INFRASTRUCTURE COMMITTEE

Wednesday, January 21, 2026
Immediately Following Finance Committee
City Hall Council Chambers
Agenda

1. **City of Bangor Urban Forest Management Plan (UFMP) – Ben Arruda**
   (Materials attached)

2. **Red Pine Scale Response Plan – Ben Arruda**
   (Materials attached)

3. **Timber Harvesting Contractor – Ben Arruda**
   (Materials attached)

4. **Penjajawoc Stream Watershed Plan DEP Approval – Jefferson Davis**
   (Materials attached)

5. **Stormwater Training – Richard May**
   Link to presentation below
   Stormwater101 202601.pptx

6. **Sidewalk Snowplow Update – David Teelon**

Bangor UFMP Project Webpage Plan

Webpage Content

Project Description

The City of Bangor is committed to cultivating a healthier, more resilient urban forest to benefit residents and visitors alike. Bangor's trees provide numerous benefits, including shade, beauty, a sense of community, stormwater interception, pollution uptake, and wildlife habitat. Trees require proactive management to ensure their benefits are enjoyed throughout their long lifespans. We're currently developing a comprehensive Urban Forest Management Plan (UFMP), which will provide a strategy for long-term care and investment in our community's tree canopy. This plan will build upon existing efforts by the City to ensure sustainable growth, equitable distribution of tree coverage, and a vibrant urban landscape for generations to come. By assessing current conditions, envisioning a thriving future, and outlining actionable strategies, the UFMP will guide Bangor toward a greener, more inclusive city.

Bangor's UFMP project will take into consideration all trees in the City: the public tree inventory will provide information on trees right-of-way and on public property, and a tree canopy assessment will evaluate the percent of the City shaded by trees, both on public and private property and in forested areas. This project will build off of existing relevant plans that have already been developed for the City, such as the Parks & Recreation Master Plan, Roland F. Perry City Forest Management Plan, and the Emerald Ash Borer Response Plan. The UFMP will use this information to develop management recommendations for City-managed trees and preserving the tree canopy for everyone.

This project is funded by a grant through the Inflation Reduction Act Urban and Community Forestry (IRA UCF) grant program, administered by the Maine Forest Service (MFS) Project Canopy program.

Project Contact

Ben Arruda, Urban Forestry Manager, 207-992-4514, ben.arruda@bangormaine.gov

Project Timeline:

- January 2026: Project Website Launches

- February 2026: Community Survey Launches
- March 2026: Operation Plan Draft for Review
- April 15, 2026: Quarterly Tree Board Meeting (link to Tree Board event details, a la https://bangormaine.gov/Calendar.aspx?EID=2738&month=1&year=2026&day=7&calType=0)
- April 2026: Community Workshop
- Third Week of May 2026: Arbor Week in Maine
- June 2026: UFMP Draft for Review
- June: Infrastructure Meeting
- July 2026: Final Delivery of UFMP

Project Components (drop downs with descriptions/links)

TREE INVENTORY

Bangor's tree inventory is a record of publicly owned and managed trees, including those along streets and in parks. Collected data includes tree species, size (diameter at breast height, or DBH), and location, both GPS coordinates and street address. The City's Forestry Division maintains the inventory and updates the data. The information in the tree inventory will be used in Bangor's Operations Plan and UFMP to develop work and budgetary estimates, and provide recommendations on where public trees can be planted.

The tree inventory can be viewed here: https://storymaps.arcgis.com/stories/8d25fbd1888d43af937b1a15171e83af.

TREE CANOPY ASSESSMENT

While the tree inventory looks at individual trees and their management, a tree canopy assessment looks at *all* of the trees within Bangor's city boundary. This is done using publicly available satellite imagery provided by the National Agricultural Imagery Program (NAIP, https://naip-usdaonline.hub.arcgis.com/). Looking just at Bangor, the land cover is determined to be bare earth, water, impervious (buildings/roads), herbaceous (non-woody plants), or tree. That data is then analyzed for the City as a whole, and also for distinct geographies such as neighborhoods or census blocks. This information will be used to inform the UFMP on where tree canopy inequalities may exist, and provide recommendations on future tree planting efforts.

To see an example of tree canopy data, visit https://treecanopy.us/

PROGRAM REVIEW

In order to make recommendations for how Bangor should manage its trees in the future, we first need to understand how it is currently being managed. To do this, we'll be looking at current

policies and procedures, City ordinances, and related plans that are already developed. We will also interview City staff involved with tree maintenance, and benchmark the City against similar communities. With this information, we can understand what the City is doing well and where things could be better.

OPERATIONAL PLAN

The Operational Plan will provide guidelines for how the City should manage the urban forest in the near future (3-5 years). Starting with current operations, we will look at what work the City is doing and what it needs to do to develop workloads and budgets. We will also look at the current workflows and procedures, and work with the City on how they want those to adjust in the near future.

URBAN FOREST MANAGEMENT PLAN (UFMP)

The UFMP will pull together all of the information from the previous phases to create a roadmap for the City to manage its urban forest into the future, over the next few decades. It is meant to be easily accessible and usable, with a vision for the program, and goals, objectives, and actions built out to realize that vision. Besides relying on the review of data, the voice of the community is needed to build out the UFMP and guide its recommendations.

COMMUNITY INVOLVEMENT

YOU are needed to help make this project possible. The people of Bangor are invited to share their opinion on the City's urban forestry practices: what is done well and what would you like to see happen? You will be invited to share your knowledge and opinions through a community survey, and through the comment box on this website. A community workshop will be held in April to collaborate in person. Please reach out with your ideas!

Quick Links

- Tree Board https://onboard.bangormaine.gov/board/3693
- Bangor Beautiful https://www.bangorbeautiful.org/
- Benefits of Trees https://www.arborday.org/strengthening-communities
- Tree Equity Map https://www.treeequityscore.org/map
- Maine Project Canopy Assistance Grants https://www.maine.gov/dacf/mfs/policy_management/project_canopy/grants/index.html
- US Tree Canopy Map https://treecanopy.us/

INVITE COMMUNITY FEEDBACK

These would be nice to have, if the Bangor City website can host.

- Survey info with link (launch in January)
- Upload pictures of trees, add a story
- Provide comment box for input and feedback
- Sign up for website updates
- Link to social media posts
    - Like on Parks & Rec page https://www.bangormaine.gov/635/Parks-Recreation

DRAFT

City of Bangor Strategic Urban Forest Planning Community Survey

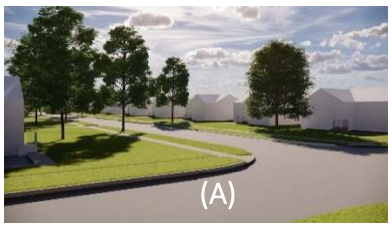
The goal of this survey is to understand the community's opinions and interactions with their trees and provide an opportunity for input on how the urban forest should be managed into the future. The feedback from this survey, along with related information from existing City plans, will be used to inform an Urban Forest Management Plan to guide tree management.
This survey should take 5-10 minutes to complete.

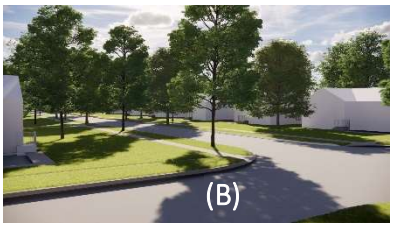
Experience with Trees

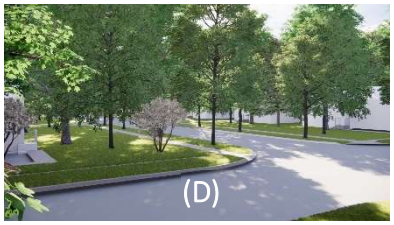
This section applies to **all trees** in your neighborhood, both those on private property and those in public rights-of-way or parks.

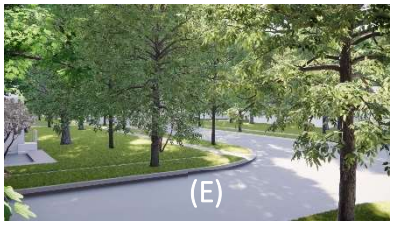
1) **Having trees in my community or neighborhood is:**
   - ☐ Not important (1)
   - ☐ Somewhat important (2)
   - ☐ Moderately important (3)
   - ☐ Very Important (4)
   - ☐ Extremely Important (5)

2) **Which of the following images (letter) best represents the tree cover/shade in your neighborhood?** (note that this is a representation of tree cover, not necessarily what your neighborhood may look like)
   Choose the letter that most closely represents your neighborhood: A | B | C | D | E | F







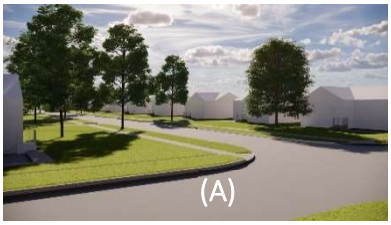


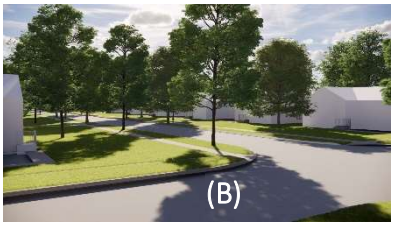
My neighborhood doesn't have trees.

