



Department of
Environmental
Conservation

NEW YORK STATE SOUTHERN PINE BEETLE RESPONSE

2017 Annual Report

Division of Lands and Forests

Bureau of Invasive Species and Ecosystem Health



**New York State Southern Pine Beetle Response
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Division of Lands and Forest, Bureau of Invasive Species and Ecosystem Health - (518) 402-9425

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Table of Contents

Executive Summary	4
Southern Pine Beetle in New York State	5
Incident Command Structure	5
Detection and Monitoring	7
Trapping	7
Aerial Detection Surveys	9
Ground Surveys	9
Management Strategies	11
Spot Suppression	11
Thinning	13
Restoration	14
Southern Pine Beetle Community Recovery Grants	15
DLF Research	16
Public Information and Outreach	17
Literature Cited	19

Executive Summary

The New York State Department of Environmental Conservation (DEC), Division of Lands and Forests (DLF) has continued to track and manage infestations of southern pine beetle (SPB) since it was found on Long Island in 2014. During 2017, aerial surveys mapped 6,631 acres of potentially infested trees. Priority areas were identified based on where management would be most crucial for controlling SPB and protecting the ecosystem. Ground surveys were conducted to verify and delimit infestations on 57 acres of Long Island and a total of 8,303 trees were marked for spot suppression. Although early detection traps captured fourteen SPBs in Bear Mountain State Park and one SPB in the Albany Pine Bush Preserve, no infested trees have been found north of Long Island. The trap catch in Albany is the farthest north SPB has ever been confirmed in the Northeastern United States.

DLF crews cut 6,777 trees during suppression efforts. Two demonstration forests were created in the Rocky Point Pine Barrens State Forest to show the value of using forest management techniques to control SPB. A total of 36 acres were thinned at these two sites to improve tree health and increase resistance to attack by SPB. Three firebreaks were installed in the demonstration forests as well, to prepare for prescribed burn treatments planned for 2018.

As part of the restoration efforts, more than \$513,000 was awarded to seven municipal projects to cut infested and hazard trees in parks and along roadways. Eight bushels of pitch pine cones were collected during an event hosted by the Central Pine Barrens Joint Planning and Policy Commission. 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. DLF research projects examined pitch pine regeneration, SPB survival in white pine, the efficacy of winter cut and leave suppression, and vegetation composition in the demonstration forests. In addition, the Central Pine Barrens Joint Planning and Policy Commission and DLF co-hosted a Southern Pine Beetle in the Northeast Research and Management Forum.

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 NYS Agriculture and Markets, and infested trees were found later the same year in October. Prior to this, SPB had been detected only as far north as Pennsylvania and New Jersey (Payne, 1980), but have since spread to Connecticut, Massachusetts and Rhode Island. SPBs 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. SPB has been found only in traps in the Lower Hudson River Valley, but it raises concerns for the pitch pine 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 Central Office (Albany, NY) to coordinate and implement consistent management activities in each of the DEC Regions that 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 in Central Office and in Region 1; the Central Pine Barrens Joint Planning and Policy Commission; the US Fish and Wildlife Service; the National Park Service; the US Forest Service; the Brookhaven National Laboratory; the NY Office of Parks Recreation and Historic Preservation; Suffolk County; the Town of Brookhaven; the Town of Islip; and the Town of Southampton.

