



NEW
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New York State Southern Pine Beetle Response 2020 ANNUAL REPORT

DIVISION OF LANDS AND FORESTS

Kathy Hochul, Governor | Basil Seggos, Commissioner



**New York State Southern Pine Beetle Response
2020 Annual Report**

New York State Department of Environmental Conservation
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) Forest Health staff has continued to track and manage infestations of southern pine beetle (SPB) since the beetle was first found on Long Island in 2014.

In 2020, DLF staff mapped more than 11,000 acres of potentially infested trees during aerial surveys. Using this data, they identified priority areas for management based on where the greatest impact would be for controlling SPB and protecting the unique pine barren ecosystem. DLF staff and partners then conducted ground surveys to verify and delimit infestations. A total of 1,030 infested and buffer trees were marked for spot suppression, of which DLF crews cut 556. The remaining 474 trees no longer harbored SPB at the time of suppression or were on properties where cutting could not occur. The crews also performed a 75-acre restorative thinning in the David A. Sarnoff Pine Barrens State Forest to improve tree health and increase their ability to resist an SPB attack.

DEC and the Central Pine Barrens Joint Planning and Policy Commission plan to do prescribed burns in these thinned areas in 2021 to continue restoring the health of the pine barrens. In preparation for future prescribed burns, DEC put in 1,400 meters of fuel breaks in December 2020.

DLF and partners conducted early detection trapping in Oneida, Orange, Ulster, Columbia, Albany, and Saratoga counties. A total of 50 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 lower Hudson Valley continues to be of concern due to trap catches. Going forward, DEC and partner survey efforts to locate possible SPB infestations in the Hudson Valley will be increased.

DEC's Colonel William F. Fox Memorial Saratoga Tree Nursery continues to grow pitch pine seedlings from Long Island seed stock that has been collected over the past several years. The seedlings have and will be used for replanting in areas severely impacted 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 New York State 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 since expanded their range into Connecticut, Massachusetts, and Rhode Island as well.

SPB use pheromones to communicate and attack pine trees in groups. When population numbers are high, groups of beetles can overwhelm a tree's defenses and kill it in just two–four months. Aerial and ground surveys show that SPB is widespread and abundant on Long Island, where it has killed hundreds of thousands of trees, mostly pitch pines. This has

been especially damaging in the Central Pine Barrens, where pitch pine, the insect's preferred host species, dominates or co-dominates more than 100,000 acres of public land.

The absence of natural fire disturbance and lack of forest management in this fire-dependent ecosystem have caused the Central Pine Barrens on Long Island to become overcrowded with weakened trees. These crowded forest conditions, coupled with climatic changes favorable for bark beetles, set the stage for the severe SPB outbreak that has dramatically affected this region. If these unhealthy forest conditions are not rectified through the holistic implementation of landscape-level forest management, SPB will continue to threaten the health and existence of pitch pines in the Central Pine Barrens.

Incident Command Structure

To help effectively manage the response to SPB in New York State, an incident command structure (ICS) was established in 2014 by DLF in DEC's Central Office (Albany) 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 the 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 New York State Office of Parks, Recreation and Historic Preservation (State Parks); Suffolk County; and the towns of Brookhaven, Riverhead, Islip, and Southampton.

As the severity of the infestation moved from an emergency response into sustained management, an incident command structure was no longer needed year-round. In 2020, the SPB team transitioned to using ICS only during active suppression, from September through December.

Detection and Monitoring

Black Turpentine Beetle

Black turpentine beetle (BTB) is a native bark beetle that is prevalent on Long Island and is often found cohabiting in pitch pines with SPB. BTB does not cause the same level of tree mortality as SPB; however, it can cause tree mortality in severe outbreaks. BTB populations and associated tree mortality should continue to be monitored through both aerial and ground surveys, especially as climate change projections suggest favorable conditions for bark beetles and increased climate-related stress on pitch pine.

in traps at the same three locations. Slightly lower trap catch numbers could have resulted from traps being damaged during a storm. Continued trap catches in the lower Hudson Valley are concerning due to the potential impacts on the pitch pine forests in the surrounding areas, though no infested trees have yet been found north of Long Island. In 2021, aerial and ground surveys should be conducted in these areas to help detect any infested trees.

