

**Forestry Practice Plan for Sparta Mountain Wildlife Management Area (SMWMA)**

This practice plan addresses a general activity provided for in year 2017-2018 of the management schedule within the *Sparta Mountain Forest Stewardship Plan*, approved March 13, 2017

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Practice Plan being submitted on behalf of the New Jersey Department of Environmental Protection,  
Division of Fish and Wildlife, PO Box 420 MC 501-03, Trenton, NJ 08625

Property parcel data below as referenced in the approved Sparta Mountain Forest Stewardship Plan and on the original property deeds. Some township block and lot designations may have since changed.

Sparta Township Sussex County	Hardyston Township Sussex County	Borough of Ogdensburg Sussex County
Block 1, Lots 1.02, 1.03 & 2	Block 35, Lot 18	Block 1, Lot 1
Block 2, Lot 1	Block 59, Lot 1	Block 1, Lot 3
Block 3, Lots 1, 12, 13, 14 & 21	Block 60, Lot 1	Block 11, Lot 35
Block 7, Lots 2, 2.01, 16,17 & 90	Block 60, Lot 1.03, 2.01, 2.02, 3.02, 17	

**Purpose**

The management objective is to regenerate patches of maturing forest by opening the canopy sufficiently for intolerant and mid-tolerant vegetation to germinate or be released from competition. A primary emphasis is to regenerate diverse vegetation that accompanies the central hardwood oak-hickory forest types. Doing so will promote biodiversity and sustain a complexity of habitats in the region. In addition to the structural variation in the forest cover that accompanies patches of new young tree growth, the treatment will perpetuate woodland shrubs, sedges, grasses and forbs that have co-evolved with the ephemeral nature of natural disturbances but are otherwise relatively uncommon when canopy conditions remain closed for extended periods. Since these early successional habitat characteristics are currently underrepresented as a percentage of the regional forest landscape, restoration activities will provide necessary breeding and/or foraging habitat for over 60 different bird species, including the endangered golden-winged warbler. Other mammals and reptiles are also expected to benefit under these objectives.

This project originally began in the latter months of 2017, whereas the general location was selected by NJDEP biologists based on the habitat requirements for certain focal wildlife species and then the project area was narrowed using appropriate buffers to avoid water features,

wetlands, vernal pools, rare plants and sensitive wildlife. The specific project area was selected within those parameters based on the suitability of available vegetation to be manipulated for success, topography and accessibility. This resulted in an 18.5-acre treatment site that covered a centrally located ridge running north to south, surrounded to the east, south and west by lower elevation areas. The purposeful inclusion of variable topography and aspect was done to provide a spectrum of regeneration conditions. Since our goal is to emulate certain natural disturbance mechanisms that are less frequent now, diverse site characteristics provide some of the inherent randomness resulting from a natural disturbance event and therefore provide a greater diversity of successional habitat types. To accommodate this, the boundary locations were delineated to allow for equipment access to all portions of the project site in a way that provides multiple options to work around obstacles and steeper sections, thereby reducing the potential for environmental degradation and erosion. This was particularly relevant for accessing the ridgetop and slope in the east, where material could be moved gently downhill and away from the site in a less intrusive manner.

After defining the harvest area and *leave* trees within it using orange tree paint, the wood volume to be extracted was calculated and the original practice plan was prepared and submitted to the NJDEP. The project was then offered for bid to potential forestry contractors, but the project was put on-hold by the NJDEP in the early months of 2018 prior to awarding a bid. Subsequently, at the request of external stakeholders in the latter months of 2018, the NJDEP agreed to reconfigure the project boundaries, which reduced the project size and necessitated this revision to the practice plan and bid documents. Additional requests made by the same stakeholder group that the NJDEP accommodated included 1) adjusting how trees are retained in the project area by establishing at least four unharvested clusters of vegetation, each being roughly 0.25 acres in size, rather than widely spaced individual trees throughout the site, and 2) maintaining the residual stocking density in the revised treatment area at the original target range prescribed for the 18.5-acre area, which was 25-30 sq. ft. of basal area/acre averaged across the entire project.