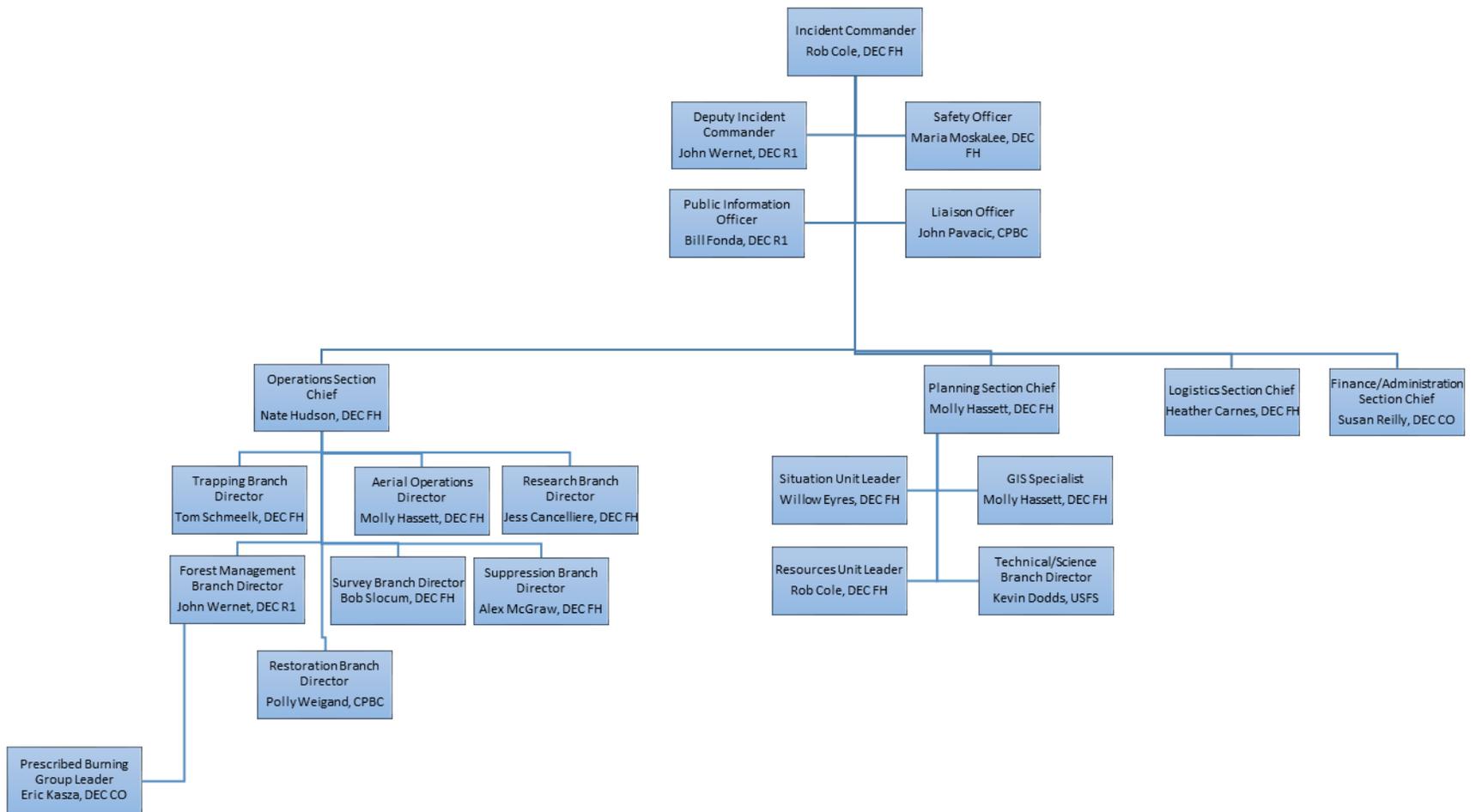


Figure 1. Incident command structure in place December 31, 2017.

Detection and Monitoring

Trapping

During 2017, DLF focused its trapping efforts on early detection. Twenty-five traps were set outside of Long Island in Albany, Columbia, Dutchess, Orange, Sullivan, and Ulster counties (Table 1, Figure 2) from May to October at sites with pitch pine. A total of fourteen SPBs were caught in three traps at Bear Mountain State Park.

On Long Island, three traps were used by the Central Pine Barrens Joint Planning and Policy Commission staff to monitor beetle populations in Suffolk County, year-round. This trap data is being analyzed and compared to 2016's findings to look for trends in beetle emergence and peak population levels, to aid in management activities.

In a separate trapping effort to examine the beetle species associated with forest thinning, one SPB was captured in the Albany Pine Bush Preserve.

Table 1. Location and distribution of SPB traps in New York State

<u>DEC Region</u>	<u>Function</u>	<u>County</u>	<u>Number of traps</u>
Region 1	Population monitoring	Suffolk	3
Region 3	Early Detection	Dutchess	1
		Orange	5
		Sullivan	5
		Ulster	11
Region 4	Early Detection	Albany	2
		Columbia	1



Photo 1. DLF Tom Schmeelk checks an early detection trap for southern pine beetle



Figure 2. Location of tested 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); Bear Mountain, Minnewaska, and Schunnemunk State Parks; and Roosa Gap State Forest, 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 was specifically used to guide ground survey and suppression efforts by identifying locations with large numbers of potentially infested trees, and where suppression activities would have the greatest impact.

