



Department of
Environmental
Conservation

New York State Southern Pine Beetle Response 2018 ANNUAL REPORT

DIVISION OF LANDS AND FORESTS

Andrew M. Cuomo, Governor | Basil Seggos, Commissioner



**New York State Southern Pine Beetle Response
2018 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

Southern Pine Beetle Response Incident Commander (current), Nathan Hudson,
Nathan.Hudson@dec.ny.gov

Southern Pine Beetle Response Planning Section Chief, Bryan Ellis,
Bryan.Ellis@dec.ny.gov, (518) 402-8975

Southern Pine Beetle Response Incident Commander (2018), Molly Hassett

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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 2018, aerial surveys mapped more than 9,000 acres of potentially infested trees. Priority areas were identified based on where management would be most crucial for controlling SPB and protecting the unique pine barren ecosystem. Ground surveys were conducted to verify and delimit infestations and a total of 3,321 trees were marked for spot suppression. Although early detection traps captured five southern pine beetles in Bear Mountain and Schunnemunk State Parks, no infested trees have been found north of Long Island.

DLF crews cut 2,466 trees during suppression efforts. A total of 72.5 acres were thinned in Rocky Point Pine Barrens State Forest to improve tree health and increase resistance to attack by SPB.

As part of the restoration efforts, more than \$285,000 was awarded to five municipal projects to monitor for SPB, cut infested trees that posed safety hazards to people or property in parks and along roadways, and conduct restoration projects at impacted sites. Eleven bushels of pitch pine cones were harvested in collection events led by the Town of East Hampton. Thanks to collections in prior years, DEC's Saratoga Tree Nursery has grown more than 9,000 pitch pine seedlings from Long Island seed stock. At a press event hosted by Suffolk County, the Central Pine Barrens Joint Planning and Policy Commission (CPBC), and DEC, 350 trees were planted in Hubbard and Sears Bellows County Parks. DLF research projects examined pitch pine regeneration, the efficacy of winter cut-and-leave suppression, vegetation composition and SPB interactions with white pine.

Southern Pine Beetle in New York State

In July 2014, southern pine beetles (SPB) were discovered in a beetle trap placed on Long Island by the NYS Department of Agriculture and Markets, and infested trees were found in October 2014. Prior to 2014, SPB had been detected only as far north as Pennsylvania and New Jersey (Payne 1980), but is now also present in Connecticut, Massachusetts, and Rhode Island. 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 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. Outside of Long Island, SPB has so far been found only in traps (in the lower Hudson Valley and the Albany Pine Bush Preserve), but it raises concerns for the pitch pines that are prevalent on the Shawangunk Ridge and in adjacent areas.

Incident Command Structure

To help effectively manage the response to SPB in New York State, an incident command structure (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 DLF Forest Health (FH) in Central Office (CO) and in Region 1; the Central Pine Barrens Joint Planning and Policy Commission (CPBC); the U.S. Fish and Wildlife Service (FWS); the U.S. National Park Service; the U.S. Forest Service (USFS); the Brookhaven National Laboratory; the NYS Office of Parks, Recreation and Historic Preservation; Suffolk County; the Town of Brookhaven; the Town of Islip; and the Town of Southampton.

