NEW YORK STATE | Department of Environmental Conservation

New York State Southern Pine Beetle Response

2019 ANNUAL REPORT

DIVISION OF LANDS AND FORESTS

Andrew M. Cuomo, Governor | Basil Seggos, Commissioner

New York State Southern Pine Beetle Response
2019 Annual Report

New York State Department of Environmental Conservation
Division of Lands and Forests
Bureau of Invasive Species and Ecosystem Health

Division of Lands and Forests, Bureau of Invasive Species and Ecosystem Health

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Executive Summary

The New York State Department of Environmental Conservation's (DEC) Division of Lands and Forests (DLF) has continued to track and manage infestations of southern pine beetle (SPB) since the beetle was first found on Long Island in 2014. During 2019, aerial surveys mapped more than 9,000 acres of potentially infested trees. Using this data, priority areas for management were identified based on where the greatest impact would be for controlling SPB and protecting the unique pine barren ecosystem. Ground surveys were conducted to verify and delimit infestations. A total of 655 trees were marked for spot suppression, of which DLF's Forest Health crews cut 554. The remaining 101 trees no longer harbored SPB and, therefore, did not need to be cut for suppression. The crews also performed a 75-acre restorative thinning in Sarnoff State Forest to improve tree health and increase their ability to resist an SPB attack.

Early detection trapping was expanded northward to include Oneida, Saratoga, and Clinton counties. A total of 186 SPB were caught in traps at Bear Mountain, Schunnemunk, and Minnewaska State Parks; however no infested trees have been found north of Long Island. The increase in trap catches from 5 beetles last year to nearly 200 this year suggests that SPB has begun to gain a foothold in the Hudson Valley. In light of this possibility, survey efforts to locate possible infestations in the area will be increased.

DEC's Saratoga Tree Nursery has grown more than 9,000 pitch pine seedlings from Long Island seed stock that has been collected over the past several years. The seedlings have and will continue to be used for replanting in areas hard hit by SPB.

Southern Pine Beetle in New York State

In July 2014, SPB were discovered in a beetle trap placed on Long Island by the NYS Department of Agriculture and Markets, and infested trees were found later the same year. SPB had previously been detected only as far north as Pennsylvania and New Jersey (Payne 1980), but have now expanded their range into Connecticut, Massachusetts, and Rhode Island as well. SPB use pheromones to communicate with each other and attack pine trees in groups. When population numbers are high, groups of beetles overwhelm a tree's defenses and kill it in just 2–4 months.

Aerial and ground surveys show that SPB is widespread and abundant on Long Island, where it has killed hundreds of thousands of trees. Pitch pine, a preferred host, is commonly found on Long Island, especially in the Central Pine Barrens, where it dominates or co-dominates more than 100,000 acres. Suppression of natural fire disturbance in this fire-dependent ecosystem, and a lack of forest management, have caused much of the pine barrens to become overcrowded with trees weakened from increased competition with each other. These crowded forest conditions, coupled with climatic changes, set the stage for a severe SPB outbreak that has affected most of Long Island.

Incident Command Structure

To help effectively manage the response to SPB in New York State, an incident command structure (See Appendix A, Figure 1) has been established by DLF in DEC's Central Office (Albany, NY) to coordinate and implement consistent management activities in each of the DEC Regions where SPB has been found (Regions 1, 2, and 3). The incident command structure allows for the organization of personnel and resources across multiple jurisdictions and provides for a clear path of communication between all parties involved in the response. This has been critical for communication and participation between several partner groups, including DEC Forest Health (FH) in Central Office (CO) and in Region 1 (R1); the Central Pine Barrens Joint Planning and Policy Commission (CPBC); the U.S. Forest Service (USFS); the Brookhaven National Laboratory; the NYS Office of Parks, Recreation and Historic Preservation; Suffolk County; and the towns of Brookhaven, Islip, and Southampton.

Detection and Monitoring

Trapping

During 2019, DLF focused its trapping efforts on early detection, expanding these efforts farther north than in previous years. Traps were set in Orange, Ulster, Albany, Columbia, Saratoga, Oneida, and Clinton counties (Table 1, and see Appendix B, Figure 2) from May to October at sites with pitch pine. Traps were not set on Long Island due to high levels of SPB throughout the region.