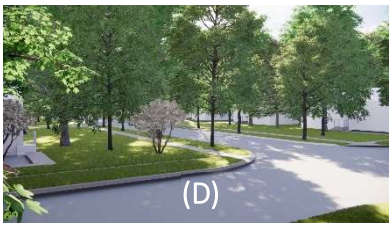
(F)

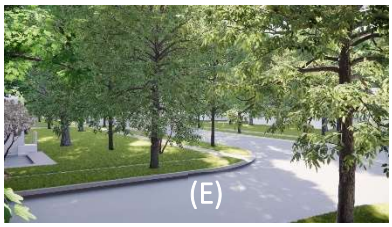
3) **Compared to most other neighborhoods in Bangor, my neighborhood has _____trees.** This refers to all trees: on streets, in yards and private properties, and in parks.
   - ☐ Fewer (-1)
   - ☐ The same amount of (0)
   - ☐ More (1)

4) **Which of the following images (Letter) would you prefer the tree cover in your neighborhood to look like?** A | B | C | D | E | F









My neighborhood doesn't have trees.

(F)

5) **Since moving to my neighborhood, the tree cover/shade has _____**
   - ☐ Decreased (-1)
   - ☐ Stayed the same (0)
   - ☐ Increased (1)

6) **When I look out of the windows of my home, I see _____**
   - ☐ No trees (0)
   - ☐ A few Trees (1-2)
   - ☐ Several Trees (3-7)
   - ☐ Many Trees (7-11)
   - ☐ A forest/woodland environment (12 or more trees)

7) **How many minutes does it take to walk from your home to the nearest park, green space, or natural area?**
   _____ Minutes

8) **What City park or natural area do you most frequently visit?** (open ended)

9) **How frequently do you visit/recreate City parks, green spaces, or natural areas?**
   - ☐ Daily
   - ☐ Weekly
   - ☐ Once a month
   - ☐ Several times a year
   - ☐ Once a year
   - ☐ Never
   - ☐ Not applicable

10) **What, if any, are the top benefits you associate with trees in your community or neighborhood?** List up to three benefits. **(**Open Ended)

11) **What, if any, are the drawbacks associated with the trees in your community or neighborhood?** List up to three drawbacks. **(**Open Ended)

12) **Have you ever had a negative experience with a tree?** (Check any that apply)
- ☐ No negative experience
- ☐ Growing into and damaging your property
- ☐ Causing injury after losing a branch or tipping over
- ☐ Requiring costly maintenance or removal
- ☐ Preventing you from developing your property given local protections
- ☐ Causing issues when obtaining a new home insurance policy
- ☐ Other (please specify:_____)

13) **Rate the importance to you of the following economic, social, and environmental benefits provided by public trees? (public trees are those along the street ROW, in medians, in parks, and on other public properties)**
Rank each one of these as Very Unimportant (1), Unimportant (2), Neither Unimportant or Important (3) Important (4), Very Important (5)
___ Increase property values by improving the curb appeal of the neighborhood
___ Reduce cooling and heating costs
___ Trees in business and commercial districts attract visitors/customers
___ Visual beauty
___ Buffer between pedestrians and streets
___ Provide sense of place to neighborhood and community
___ Calm and reduce traffic speed
___ Reduce crime levels
___ Reduce stress and improve mood
___ Provide nesting habitat and food sources for butterflies, birds, bees, and other wildlife
___ Reduce noise pollution
___ Reduce levels of particulate matter and other air pollutants
___ Reduce global warming gases, like carbon dioxide
___ Reduce soil erosion caused by stormwater
___Roots filter out pollutants and protect groundwater
___ Cooling effect on heat from asphalt and buildings

14) **How important do you believe trees are in protecting Bangor from climate-related issues (like heat waves, flooding, air pollution)?**
- ☐ Not important (1)
- ☐ Somewhat important (2)
- ☐ Moderately important (3)
- ☐ Very Important (4)
- ☐ Extremely Important (5)

Management of Public Trees

This section applies to **trees that the City maintains**: those in the rights-of-way along streets and in public parks.

15) Overall, would you say the trees on your street are:

- ☐ Healthy
- ☐ In decline

16) What types of care have you observed? Select all that apply.

- ☐ Pruning
- ☐ Planting
- ☐ Removal when dead
- ☐ Protection from construction
- ☐ Treatment for pests
- ☐ None
- ☐ Other: _____

***17)* What sort of damage have you observed to trees on your street?** Select all that apply.
Note: please report damaged trees that appear hazardous to See Click Fix.

- ☐ Damage from vehicles
- ☐ Damage from snowplows
- ☐ Damage from weed whackers/mowers
- ☐ Poor pruning from sidewalk/street
- ☐ Poor pruning from utility wires
- ☐ Roots excavated or cut from construction
- ☐ Improper mulching
- ☐ Items attached to trees
- ☐ Pest damage
- ☐ Vandalism
- ☐ Other: _____

18) What, if any, could be improved about the Bangor's public trees? List up to three things.

19) Looking at the trees on my street, I think that there is _____ of trees.

- ☐ A good variety
- ☐ Too much of one kind
- ☐ Too many different kinds

20) I would like to see the following in my park or on my street: (Check all that apply)

- ☐ Edible fruit and nut trees
- ☐ Evergreen trees (e.g. pine, spruce)
- ☐ Fall colors
- ☐ Flowering trees (e.g. cherry, redbud)
- ☐ More uniformity of trees
- ☐ More variety of trees
- ☐ Native plants/trees
- ☐ Prairie/tall grass areas
- ☐ Shade trees
- ☐ Shrubs

21) How strongly would you support or oppose restoration and maintenance of native trees on public lands?

- ☐ Strongly Oppose (-2)
- ☐ Oppose (-1)

☐ Neither Support nor Oppose (0) ☐ Strongly Support (2)
☐ Support (1)

22) Which of the following would be your first choice of where the city should plant trees?

- ☐ Along streets
- ☐ Along rural rights-of-ways
- ☐ In commercial/industrial areas
- ☐ In parks
- ☐ In people's yards
- ☐ Near streams, natural and or forested areas
- ☐ Other

23) Which of the following statements most closely represents your opinion about trees?

- ☐ Allow individuals to remove trees as they wish
- ☐ Preserve as many as possible
- ☐ Preserve only large or unique trees
- ☐ When trees are removed, replace them
- ☐ Other (please specify:_____)

24) Would you plant trees on your property if offered a monetary incentive?

- ☐ Yes
- ☐ No
- ☐ Need more information
- ☐ Not applicable

25) Are you in favor of increasing the City's operating budget to maintain trees? Y/N

26) What would you like Bangor to offer for future forestry programming or activities? Check all that apply.

- ☐ None
- ☐ Volunteer opportunities
- ☐ Maintenance/educational materials – print or online
- ☐ Maintenance/educational presentations
- ☐ Reports on the City's forestry efforts
- ☐ Tree giveaways
- ☐ Educational activities for children
- ☐ Lending library of tree tools
- ☐ Narrated tree walks
- ☐ Trees as art inspiration
- ☐ Other (Please specify):_____)

Demographic Information

Please answer the following questions as you are comfortable with them; it helps to understand if we are hearing from all areas of the City and population.

27) Do you live or work in the City of Bangor?

- ☐ Live
- ☐ Work
- ☐ Live and Work
- ☐ Neither

28) If you live in the City of Bangor, in which neighborhood do you live? Refer to neighborhood map to answer.

1. New Capehart 2. Lower Main 3. Center Street 4. Little City

5. Broadway Park
6. Downtown
7. Dakin Park
8. Howard
12. Burleigh
13. Church Road
14. Old Capehart
15. Hammond Street South
18. Outer Stillwater
19. Essex
20. Kenduskeag Stream East
21. Kenduskeag
24. Outer Ohio/Union
25. Other:_____

9. Rolling Meadows
10. Meadowbrook
11. Bangor Gardens
16. Hammond Street North
17. Husson
Stream West
22. Stillwater
23. Tree Streets

29) How many years have you lived in your current neighborhood _____? (Fill in the blank)

30) Which of the following best describes your housing type?

- ☐ Apartment
- ☐ Duplex
- ☐ Condominium
- ☐ Group home
- ☐ Mobile home
- ☐ Single family housing
- ☐ Unhoused
- ☐ Other (please specify:___)

31) Which of the following best describes your current housing situation?

- ☐ Own
- ☐ Rent
- ☐ Living with others but not paying rent
- ☐ Living with others but assisting with paying rent
- ☐ Other (please specify:___)

32) Which of the following identities best describes you? (select all that apply)

- ☐ American Indian
- ☐ Asian
- ☐ African American or Black
- ☐ Hispanic, Latinx, or Spanish origin
- ☐ Native Hawaiian or Pacific Islander
- ☐ White or Caucasian
- ☐ Prefer not to say
- ☐ Something else (please specify:_____)

33) What is your age group?

