



Department of
Environmental
Conservation

NEW YORK STATE OAK WILT RESPONSE

2017 Annual Report

Division of Lands and Forests

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Background

Oak wilt, a disease that affects oak trees, was first identified in Wisconsin in 1942 (Wilson and Lester 2002) and has caused extensive damage in several north-central states and Texas. It is caused by *Ceratocystis fagacearum*, a fungus that develops in the xylem or water-carrying cells of trees. The fungus blocks the flow of water through the tree, causing the leaves to wilt and fall off, usually killing the tree. All oaks are susceptible to the fungus, but red group oaks (with pointed leaf tips) can die within one to six weeks while white group oaks (with rounded leaf tips) may take years to succumb.

Oak wilt was first detected in New York in Glenville in 2008 and again in the same area five years later. In 2016, oak wilt was confirmed in Brooklyn, Islip, Riverhead, Southold, and Canandaigua as a result of aerial and ground surveys, as well as reports by the public.

The New York State Department of Environmental Conservation (DEC) Division of Lands and Forests (DLF) created an Oak Wilt Response Plan to prevent, detect and manage the disease in New York. To effectively manage the response to oak wilt, an Incident Command System (ICS) organization structure (See Appendix A, Figure 1), was established by DLF in Central Office (Albany, NY) to apply consistent implementation of the response, delineate roles and responsibilities, and effectively disseminate information.



A symptomatic tree found at Sanders Preserve in Glenville, NY during a drone survey.

Detection and Monitoring

Aerial Surveys

Aerial surveys to document signs of disease expansion were conducted between July and October over the Riverhead, Southold, Islip, Glenville, Canandaigua, and Brooklyn infections, including a 16-square mile buffer around most sites. Additional aerial surveys looking for new infection sites were conducted over oak forests in the lower Hudson River Valley and the Southern Tier (See Appendix B, Figure 2). DEC's new Unmanned Aerial Vehicle Program (UAV) worked with program staff to conduct a drone survey of more than 600 acres of oak forest in Sanders Preserve, Schenectady County.

A number of symptomatic oaks were detected during aerial surveys including 30 in Canandaigua, 16 in Glenville, 372 in Suffolk County, and 89 in Brooklyn (See Appendix C, Table 1).

Ground surveys

Based on aerial survey data and public reports of symptomatic trees, ground surveys were conducted across dozens of counties in DEC Regions 1, 2, 3, 4, and 8 from July through October. DEC Lands and Forests staff also conducted ground surveys, mostly along roadways, in areas considered high risk due to their close proximity to Pennsylvania counties with oak wilt detections and large oak populations.



DEC staff use a lift to sample an oak tree for oak wilt

Sampling

Samples were collected from 146 symptomatic trees across the state and sent in for oak wilt testing (Table 2). Oak species tested for the disease included red oak (*Quercus rubra*), swamp white oak (*Quercus bicolor*), white oak (*Quercus alba*), bur oak (*Quercus macrocarpa*), scarlet oak (*Quercus coccinea*), black oak (*Quercus velutina*), water oak (*Quercus nigra*) and swamp Spanish oak (*Quercus palustris*). The oak wilt fungus is notoriously hard to diagnose so several methods of testing are conducted. Samples were analyzed by staff at the Cornell Plant Disease Diagnostic Clinic in Ithaca, NY, using live culture methods, standard PCR (polymerase chain reaction), and sequencing procedures. Three of the samples collected in Schenectady County tested positive for oak wilt (See Appendix C, Table 1 and Appendix D, Figure 3).



DEC staff measure the distance of an oak tree to a nearby oak-wilt infected tree during tree marking.

Tree Monitoring

In areas marked for oak wilt control, only infected trees were removed. Any remaining trees at risk of becoming infected due to root graft potential were identified for future evaluation. These trees were monitored during the growing season to document any symptoms.

Control Tactics and Treatment

With the use of quarantine districts to define regulated areas, protective zones now identify areas marked for oak wilt management. To date, all established protective zones and quarantine districts share the same boundaries.

