

Department of Park Operations
Division of Natural Resources

Tree Health Survey User Manual

Cleveland Metroparks Technical Report 2020/NR-02



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Introduction

Beech leaf disease (BLD) is an emerging threat to American beech (*Fagus grandifolia*). This affliction is causing decline in beech health and is being detected in multiple states across the eastern US. In order to help determine the range of BLD, we are working with federal, state and local partners to collect records of American beech across the region. In addition to professional field staff, our data collection effort was created with citizen scientists in mind. Our goal is to collect 10-15 symptomatic **or asymptomatic** beech records per county. If you are interested in helping track the spread of BLD symptoms, you can record observations using these easy steps!

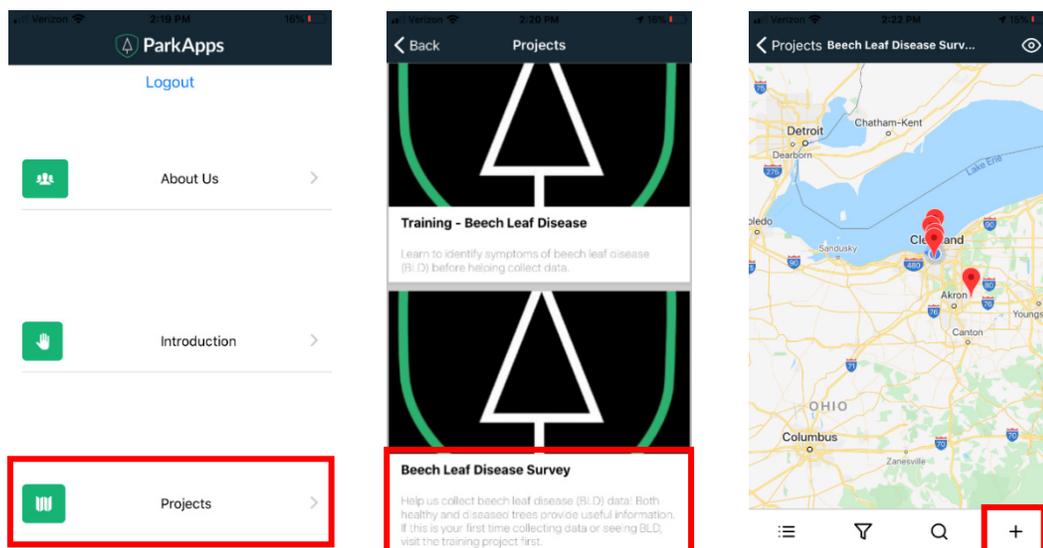
Tree Health Survey App

1. Download “Tree Health Survey”
 - Available for free on [iOS](#) or [Android](#)
2. Create an account
 - Previous THS Users: you will need to create a new account.
 - New THS Users: Identify your data contribution as Citizen or Professional User and choose which affiliation is most accurate (ex: Professional User from Ohio Department of Natural Resources or Citizen User as a Naturalist). Selecting the data access option is only necessary if you are leading efforts on behalf of an organization like a state department of natural resources and have already discussed data collection efforts with Cleveland Metroparks. All users must be over the age of 14.
 - Once you click “Create an Account”, you will receive an email with a verification link which is active for one hour. **Note:** you may or may not briefly see the green ribbon appear at the top of the screen. However, you still need to check your email and click the verification link before you can log in for the first time. If after five minutes, you have not received an email, send a message to treehealthapp@gmail.com.

A screenshot of the ParkApps mobile application interface. At the top, it says "ParkApps" with a location icon. Below that are input fields for "Email" and "Password". There are links for "Forgot Password?" and a green "Login" button. At the bottom, there are two buttons: "Create an Account" (highlighted with a red box) and "Try Us Out!".A screenshot of the account creation confirmation screen. At the top, it says "Your account has successfully been created!" with an "OKAY" button. Below that are fields for "Name" (Test), "Email" (Test@gmail.com), "Password" (masked with dots), and "Confirm Password" (masked with dots). There are dropdown menus for "Citizen" and "General public". There are checkboxes for "At least 14 years old?" (checked) and "Request Data Access?" (unchecked). At the bottom, there is a checkbox for "I agree to the terms" (checked) and a "CREATE AN ACCOUNT" button.

- Guests can “Try Us Out!” if you’d like to get a feel for the app before creating an account. This will let you browse the app, but will not allow you to submit data.