- ☐ Under 18
- ☐ 18-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55-64
- ☐ 65+

34) Please share any final comments that you would like to provide on Bangor's trees or their management:

35) If you would like to receive updates on this project, please provide your contact information. (name, email)

Thank you for taking the time to complete this survey. Your input will inform the management of Bangor's trees for years to come.

DEPARTMENT OF PUBLIC WORKS
FORESTRY DIVISION

To: Infrastructure Committee
From: Benjamin Arruda, Forestry Manager
Date: December 29th, 2025
Re: Red Pine Scale Response Plan

The Public Works Forestry Division has begun a long-term monitoring, and management project to account for, and manage, planted forest stands of red pine (*Pinus resinosa*). Forestry Division staff have surveyed City owned properties within Bangor, and the Town of Winterport for the presence of pure plantations of this particular tree species, as it is susceptible to damage from a number of native and invasive pests and diseases. The most notable of which is an invasive pest from Asia; red pine scale (*Matsucoccus matsumurae*). This pest feeds on the nutrients that are meant to be used by the trees, causing needle loss, crown thinning and eventual death of individual trees and all surrounding red pine trees a few years after initial feeding, this pest does not target any other native forest trees. Currently there are no proven large-scale prevention or treatment measures for forest stands infested with red pine scale but mitigating the overall impact they have on a forest ecosystem by harvesting stressed and at risk red pine has been proven to be a viable approach.

During the Forestry Division survey, it was determined that approximately 36 acres of pure red pine plantations are present across five (5) city owned parcels in both the City of Bangor and the Town of Winterport.

Forestry Division staff have written the Red Pine Scale Response Plan as a means to guide current and future management activities within City owned and managed red pine stands. This document aims to manage red pine scale utilizing existing Forestry Division funds in the budget, but eventual need for additional funding in the future to harvest and replant areas affected can be anticipated, and requests for additional funding will be made at the appropriate time.

It is my request that the infrastructure committee considers accepting this plan into the City of Bangor Forestry Division's operating procedures.

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City of Bangor, Forestry Division

Red Pine Scale Response Plan

Authored by Sophia Cameron, MF, FI, in partnership with Ben Arruda, LF, City Forest Manager

Red pine trees succumbing to red pine scale in Merrimack River Outdoor Education and Conservation Area in New Hampshire. Image retrieved from the Society for the Protection of New Hampshire Forests.

Table of Contents

Executive Summary

Red pine scale (RPS) is a scale insect native to Asia that is believed to have been introduced to the U.S. in the 1930s. It feeds on nutrients in red pine trees by inserting their sucking mouthparts into the upper branches and twigs. This feeding interrupts the flow of nutrients and water to the needles of the trees, leading to canopy decline and eventual death. RPS was first detected in Maine in Hancock County on Mount Desert Island in 2014. Since then, it has also been found in Washington County and York County. Over 1,800 acres of red pine mortality have been detected by the Maine Forest Service and are directly attributed to RPS. There is concern that it will eventually spread to Penobscot County.

The City of Bangor has 131 red pine street and park trees. These trees will continue to be monitored for signs and symptoms of RPS; however, they are of relatively low concern because they are a low percentage of the urban canopy. What is of greater concern are the thousands of red pine trees planted in plantations across the City's publicly owned properties and parks in Bangor and Winterport. These are monocultures of red pine that are highly susceptible to RPS infestations and much more difficult to monitor on a regular basis.

Chemical treatment of publicly owned red pine is not a viable option for managing RPS in the City. For this reason, active management through invasive plant management, pre-commercial thinning, harvesting and replanting these red pine plantations is the chosen course of action. Invasive plant management will occur first and involve the use of mechanical, cultural, and chemical controls. This will be followed by a pre-commercial thinning of the red pine, where the least successful trees are removed to allow the remaining red pine to maximize their growth, and promote natural regeneration of other tree species. This management will reduce wildfire risks, increase forest species and age diversity, and improve wildlife habitat. A final harvest of the remaining red pine will be performed once RPS is detected in Winterport or Bangor. Spacing out the removal of red pine in these plantations will give the more successful trees the opportunity to increase in size so that they are more likely to be merchantable by the time they are harvested. If adequate regeneration of native tree species isn't achieved by the time the final harvest is completed, replanting the areas with seedlings may be necessary. Appropriate species for the soil types and other environmental conditions will be selected.

Purpose

This document serves the following purposes:

1. To educate the public about red pine scale and its potential impacts on the red pine population of Bangor.
2. To propose a proactive response plan for red pine scale in Bangor to mitigate potential safety hazards and infrastructure damage caused by standing dead trees and to improve the overall health of Bangor's forests.
3. To inform the public of future changes that will be made to the species compositions of areas of public forests and parks in anticipation of red pine scale in Bangor.

Background Information

Red and Other Species of Pine in Maine

Maine is known as the Pine Tree State. While this name comes from the large, distinguishable Eastern white pines (*Pinus strobus*) you can find across the state, there are several native Maine species of pine. This includes red pine (*Pinus resinosa*), pitch pine (*Pinus rigida*), and Jack pine (*Pinus banksiana).* Scots pine (*Pinus sylvestris*) can also be found distributed across the state, but is not native to Maine. Pine species (genus *Pinus*, family *Pinaceae*), are coniferous or evergreen. This means that they have needles instead of leaves for photosynthesis, keep these needles through the winter, and reproduce using cones instead of flowers and fruits.

The easiest way to distinguish Eastern white pine from red pine is by looking at the fascicles (bundles) of needles. White pines will have five needles per bundle, and red pines will only have two. Their needles are also typically longer and thicker than white pine, and red pine bark appears to be "scaly" while white pines have smooth bark when they are younger and as they age it becomes furrowed. Pitch pines will have three needles per bundle, but Jack pine and Scots pine will also only have two.

Red pine has a very low tolerance for shade, and grows best in full sun and on dry, upland sites. Their trunks grow very straight and can reach 60-80 feet, which makes them suitable for being used as telephone poles. For these reasons, and to maximize their growth and eventual value, red pine is often grown plantation style, where they are planted in rows at certain spacing intervals to minimize competition with other trees.

What is Red Pine Scale (RPS)?

Red pine scale (*Matsucoccus matsumarae resinosae*) is a scale insect that infests red pine to feed on nutrients flowing to the needles and twigs. It Is also referred to as pine bast scale. It is native to Japan, where it survives on its host species of Asian pines. It is also considered an economically important pest in other Asian countries like China (McLure et al., 1983). Two species names are used to refer to it: *M. matsumarae* and *M. resinosae*. *M. matsumarae* is the species name that originated in China upon its initial discovery, and *M. resinosae* is the species name that was given by Bean and Godwin upon its discovery in the U.S. (McLure et al., 1983).

Figure 1. Wingless, adult female red pine scale insect. Image sourced from Vermont Invasives.

It is thought to have been introduced into the U.S. as far back at 1939, where it is hypothesized that it arrived on imported Asian pine species for the New York World's Fair (*Pest Alert: Red Pine Scale* (Matsucoccus resinosae), 2012). It was detected in Connecticut in 1946, New York in 1950, and New Jersey in 1960. These infestations remained fairly localized, most likely because these areas are in the southern range of red pine, so there were not as many host trees and the scale mostly affected plantations and ornamental plantings (Bean and Godwin, 1971). It was found in New Hampshire in 2012, and in Maine in 2014 on Mount Desert Island in Hancock County (*Maine Department of Conservation, Agriculture, and Forestry,* 2014).

The insect has two generations per year. The first begins when the eggs are laid by adult females in late spring, and hatch in the early summer. The larvae feed under the scales of the red pine bark until mid-July, when they develop into the intermediate stage. For the males this means that they develop into a pre-adult phase, and then enter cocoons around August. They then emerge as true-adult males. Intermediate phase females do not develop into pre-adults, but directly into true-adults. These females lay eggs in late August. These eggs hatch before the winter, marking the second generation. They overwinter as partially developed larvae and then resume growth in the Spring. They go through the same intermediate phase as the summer generation and develop into adults by April, starting the cycle over again (Bean and Godwin, 1971).

Figure 2. A heavy infestation of red pine scale where wooly structures are visible on the branches. Image sourced from Vermont Invasives.

Adult females are larger than adult males. Both are pear-shaped and appear to be wrinkled. Males have wings, though their flight do not contribute to long-range spread. Eggs are yellow, and laid in wooly sacs (*Red Pine Scale,* Vermont Invasives).