A total of fourteen infected trees were removed from the infection sites across the state (Table 2). The stumps were treated with glyphosate to eliminate the spread of the fungus by killing the remaining tissue and roots. In most locations, trees were chipped onsite for disposal. At two locations, additional uninfected trees adjacent to the infected ones were removed to create a buffer. In Canandaigua, a root graft disruption barrier made of a thick landscape fabric was inserted vertically between broken roots to prevent root grafts from re-forming between the trees.



Root graft disruption barrier installed in Canandaigua to help prevent the spread of oak wilt.

Location	Infected Trees Removed	Buffer Trees Removed	Herbicide	Root Graft Disruption	Trees Chipped
Canandaigua	1	7	X	X	X
Brooklyn	1		X		X
West Islip	1	1	X		X
Central Islip	9		X		X
Southold	1		X		X
Riverhead	1		X		
Total	14	8			

Regulatory

DLF established quarantine districts (formally known as protective zones) in areas with confirmed oak wilt infection sites to prevent potentially infected oak wood from moving out of the regulated areas. The discovery of multiple infection sites on Long Island led to the development of criteria to determine the size of a quarantine district:

- When there is only one infection center per town, a neighborhood quarantine district will be established.
- When there are two or more infection centers per town, a town quarantine district will be established.
 - Infection centers are considered separate if there is more than a half mile between infected trees.
- A county quarantine district will be established when there are four or more infection centers in three or more towns (See Appendix E, Figure 4).

The Central Islip quarantine district was expanded to include all of Suffolk County due to the number of infection sites that are located across the county. The regulatory area in the Glen Oaks neighborhood of Glenville was expanded to encompass the entire town due to the additional finds in Sanders Preserve (See Appendix F, Figure 5).

Research and Development

Symptom Monitoring

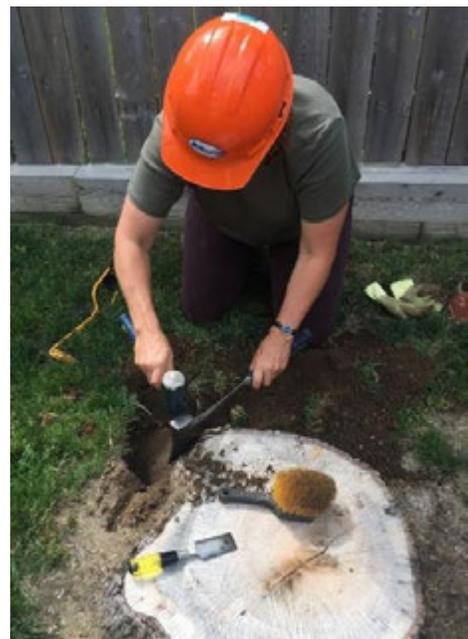
In areas marked for control, trees that had a high probability of becoming infected were photographed during the growing season to document changes over time if symptoms began to appear. Photos were taken of the same trees from the same angles every two weeks. No symptoms were captured during the 2017 growing season, but this monitoring will be continued in future years in an effort to record the progression of the disease symptoms.

Improved Sampling Methods

DLF staff worked closely with regional experts from the US Forest Service and the Cornell Plant Pathology Lab to improve sampling methods, collection techniques and training for the identification of oak wilt symptoms. Sampling techniques, including trunk and root collar sampling, are being evaluated and may be an alternative to branch sampling when symptomatic branches are out of reach or have died.

Sap Beetle Trapping

In the central United States, sap beetles (Coleoptera: Nitidulidae) have been the primary insects that transport the oak wilt fungus. DEC is using insect traps to capture sap beetles between March and October to determine what species are present in NYS and the time of the year they are most active. Knowing the diversity and seasonal distribution of insects that may transport oak wilt will help guide management decisions. Traps were deployed in Brooklyn, Canandaigua, and Central Islip. Preliminary trapping results show populations of nitidulid beetles being most significant between April and July.