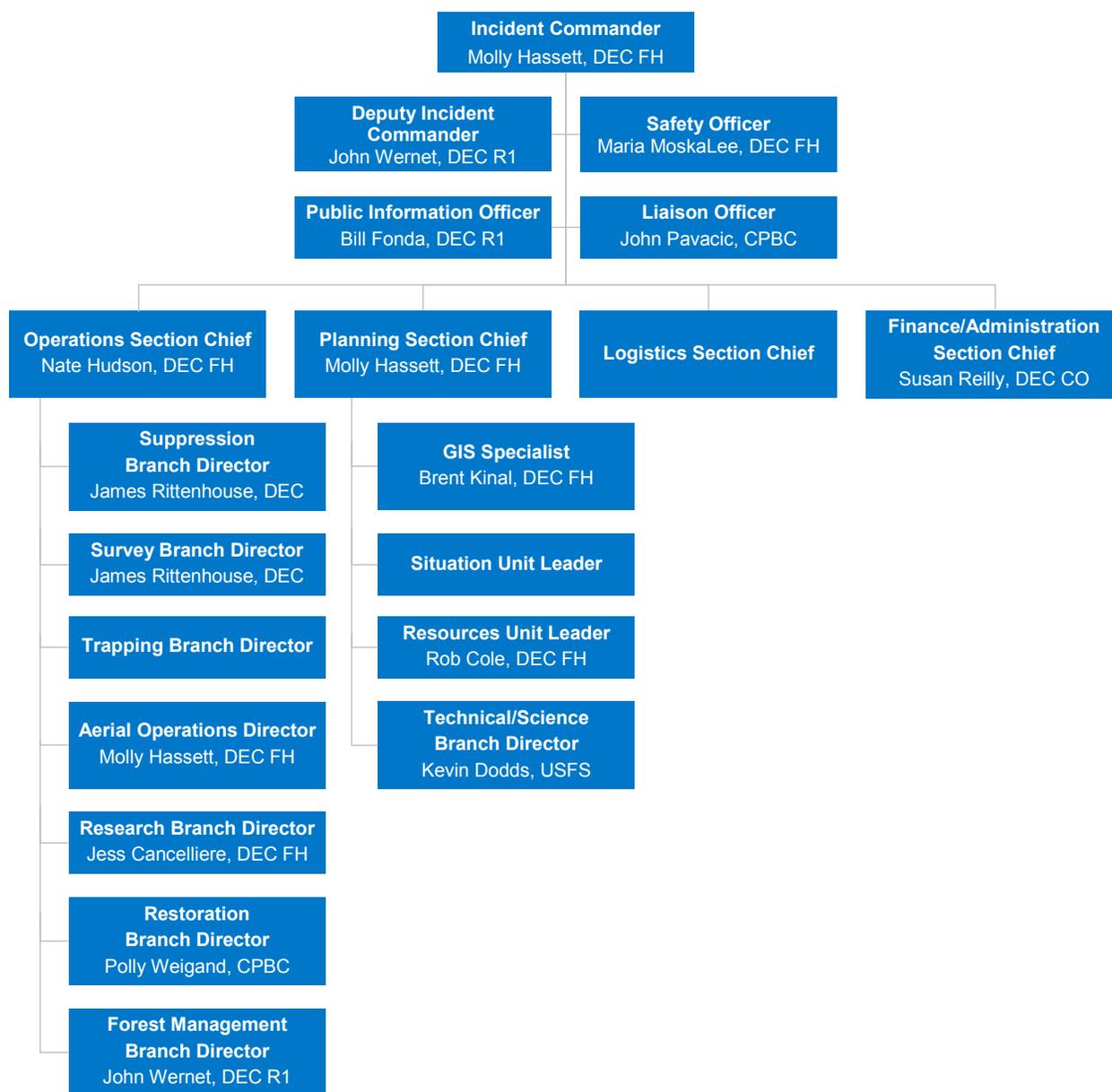


Figure 1. Incident command structure in place for 2018

Detection and Monitoring

Trapping

During 2018, DLF focused its trapping efforts on early detection. Sixteen traps were set outside of Long Island in Albany, Orange, Sullivan, and Ulster counties (Table 1, Figure 2) from May to October at sites with pitch pine. A total of five SPB were caught in traps at Bear Mountain and Schunemunk State Parks.

On Long Island, three traps were used by the CPBC staff to monitor beetle populations in Suffolk County from March to November. This trap data is being analyzed by CPBC and Suffolk County Cornell Cooperative Extension staff. Comparing trap data from consecutive years may reveal trends in beetle emergence and population levels, which aids in management activities.

DEC Region	Function	County	Number of traps
Region 1	Population monitoring	Suffolk	3
Region 3	Early detection	Orange Sullivan Ulster	5 2 4
Region 4	Early detection	Albany	5



DLF's Tom Schmeelk checks an early detection trap for southern pine beetle.