As originally prescribed, the range of basal area/acre was predicated on averaging two treatment types of up to 10 acres each, with a residual density of 10 sq. ft. and 50 sq. ft., respectively. Done at that scale, the different target densities would favor different regeneration conditions, with the latter favoring conditions that are probably less favorable for early successional obligates such as the state endangered golden-winged warbler but would be more suitable for other species of lesser concern at this time. These modifications still allow for the accomplishment of the plan's objectives, but are on the verge of exceeding certain thresholds: The effective size of the site is nearing the lowest threshold at almost half its original size, the residual basal area is at the upper threshold for the size of the site to allow for regeneration and golden-winged warbler suitability, and some "save" trees have been kept because they were the stakeholder's "favorites", but are not positively correlated with golden-winged warbler occupancy. Nevertheless, the unharvested clusters were expanded to increase residual basal area and accommodate stakeholder concerns.

## **Site Description**

*Location:* The project area is within Hardyston Township on the north side of the east-west powerline that bisects the WMA, in an area referenced in the approved plan as Stand 18, roughly a quarter mile southeast of Beaver Lake (see attached *Project Location* map from the initial Practice Plan prepared in 2018).

*Size:* The project area has been reduced from the originally planned 18.5 acres to 12.2 acres to accommodate concerns expressed by certain external stakeholders. Those individuals suggested that a 5.5 acre area be excised along the eastern boundary because the subject area encompassed “*a nice cove that they didn’t want to see altered*”, and another 0.8 acres be excised from the northwest corner of the site because “*it is the area of closest proximity to a vernal pool on the other side of the slope*” (see attached *2019 Harvest Area Revision* map).

*Access:* A pre-existing access road follows the southern project boundary and connects to the powerline easement. This will be used as the primary skid trail. This road appears to be an extension of the utility access road, although it may simply be a spur to Beaver and Tamarack Lakes that has been maintained by years of illegal off-road vehicle trespass. During the field reconnaissance conducted for this plan revision, a small section of the road between the project boundary and the powerline had surface water seeping from the upper soil profile; undoubtedly due to the extraordinary amount of rainfall that had occurred during the prior six months. If surface water remains present when the harvest commences, an alternate path following higher ground slightly to the west of the road will be used to avoid the wet spots. This re-routed section will be kept as close to the original road as possible.

From the powerline easement, access will be obtained via the existing utility access road that passes the 2013 project area (also known locally as the Edison Bog area) and eventually connects to Edison Road located roughly  $\frac{3}{4}$  mile to the south. Portions of this road are in rough condition, but it is regularly traveled by trucks and equipment used by the utility company to maintain the lines, and it is sufficient for temporary forestry equipment access. This method of access is the same that was used for projects in 2013 and 2015 with no conflicts or problems to the local community. In 2013, a stone tracking pad was installed at the entrance from Edison Road to alleviate any excessive mud from being transported onto the pavement. The tracking pad was recently inspected and remains functional for use in this project (see attached *Project Location* map from the initial Practice Plan prepared in 2018).

The boundary locations were originally delineated to allow for equipment access to all portions of the project site in a way that provides multiple options to work around obstacles and steeper sections, thereby reducing the potential for environmental degradation and erosion. This was particularly relevant for accessing the ridgetop and slope in the east, where material could be moved gently downhill and away from the site in a less intrusive manner.

However, because of the modifications of the boundaries at the stakeholder's request, equipment access will now be concentrated along the ridge as opposed to accessing it from the downhill side. This may increase the risk of soil degradation and possible erosion, but when presented with this fact, the stakeholders felt the tradeoff was warranted.

*Topography and Soils:* The project area sits on undulating terrain that transitions between coves and rock outcrop features over short distances. Slopes are highly variable but average between 15% - 35% over large expanses. As per USDA Natural Resources Conservation Service (NRCS) soil mapping, the entire project falls within the Rockaway Chatfield – Rock Outcrop Complex, which is a moderately productive soil type that contains a high proportion of cobble size and larger rock on the surface. Soil depth tends to be thinner along the ridgetop in the north and east and becomes deeper in the lower elevation areas to the west. As NRCS soil scientists who have examined the property have pointed out in earlier correspondence to the NJDEP (during the plan approval process), much of the soil in the WMA has been extensively disturbed during the Edison mining era, and today's soil profiles may not actually be reflective of the typical Rockaway profile. For Rockaway soil, the off-road erosion hazard on exposed areas is moderate, but the hazard becomes severe on roads that are not properly maintained or retired. Rockaway soils can also be susceptible to compaction and rutting in places where the rock content is low, although the rock appears to be consistently significant here, nullifying that concern (see attached *Project Area* map from the initial Practice Plan prepared in 2018).