US Forest Service Research Plant Pathologist Jenny Juzwik demonstrates how to collect a root collar sample for oak wilt testing.

Public Information and Outreach

Outreach and education are important tools in the detection and prevention of oak wilt. Several events and tactics were used to inform the public and stakeholders about the disease (See Appendix G).

- An Oak Wilt Symposium was held in Suffolk County on October 25 for regional partners, stakeholders, and researchers.
- Municipalities and other stakeholders in areas with infected oak trees were contacted to create partnerships for oak wilt detection, management, and outreach.
- Various presentations, workshops, and trainings were conducted across the state for professional staff, partners, municipalities, and college students. Some were individual events, and others were part of established venues such as the Society of American Foresters Annual Meeting and the NYS International Society of Arboriculture Annual Conference.
- Mobile signs were created to reach specific regional audiences about prevention methods for oak wilt, including when to prune oaks and to use local firewood.
- Print materials were developed and distributed to specific target audiences, including arborists and landscape professionals.
- Electronic methods of outreach dissemination were used, including social media posts on DEC's Facebook, Twitter and Instagram pages; DEC press releases; DEC Delivers emails; YouTube; and posts on the NYS Urban Forestry Council blog
 - A total of 110,033 people was reached through nine oak wilt Facebook posts, and nearly 3,000 people viewed two oak wilt YouTube videos.
 - Oak wilt press releases and DEC Delivers informational emails were sent to 36,890 and 50,698 subscribers, respectively.



An example of a Brooklyn bus shelter installation on Fifth Avenue.