New York 2018 Early Detection SPB Traps

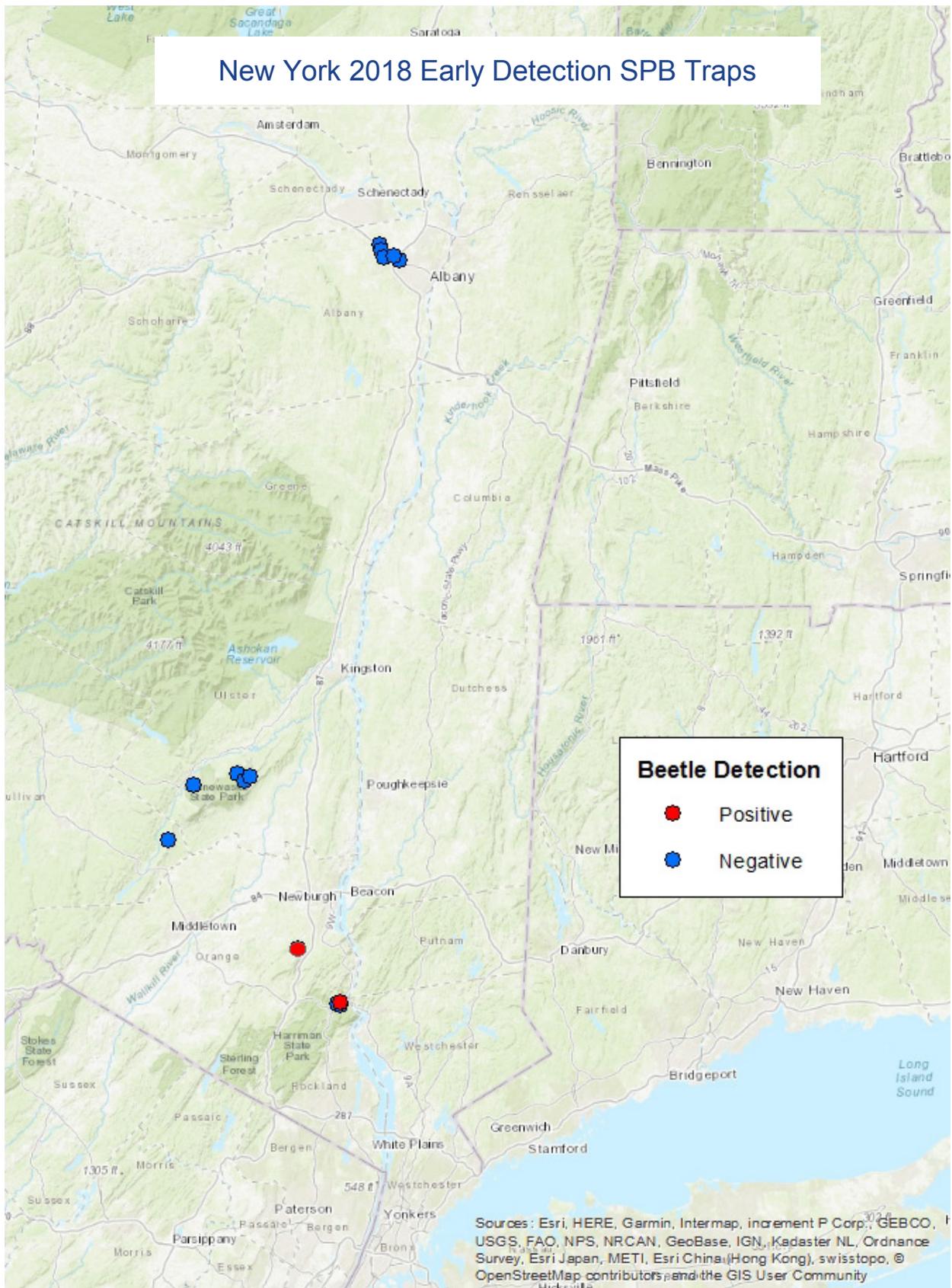


Figure 2. Locations of early detection SPB traps in New York State

Aerial Detection Surveys

DLF conducted aerial detection surveys in January, May, June, and August over DLF's priority management area on Long Island (the Central Pine Barrens Core and Preservation Areas) and in areas where SPB have been captured in traps but no infested trees have been found (Bear Mountain, Minnewaska, and Schunnemunk State Parks; Roosa Gap State Forest; 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. This additional information was used to guide DLF management activities and provide information to the public regarding the impacts of SPB. The data collected in May, June, and August were specifically used to guide ground survey and suppression efforts by identifying locations with large numbers of potentially infested trees and help identify where suppression would be most effective. More than 9,000 potentially infested acres were mapped during the year.

Ground Surveys

DLF, Suffolk County, and CPBC staff identified 57 SPB-infested acres on Long Island, most of which were on lands owned by Suffolk County. During ground surveys, 3,321 trees were marked for removal on the infested acres. DLF staff conducted spot suppression on these sites no more than two weeks after ground surveys were completed, because infestations can otherwise continue to expand. The short time period between surveys and suppression provides for more effective suppression and fewer total trees needing to be removed.

In addition to DLF efforts, Town of East Hampton staff conducted ground surveys on 88 parcels totaling more than 1,000 acres on both public and private properties to identify areas for suppression. Town of East Hampton staff offered free inspections of private lands and dump fee waivers for private property owners interested in conducting suppression.

Combined aerial, ground, and trap surveys show that SPB is widespread on Long Island (Figure 3). No infested trees were found in the Hudson Valley.