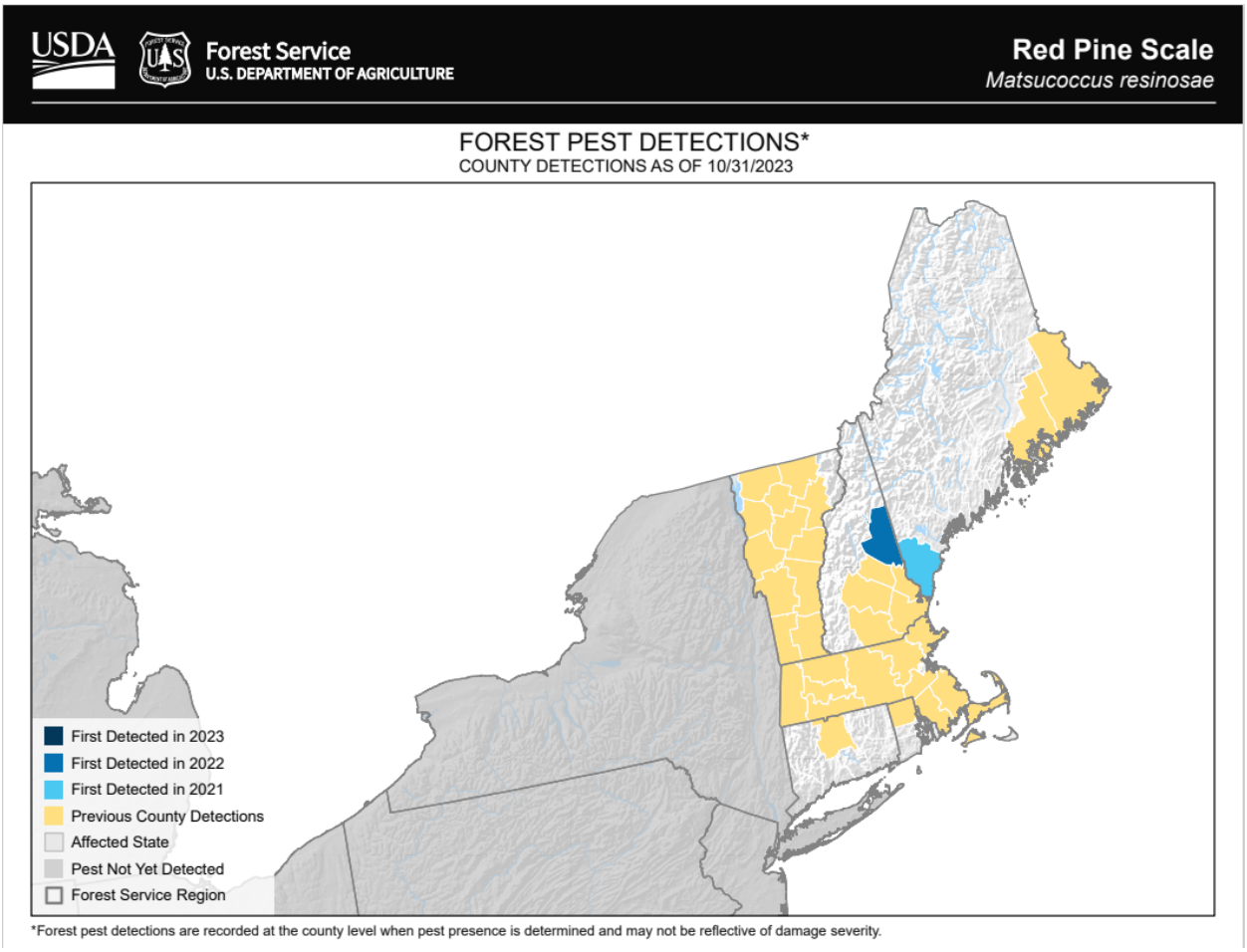

Figure 3. 2023 red pine scale county detection map. Map acquired from the [USDA Forest Service](#).

Red Pine Scale Signs and Symptoms

RPS is fairly difficult to detect in early infestations, especially on mature red pine trees. This is because the insect is so small, there are very few lower branches on red pine trees, and because an initial or low-level infestation of RPS looks like normal dieback of needles. Additionally, there are several other causes that can cause needle dieback that looks like RPS, such as Diplodia tip blight, Sirococcus shoot blight, or even salt damage from nearby roads. Once the infestation grows, there is noticeable browning of the needles because the water and nutrients required to maintain their function is being intercepted by the scale insect.

Eventually, the browning needles will fall off the tree, and there will be noticeable crown loss. When the entire crown has been infested, the tree is no longer able to keep itself alive, and it will die. When inspecting the twigs and limbs of an infested tree, white to off-white, wooly structures can be seen.

Red Pine Scale in Maine

Since it was found in 2014 on Mount Desert Island, RPS has spread throughout Hancock and Washington counties. RPS is typically spread through wind dispersal, and the very small juveniles can travel up to a quarter mile through the air (Bean and Godwin, 1971). It is also spread through the movement of red pine wood either as it's transported to mills or as firewood for recreation. It can also be transported on nursery stock of its host species. It is likely more easily spread along the coast of Maine because of the higher average wind speeds, which can carry the insect further.

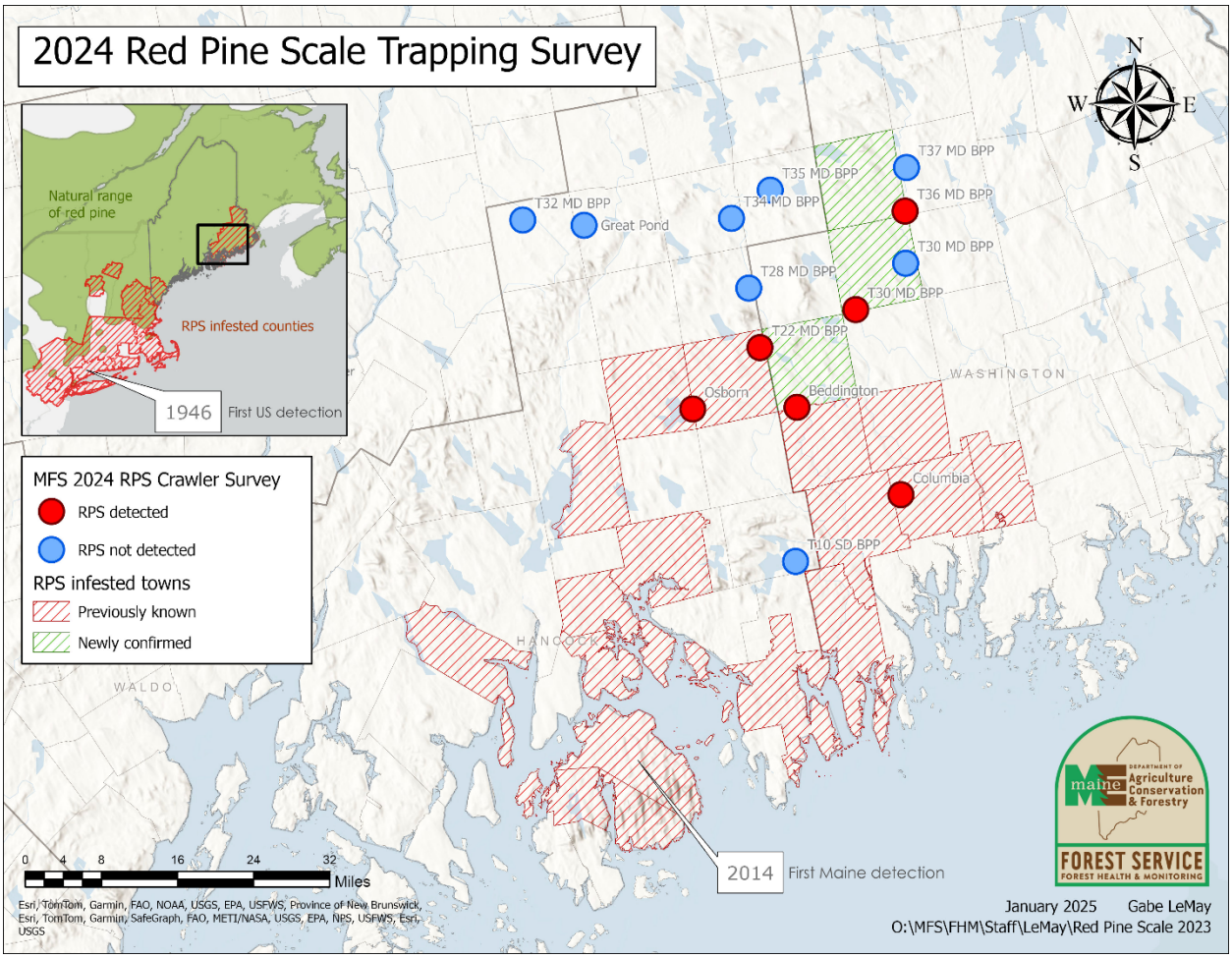

Figure 4. Map of the Maine Forest Service's 2024 red pine scale trapping survey in Hancock and Washington Counties. Map created by Gabe LeMay and published in the "Forest and Shade Tree Insect and Disease Conditions for Maine" summary for 2024.