Appendix A

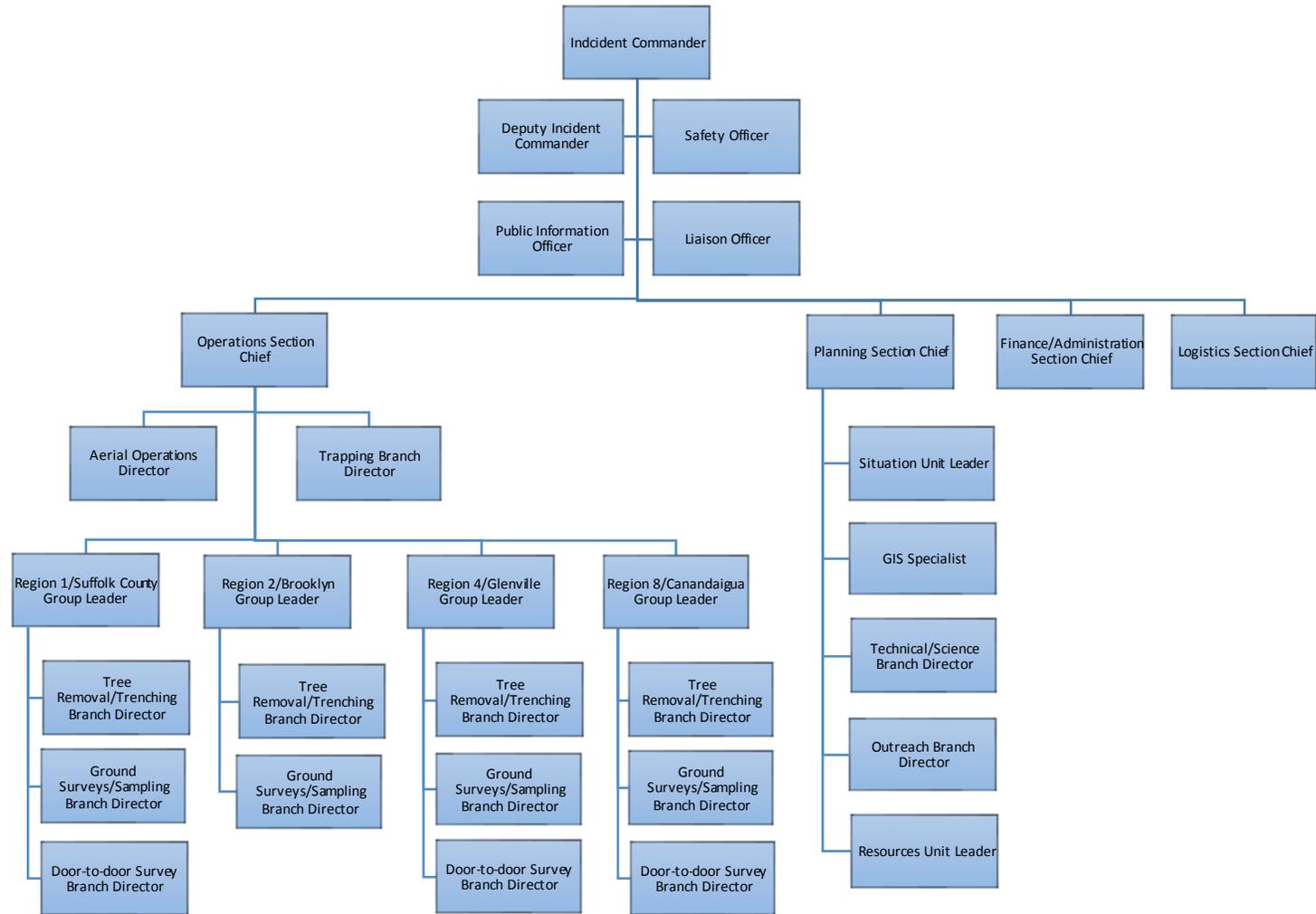


Figure 1. The Incident Command System in place during 2017.