A total of 6,631 acres of potentially infested areas were mapped during the year, 1,255 acres of which were within the Central Pine Barrens Core Preservation Area and 1,758 acres within the Central Pine Barrens Compatibility Area.



Photo 2. Infested (orange) trees are visible from the air in Connetquot River State Park, Oakdale.

Ground Surveys

DLF, Suffolk County, and Central Pine Barrens Joint Planning and Policy Commission staff conducted ground surveys on 57 SPB-infested acres in Long Island, most of which was on lands owned by Suffolk County. During ground surveys, more than 8,303 trees were marked for removal. DLF conducted ground surveys about two weeks prior to spot suppression activities since infestations would continue to expand after surveys were completed. This provided a more accurate count of how many, and which trees needed to be removed for best results.

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.

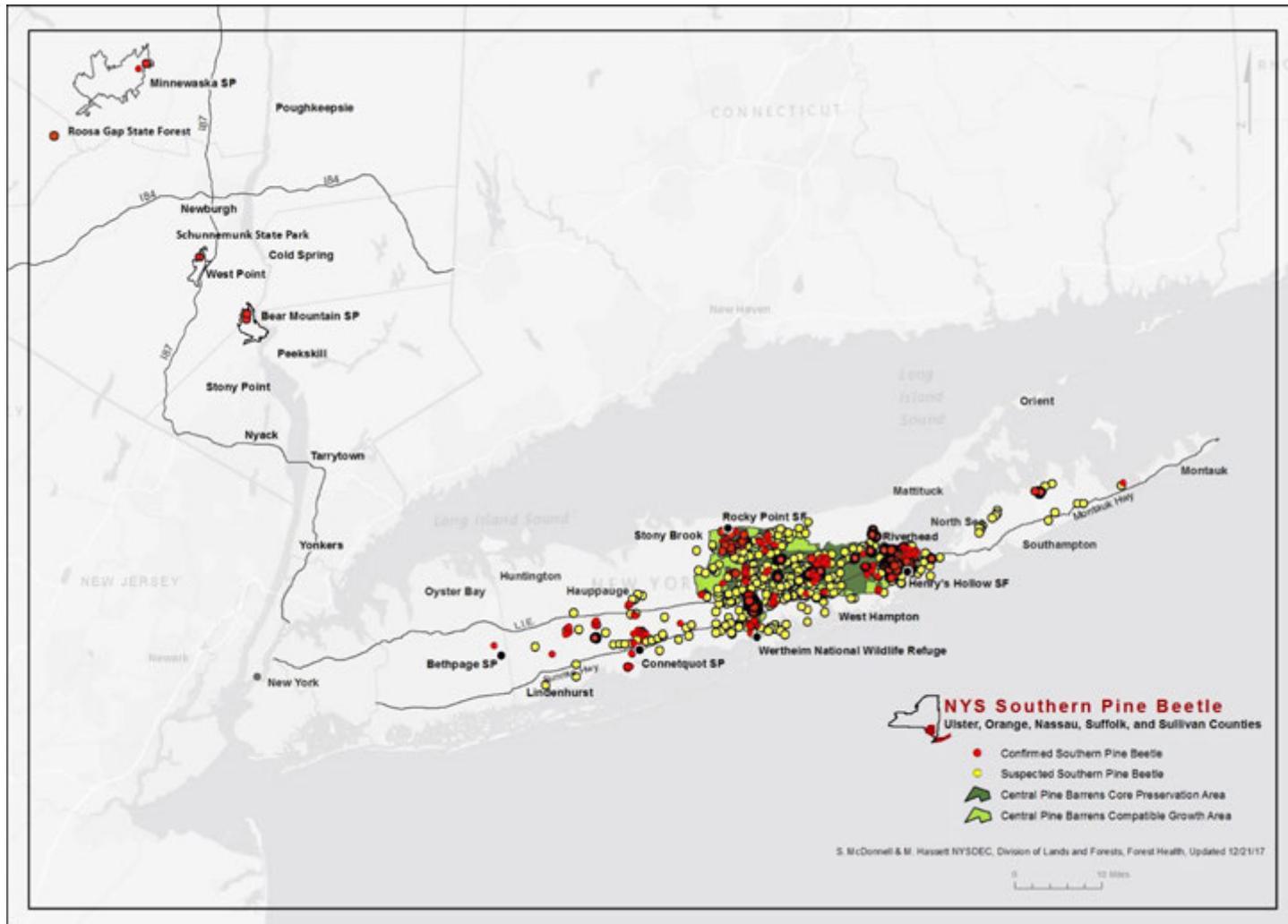


Figure 3. Combined aerial (suspect) and ground surveys (SPB traps and ground-truthing surveys, confirmed) in New York State since 2014.

Management Strategies

Spot Suppression

No infested trees were found in the Hudson River Valley so suppression activities occurred only on Long Island. Live, infested trees were cut down and then crews cut grooves along the bark to expose beetles