A total of 186 SPBs were caught in traps at Bear Mountain, Schunnemunk, and Minnewaska State Parks. Increased trap catches in the Hudson Valley is concerning due to the potential impacts on the pitch pine forests in the surrounding areas. Ground survey efforts are being expanded to help detect infested trees as soon as possible.

Table 1. Location and Distribution of SPB Early Detection Traps in New York State

Trapping Site	DEC Region	County	Total Catch
Bear Mountain 1	3	Orange	71
Bear Mountain 2	3	Orange	30
Schunnemunk 1	3	Orange	84
Schunnemunk 2	3	Orange	0
Minnewaska	3	Ulster	1
Sam's Point	3	Ulster	0
Sunset Rock	3	Columbia	0
Albany Pine Bush	4	Albany	0
Rome Sand Plans	6	Oneida	0
Saratoga Sand Plains	6	Saratoga	0
Flat Rock State Forest	6	Clinton	0
Macomb Reservation	6	Clinton	0

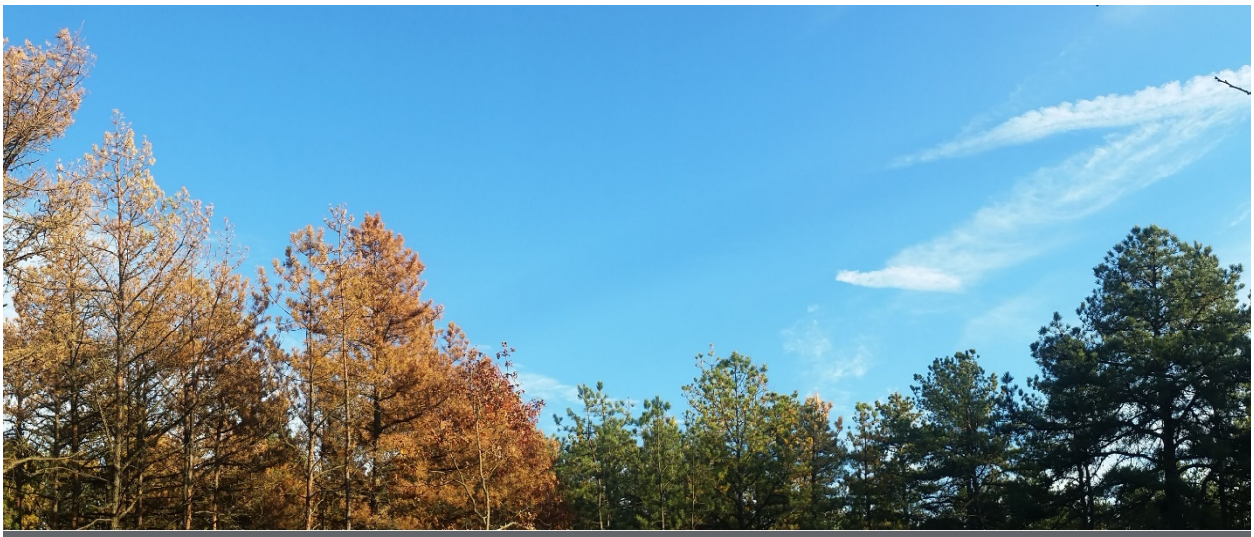
Aerial Detection Surveys

DLF conducted aerial detection surveys in January, June, and the end of August over Long Island (the Central Pine Barrens Core and Preservation Areas); Bear Mountain, Minnewaska, and Schunnemunk State Parks; Roosa Gap State Forest; and the Albany Pine Bush Preserve to map potential SPB infestation damage. In addition to the specific areas listed, the January survey covered all of Suffolk County to map the full extent of SPB damage. More than 3,000 potentially infested acres were mapped during the year. This information was used to guide DLF management activities and provide information to the public regarding the impacts of SPB. The data collected during the growing season was used to prioritize areas for ground surveys and assisted in suppression efforts by identifying locations with large numbers of potentially infested trees, where suppression would be most effective.