Trapping

During 2020, DLF focused its trapping efforts on early detection. DLF staff set traps in Orange, Ulster, Albany, Columbia, Saratoga, and Oneida counties (Table 1, and see Appendix A, Figure 1) from June to October at sites with pitch pine, with help from State Parks and Albany Pine Bush Preserve staff. Traps were not set on Long Island due to high levels of SPB that were already known to be established throughout the region.

A total of 50 SPBs were caught in traps at Bear Mountain, Schunnemunk, and Minnewaska State Parks. In 2019, a total of 186 SPBs were caught

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	7
Bear Mountain 2	3	Orange	24
Schunnemunk 1	3	Orange	9
Schunnemunk 2	3	Orange	9
Minnewaska	3	Ulster	1
Sam's Point	3	Ulster	0
Sunset Rock	3	Columbia	0
Albany Pine Bush	4	Albany	0
Rome Sand Plains	6	Oneida	0
Saratoga Sand Plains	6	Saratoga	0

Aerial Detection Surveys

DLF conducted aerial detection surveys for SPB and native BTB in January and August over Long Island (the Central Pine Barrens Core and Preservation Areas) (see Appendix A, Figure 2). More than 11,000 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 infestation size and location data are collected during growing season flights and are used to prioritize areas for ground surveys. Suppression efforts are determined 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 and CPBC staff. SPB-infested areas averaged 2 infested trees per survey point within each of the 8 locations, which was a drop from the 2019 average of 5 infested trees per location (with the 2018 average being 15). As part of the spot suppression efforts, 1,030 infested and buffer trees were marked for removal during surveys.

East Hampton municipal staff surveyed town-owned properties for SPB, with special attention to those properties where they had conducted management in past seasons.



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. Infested and buffer trees must be cut within two weeks of being marked during a ground survey. This short window of time lowers the likelihood that the infestation will spread, which reduces the number of total trees being cut for the suppression. Once infested trees are cut down, grooves are cut along the length of the trunk to

expose developing beetle larvae to temperature extremes, moisture fluctuation, increased insect predation, and fungal pathogens. Uninfested buffer trees are also cut to increase the distance between host trees. Cutting buffer trees increases airflow between remaining trees, which disperses SPB pheromones and makes it harder for SPB to congregate. This decreases the likelihood of future SPB attack.

Of the 1,030 pitch pine trees that had been marked during ground surveys, DLF cut 556, of which 422 were infested and 134 were buffer trees (Table 2, and see Appendix A, 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. For comparison, 673 trees were marked during ground survey efforts and 554 trees were cut during suppression efforts in 2019. At Longwood Estates in the Town of Brookhaven, eight infested white pine trees were found. Infested white pines were not cut for suppression due to a high tree-survival rate and low chance of SPB reproduction in this species.

The overmarking of trees is likely due to surveyor error combined with a lack of early suppression during the summer months due to delays caused by the COVID-19 pandemic. Many trees were marked in June and July but were not visited again until November. When suppression activities began in September and November, many of the marked trees had been evacuated by SPB and so were not cut. This overabundance of marked trees can be reduced next year by not marking trees that have already been evacuated by SPB, and limiting the number of surveys conducted when suppression activities are unable to proceed as normal.

Table 2. Location and Number of Trees Cut by DLF for Spot Suppression in 2020

Location	Trees Cut
Longwood Estate	0
Rock Hill County Park Lands	18
Hubbard County Park	77
Dennis Puleston Warbler Woods Preserve	163
Robert Cushman Murphy County Park	0
Sears Bellow County Park	34
Manorville Hills County Park	95
Southaven County Park	169
Total	556



DLF's Nathan Hudson prepares to cut down an infested pine tree.

South Fork

SPB has been prevalent on the South Fork of Long Island in the Town of Southampton and Town of East Hampton since before 2017, but management in this region has been an objective secondary to managing the Central Pine Barrens because of its location outside the designated area of the Central Pine Barrens. As a result of challenges such as landowner permission, forest and habitat fragmentation, and difficulties presented by the COVID-19 pandemic, the region's infestations continued to spread in 2020.

Southampton: During the winter 2020 aerial survey, it was discovered that a small SPB infestation in the Great Hill area of Southampton was poised for rapid expansion. Great Hill is a checkerboard of town, county, and small private parcels. Staff determined that based on the size of the current infestation and parcelized nature of the property, suppression would be ineffective and would result in the complete removal of pine from the property. Lacking suppression, the majority of the pine-dominant area in Great Hill was consumed by SPB in 2020. As this infestation expands in the suburban landscape, public awareness and concern will likely increase.