*Equipment to be Used:*

- 1) Skidder and/or mechanical felling equipment similar in size to typical construction equipment such as a backhoe, which will be offloaded from a trailer at the tracking pad on Edison Road at the beginning of the project, then left on-site during the project and hauled out on a trailer at the end of the project.
- 2) Log truck that is similar in weight capacity to commonly used garbage trucks, moving trucks, propane delivery trucks or other delivery service vehicles. In total it will transport approximately 200 cords, or roughly 20 truckloads of logs, out of the access road onto Edison Road over the course of 6-12 months.

All transportation vehicles and operators will be aware of and follow NJ Department of Transportation weight restrictions and operating rules for the roads they travel.

*Wetlands:* The project boundaries were compared against NJDEP GIS 2012 wetland mapping, and the nearest mapped wetland is more than 175' away, which exceeds the maximum 150' transition buffer for *Exceptional Resource* wetlands. The entire project was also physically walked to field verify if unmapped wetlands exist, and none were found. This project will have no effect on wetland resources (see attached *Project Area* map from the initial Practice Plan prepared in 2018).

*Vernal Pools:* NJDEP GIS vernal pool data was also compared to the project boundaries, and the nearest vernal pool is approximately 400' from the project boundary on the other side of a hill. The entire project was also physically walked to field verify if unmapped vernal pools exist, and none were found. This project will have no effect on vernal pools (see attached *Project Area* map from the initial Practice Plan prepared in 2018).

*Streams and Water Bodies:* The project boundaries were compared against NJDEP GIS stream and water body layers, and there are no classified or unclassified water bodies within 300' of the project, which is the maximum width of a regulated riparian zone. Similarly, the project does not intersect with a flood hazard area. As noted earlier, due to seasonally saturated ground conditions, some minor sections of the access road contain concentrated water drainage and these areas will either be avoided entirely, or the water flow will be diverted from the road using a swale. This project will have no effect on water resources (see attached *Project Area* map from the initial Practice Plan prepared in 2018).

*Rare Plants:* A review of information (conducted by NJDEP staff) in the Natural Heritage Biotics Database as well as the results of field surveys performed by the NJDEP Office of Natural Lands Management in the Sparta Mountain WMA during 2017-2018 (but not currently documented in the database), have yielded no occurrences of State Endangered or rare plant species in the original 18.5-acre area project area. Additionally, no rare plants were found in the immediate vicinity of the access road between the utility easement and project area.

*Rare Wildlife:* Both Hardyston and Sparta Townships are listed for hibernation and maternity occurrences of federally listed Indiana and northern long-eared bats. The proposed tree felling period between November 15<sup>th</sup> to March 31<sup>st</sup> aligns with USFWS conservation recommendations to protect both species. Efforts have been made to retain trees that exhibit roost potential due to their bark character or existing cavities. The proposed tree felling period also aligns with recommendations from NJDEP Endangered and Nongame Species Program to minimize harm to breeding songbird, raptor, reptile and insect species of concern that have been documented in the area. The area is >500 feet from documented raptor nests and >400 feet from documented vernal pools. Furthermore, a NJDEP biologist visited the site multiple times to assess the trees for wildlife value and did not observe any undocumented raptor nests or potential barred owl cavities throughout and adjacent to the project area.

### **Forest Description**

The project area falls within Stand 18 of the approved Forest Stewardship Plan (FSP). The stand is described as a mixed upland oak stand that is fully stocked at roughly 100 sq. ft. of BA/acre, dominated by red and chestnut oaks with a subordinate component of smaller diameter red maple. To implement this project with increased certainty for the vegetation that is locally present, the 18.5-acre area was re-inventoried in January 2018 using seventeen inventory plots

measured using a 10 BAF prism. The resulting data was processed using a 90% confidence interval and was found to be highly correlated with the overall stand data provided for Stand 18 in the FSP.

Listed in decreasing order of abundance (i.e. basal area), the most frequently encountered species in subject area are red oak, red maple, chestnut oak, mixed hickories, black oak, white oak, black birch, scarlet oak, white ash and sugar maple. The area has sporadic occurrences of tulip poplar, black cherry, yellow birch, aspen and hop hornbeam. The overall basal area is about 115 sq. ft./acre, and there are roughly 365 trees per acre. The medial stem diameter is 12.0 inches and the quadratic mean diameter is 6.7 inches. The wide disparity between diameter values is reflective of having a large abundance of sapling and pole size ingrowth in comparison to the trees comprising the co-dominant canopy class. In this case, the smaller in-growth is predominantly maple and birch, compared to the oak dominance in the overstory where co-dominant stems reach 100' in height. As gap-phase regeneration dynamics increase as a successional force over time, this stand will undoubtedly transition to a maple-birch forest type. The effective stand age is 80 years old for all species, and 90 if just the oaks are considered. The net total volume in all trees to a 4-inch top is 18 cords per acre; if divided into firewood and sawtimber, the net volume is approximately 13 cords of firewood and 2.5 MBF of sawtimber (Scribner log rule).