Ground Surveys

Ground surveys were conducted primarily on county land by DLF, Suffolk County, and CPBC staff. SPB-infested areas averaged 5 infested trees per location, which was a significant drop from the previous year's average of 15 infested trees per location. As part of the spot suppression efforts, 673 infested and buffer trees were marked for removal. DLF staff cut the trees within two weeks of the ground surveys being completed to prevent the infestations from expanding, cutting as few trees as necessary for the suppression effort to be successful.

East Hampton municipal staff survey town-owned properties for SPB, with special attention to those properties where management was conducted in past seasons and manage smaller infestations in-house



Ground survey showing the SPB front advancing from left to right:
dead, formerly infested trees on left; active infestation in middle; uninfested trees on right.

Management Strategies

Spot Suppression

Spot suppression is a management technique that involves cutting live, infested trees to disrupt the progression of an infestation. Once infested trees are cut down, grooves are cut along the length of the trunk to expose developing beetle larva to temperature extremes, moisture fluctuation, increased insect predation, and fungal pathogens. Uninfested, buffer trees are also cut to increase the distance between host trees, making future SPB attacks less likely

Of the 673 trees that had been marked during ground surveys, DLF cut 554 (Table 2, and see Appendix C, Figure 3). The remainder were not cut either because they no longer had SPB present at the time of cutting or because the trees were on properties where cutting could not take place this year. For comparison, 2,466 trees were cut during suppression efforts in 2018.

DLF's Luke McEntee and Cooper Weinman perform cut-and-leave suppression.

DLF's Christopher Kasyjanski prepares to cut down a pine tree.

Table 2. Location and Number of Trees Cut by DLF for Spot Suppression in 2019

Location	Trees cut
Barcelona Neck State Forest	9
Brook Haven State Park	2
Hubbard County Park	22
North West Harbor	261
Peconic Bog	29
Robert Cushman Murphy County Park	20
Sear-Bellow County Park	105
Six Pole Highway	40
Southaven County Park	66
Total	**554**

Restorative Thinning

DLF's Forest Health crew completed 75 acres of a planned 145-acre thinning in Sarnoff State Forest in Riverhead (see Appendix D, Figure 4). In a pine barrens system, thinning has been shown to be a very effective tool for making forests more resistant to SPB attack (Belanger 1980, Brown et al. 1987, Fettig et al. 2007, Thistle et al. 2011). Increasing the distance between trees disrupts SPB pheromone communication and greatly reduces the likelihood of a mass SPB attack. The increased distance also reduces the competition for resources between trees, making them healthier and better able to withstand an SPB attack. In addition to reducing the chance of an SPB outbreak, thinning has the added benefits of restoring pine barrens ecosystem services, including water filtration and wildlife habitat, and increasing species diversity.

In Rocky Point State Forest, more than 500 acres were marked for future thinning. Thirteen miles of firebreaks, areas free of burnable materials intended to slow or stop forest fires, were also created to help facilitate prescribed burns.

Restoration

DEC's Saratoga Tree Nursery continues to grow pitch pine seedlings from Long Island seed stock. Pinecone collection and tree planting are a fundamental part of restoring areas effected by SPB. It is important to replant pitch pine seedlings from local seed stock to conserve the unique genetics of native Long Island pitch pine.

Before Thinning

Immediately After Thinning

Two Months After Thinning

David Sarnoff State Forest Restorative Thinning

DLF Research

Regeneration

DLF monitored and recorded pitch pine regeneration in county parks that were impacted by SPB. Seventy plots were established in Hubbard and Southaven parks in February 2016, and an initial count of pitch pine seedlings was taken. Subsequent counts were conducted in July 2016, July 2017, July 2018, and July 2019. Other data collected at these sites included distance to the stand or suppression treatment's edge, canopy cover, basal area, live tree density, percent cover of shrubs, and leaf litter thickness.