to winter weather, moisture, and/or predation by other insects or fungi, depending on the time of year. Uninfested trees nearby were also cut to increase the distance between host trees and make attacks by any surviving SPB less effective.



Photo 3. DLF Nate Hudson prepares to cut down an infested tree.

DLF staff organized twelve partner suppression days with Suffolk County, National Park Service, Forest Service, Central Pine Barrens Staff, and volunteers. DLF and partner crews cut 6,777 trees during 2017 spot suppression efforts (Table 2, Figure 4).

Location	DLF Forest Health Crew	Partner Days	Total
Henry's Hollow State Forest	563	42	605
Hubbard & Sears Bellows CO Parks	3,018	23	3,041
Curtis Preserve	259	257	516
Indian Point CO Park	43	72	115
Manorville Hills	49		49
Robert Cushman Murphy CO Park	4		4
Brookhaven National Laboratory	78		78
Southaven CO Park	2,146	223	2,369
Total trees cut	6,160	617	6,777

In addition to DLF's efforts, infested trees were cut at Fire Island National Seashore by National Parks Service Staff (24 as of 11/30/17), the Town of East Hampton (8,202 as of 12/21/17), and the Town of Brookhaven (90, as a part of a 2016 SPB grant project); and hazard trees killed by SPB were cut by NYS Department of Transportation (1,424 as of 11/1/17) and the Town of Southampton Parks Department (1,200, as a part of a 2016 SPB grant project).