East Hampton: Having a history of SPB suppression dating back to 2017, the SPB presence in East Hampton is less expansive than in neighboring Southampton and is made up of several smaller infestations. While Town staff performed some suppression in 2020, these dispersed infestations still have the potential to coalesce and consume the remaining pine stands.

Based on the fragmented nature of the South Fork landscape, it is not possible to get landowner permission to cut all the necessary trees within the effective time period. In 2021, DEC will focus on monitoring these infestations and performing SPB suppression on public forest and park lands where efforts will be effective. We will continue to place the majority of our available resources on the protection of the Central Pine Barrens.

Restorative Thinning

DLF's Forest Health crew has completed 75 acres of a planned 145-acre thinning in the David A. Sarnoff Pine Barrens State Forest in the Town of Southampton (see Appendix A, Figure 4). In a pine barrens ecosystem, thinning has been shown to be a very effective tool for increasing resistance to SPB attack (Belanger, 1980; Brown et al., 1987; Fettig et al., 2007; Thistle et al., 2011). Thinning involves cutting down trees to increase the distance between them, which disrupts SPB pheromone communication and greatly reduces the likelihood of a mass SPB attack. The increased distance also reduces the competition for resources between the remaining 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; increasing wildlife species diversity; and decreasing the risk of a catastrophic wildfire. These pictures are taken at the same location at different stages of thinning.



DLF's Joe Bodine performs cut-and-leave suppression.



Before thinning



Immediately after thinning



Two months after thinning

David A. Sarnoff State Forest restorative thinning

Public Information and Outreach

Public information and outreach remain an important part of the SPB program. Infestation maps, reports, educational materials, and the SPB management plan are updated and made available on the DEC website. 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.

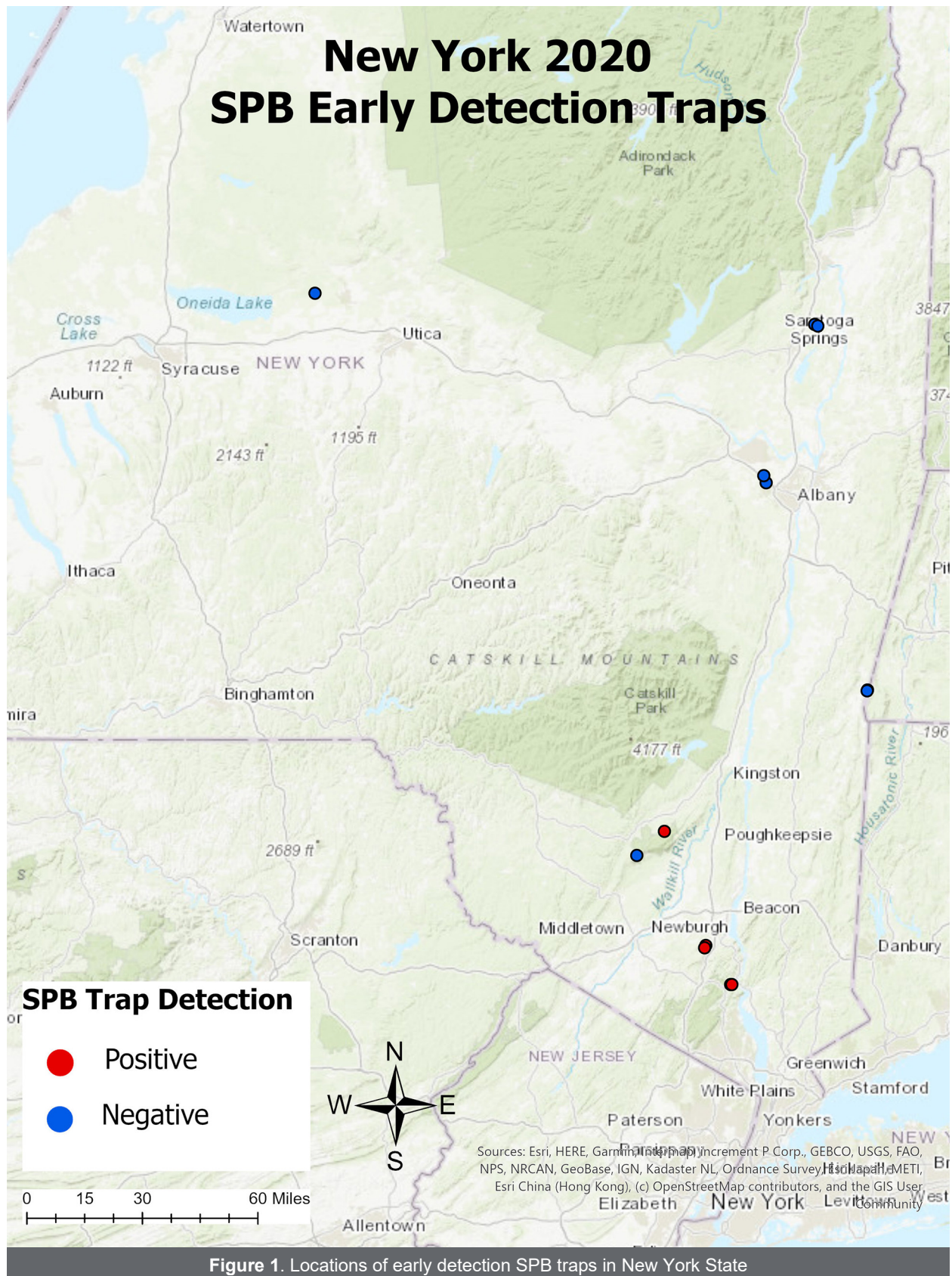
DLF staff created two new documents that are available on the DEC website. One provides information about signs of SPB and how to report them through iMapInvasives. The other is an update on the DLF restoration projects within the Central Pine Barrens on Long Island (see Appendix B, Figures 5 and 6).