Overall, there was little regeneration found regardless of whether spot suppression had been conducted in the area or not. A variety of factors may have contributed to this, such as deer browse or a high proportion of serotinous cones in the population that need fire to release their seeds. Of the factors that were measurable at observation sites, high shrub cover was negatively associated with regeneration. If regeneration of pitch pine is the goal at these sites, mowing or another form of shrub management will most likely need to be applied. This study will be conducted yearly to determine any changes to regeneration over time at these sites (Hassett and Cole, 2018, DLF Technical Report).

A pitch pine seedling reaches toward the Sun

Public Information and Outreach

Public information and outreach remain an important part of the SPB program. Infestation maps, reports, educational materials, and the management plan will continue to be updated and made available. Press releases, newspaper articles, social media posts, and signs will continue to be used to inform the public about SPB and DLF's management activities.

DLF trail sign at Barcelona Neck State Forest

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Appendix A

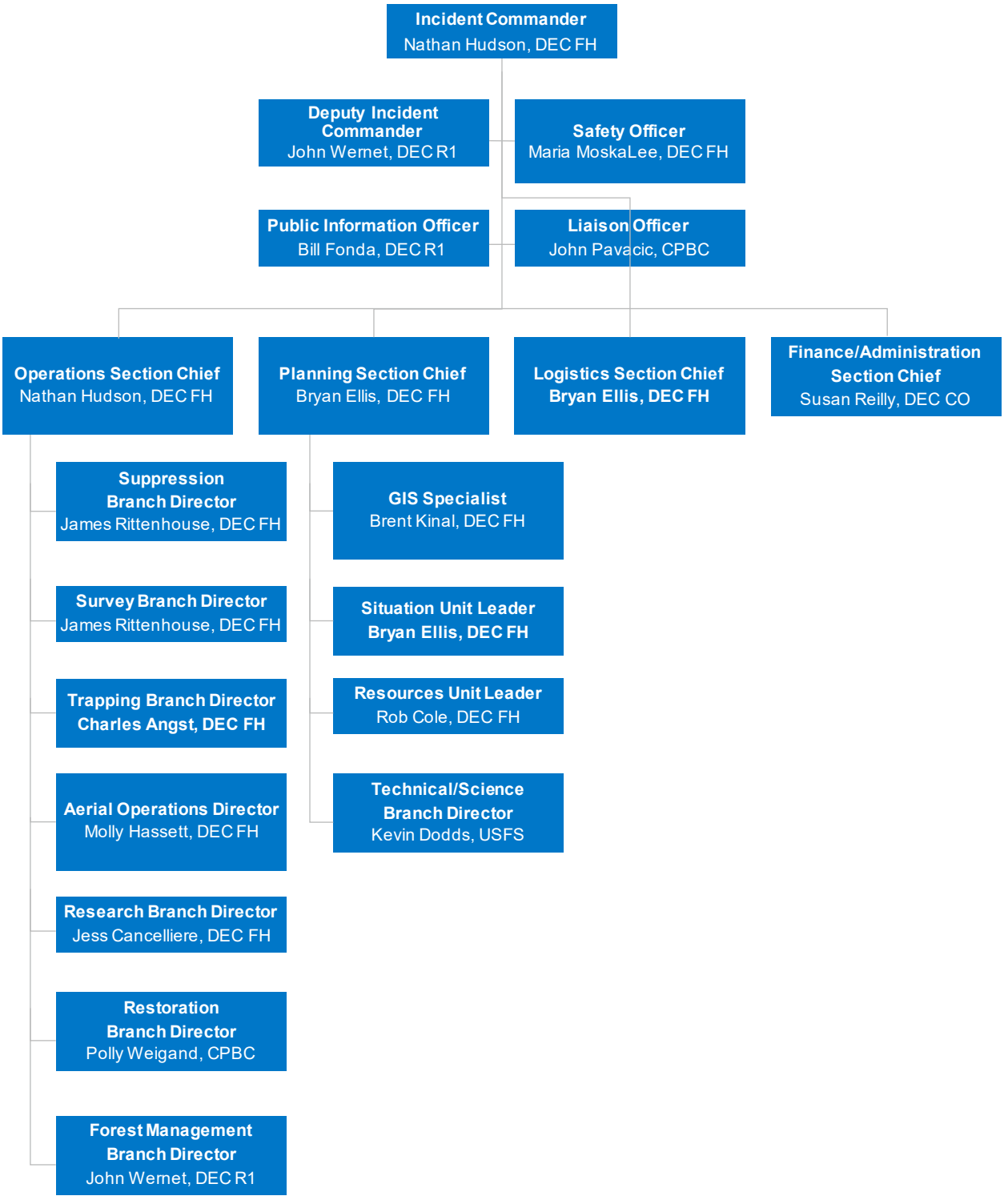