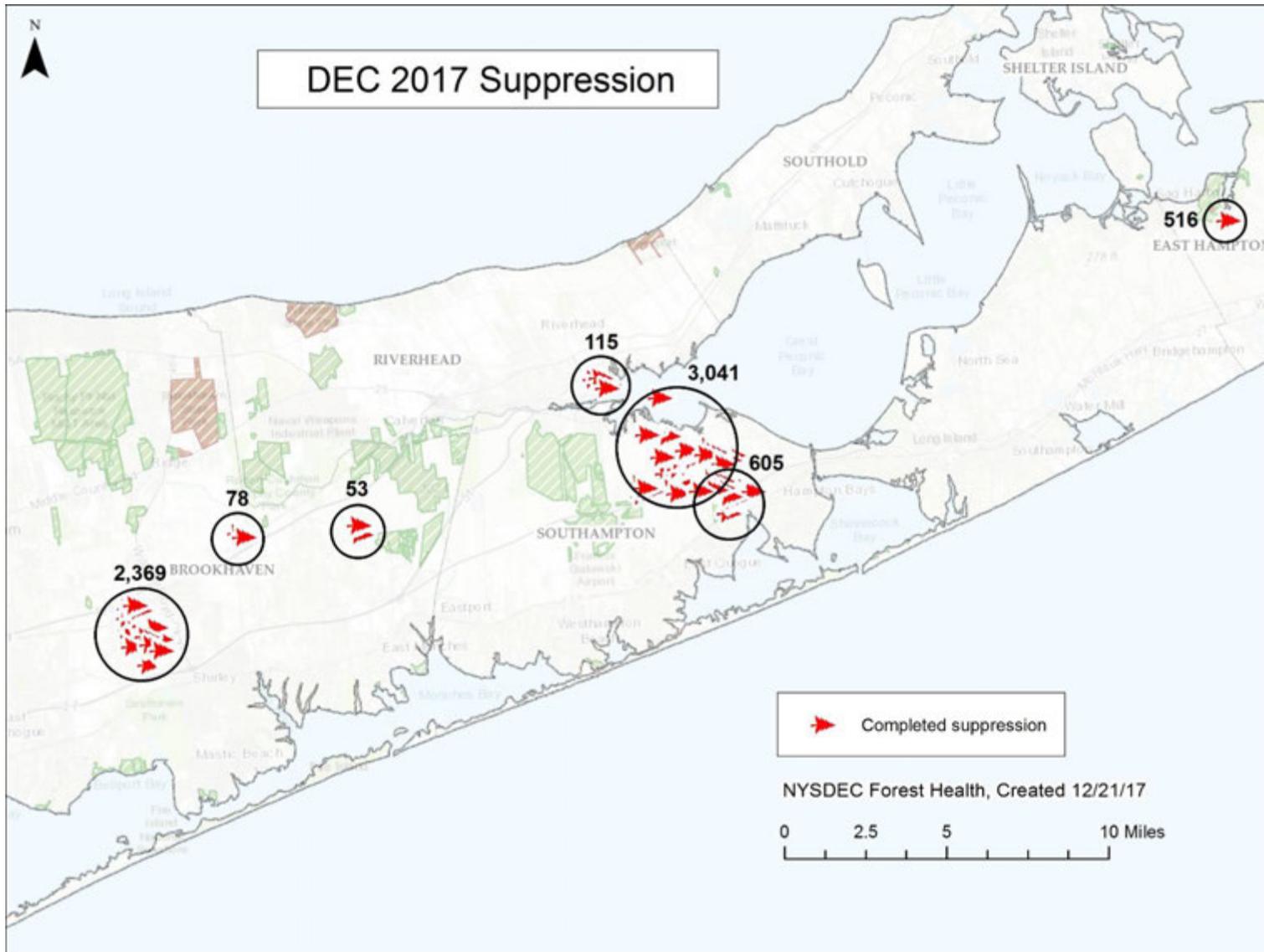


Figure 4. Spot suppression treatment areas. Number of trees cut per circled area are in black.

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 increases the health of individual trees by cutting out a certain percentage of a forest, thereby reducing competition for water and nutrients. Increasing the space between trees also makes it more difficult for beetles to communicate using pheromones and attack a tree in great numbers.

In the Rocky Point Pine Barrens State Forest, 36 acres were thinned in two forest stands along Whisky Road (Figure 5, p.14) to create demonstration forests for educating the public about the benefits of using management techniques to protect forests against extensive SPB damage. These forest stands were specifically chosen because they were overgrown and at high risk of being overrun by SPB. Each demonstration forest has nine acres that were thinned and nine acres that were thinned and burned, for comparison to the surrounding areas that were left unmanaged. Thinning began in January 2017 and three firebreaks have been installed in preparation for prescribed burning. All management activities, trails and signage for the demonstration forests are expected to be completed in 2018.

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 2018 to prepare for additional prescribed burns.



Photo 4. Thinned trees are healthier, less stressed and better able to fight off beetle attacks.



Figure 5. Map of thinned locations for SPB prevention in 2017.

Restoration

The Central Pine Barrens Joint Planning and Policy Commission hosted a pitch pine cone collection event in 2017, during which volunteers and staff collected eight bushels of cones. Seeds were sent to several places, including the Long Island Native Plant Initiative and DEC's Saratoga Tree Nursery, for storage and planting. Thanks to cone collection efforts in 2015 and 2016, there are now approximately 9,000 pitch pine seedlings, grown from Long Island seed stock, available for replanting. DLF and the Central Pine Barrens Joint Planning and Policy Commission are searching for locations to host replanting efforts for the spring of 2018.

Southern Pine Beetle Community Recovery Grants

In 2017, DLF awarded more than \$513,000 to seven projects during the first round of Southern Pine Beetle Community Recovery Grants. Funding ranged from \$63,870 to \$75,000 per project and activities included cutting infested and/or hazard trees in parks and along roadways (Table 3).