Appendix B

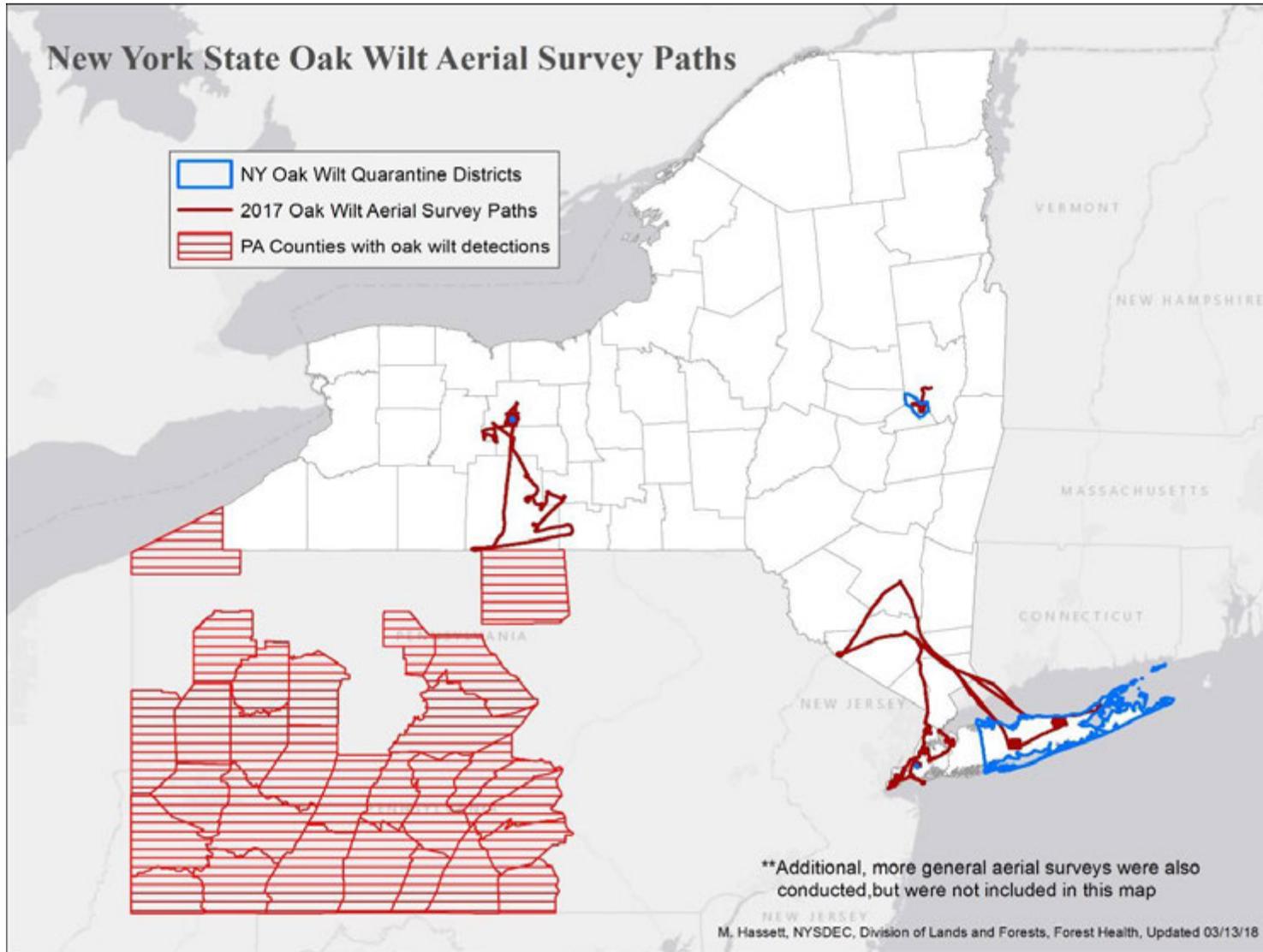


Figure 2. Map showing oak wilt aerial flight locations in 2017.

Appendix C

Table 1. Number of trees detected by aerial surveys and ground surveys, number of trees sampled, and number of positive trees from samples.				
DEC Region/ County	Aerial surveys - damaged trees detected	Ground-surveyed trees from public reporting	Trees sampled	Oak wilt positive trees
REGION 1				
Nassau	2	4	9	
Suffolk	372	22	66	
REGION 2				
Kings	89	3	27	
Richmond	59	1	0	
New York	1		1	
Queens	39	9	4	
Bronx	32	1		
REGION 3				
Westchester	9	2	0	
Ulster	1	1	0	
Dutchess	1		1	
Rockland	1			
Orange	1	2	3	
Putnam		1		
REGION 4				
Schenectady	16	3	11	3
REGION 5				
Fulton			1	
REGION 6				
Jefferson		1	1	
REGION 7				
Cortland			3	
Onondaga		2	11	
REGION 8				
Steuben	9	1	1	
Ontario	30	4	1	
Monroe		3	1	
Orleans		1	0	
Wayne		1		
Yates	3			
Schuyler	1			
REGION 9				
Erie			1	
Total	666	62	146	3