Figure 1. Incident command structure in place for 2019

Appendix B

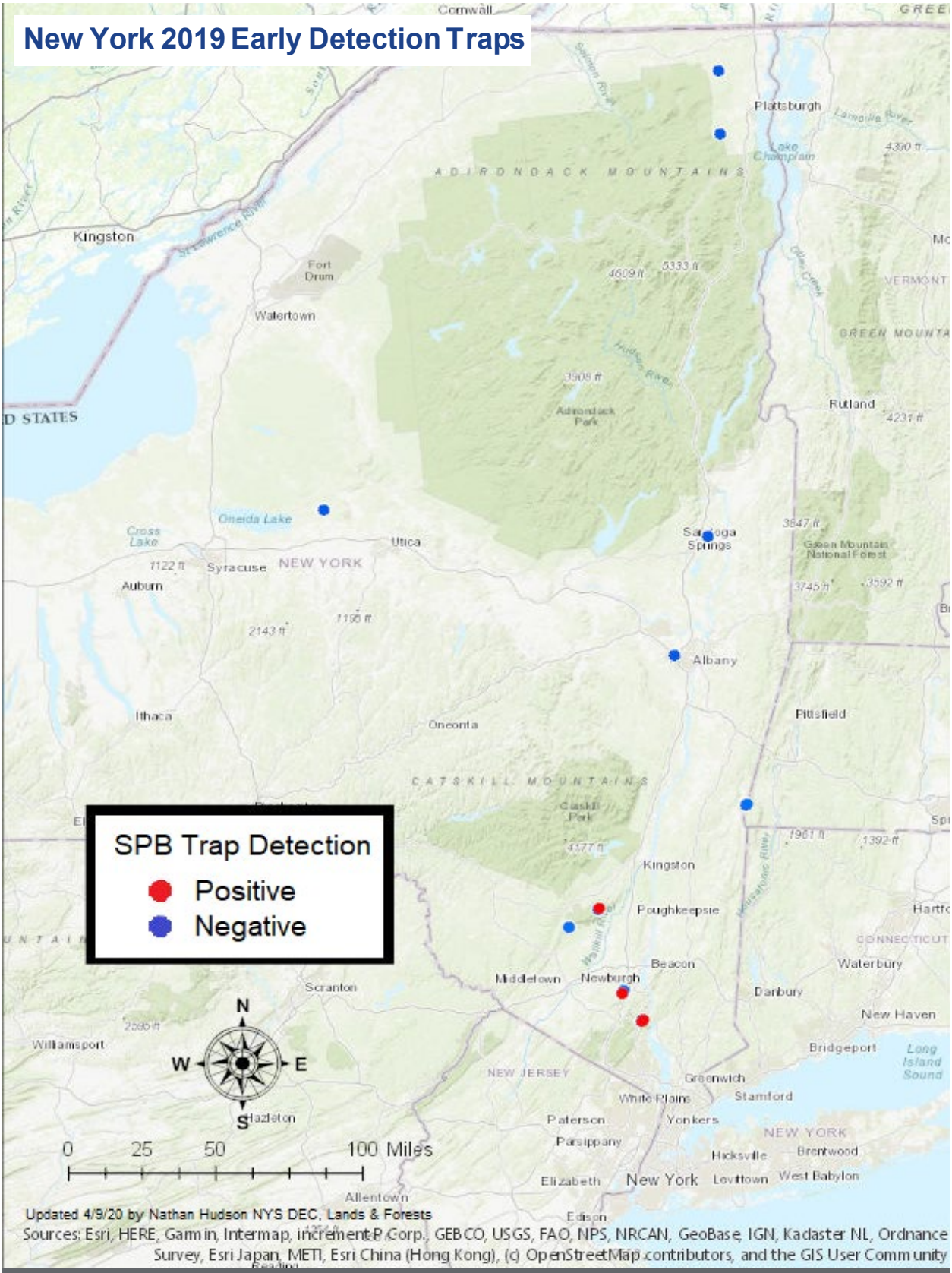

Figure 2. Locations of early detection SPB traps in New York State

Appendix C

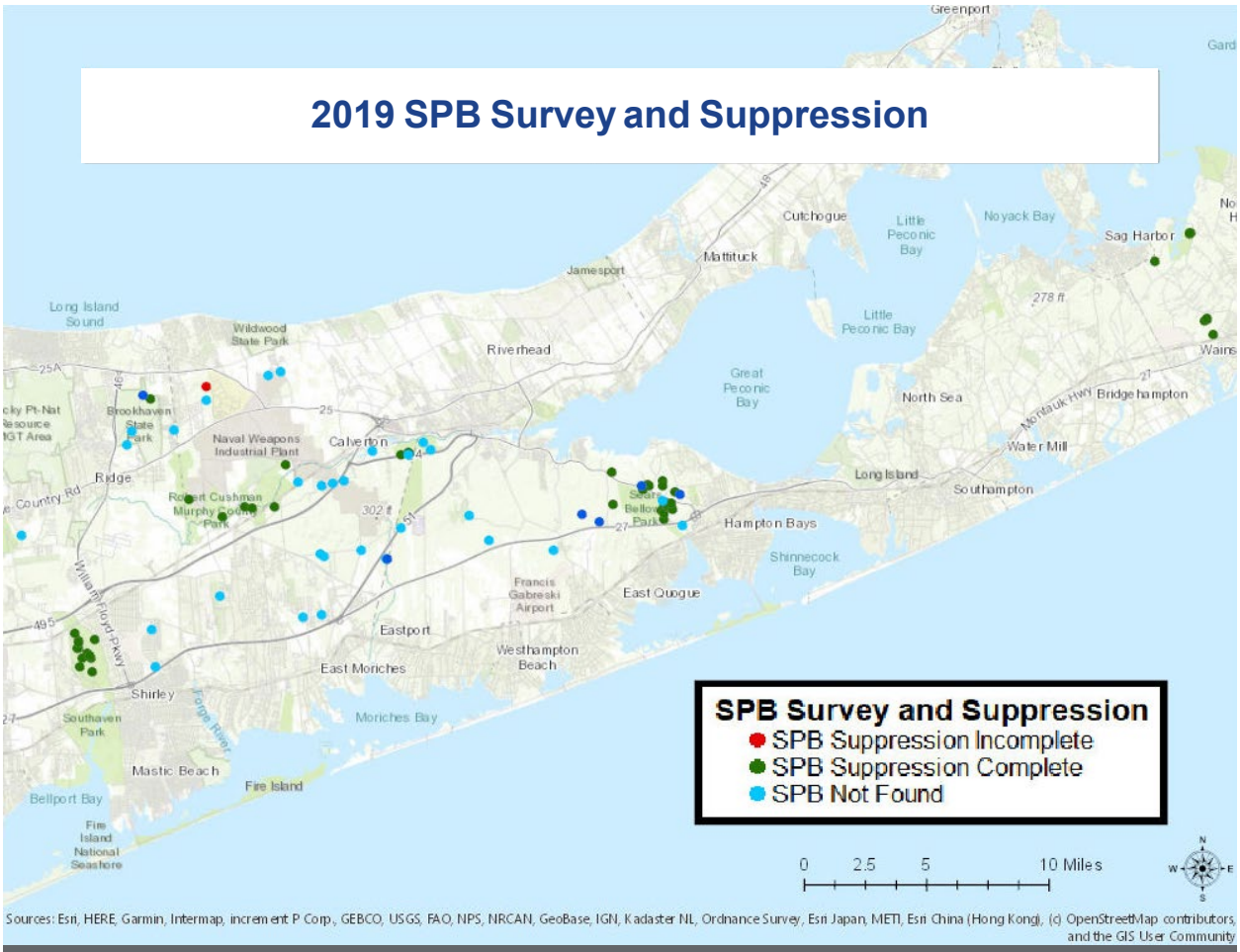

Figure 3. Spot suppression treatment areas

Appendix D

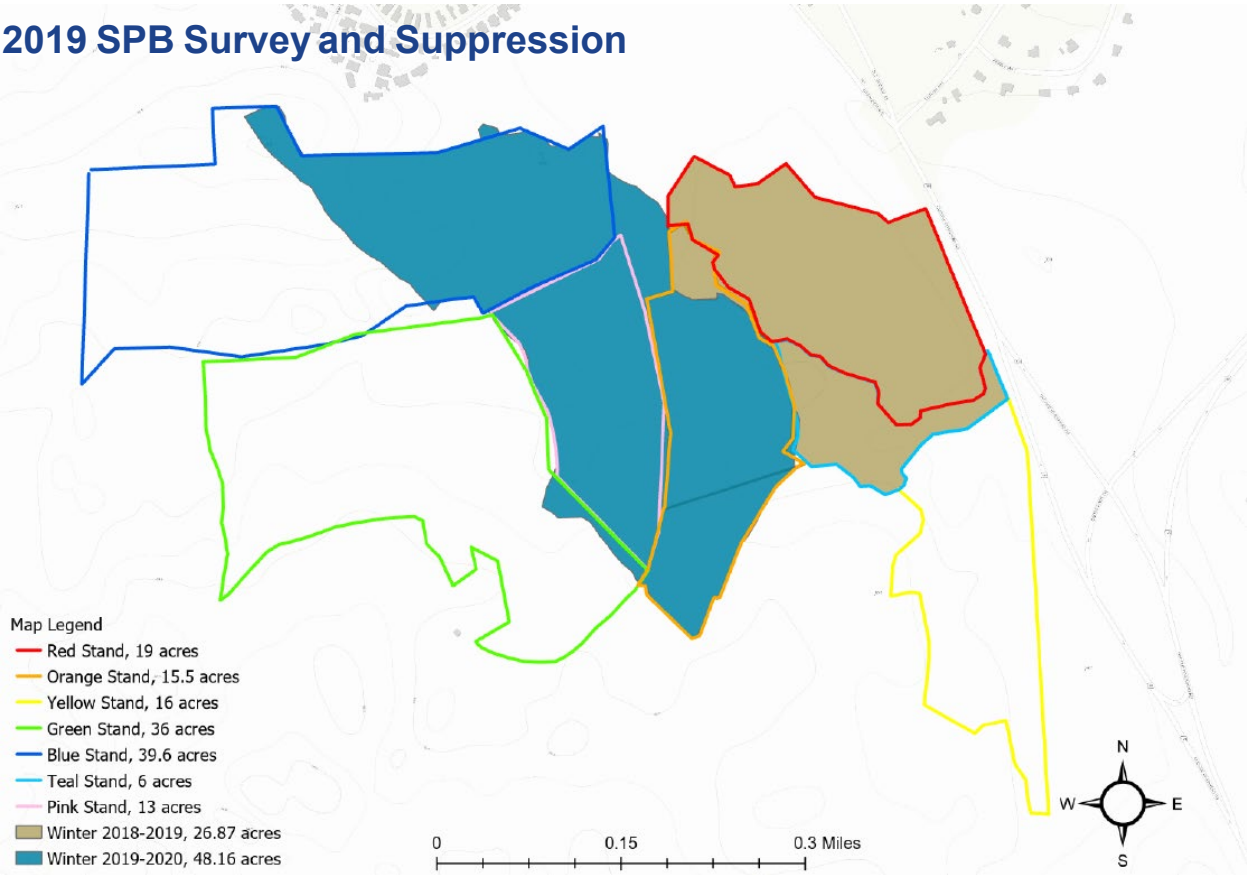

Figure 4. Map of Forest Restoration and SPB Preventative Thinning in David Sarnoff State Forest, Riverhead, Long Island