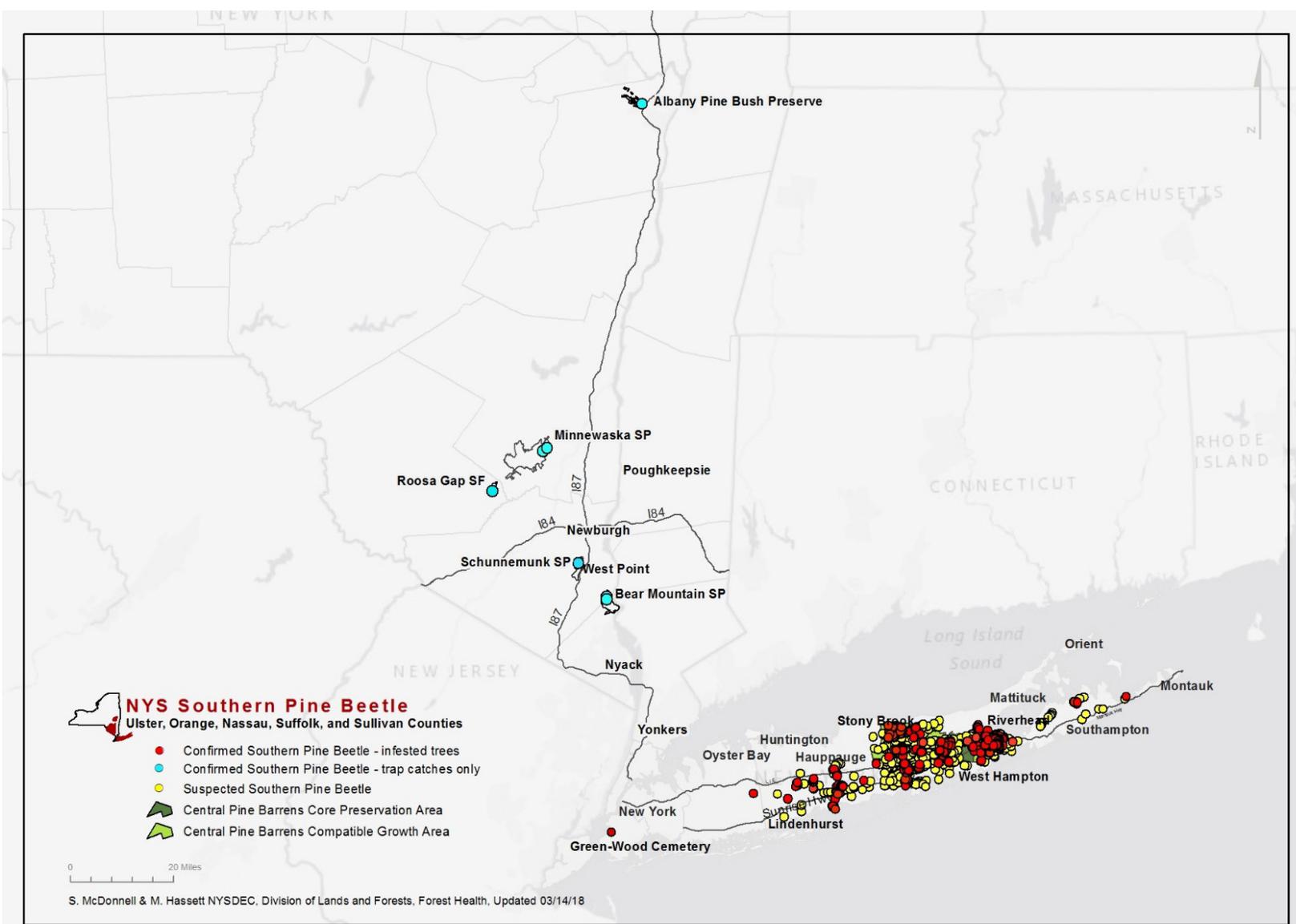


Figure 3. Combined aerial (suspected) and ground surveys (SPB traps and ground truthing surveys, confirmed) in New York State since 2014. There were no new detection locations in 2018.

Management Strategies

Spot Suppression

Spot suppression is when live, infested trees are cut down and 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. Suppression activities occurred only on Long Island because infested trees have only been found on Long Island (no infested trees have been found in the Hudson Valley or Albany Pine Bush).

DLF staff organized a partner suppression day with Suffolk County, U.S. National Park Service, USFS, CPBC staff, and volunteers. DLF cut 2,466 trees during 2018 spot suppression efforts (Table 2, Figure 4). Of the 3,321 that had been marked during surveys, 855 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.