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Appendix A – Maps



August 2020 SPB and BTB Aerial Detection Survey on Long Island, NY

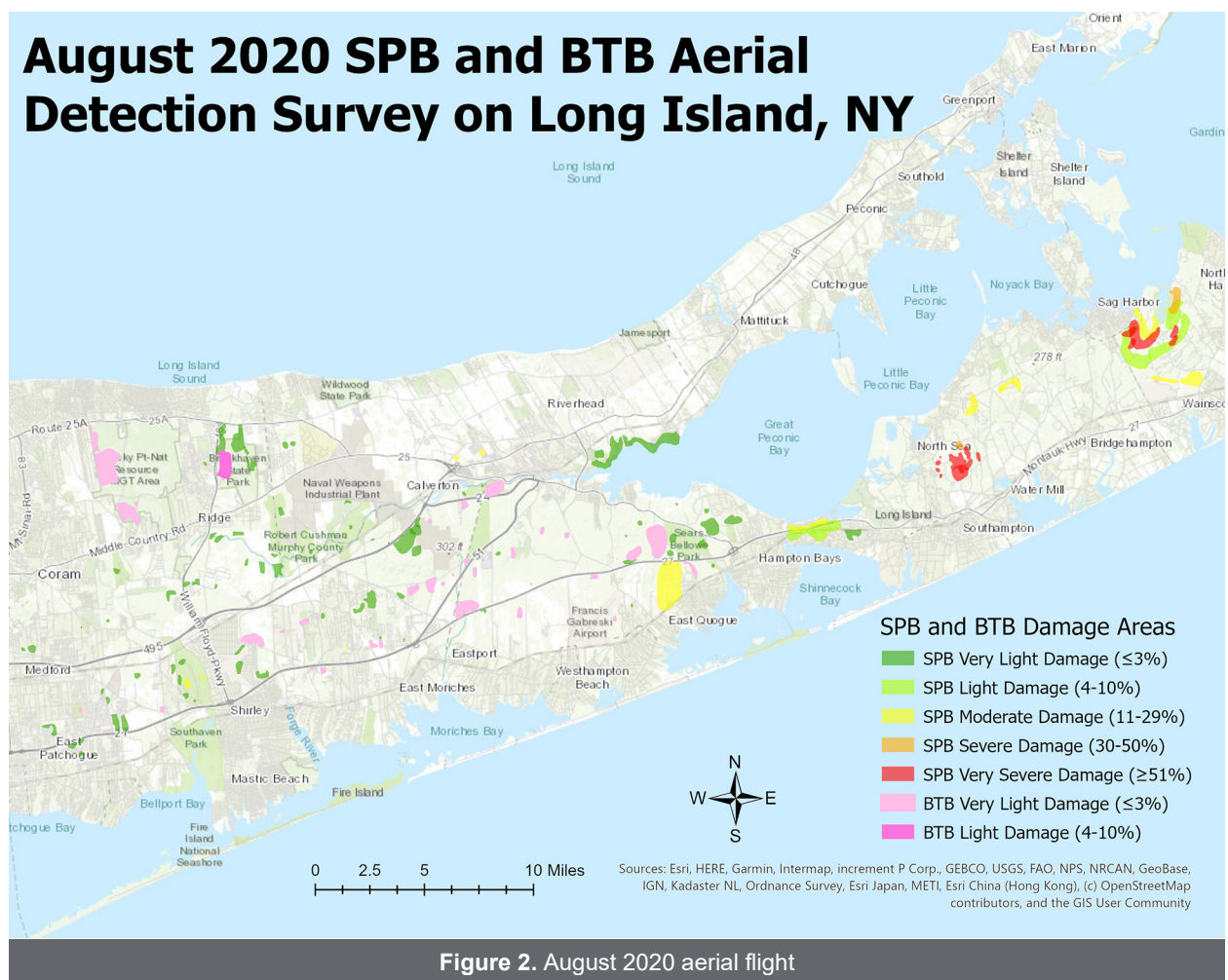


Figure 2. August 2020 aerial flight

2020 SPB Survey and Suppression in Long Island, NY