Appendix D

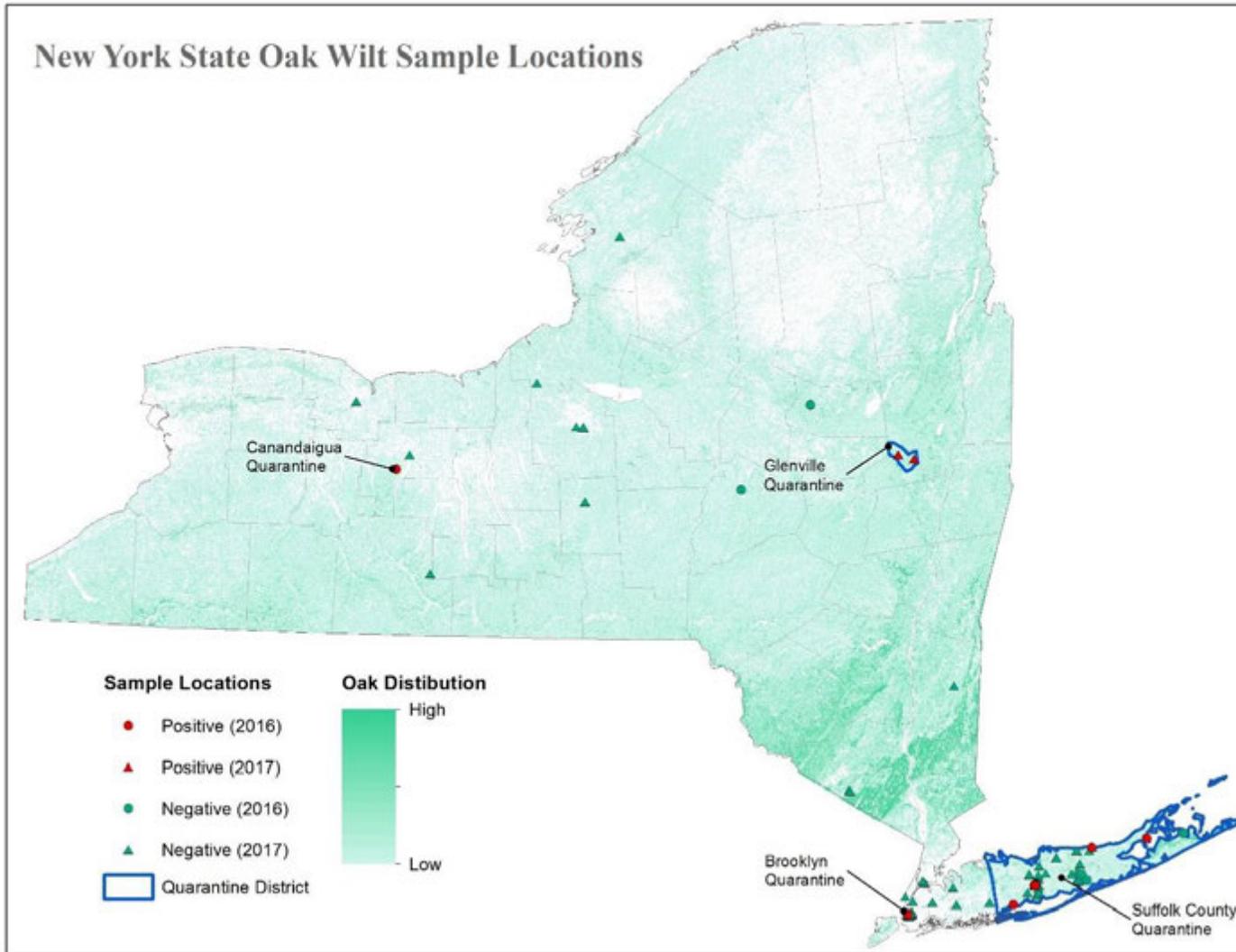


Figure 3. A map showing NY sampling results. Positive samples for 2017 were only collected from Schenectady County.

