2019/20 Stand 8 Sparta Mountain Wildlife Management Area Report

January 2025

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Site Description and History

This site is located along the east side of Sparta Mountain Wildlife Management Area (SMWMA), west of Rock Lodge Road and accessed using an existing unpaved road from Rock Lodge Road to and through the site (Fig. 1).

Before treatment, the 10-acre site consisted of a maturing mixed upland oak forest, about 77 years of age, with an average 239 trees per acre averaging about 9 inches in diameter. Most canopy trees on the site consisted of red oak and chestnut oak, and most saplings and younger trees consisted of sugar maple and hickory indicating the oak forest may be converting to a northern hardwood forest (Fig. 2). Deer densities appeared to be below 20 individuals per sq. mi., evidenced by patches of oak seedlings and maple-leaf viburnum in the understory with little to no browse, as well as a deer fence erected in another area of SMWMA with no differences in vegetation diversity and height inside and outside the fence. Non-native invasive plants were not observed in the site.

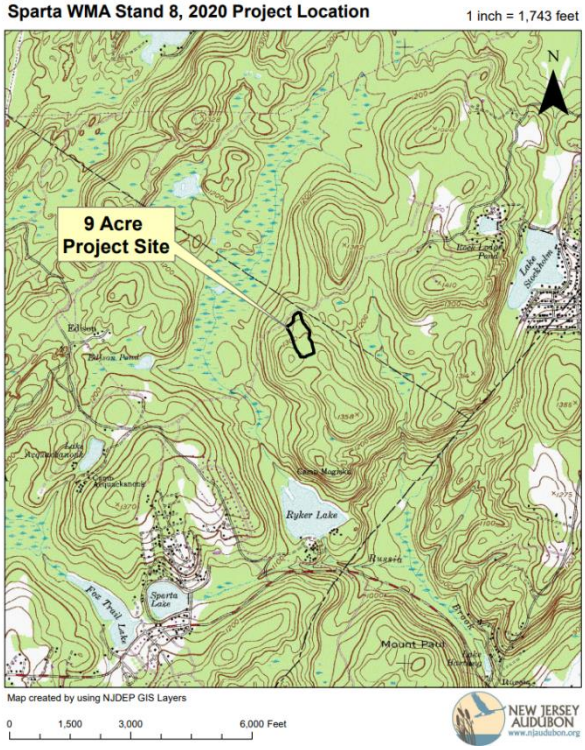

Figure 1. Map of the location of the site in Stand 8 (black bold) on SMWMA.

2019/2020 Treatment

Activities proposed for this year were one year behind the schedule in the 2017 Sparta Mountain WMA Forest Stewardship Plan and included a modified seed tree treatment on 5-10 acres in Stand 8, a single tree selection on 25-75 acres in Stand 21, and an overstory removal in ½ acre of the wetlands of Stand 23.

Figure 2. Photo of the forest in the site in Stand 8 on SMWMA prior to treatment (January 2020). Trees with orange markings were retained during treatment.

NJ DEP Fish & Wildlife incorporated site-specific feedback provided during months of stakeholder engagement and planning. Changes based on this feedback included not conducting the single tree selection or overstory removal treatments and locating the seed tree treatment in an area with a rather level plateau of Pennsylvania sedge and mature but not old growth trees which reduced the size of the site to 9.1 acres. A state-approved forester provided the details of the 9.1-acre seed tree prescription in accordance with the approved 2017 Forest Stewardship Plan. The intent of a seed tree treatment is to open the forest

canopy by 60-90% to enable the regeneration of shade-intolerant and mid-tolerant native vegetation (such as oak trees) while also maintaining mature "seed" trees. The objectives for this activity are to increase structural and age-class diversity of forests across the larger landscape scale, regenerate the oak-hickory forest type, and create critical habitat for rare, endangered, and declining wildlife. The seed tree treatment was conducted in the winter and tree felling was completed March 2020.

The treatment involved cutting most of the trees across all size classes (Fig. 3) while retaining the healthier mature oak and hickory canopy trees (Fig. 4). After treatment, about 13 trees per acre (average 14.5 inches in diameter), mostly oak and hickory, were retained on site. The residual basal area was approximately 19 ft^2/ac. Based on the forest inventory, trees which were cut averaged 8.4 inches in diameter.