Table 3 Grant recipients announced in 2017.		
Recipient	Project	Award
Suffolk County Department of Parks, Recreation and Conservation	Lakeland and Southaven Hazard Tree Removal	\$75,000.00
Suffolk County Department of Parks, Recreation and Conservation	Sears Bellows County Park Suppression and Hazard Removal	\$75,000.00
Suffolk County Department of Parks, Recreation and Conservation	Southaven Southern Pine Beetle Suppression	\$75,000.00
Town of Brookhaven	Suppression of the Southern Pine Beetle	\$63,869.50
Town of Southampton	Town of Southampton Highway Department Southern Pine Beetle Tree Removal	\$75,000.00
Town of Southampton	Southampton Town Parks Department: suppression cutting and removal of standing dead trees at Red Creek Park and adjacent parkland	\$75,000.00
Town of Southampton	Southern Pine Beetle Suppression Cutting at Former Baird Property	\$75,000.00

Work completed in 2017 using these grant funds included:

- Suffolk County
 - o Staff inventoried and marked infested trees throughout County parklands.
 - o Ten personnel received S-212 sawyer training at the NY Wildfire Academy.
- Town of Brookhaven
 - o Contractors cut 90 infested trees, which were scored and left on site.
- Town of Southaven
 - o Contractors cut more than 1,200 dead hazard trees in Red Creek Park.
 - o Staff attended the SPB Symposium to learn more about this beetle
 - o The highway department discussed the project at a board meeting and created pamphlets and signage for outreach.

DLF announced a second round of Southern Pine Beetle Community Recovery Grants in the fall of 2017. In this round of grants, funded activities include removal of SPB-infested and hazard trees, forest thinning, replanting, and conducting prescribed burns in areas impacted by SPB. The grants are funded by NY's Environmental Protection Fund (EPF) and will be administered by DLF. Awardees are expected to be announced in January 2018.

DLF Research

Regeneration

DLF measured pitch pine regeneration in areas impacted by southern pine beetle in Hubbard and Southaven county parks. Pitch pine seedlings were counted in 70 plots in February 2016, July 2016, and July 2017. 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.

Overall, there was little regeneration found in both managed and unmanaged stands. 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. This study will be conducted yearly to determine if regeneration changes over time at these sites (Hassett and Cole, 2017, DLF Technical Report).

White pine attack and mortality due to SPB

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 more than 90 white pine trees in East Hampton were infested by SPB in the summer of 2017, DLF sought to confirm this to guide their management decisions. In cooperation with the US Forest Service, DLF staff cut and sampled thirteen infested white pines. The data collected included the tree's total height; height to live crown; diameter at breast height; diameter (DBH) 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. Four, 15-inch bolts were cut from each tree and sent for testing. A total of 25 samples are being processed at the US Forest Service and Dartmouth University labs. Results of this study are expected to be available in 2018.



Photo 5. DLF Research Scientist Jess Cancelliere examines an SPB-infested white pine tree.

Efficacy of winter cut-and-leave suppression

DLF Forest Health 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 because infestation expansion has been documented in New York into December, a preliminary study was conducted to measure the effectiveness of suppression in the winter months. For this study, 15 infested trees were cut in January (treated) and 15 were left standing (untreated). In March, wood samples were collected from all 30 trees and placed in emergence tubes to assess whether cutting trees affected SPB brood mortality. Initial results were inconclusive, however, and this study will need to be improved upon and repeated in 2018 with additional consideration for sample size and possible early emergence. Insects collected during this study were sent to the University of New Hampshire for identification and comparison to similar collections in the Southern United States.

Demonstration forest vegetation study

Permanent vegetation plots were established in the demonstration forests to monitor changes in forest structure and composition as a result of thinning and burning treatments. Tree DBHs, seedling and sapling counts, and amount of woody debris that could fuel wildfires were measured for this study.