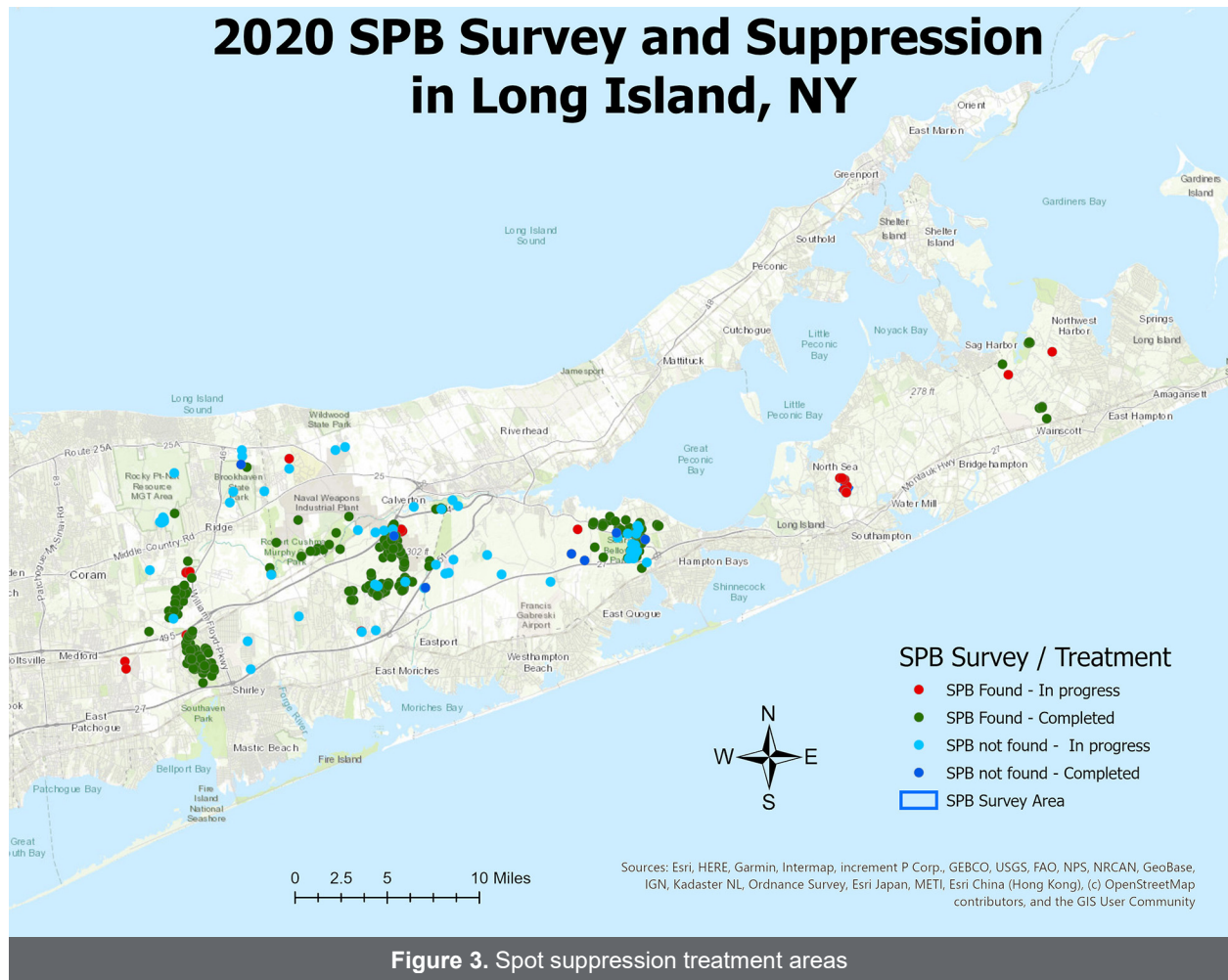
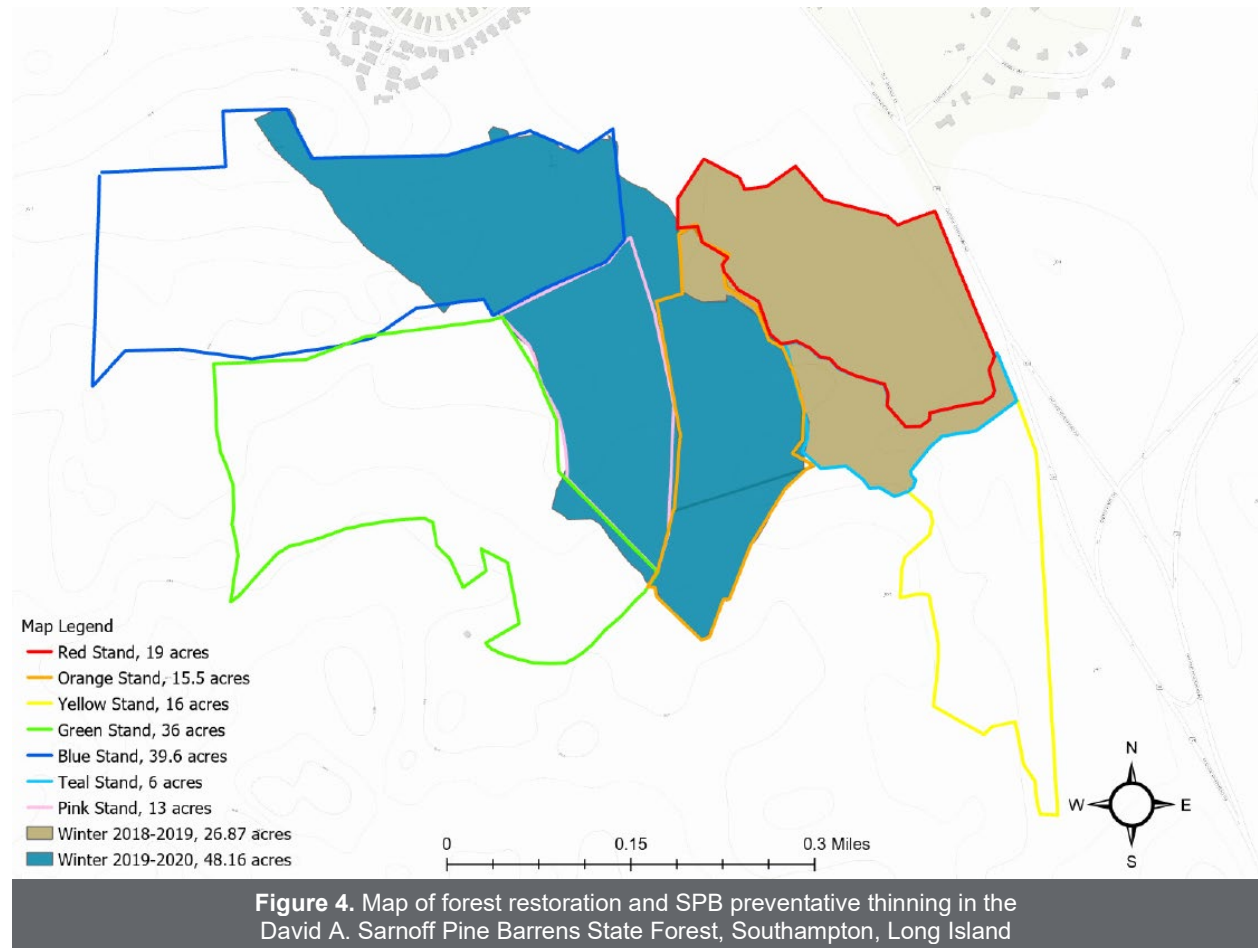


Figure 3. Spot suppression treatment areas

SPB Survey and Suppression in David A. Sarnoff Pine Barrens State Forest



Appendix B – 2020 Outreach Materials

Help DEC Track Southern Pine Beetle (SPB)

Report Sightings Using New York iMapInvasives

What to Look For

Sign 1: Discoloration

Dead, formerly infested trees have brownish-red needles (left), and trees with an active infestation have yellowing needles (middle). Newly infested trees will still have full canopies with green needles (right).