Appendix E

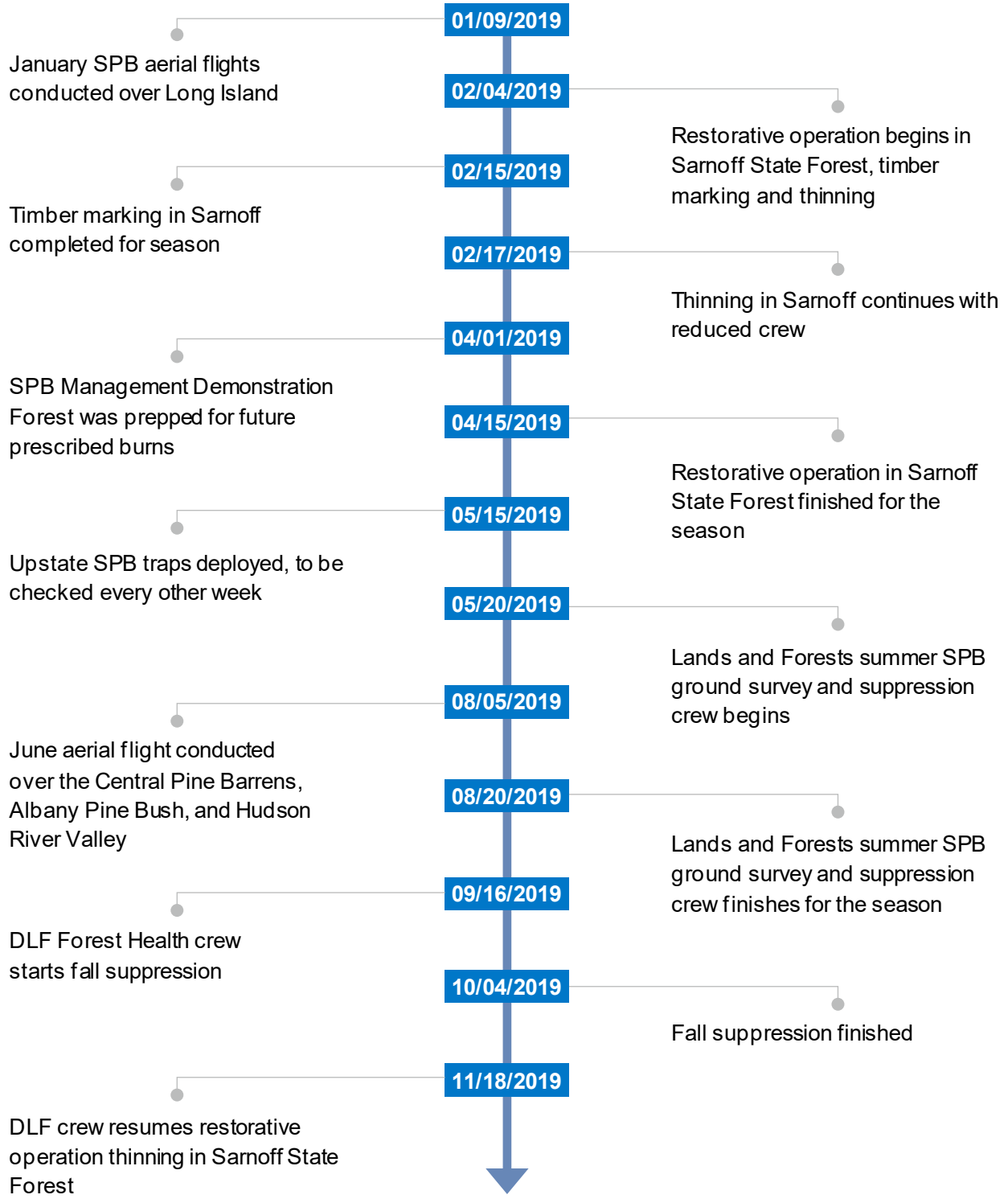

Figure 5. Timeline of SPB control activities in 2019

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