Appendix E

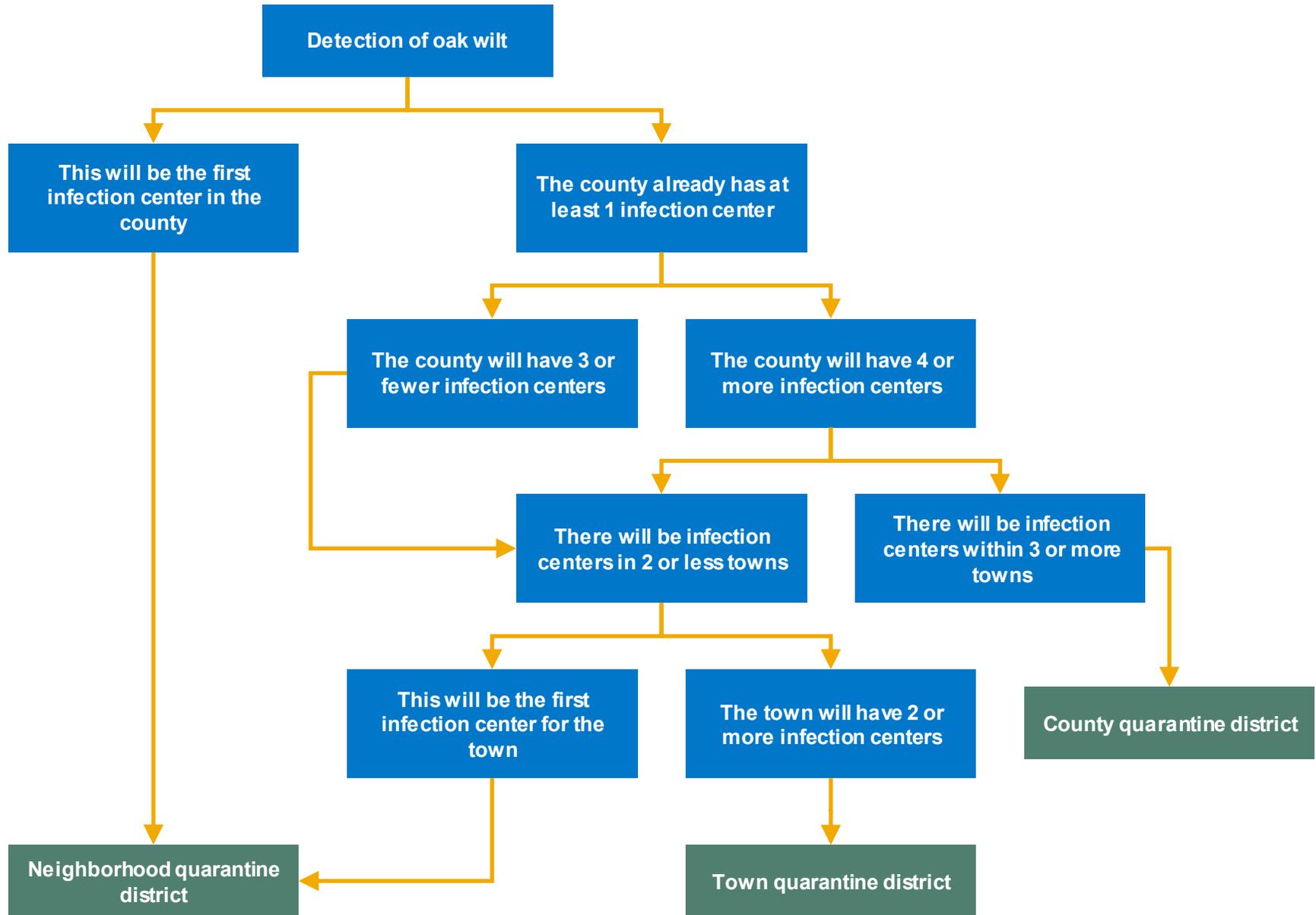


Figure 4. Flow chart used to help determine the type of Quarantine District that is established from a new oak wilt infection center.