The relative stand density is 87%, which is above optimum for individual tree growth. Relative density is a measure of tree crowding that accounts both for the size of each tree and the amount of space typically occupied by that species. Maximum stand growth occurs near 60% relative density, and a relative density of 100 percent implies that the growing space is fully occupied. As the density increases from 60% to 100%, trees must either slow their growth to survive, or some trees will be crowded out and die, making room for more vigorous ones.

### **Treatment Description**

Year 1 of the approved FSP for Stand 18 (see pages 50-52 and 65-67 in the FSP) calls for implementing both shelterwood and seed tree harvesting methods to regenerate vegetation and create various habitat types including early successional habitat. In accordance with the approved FSP, both treatment types were to be implemented at a rate of 5-10 acres individually, and the original intent for this project when it was 18.5 acres was to combine the two treatments into a single hybrid project. That scenario called for variable stocking retention that averaged 30 sq. ft of BA/acre overall but included patches between 10 and 50 sq. feet of BA/acre. As the project evolved in response to stakeholder requests, the treatment is now being implemented across 12.2-acres that will maintain an overall average of 25-30 sq. ft. of BA, within which there will be five uncut patches totaling 2.9 acres (1.3ac, 0.1ac, 1.1ac, 0.3ac and 0.1ac, respectively - see *2019 Harvest Area Revision* map for locations). In the 9.3 acres where tree removal will occur, the silviculture will be reflective of the seed tree method for regeneration and habitat creation; whereas widely scattered individual stems will be retained and all others will be removed. Being

9.3 acres, the seed tree treatment area complies with the prescription range of 5-10 acres listed in the approved FSP for 2018.

The 12.2-acre project area was delineated in the field using blue dots of paint on the boundary trees facing the project interior, and these trees will not be harvested. The five harvest exclusion blocks were also delineated with blue paint marks on the trees. Other individual stems to be retained in the seed tree treatment area have been marked with blue slashes at eye level and dots on the stump, and these were selected for retention based on one or more of the following qualities (not listed in any particular order of importance); spacing consideration, vigor class, to maintain under-represented species in the stand, stems that have important wildlife habitat characteristics (cavities or other unique features), or because the species is highly correlated with golden-winged warbler usage. All orange paint is irrelevant and should be ignored. Chainsaws and/or heavy machinery will be used to mechanically fell all stems in the seed tree area that are *not* marked with blue paint. All existing dead stems that do not present a hazard to workers will be retained even when not marked with blue paint. Branches, slash and some entire trees will be left on the ground for wildlife cover, while other trees may be removed and sold by the contractor at their discretion. Dense slash piles that may present a hazardous fuel concern will be lowered so as not to exceed the height limit recommended by NJ Forest Fire Service. Tree felling is expected to be completed prior to April 1, 2019 but may resume after November 15, 2019 if needed. Non-native plants are essentially non-existent in the seed tree area, so herbicide treatments will not be needed. One existing Japanese barberry was noted in a harvest exclusion block in the western half of the property, and this area in particular will be monitored closely moving forward.

Harvesting and log removal equipment will be confined to the seed tree area and the access road. Logs may be temporarily staged at the staging area used in 2013 while in the process of being transported to Edison Road. Although there are no hydrological features within the harvest boundary that necessitate the use of BMPs, individual skid trails will be constructed in accordance with the provisions of Section V – Timber Harvesting found in the NJ Forestry and Wetlands BMP Manual (1995). At the close of the harvest, areas that have been exposed and are prone to erosion will be stabilized with an appropriate seed mix, and the main access road will be re-graded and water diversions installed as needed.

Within the seed tree area, it is estimated that 120 cords of firewood grade material will be harvested and potentially removed from the site (~13 cords/ac). A total of 190 potential sawtimber trees were individually tallied in the same area, comprising 31 MBF of harvestable material (mostly red, chestnut and black oaks).