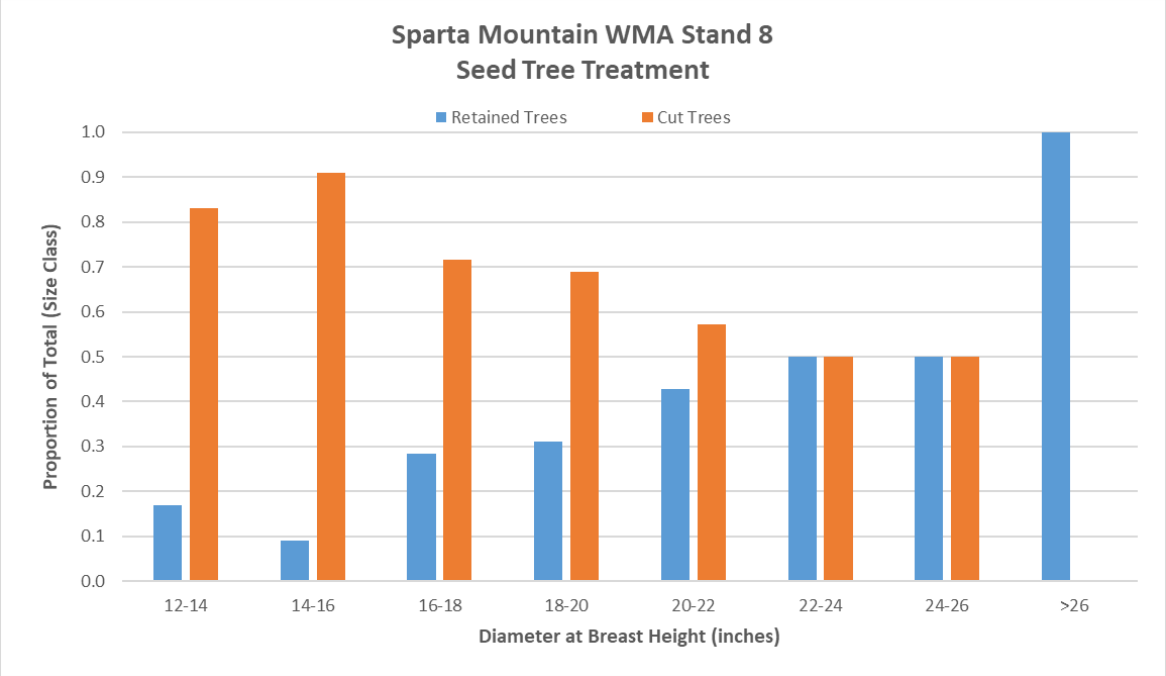

Figure 3. Proportion of trees retained (blue) vs cut (orange) by diameter size class for the 2019/20 seed tree treatment in Stand 8 on SMWMA.

Stand 8 Bird Survey Results (2020 – 2024)

This site was surveyed for all bird species during the breeding season (May 15 – June 15) in 2008 and then once a year after treatment. Before treatment, twelve species of birds were observed, two of which were Species of Greatest Conservation Need (SGCN), giving the site a bird conservation score of 24. A few months after treatment, the total number of species increased, the number of SGCN tripled, and conservation score more than doubled. Three years after treatment the total number of bird species more than doubled to 28 bird species (13 SGCN) and a bird conservation score of 123 (Fig. 5). Most of bird species observed before

Figure 4. Photo of the forest in the site in Stand 8 on SMWMA after treatment (June 2020).

treatment were also observed after treatment, while birds like the eastern towhee and other species that have been steeply declining and considered to be at their Tipping Point, were observed afterwards because of the treatment done.