In 2024, RPS monitoring continued in Maine. The Maine Forest Service flew an aerial survey to observe areas that were previously found to have been infested by RPS, and to determine any new areas of infestation. They documented 1,800 acres of RPS damage, primarily in Washington County, with a new detection in the town of Osborne (*Maine Forest Service: Forest Health and Monitoring,* 2025). They also deployed sticky traps that were developed to attract and trap hemlock wooly adelgid—another invasive scale insect that affects Eastern hemlock—in an attempt to detect emerging infestations. The traps were placed in the Downeast region, and confirmed several new infestations in T36 MD BPP, T30 MD BPP, and Beddington (*Maine Forest Service: Forest Health and Monitoring,* 2025).

In 2025, traps were deployed once again, however the results of these have not yet been assessed. One of these traps was placed in Old Town to determine if there is an infestation in Penobscot County. The 2025 aerial survey season ended in August 2025, and according to the August 25th "Forest & Shade Tree Insect and Disease Summary," from the Maine Forest Service, 14 new towns were identified as having infestations in both southern Maine and the Downeast region via aerial survey flights. Three more towns were identified as having an infestation through ground surveys in southern Maine (*Forest and Shade Tree—Insect and Disease Conditions for Maine*, 2025).

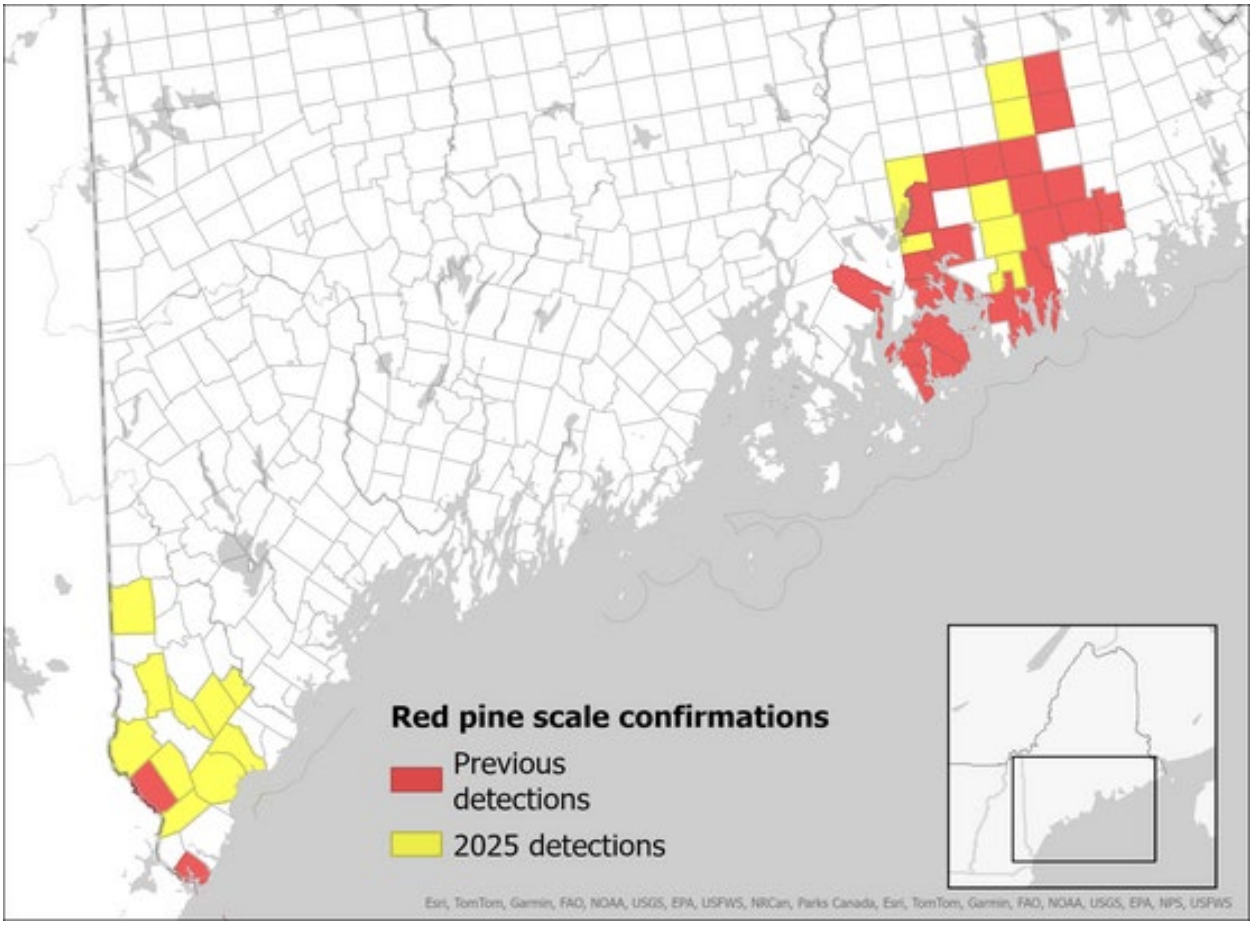

Figure 5. Map of the new towns in Maine where red pine scale was detected using aerial and ground surveys in 2025 by the Maine Forest Service. Map created by Gabe LeMay, and taken from the August 25th, 2025 Forest & Shade Tree-- Insect & Disease Conditions for Maine bulletin.

Red Pine Scale in Bangor

Fortunately, RPS has yet to be identified in Bangor. The infestations in Maine have so far appeared to remain closer to the coast. The Forestry Division will continue to monitor for its presence within the city into the future. There is also potential to work with the Maine Forest Service to deploy traps for early detection of RPS on City-owned properties.

Figure 6. Map of the red pine plantations found in Prentiss Woods (top left) and Essex Woods (bottom right).

If RPS is found within the City, the publicly owned red pine plantations in the City parks and forests are at great risk. In the 1990s, thousands of red pine seedlings were planted in Prentiss Woods, Cascade Park, Essex Woods, on a property in Winterport that is owned by the City, known as Twining Pit, and on a parcel owned for Bangor Community and Economic Development (CED) found on tax map 01 as lot 014. In total there are approximately 36 acres of red pine plantations owned by the City. There is a small plantation of red pine in the City Forest, however, most of these have already died and their management will be performed in tandem with other management in the City Forest. Red pine has been planted individually across the City as street and park trees. Though, in the 2024 Complete Urban and Street Tree Inventory (CUSTI), only 131 red pine trees were recorded as street or principal park trees within the City.

Tree plantations are typically monocultures, and are specifically spaced and planted to maximize the growth of the species you are trying to favor. They are more similar to how we grow crops than forests, and are primarily used to generate income from timber production. The success of a plantation is highly dependent on the types of soils found at the planting sites. Different species of trees require soils with different drainage types or moisture levels, mineral and nutrient compositions, etc. These

differences in soil properties also greatly influence the growth and success of planted trees of the same species.

For this reason, although the red pine plantations owned by the City were planted within a few years of each other, the trees in some of them have grown enough to be considered merchantable--like those found in Prentiss Woods-- and others have not-- like those found at Twining Pit. A sustained lack of appropriate soil moisture, minerals and nutrients also causes individual trees to be continually stressed, making them much more susceptible to pests and disease. So, because of the poor soil quality for red pine at Twining Pit, there is now approximately 17 acres of stressed red pine that is highly susceptible to an RPS infestation.

Figure 7. Map of red pine plantations in Cascade Park.