Table 2. Location and Number of Trees Cut by DLF for Spot Suppression in 2018

Location	Trees Cut by DLF
Henry's Hollow State Forest	41
Hubbard County Park	599
Sears Bellows County Park	476
Curtis Preserve	676
Manorville Hills	3
Robert Cushman Murphy County Park	455
Southaven County Park	216
Total trees cut	2,466

In addition to DLF's efforts, 492 infested trees were cut by the Town of East Hampton on public properties in the Town.



DLF's Luke McEntee prepares to cut down an infested tree.

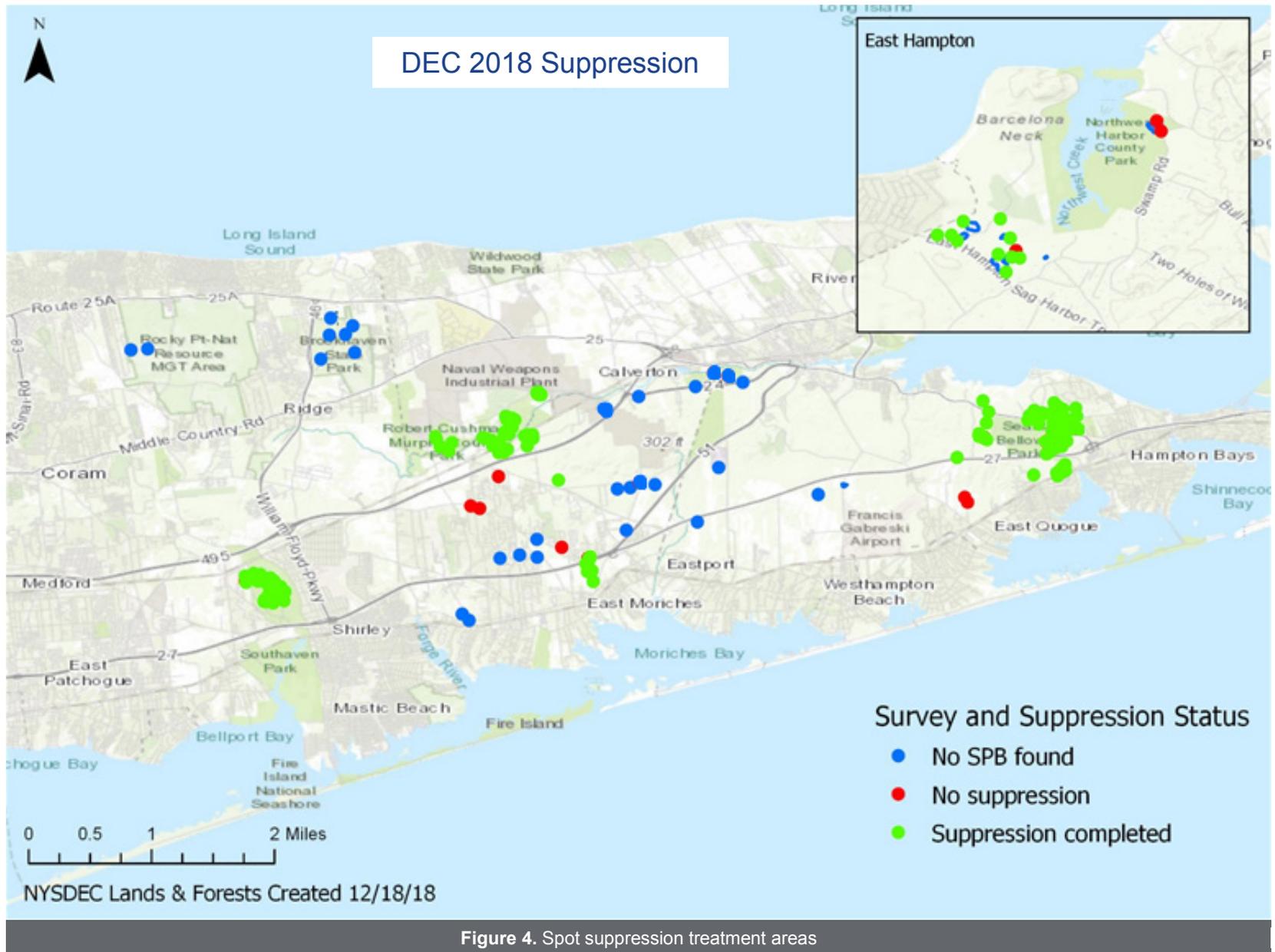


Figure 4. Spot suppression treatment areas

Thinning

Thinning has been proven to be an effective tool for making trees more resistant to SPB attack (Belanger 1980, Brown et al. 1987, Fettig et al. 2007, Thistle et al. 2011). Thinning is a forest management activity that promotes tree health and reduces competition for light, water, and nutrients by increasing spacing between trees. Increasing the distance between trees inhibits SPB pheromone communication and greatly reduces the likelihood of an SPB attack.

