. General Comments

The NJ Audubon Society, which is a partner in the SMFP and whose professional foresters prepared the Plan, states on its website that the NJDEP classified the wetland and upland forests at SMWMA as Class 5 for important wildlife—which, the website points out, is the highest ranking. The same website then goes on to state that this forest *needs* to be managed. It is worth mentioning that many of the "important" species of wildlife that inhabit Sparta Mountain are also very sensitive to disturbance. The Plan's stated protective measures are replete with phrases such as "to the best extent practicable" and are inadequate to protect E&T species and more common species that are sensitive to disturbance. Northern Goshawk, in particular, is very sensitive to disturbance and selects nest trees far from roads.

The Plan discusses creating habitat for species such as Barred Owl, Red-shouldered Hawk, Northern Goshawk, and Cerulean Warbler. However, these species already occur within SMWMA. The Plan, if fully implemented, may cause more harm than good to these and other sensitive raptors that require large, contiguous, areas of mature forest.

No clear metric measure of success has been identified in the Plan. If success means that the removal of trees will open up the forest to sunlight thus promoting the growth of a diversity of plants that in turn will attract species of birds and other wildlife adapted to a more open environment, then the Plan is guaranteed to be successful. But this a very low bar indeed. The measure of success should be whether the Plan does more good than harm to the environment in

general, which cannot be determined on the SMWMA because of the failure to collect sufficient baseline data.

The Plan contains many promises of avoiding or minimizing environmental impacts, in following BMPs, and in monitoring the myriad activities. Collectively, it would seem that fulfilling these promises would be very costly and yet instead of a hard budget, the Plan offers only words. The Plan should propose a realistic budget broken down for every task for at least 5 years so stakeholders and other interested parties can monitor the success of the Plan.

In conclusion, creating numerous large forest openings throughout Sparta Mountain Wildlife Management Area will cause far more ecological harm than good. The WMA now is a landscape of priceless forests whose unbroken extent is fundamental to their health, resilience, value to native species, and landscape and state-level importance. Instead of creating holes in these forests, the Plan should abandon these inappropriate commercial goals and instead continue stewardship actions that focus on protection from such incursions. Thank you for your attention to our concerns.

Sincerely,

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