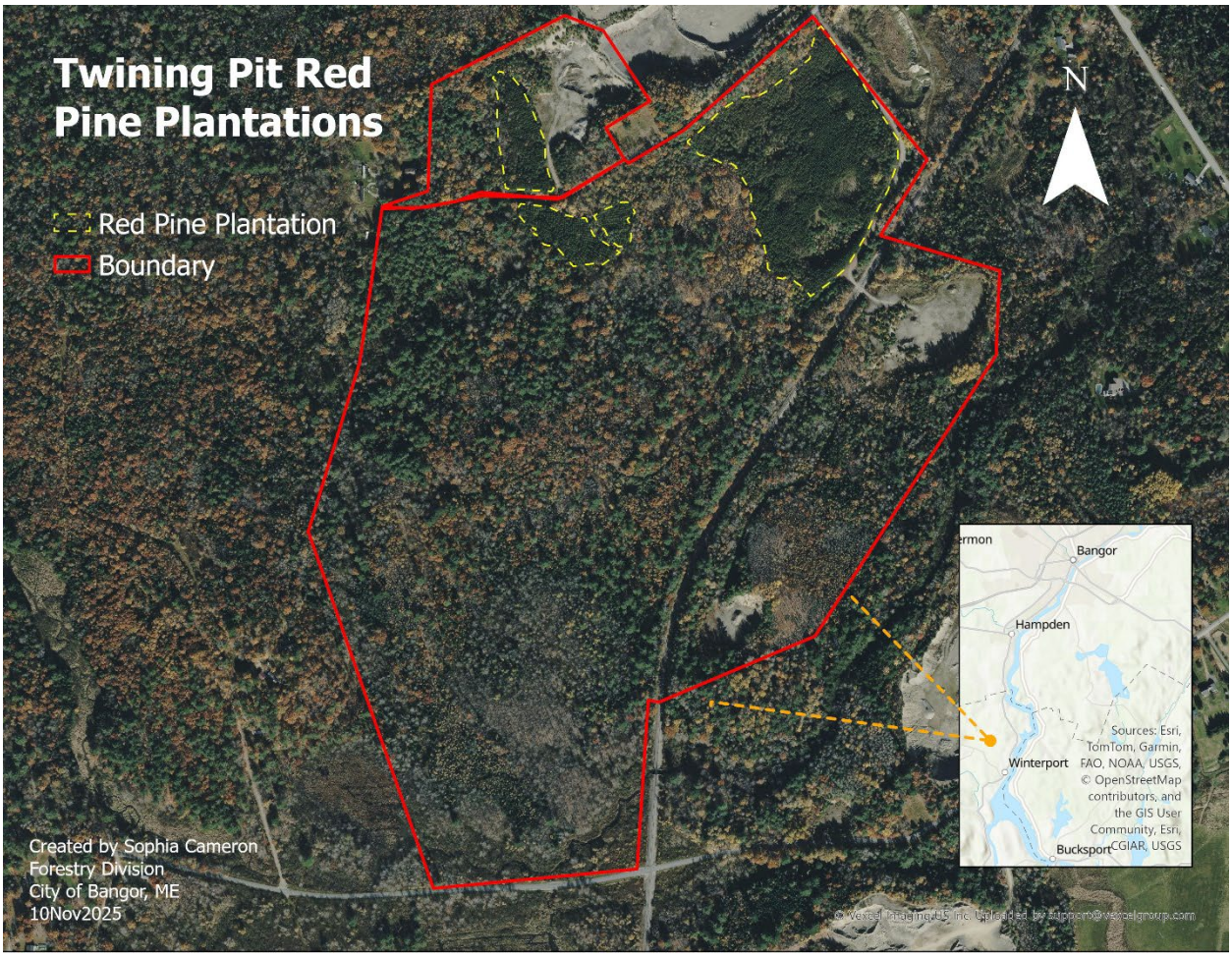

Figure 8. Map of red pine plantations in Twining Pit in Winterport, ME.

There are two major concerns within the City when it comes to RPS. The first is the hazards that could be posed should street or park red pine begin to succumb to RPS. Dead trees in urban areas can drop large branches or collapse entirely if not properly dealt with, which can result in injuries or property damage. The second—in regards to the red pine plantations—is the increased amount of deadwood that would be present in a forested area. Dead or downed woody debris can be a great source of nutrients for future growth, create wildlife habitat, and promote a higher diversity of fungi. However, it also creates a perfect environment for forest fires during drought conditions. Dried red pine wood lights easily and burns quickly, and the tight spacing of the plantation means that when trees die, they may lean up against other trees, serving as “ladder fuels” that bring fires up into the forest canopy. A canopy fire is incredibly dangerous, fast moving, and difficult to extinguish once started. Forest fires can spread at a speed of 14 miles per hour, depending on wind and other conditions (*How Fast Do Wildfires Spread?*, 2024). To mitigate forest fire risk, dried fuels need to be removed either through harvesting and debris removal or relocation, or through prescribed burning.

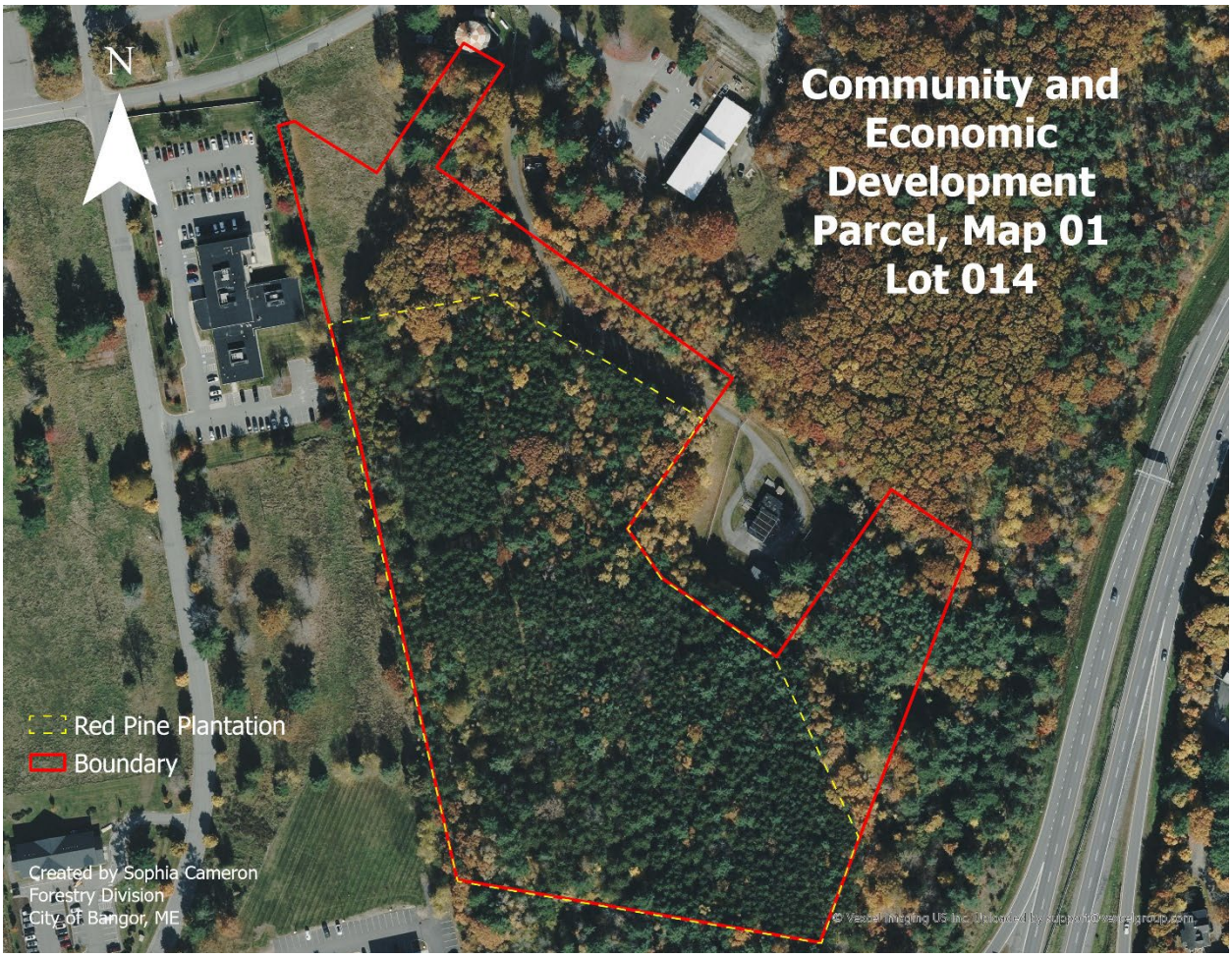

Figure 9. Map of the red pine plantation in C&ED parcel Map 01, Lot 014.

Red Pine Scale Response Plan

Scope

This RPS response plan applies to all publicly owned properties in the City of Bangor where red pine trees may grow, including public parks, cemeteries, public school grounds, rights-of-way, and forested areas. Red pine management on private properties will be determined separately.

Administration

The City Forestry Manager will be responsible for implementing this plan and ensuring its completion through the Department of Public Works in conjunction with other departments based on tree placement through separately managed properties within the city (Parks and Recreation Department, Bangor School Department, etc.). He will oversee Forestry Division employees, hired interns, and contractors conducting RPS management work. All management work will be performed internally when possible. However, given the scope of the issue, hiring contractors may be necessary.

Removal of Red Pine

Because of the nature of the red pine growing in the City, and the lack of significant landscape red pine, removals are going to be the best strategy for managing red pine in the face of RPS. As stated previously, there are only 131 street and park red pine trees recorded in the 2024 CUSTI. This is not a high enough percentage of the urban canopy to require proactive removals. However, these trees should be monitored closely for signs of RPS and should be removed at the first sign. This may look like single tree decline in urban areas, so reporting from the public will also be helpful.

In the red pine plantations harvesting will be necessary, though the timing of how this is accomplished will be dependent on the continued results of the Maine Forest Service's monitoring efforts. It is recommended that trees that appear to have limited growth, are stressed, or have a poor growth form are removed preemptively and within the next one to two years. This is considered pre-commercial thinning (PCT) and will accomplish several goals.

The first is that the removal of these trees will allow for the remaining trees that are more successful to have more growing room and more access to resources such as water. This may contribute to better growth for these trees should it take RPS longer to arrive in the area. Ideally, the City would like to maximize the growth of these remaining trees so as to maximize their value when they are finally harvested. Increased health and vigor of the remaining red pine trees in the plantations may also reduce their susceptibility to RPS.