In the Rocky Point Pine Barrens State Forest, 72.5 acres were thinned (Figure 5). These forest stands were specifically chosen

because they were at high risk of being overrun by SPB. Plans are underway to thin additional acreage based on the risk maps created for Rocky Point State Forest. DLF plans to create additional firebreaks in Rocky Point State Forest during 2019 to prepare for additional prescribed burns. Firebreaks are areas free of burnable materials and are intended to slow or stop the spread of forest fires.

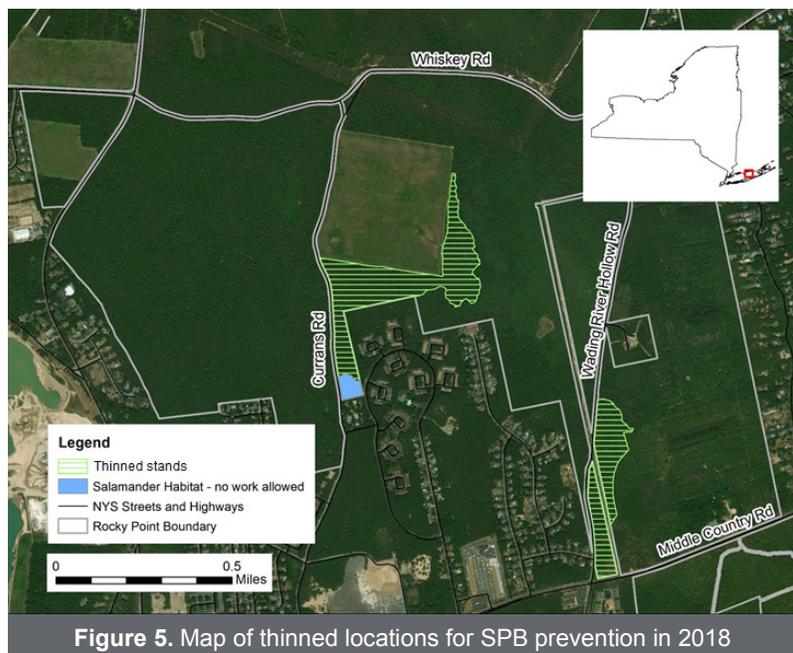


Figure 5. Map of thinned locations for SPB prevention in 2018



A thinned forest stand in Rocky Point Pine Barrens State Forest.

Restoration

Eleven bushels of pitch pine cones were harvested in collection events led by the Town of East Hampton. Thanks to collections in prior years, DEC's Saratoga Tree Nursery has grown more than 9,000 pitch pine seedlings from Long Island seed stock. Three hundred and fifty trees were planted at an event in Hubbard County Park hosted by Suffolk County, the CPBC, and DEC.



Pitch pine cones

Southern Pine Beetle Community Recovery Grants

In 2018, DLF awarded \$288,514 to five projects during the second round of Southern Pine Beetle Community Recovery Grants. Funding ranged from \$28,050 to \$75,000 per project and activities included cutting infested trees in parks and roadways, many of which posed safety hazards to people or property (Table 3).

Table 3: Grant Recipients Announced in 2018

Recipient	Project	Award
Bayard Cutting Arboretum Horticultural Society	NYS Bayard Cutting Arboretum, Paradise Island	\$60,820.00
Nassau County Soil and Water Conservation District	Southern Pine Beetle Suppression and Management in Peter J. Schmitt Massapequa Preserve	\$60,644.80
Sisters of St. Joseph	Southern Pine Beetle Initiative at The Sisters of St. Joseph	\$75,000.00
Town of East Hampton	Open Space Southern Pine Beetle	\$64,000.00
Town of Southampton	Removal of Hazard Trees at Good Ground Park and Foster Avenue Park	\$28,050.75

DLF Research

Regeneration

DLF measured pitch pine regeneration in areas impacted by SPB in Hubbard and Southaven county parks. Pitch pine seedlings were counted in 70 plots in February 2016, July 2016, July 2017, and July 2018. Other data collected at these sites included distance to the stand or suppression treatment's edge, canopy openness, basal area, live tree density, percent cover of shrubs, and leaf litter thickness.