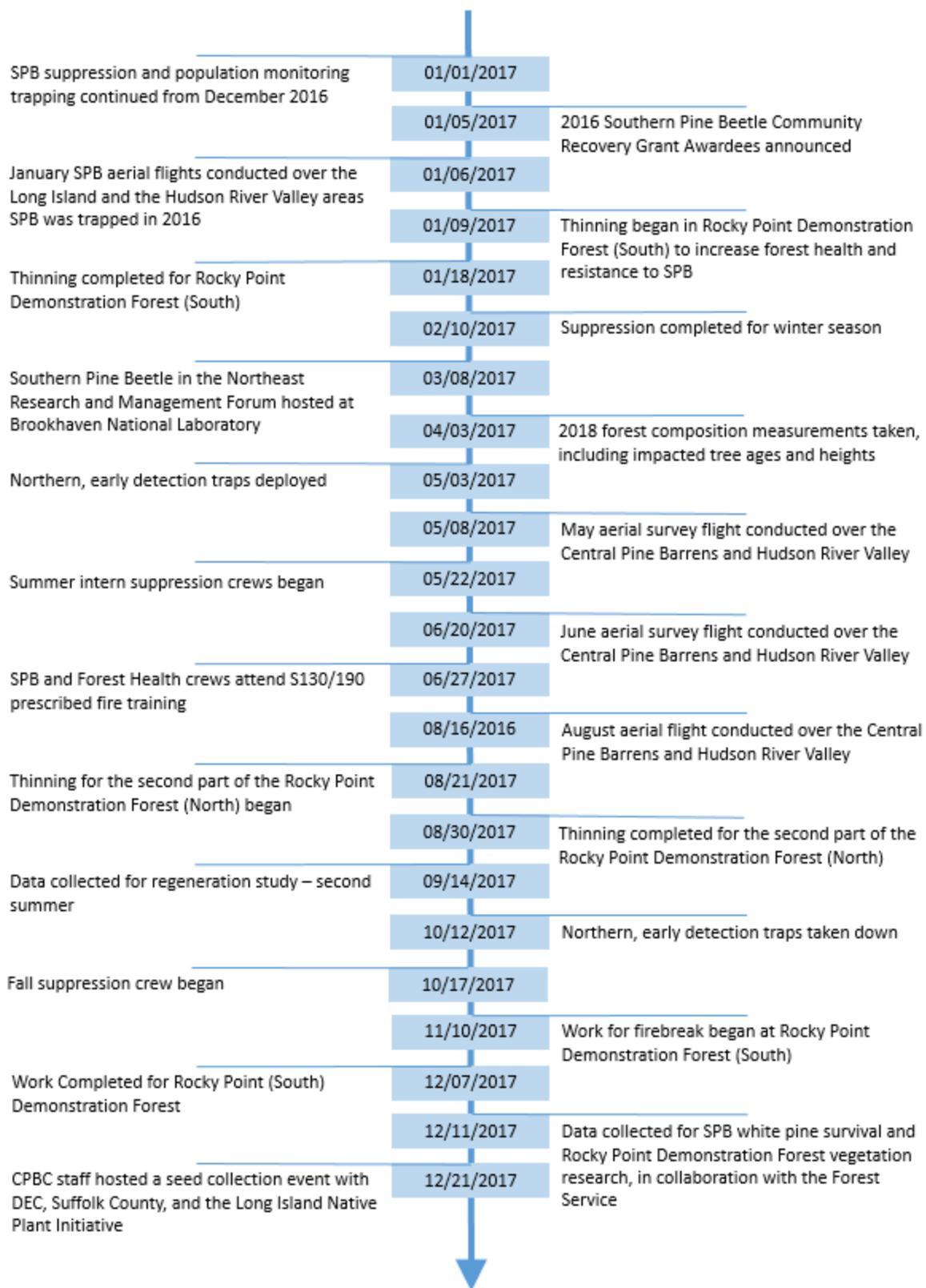
Public Information and Outreach

The Central Pine Barrens Joint Planning and Policy Commission hosted a Southern Pine Beetle in the Northeast Research and Management Forum in partnership with the US Department of Energy; US Forest Service; US Fish and Wildlife Service; DLF; National Park Service; Suffolk County Parks; Cornell Cooperative Extension of Suffolk County; and the New York State Office of Parks, Recreation and Historic Preservation. This public and professional forum took place from March 8th-9th and included several presentations by SPB experts, a panel discussion and field tours of impacted areas.



Photo 6. DLF John Wernet discusses the Rocky Point Pine Barrens Demonstration Forest at the SPB symposium.

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 billboard have been used to inform the public about SPB and the DLF management activities that are being conducted.



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