The second is that more light will be able to reach the ground in these plantations, allowing for the germination and growth of a new and more diverse cohort of trees. Because of the tight spacing of these trees when they were planted, not much has regenerated underneath them in some of the plantations. In general, forests with a greater number of species and a greater number of age-classes are considered to be healthier for the following reasons:

1) Increased species diversity lowers the risk of a forest being wiped out by a species-specific insect or disease, such as RPS.

2) Different tree species have different tolerances of environmental factors such as drought or flooding. This means that the more species that are present in a forest, the more tolerant the entire ecosystem is to these factors. This is especially important to consider as climate change progresses.
3) Forests with varying age-classes create habitats for wildlife, and create more diverse ecosystems which increases the number of wildlife species present.

The final goal that preemptive removals of stressed or poorly growing red pine in plantations will achieve is the removal of potential forest fire fuels. These stressed trees would likely be the first to be affected by RPS in these plantations, and by removing them ahead of an infestation the Forestry Division is heading off their uncontrolled mortality and creating a scenario where the debris can be systematically removed from the plantation and either utilized or disposed of. Summer drought conditions—like those of the Summer of 2025—are likely to become more common as climate change progresses, thus making forest fires more common in Maine. By removing potential fuels sooner rather than later, we are able to limit the likelihood of ignition as well as rate of spread.

Eventually, all red pine in the plantations will be harvested to capture their value ahead of their loss to RPS. The timing of this final harvest will depend on continued monitoring and the arrival of RPS in either Winterport or Bangor.

Any cutting of red pine should be done in the winter months to avoid the increased spread of the scale. This will also reduce the likelihood of the spread of a fungal pathogen called Heterobasidion root disease (*Heterobasidion annosum*), which is discussed further in the "Other Considerations" portion of this response plan below.

Chemical Treatment Options

There are currently no recommended effective chemical treatment options for RPS in plantations. The only recommendation put forward by the Maine Forest Service is to maintain the vigor of red pine in plantations, which may increase their survival rates. This will be accomplished through the preemptive removal of stressed red pine as stated above. Fertilization of trees should be avoided, as this has been found to encourage the scale (*Pest Alert: Red Pine Scale* (Matsucoccus resinosae), 2012).

Ornamental red pine can be treated with horticultural oil to attempt to control the scale, though this requires direct contact with the insect, which means that you would need to be able to reach and coat the upper branches for effective control. Two applications per year are recommended to align with the two insect generations (*Red Pine Scale* (Matsucoccus matsumarae), 2023). Logistically, this would only be appropriate for very high-value ornamental red pine trees, of which the City maintains none.

Other Considerations

When managing forested areas, it is always important to consider how management action against one disease or pest may inadvertently promote another disease or pest. In the case of managing for RPS, we must consider a fungal pathogen called Heterobasidion root disease (*Heterobasidion annosum*). Heterobasidion root disease (HRD) is hosted by several native Maine conifer species: all native pine species, all native spruce species, Eastern hemlock, and balsam fir. It is a decay fungus that enters trees through wounds left behind after harvests in conifer stands. It breaks down living tree tissues, rots the structural wood, and results in extensive blow-down and mortality of conifer hosts. HRD

also colonizes fresh stumps of conifer host species left behind after a harvest or management (*Heterobasidion Root Disease*, Maine DACF).

Figure 10. Fruiting bodies of heterobasidion root disease (HRD) fungi on a conifer tree stump. Image retrieved from Invasive.org.

HRD is usually very difficult to detect in early stages of disease, because it can be present in trees long before they start exhibiting symptoms. For this reason, when harvesting conifers in forested areas where other host trees will be left standing, it is best to assume that HRD is already present. Since the primary management strategy for managing RPS in City-owned red pine plantations will be harvesting red pine, additional steps must be taken to mitigate further ecosystem damage from HRD.

To reduce potential spread of HRD through the remaining red pine or other conifers left standing in the plantations, all harvesting should be done in the winter during the coldest months. This reduces the likelihood of spore dispersal should a tree containing HRD be cut. Care should be taken to minimize residual harvest damage done to the remaining trees as well to maintain the trees' resistance to both HRD and RPS. Stumps from the harvest can also be treated with sodium borate powder or solution to prevent their colonization by HRD (*Heterobasidion Root Disease*, Maine DACF). While this

Figure 11. Invasive Norway maple seedlings invading the understory of a forest. Image retrieved from the Minnesota Department of Agriculture.

may be labor intensive, it will preserve the remaining conifer species in the plantations and surrounding forested areas and prevent widespread mortality from HRD.

It is also important to consider the other plant species already present in the understory of these red pine plantations. While there is some light regeneration of other native species—such as red oak and white pine at Essex Woods—there are also large populations of invasive plant species such as Norway maple, bittersweet vines, and Japanese barberry. If these invasive species are not dealt with ahead of other management, they may outcompete and suppress the natural regeneration that we are attempting to encourage. For this reason, invasive plant management should be performed ahead of pre-commercial thinning or final harvesting.

Privately Owned Red Pine Management

If you are concerned about RPS on privately owned red pine, you can contact the Forestry Division or the Maine Forest Service. At the time of this document's publication, no determined course of action was established for red pine trees found on private property throughout the city. If you would like to attempt to treat or remove a privately-owned red pine tree, you can contact a licensed Maine arborist or pesticide applicator.

Red Pine Scale Monitoring

The Forestry Division will continue to monitor the City's red pine plantations for signs and symptoms of RPS. This will be mostly visual monitoring for needle browning and canopy decline from the ground, and closer inspection of needles and branches during individual removal of red pine trees across the City. The Forestry Division has also been in contact with the Maine Forest Service to coordinate the deployment of sticky traps in several of the red pine plantations owned by the City. The findings of these traps will help inform not only RPS management in the City, but also statewide management and infestation tracking. If you are concerned about RPS in a public or privately-owned tree you can contact a member of the Forestry Division, submit a report through SeeClickFix, or reach out to the Maine Forest Service.

Red Pine Plantation Harvest Plan

Management Schedule

Below is the proposed timeline for the proposed management strategies for RPS:

Management Item	Approximate Time Performed
Invasive plant management in understory	Fall of 2025-Fall of 2027
Pre-commercial thinning of low-quality red pine	Winter 2026 OR Winter 2027
Final harvest of red pine	Winter, dependent on detection of RPS
Replanting of other tree species (may not be necessary in all areas)	Spring or fall following the final harvest

Management Locations

Below is a summary of the stands to be included in RPS management:

Property Name	Location	Acreage
Prentiss Woods	Bangor	6.5
Essex Woods	Bangor	1.7
Cascade Park	Bangor	1.8
Twining Pit	Winterport	17.3
Community & Economic Development Parcel Map 01, Lot 014	Bangor	9.3

Invasive Plant Management

While some of the red pine plantations such as those at Twining Pit have a very limited understory, others such as Essex Woods have understories almost completely made up of invasive plants. Ahead of any other management practices, these invasive species should be controlled to prevent continued growth and spread, and to ensure the success of future regeneration. Integrated pest management (IPM) principles will be used to reduce the usage of chemical pesticides, and when pesticides are used all state and federal laws and regulations will be followed.

Woody invasive plants such as glossy and common buckthorn, and Norway maple should be mechanically removed either using a forestry mulcher or hand crew during the Fall. All debris should be removed from the plantations and chipped to reduce the possible risk of seed spread. The remaining stumps of these larger shrubs can be treated with basal bark applications of herbicides the following Spring to prevent continued sprouting if this is an issue. This control will use the principles of integrated pest management (IPM), so that the least amount of herbicide will be used. These efforts have already been started in Essex Woods. Continued mechanical removals may be necessary in the future to maintain the populations throughout future management.

Pre-commercial Thinning

Most of the trees that will be removed in the initial pre-commercial thinning (PCT) of the red pine stands will not be merchantable as timber. This is because we will be removing the least successful trees from the plantations to provide the more successful trees with greater access to resources. Any trees that are removed that have merchantable logs could be marketed through contracted services. However, the majority of the volume generated from the PCT will likely be chipped and used for biomass or possibly biochar.

Because this management activity is largely an effort to mitigate future wildfire fuels and minimize the possible existence of current low-level RPS infestations, brush generated from the PCT should not be left in the plantations. It is not feasible because of the tight spacing to remove the felled trees whole to be delimbed at a landing site where the resulting brush would then be chipped. The use of a cut-to-length system using a processer and forwarder or a hand-crew with a cable skidder will be the most effective methods of completing the PCT. At closeout, all brush generated should be removed from the plantations and chipped.

All best management practices (BMPs) and regulations will be adhered to during this management and a Forest Operations Notification will be filed with the Maine Forest Service ahead of any management done on two or more acres. To maintain soil quality and reduce any risk of HRD spread, the PCTs should be completed in the coldest months of the winter.

Figure 12. A stand of tree before (top) and after pre-commercial thinning. Images taken from the Northwest Natural Resources Group website.