Overall, there was little regeneration found in both areas where trees were suppressed and areas where trees were not suppressed. 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 and was most likely limiting regeneration of tree species at the sites. Over the three years of this study, shrub cover has increased at all of the sites. If regeneration of tree or herbaceous species is the goal at these sites, areas impacted by SPB will likely need to have mowing or another form of shrub management applied. This study will be conducted yearly to determine if regeneration changes over time at these sites (Hassett and Cole, 2018, DLF Technical Report).

SPB and White Pine

It has been surmised that SPB does not survive well or reproduce in white pine trees, but no studies have previously been conducted to document this. Since a large number of white pine trees in East Hampton were attacked by SPB in the summer of 2017, DLF sought to confirm this theory to guide their management decisions. In cooperation with the U.S. Forest Service and Dartmouth College, DLF staff cut and sampled 13 infested white pines in November 2017. The data collected included the tree's total height, height to live crown, diameter at breast height (DBH), diameter at the bottom and top of the tree, diameter at the base of the live crown, and measurements of the infested areas on the tree. It was found that SPB had only succeeded to the early larval stages and were likely not reproducing in white pine at this time.

A follow-up study was conducted in 2018 to determine if SPB was successfully reproducing in white pine during the summer months. For this study, DLF collected 10 additional white pine bolts from recently attacked trees in East Hampton in August 2018. The bolts were placed in emergence chambers at DLF's Forest Health Diagnostic Lab to see if live SPB adults would emerge from the tree. Over the following few weeks, hundreds of adult SPB emerged from the infested bolts. Upon further dissection of the bark and phloem, all life stages of SPB were found to be present in the phloem and outer bark, and it was determined that SPB had successfully reproduced in white pine. At this time, it is still assumed that white pine is only attacked when it is in proximity to outbreaks of SPB in pitch pine in New York, and that white pine trees cannot independently sustain a SPB infestation.



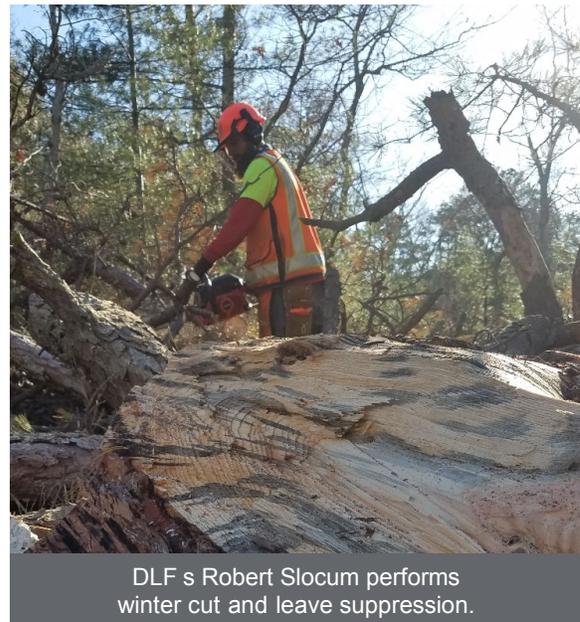
DLF Research Scientist Jess Cancelliere examines a SPB infested white pine tree.

Efficacy of Winter Cut-and-Leave Suppression

DLF uses cut-and-leave suppression to slow the spread of SPB on Long Island. In southern states, cut-and-leave is primarily applied from May–October, but in the Northeast, it has been considered that applying this treatment in the winter months would promote SPB brood mortality by exposing larvae to cold temperatures and moisture. The objective of the winter cut-and-leave effectiveness study was to compare the success of overwintering SPB within infested pitch pine trees that were cut down against SPB in those trees left standing, to determine if cut-and-leave suppression applied in the winter increases SPB brood mortality and reduces spring-emerging populations.

In general, there was no significant difference in the overwintering success of SPB between trees treated with cut-and-leave and trees left standing for the winter. In addition, data consistently showed trends contrary to our goal and that SPB success was higher in the cut trees than in the standing trees. Our results indicate that natural forces, such as predation, may play a larger role in killing overwintering SPB populations than cut-and-leave suppression during the winter months. Because cut-and-leave suppression did not cause mortality greater than what SPB naturally experience in their environment during the winter months, the results of this study suggest that cut-and-leave suppression during the winter is not effective and should not be used. Because of this study, DLF has altered its management strategy to only conduct cut-and-leave suppression during the warmer months when SPB are active and when studies have shown it to be most effective.

A demonstration forest in Rocky Point Pine Barrens State Park contains permanent vegetation plots that were established to highlight the ecological forest operations used to control SPB. In 2018, three different management treatments were performed in three-acre blocks including “no management,” “thinned,” and “thinned with prescribed fire.” The purpose of the demonstration forest is to monitor changes in forest structure and composition resulting from these treatments. Tree DBHs, seedling and sapling counts, and amount of woody debris that could fuel wildfires are being measured annually in this long-term study by the USFS.