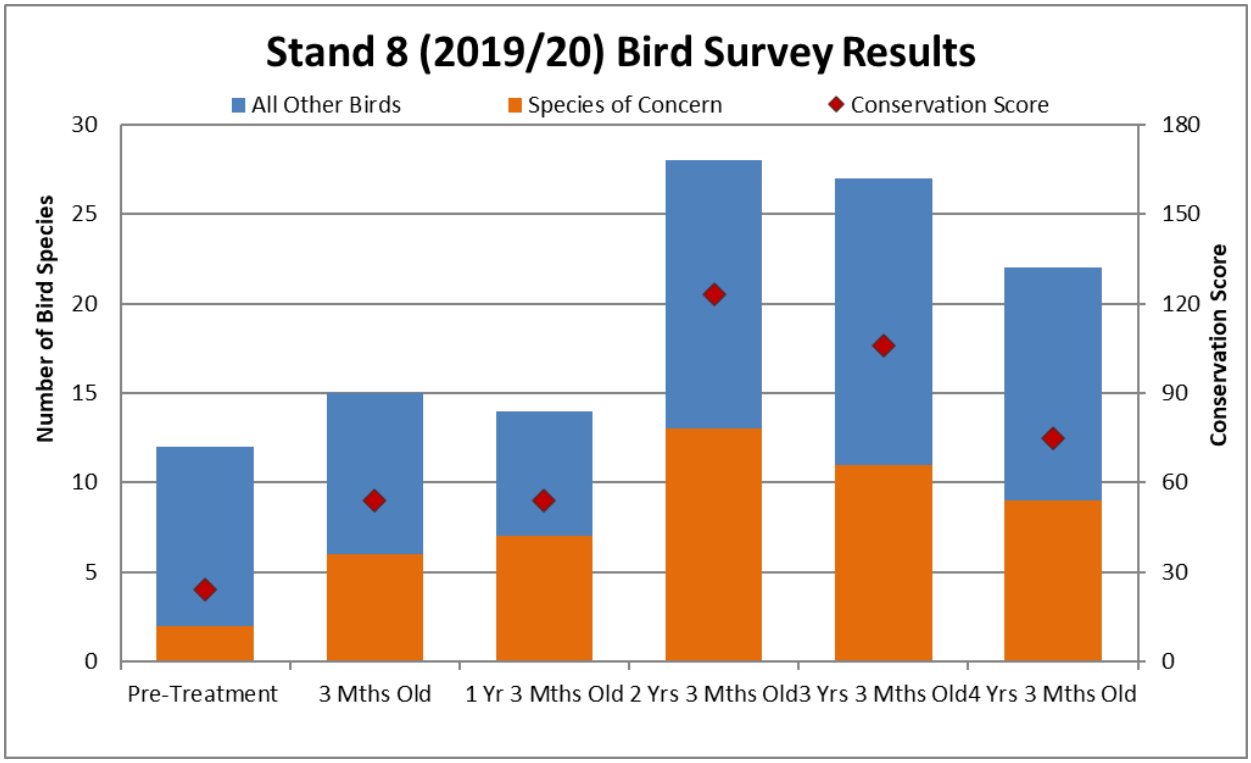

Figure 5. Number of bird species of concern (orange bar), all other bird species (blue bar), and bird conservation score (red) observed during breeding bird surveys in Stand 8 on SMWMA. Bird conservation scores are the sum of the scores of each individual bird species detected, which were determined for each species based on federal, state, and regional statuses and rankings.

Stand 8 Vegetation Survey Results (2020 – 2024)

Rapid vegetation surveys are conducted during the same time and location as the bird surveys (center of the site) post-treatment to assess the vegetation cover and dominant species of vegetation before and after treatment (Table 1). No non-native invasive plants were observed during the forest inventory before treatment. The treatment resulted in opening the canopy by about 75% retaining oak and hickory trees, and targeting northern hardwoods (maple, beech) for removal. The shrub and herbaceous cover grew in quickly after treatment (Figs. 6 & 7) and consist of a diverse mix of vegetation. Witch hazel and maple-leaf viburnum are still growing on the site but oak and blueberry responded quickly to the increased sunlight, as did blackberry.

Table 1. Vegetation cover and the dominant trees, shrubs, herbaceous, and non-native invasive plants observed during the rapid vegetation surveys on Stand 8 in SMWMA after treatment and an estimate based on the inventory of the site before treatment.

Vegetation Type	Before Treatment (estimate)	3 Months After Treatment	1 Year 3 Months After Treatment	2 Years 3 Months After Treatment	3 Years 3 Months After Treatment
Tree (% cover)	85	20	20	20	20
Shrub (% cover)	10	10	35	40	40

Herbaceous (% cover)	5	40	30	30	25
Non-native (% cover)	0	0	0	0	0
Dominant 3 Trees	Oak, hickory, maple	Oak, hickory	Oak, hickory	Oak, hickory	Oak, hickory
Dominant 3 Shrubs	Witch hazel, blueberry, sweet birch	Blueberry, sweet birch, witch hazel	Witch hazel, sweet birch, oak	Witch hazel, sweet birch, oak	Sweet birch, witch hazel, viburnum
Dominant 3 Herbaceous	Grass/sedge, forb	Grass/sedge, forb	Grass/sedge, forb	Grass/sedge, forb, fern	Forb, grass/sedge, fern
Dominant 3 Non-native Invasive	None Observed	None Observed	None Observed	None Observed	None Observed

Figure 6. Photo of herbaceous vegetation and oak seedlings in the site in Stand 8 on SMWMA 1 year, 3 months after treatment (May 2021).