Final Harvest

The long-term goal of these properties is not to continue to maintain them as red pine plantations. Instead, the aim is to increase the species diversity and restore the areas to naturally regenerating forests. Depending on the results of continued monitoring for RPS in these areas, the remaining red pine trees will be harvested. By delaying the harvest of the remaining well-formed red pine, and performing the PCT, we hope to maximize their growth and value. This harvest will hopefully produce merchantable products, but will also produce biomass and biochar.

Depending on the amount of regeneration growth between the completion of the PCT and the final harvest, the final harvest may be able to be accomplished as a whole-tree operation using a feller-buncher. This would streamline the removal of brush from the plantations, however would reduce the ability of the operator to protect the soil. Alternatively, a cut-to-length system using a processor and forwarder could be used once again, with the same close-out requirement of bringing brush out of the plantation upon completion.

Some of the red pine plantations regenerated other species early on, and these trees have also reached maturity. This is the case at Cascade Park and in parts of Prentiss Woods. In this scenario, the mature trees of any species other than red pine that are native and desirable will be left as seed sources.

All best management practices (BMPs) and regulations will be adhered to during this management and a Forest Operations Notification will be filed with the Maine Forest Service ahead of any management done on two or more acres. To maintain soil quality and reduce any risk of HRD spread, the finals harvests should be completed in the coldest months of the winter.

Replanting

Most of the red pine plantations have not regenerated adequately since they were first planted. This means that there are too few trees to succeed those that will be removed during the final harvest. The hope is that once the PCT is performed, this will allow for regeneration to begin underneath the remaining trees because more light will reach the forest floor. However, if this is also not adequate, replanting with appropriate, native tree species may be necessary.

To promote successful regeneration, the right trees must be planted in the right place. This means that we must account for light conditions post-harvest, soil types, and annual temperatures. All these factors can vary greatly by site, so the table below outlines the conditions of each red pine plantation and the species that would be appropriate for replanting for each. The goal of regeneration is not to grow crop trees, or not to increase the profitability of harvesting the stand, but to improve species diversity, so non-timber species can be used for replanting as well.

Location	USDA Plant Hardiness Zone	Primary Soil Types (% of AOI)**	Drainage Classes**	Light Conditions Post-Management	Recommended Species**
Prentiss Woods	5a	Telos-Chesuncook complex (39.2%), Elliotsville-Chesuncook association, 3-8% slopes (10.3%), Elliotsville-Chesuncook association, 8-15% slopes (47.4%)	Somewhat poorly drained, Well-drained	Partial shade* to full sun	Yellow birch, white spruce, Eastern white pine
Essex Woods	5a	Telos-Chesuncook complex (98.6%)	Somewhat poorly drained	Full sun	Red maple, white spruce, yellow birch, Eastern white pine
Cascade Park	5a	Boothbay silt loam (100%)	Moderately well-drained	Partial shade*	Northern red oak, sugar maple, red maple, white spruce, yellow birch
Twining Pit	5a	Masardis fine sandy loam (44.2%), Pits, gravel and sand (48.4%)	Somewhat excessively well-drained	Full sun	Eastern white pine, white spruce, paper birch
Community & Economic Development Parcel Map 01, Lot 014	5a	Pushaw-Swanville-Urban land association (15.1%), Chesuncook-Telos complex (73.4%)	Poorly drained, somewhat poorly drained, moderately well-drained	Partial shade*	Red maple, white spruce, yellow birch, Eastern white pine, sugar maple

*There will still be partial shade in these stands because since the red pine was planted other species have also matured within the stand, and these will be left during the final harvests.

**Determined using USDA NRCS Web Soil Survey.

Summary of Recommendations

The official recommendations of this RPS response plan are as follows:

I. Continue to visually monitor for the arrival of RPS in Bangor, and work with the Maine Forest Service to place monitoring traps in red pine plantations in the City and at the Twining Pit in Winterport, ME.

II. Continue invasive plant management in red pine plantations using both mechanical and chemical methods, with specific emphasis on using integrated pest management (IPM) to control growth and spread of invasive plants already present in the understory of the plantations.

III. Complete a pre-commercial thinning (PCT) of all plantations in either Winter of 2026 or Winter of 2027, to remove poorly formed, or unsuccessful red pine trees.

IV. Perform a final harvest of all plantations to remove the final overstory red pine trees upon detection of RPS in Bangor or Winterport. These will be winter harvests.

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DEPARTMENT OF PUBLIC WORKS
FORESTRY DIVISION

To: Infrastructure Committee
From: Benjamin Arruda, Forestry Manager
Date: January 13th, 2025
Re: Timber Harvesting Contractor- Planned Woodlands Management

The City of Bangor Public Works Forestry Division, in partnership with the Parks and Recreation Department, will be working to source a timber harvesting contractor to implement harvesting on City owned parcels. This harvesting activity will be in accordance to previously accepted management plans for the Rolland Perry City Forest, as well as City owned parcels located in Winterport, ME. Timber harvesting is anticipated on other City owned parcels once management plans and harvesting recommendations have been submitted, and approved, by City authorities.

Harvesting and forest stand management activities can be grouped into either an expense or an income for the City. Large scale harvesting activities will create a high enough volume of wood products to be brought to market, and would yield an income for the City, while other management activities will be completed as a cost, as no products will be yielded during those activities.

The initial entry in the Rolland Perry City Forest would involve following the recommended harvesting and treatment activities for Stand #4 and #5 as outlined in the Forest Management Plan written by David Irving in 2021. This initial entry would involve harvesting near the center of the City Forest in a way that would allow for the increase of Woodcock habitat. This would create several cleared patches within the forest for the singing and courtship of this native migratory bird, but would also benefit other native species of animals that prefer an early successional forest stand type. This initial entry is expected to be an income generating activity rather than an expense.

Management activities recommended, and required, on the City owned parcels in Winterport, would include the harvesting of approximately 60 acres yielding an income from the wood products harvested. The “Twining Pit” property in Winterport is managed under Maine Tree Growth Tax Law which allows for the valuation of land that has been classified as forest land on the basis of productivity value rather than on just value. A requirement of a properties enrollment into this program is the commercial management for the yield of forest products on said property. As of this writing in 2026 there have been no management activities pursuant to this tax program, outside of Forestry Division completing forest road clearing and management in 2024. Engaging in the prescribed harvesting activities will ensure our recertification in the Tree Growth Tax Law program again in 2031 when the current plan and certification period ends.

Forestry Division anticipates limiting expense-based management activities to fall within the existing budget item 7301070 Independent Contractor in the Division budget. Income from harvesting activities can go to buffer this allotted amount should an overage occur due to unforeseen circumstances involving other subcontractors for the Forestry Division; Tree Pruning and Removal, and Stump Grinding subcontractors.

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CITY COUNCIL ACTION 01/26/2026

Council Meeting Date: 01/26/2026

Item No:

Responsible Dept: Stormwater

Requested Action: Order Map/Lot: N/A

Title, Order

An order to authorize the City Manager to submit Watershed Based Plan for Penjajawoc Stream Dated March 2025 to the Maine Department of Environmental Protection (MDEP) for Acceptance.

Summary

Submitting the Watershed Based Plan (WBP) to the MDEP will allow the City to apply for grant funds for stream restoration activities described in the WBP from the MDEP Nonpoint Source Water Pollution Control Grants (Also Known As: Section 319 Grants).

In 2023, the City began to update the WBP for Penjajawoc Stream. The last plan accepted by the MDEP had expired in 2018. The City requested bids and selected the local firm Stillwater Environmental Engineering (SEE) to complete the WBP. SEE did an excellent job with this task and submitted a completed plan to the City in March of 2025.

MDEP typically posts a Request for Proposals (RFP) for 319 funds in the spring of each year. Since the WBP has a 10-year "lifespan" once approved by the Maine DEP, we wanted to wait until spring of the following year to request DEP Approval. Unfortunately, the MDEP will not be posting an RFP in the Spring of 2026. However, the best chance for plan approval will be while the same MDEP staff are present, and the planning process is still fresh in their minds.

If approved, the City would likely apply for 319 funding for a project listed in the WBP in the next several years.

Committee Action

Committee: Infrastructure Committee Meeting Date: 01/21/2026

Action: Recommend for passage For: Against:

Staff Comments & Approvals

City Manager City Solicitor Finance Director

Introduced for: Consent

CITY OF BANGOR ORDER 01/26/2026

Date: 01/26/2026

Item No:

Assigned to Councilor:

An order to authorize the City Manager to submit Watershed Based Plan for Penjajawoc Stream Dated March 2025 to the Maine Department of Environmental Protection (MDEP) for Acceptance.

WHEREAS the City has completed an update of the Penjajawoc Stream Watershed Based Plan,

WHEREAS, getting said Plan approved by the Maine Department of Environmental Protection will make the City eligible for grant funding opportunities,

Be it Ordered by the City Council of the City of Bangor that,

The Stormwater Manager is authorized to submit the Penjajawoc Stream Watershed Based Plan dated March 2025 to the Maine Department of Environmental Protection for review and approval, including any edits the the Stormwater Manager as discussed with the Department.