DLF's Robert Slocum performs winter cut and leave suppression.

Public Information and Outreach

Infestation maps have been created from aerial surveys covering the extent of Long Island and will continue to be created each January as resources allow. Press releases, newspaper articles, social media posts, signs, and one large mobile sign have been used to inform the public about SPB and the DLF management activities that are being conducted.



DLF mobile sign unit at Rocky Point State Forest

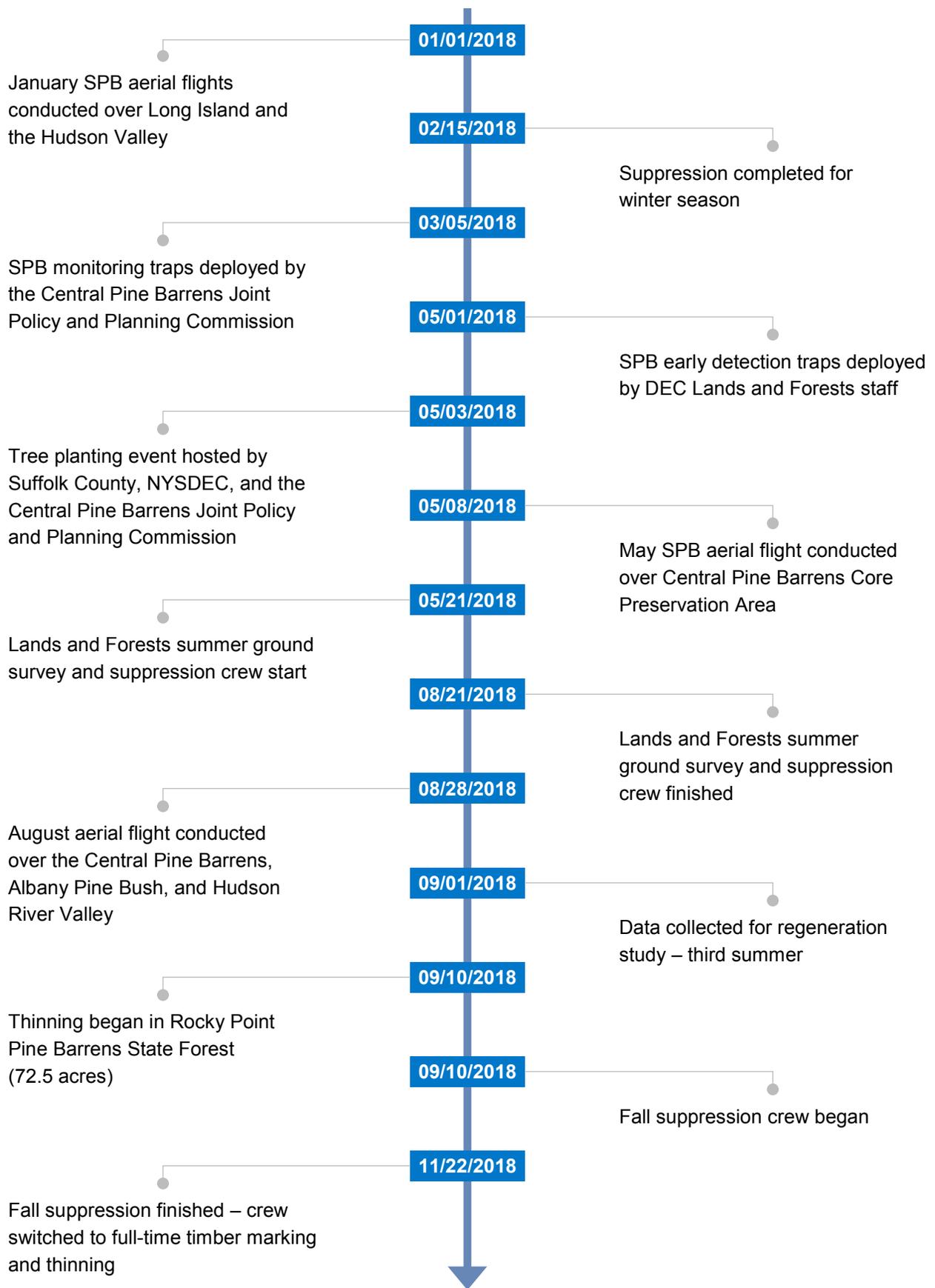


Figure 6. Timeline of SPB control activities in 2018

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