Appendix F

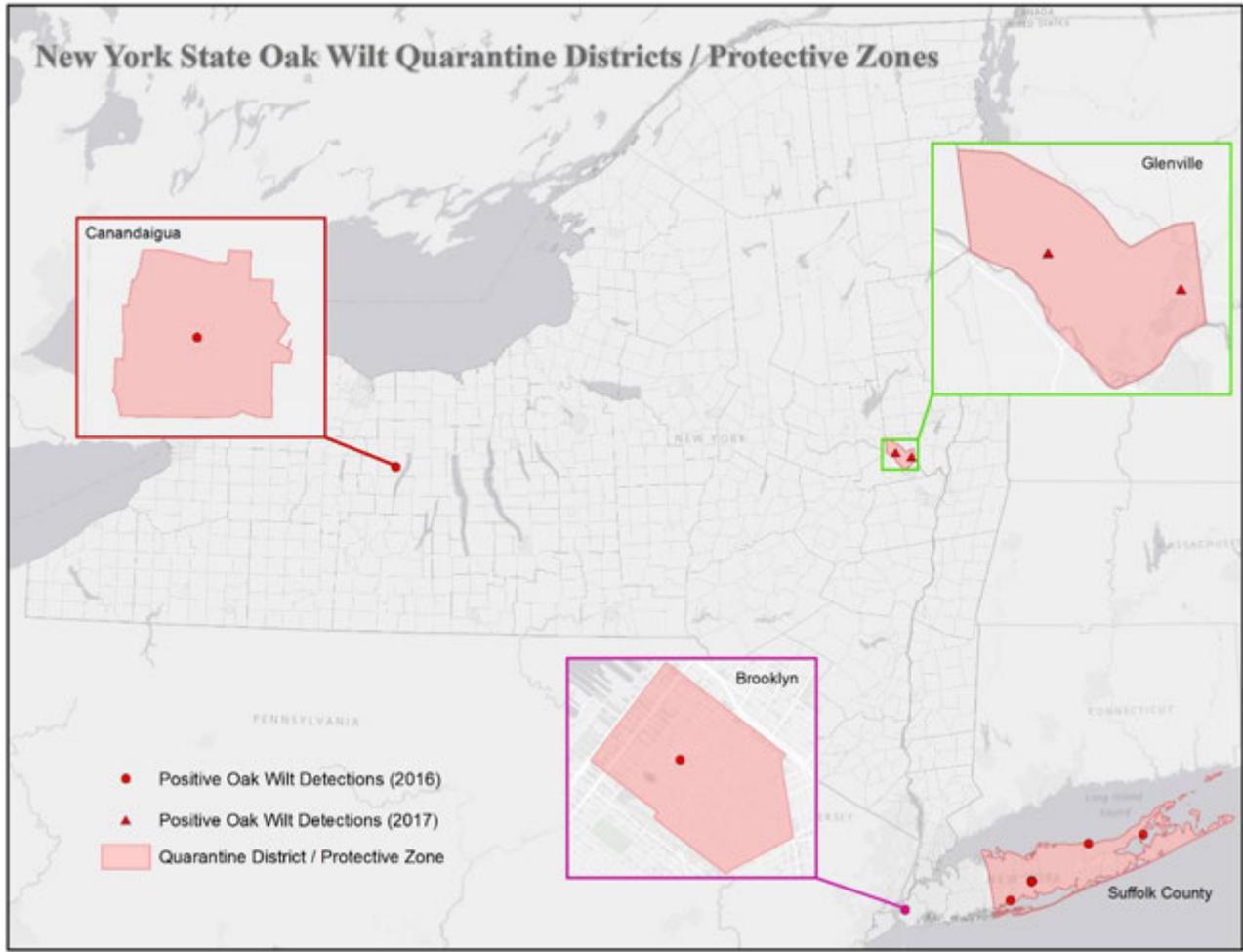


Figure 5. Protective zones and quarantine districts in Canandaigua, Brooklyn, and Suffolk County were established in 2017. The protective zone and quarantine district in Glenville will go into effect in 2018. Management for oak wilt will occur within the same areas that are designated as regulatory areas, so the protective zones and quarantine districts for each location share boundaries.

Appendix G



“Protect Your Oaks!” promoting fall and winter pruning.

Event	Materials Distributed
Invasive Pest Workshop	Directed to website
Region 3 Presentation for DEC staff	100 factsheets, 100 pruning cards, 200 magnets
Oak Wilt Workshop	34 pruning cards, letters, and factsheets
Training for County and Municipal staff	25 pruning cards, diagnostic charts, and 25 reporting instructions
Presentation to NYC Parks staff	Directed to website
Oak Wilt Symposium	100 factsheets, 100 protective zone factsheets, 100 pruning cards
International Society of Arboriculture	100 factsheets, 100 pruning cards
Society of American Foresters	100 factsheets, 100 pruning cards
Training to ECOs in Region 8 & 9	50 Emergency Orders and copies of ECL regulations
Presentation to DEC Foresters	100 factsheets, pruning cards, and magnets
Presentation to ESF students	Directed to website



This oak wilt Facebook post from November 2017 reached more than 15,000 people.



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