Figure 7. Photo of the forest in the site in Stand 8 on SMWMA 4 years, 3 months after treatment (May 2024).

In summary, while the number of species detected during surveys can vary year to year, there is a treatment effect that results from opening the forest canopy. The bird conservation score, which represents both the number and conservation concern of species observed, is highly correlated with less tree canopy cover (Fig. 8), even before the end of the first growing season post-treatment. The seed tree treatment on Stand 8 in SMWMA opened the forest canopy to allow for herbaceous and small woody vegetation (shrub and saplings) to grow, specifically vegetation that cannot grow or thrive in the shade of closed-canopy forests. This resulted in many more bird species using the area during the breeding season compared to before treatment, especially SGCN in NJ. This treatment also increased the diversity of vegetation which will help this forest be more resilient and less vulnerable to future climate conditions.

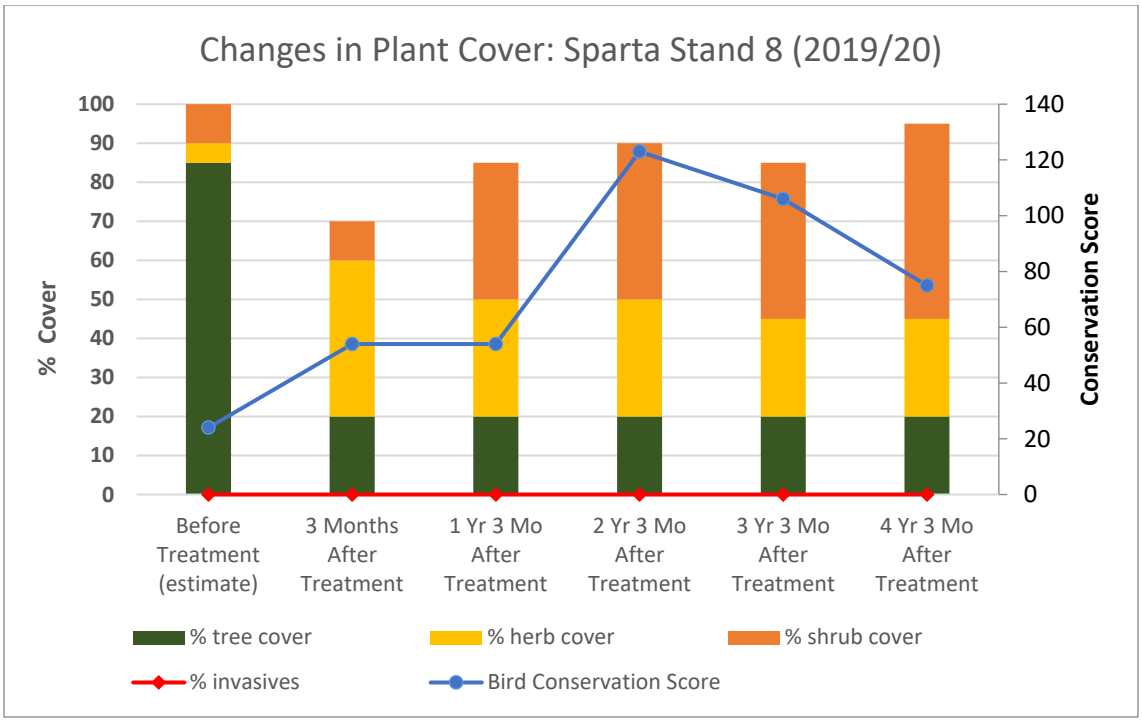

Figure 8. Bird Conservation Score (blue line) and vegetation cover (columns, red line) observed during breeding bird surveys on Stand 8 in SMWMA before and after treatment. Trees include all woody vegetation >4m tall, shrubs include all woody vegetation <4m tall, and herbs are all non-woody vegetation. The red line represents the percentage of the area with non-native invasive plants (tree, shrub, and herb).