Sign 2: Pitch Tubes

Popcorn-sized clumps of resin called pitch tubes are found on the exterior of the bark ALL the way up the tree.



Sign 3: Scattered Holes and Galleries

Scattershot pattern-like holes appear on the bark and s-shaped tunnels (called galleries) appear under the bark.



Native Lookalike



Turpentine beetles make pitch tubes as well, but those tubes are much larger in size and found only on the bottom six feet of the tree.

Where to Look for SPB

Any pine-dominant forest in NY, especially on Long Island and in the Hudson Valley.

How to Report

Download the free iMapInvasives app on your GPS-enabled smartphone or device. Use the app to submit a report and help us monitor SPB and other invasive species.

If you do not have a smart device or iMap account, you can email photos to DEC at foresthealth@dec.ny.gov.



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Figure 5. Informational flyer detailing signs of SPB and how to report them, created in 2020

LONG ISLAND PINE BARRENS RESTORATION 2019–2020



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New York State Department of Environmental Conservation's (DEC) Division of Lands and Forests (DLF) continues to manage the southern pine beetle (SPB) infestation and restore the pine barrens on Long Island. For more information on SPB, visit: <http://www.dec.ny.gov/animals/99331.html>.

The Pine Barrens

The Long Island Central Pine Barrens is a savannah-like landscape dominated by grasses and forbs with scattered trees and shrubs. It is a fire-dependent ecosystem and requires regular low-intensity forests fire to create and maintain a healthy pine barrens system.

Suppression of natural fire disturbance and a lack of forest management have caused much of the pine barrens to become densely packed with overcrowded and weakened trees.

Southern Pine Beetle

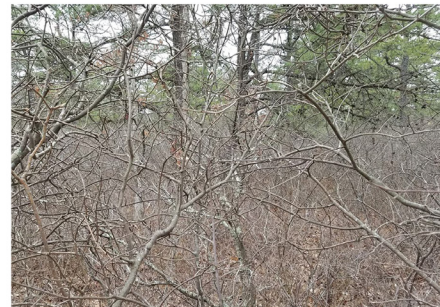
Crowded forest conditions coupled with climatic changes exacerbated the severity of the SPB outbreak discovered in 2014. SPB has since killed hundreds of thousands of pine trees on Long Island.

- DLF's Forest Health crew continued SPB survey and suppression, including aerial surveys of the entire pine barrens, which involved mapping over 3,000 acres of potential SPB activity and ground-surveying those areas.
- DLF's Forest Health crew identified and cut down 554 trees for SPB suppression in 2019. This continues the decline in the number of trees cut for suppression (6,777 in 2017 and 2,466 in 2018) and illustrates the effectiveness of DLF's efforts to combat SPB on Long Island.

Forest Restoration

To improve the health of the pine barrens, DEC practices forest restoration, which is management designed to promote ecological function. A diverse and healthy forest community is more resilient to pests, diseases, and unstable climatic conditions.

- DLF's Forest Health crew performed a 75-acre restorative thinning in Sarnoff State Forest in Riverhead on Long Island.
 - This restoration project will make the forest more resilient against future attack from SPB.
 - Removing large amounts of woody fuel sources, like smaller trees and scrub oak, decreases the risk of a catastrophic wildfire while creating an environment suitable for low- intensity prescribed burns.
- DLF's crew cleaned up hundreds of pounds of industrial waste metal from Sarnoff State Forest during management operations.
- In Rocky Point State Forest, DLF contractors marked over 500 acres for future management and built 13 miles of fire breaks to protect people and property from wildfires.



Before



Immediately after thinning



Six months after thinning

For more information, or to sign up for email updates from NYSDEC, visit our website:

www.dec.ny.gov

Figure 6. Pine Barren Restoration Progress update



www.dec.ny.gov