3. Complete the tutorial
 - Once logged in, click “Introduction” on the home page for a tutorial on how to navigate the app, answer questions, submit records, and view records submitted by other users.
4. Complete the training
 - The training exercise shows images for tree identification and helps standardize assessments of BLD symptom severity. It is best to complete training when you have internet connection to properly load pictures of symptoms.
 - To complete the training, click “Projects”, then “Training – Beech Leaf Disease”. Once on the map page, click the + button in the bottom right corner, then “Add Record” to begin.
5. Collect data in the Beech Leaf Disease Survey project
 - Make sure your GPS location services are on so we know where your record was taken. Permission for the app to use your phone’s GPS can be changed in your phone settings where your device manages app permissions (typically Settings – Apps).
 - Offline app use is available for collecting data if working in remote areas
 - If your data connection is not well established, your record will be stored locally on your device until you re-establish internet connection. Your device will automatically try to resubmit when you are back online and open the app.
 - **Note:** Occasionally, offline records can get stuck in a queue. There are three ways to help push records through the queue and each may take several seconds before the record is submitted.
 1. Navigate to other pages of the app like the home page.
 2. Turn off your data connection by temporarily turning on airplane mode or disconnecting Wi-Fi. Wait a few seconds before trying again.
 3. Close the app completely and reopen it again.
 - Do not attempt to log out or uninstall the app as these do not help.
 - **Note:** Please submit offline records as soon possible to avoid a buildup of too many records in storage.
 - Click on “Projects”, then click on “Beech Leaf Disease Survey”. This will bring you to a screen with a map showing BLD records. Click on the “+” sign in the lower right-hand

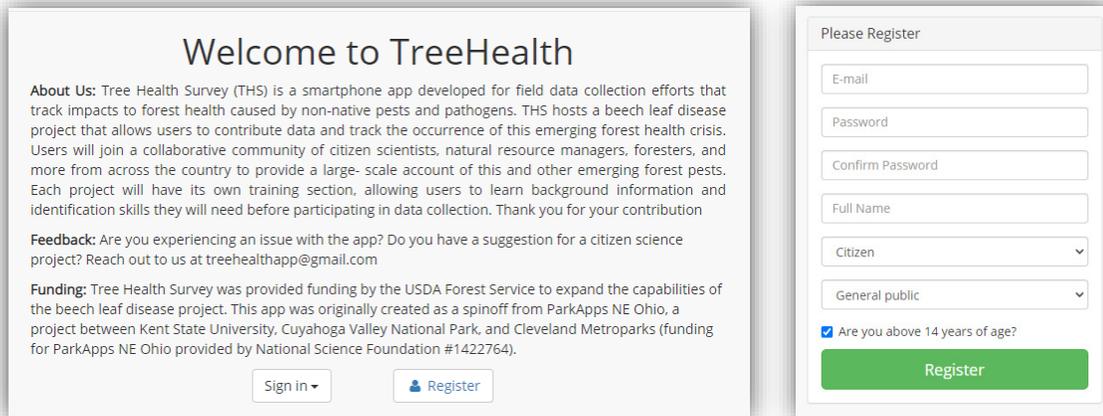


corner of the map. Allow the GPS coordinates to be captured from your phone or enter your own coordinates manually.

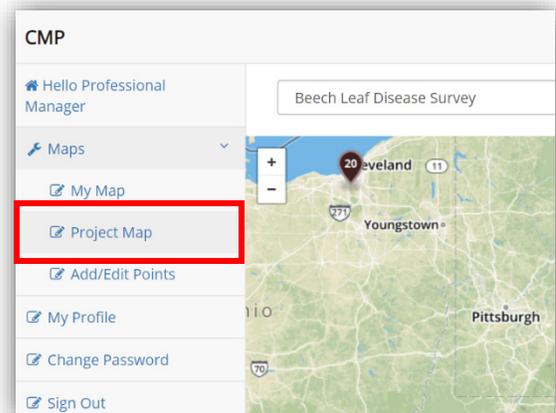
- If you are on private land or do not wish to show your record to other users, select the “Do not make data visible to all others” box before answering BLD questions
 - Click on each question to answer it. All questions with * are required to submit a record.
 - Within each question, view images of the symptom to remind you what to look for (images may load slowly or be unavailable if working offline)
 - Record symptomatic and asymptomatic trees that you encounter. See **General Guidelines for Surveys – Survey Priorities** section for more guidance on what trees to record.
 - Mortality as a result of beech leaf disease is critical to document. Mortality can be captured by saying there are no leaves and no symptoms (0%).
 - If you want to see records in a list view or edit your previous records, select the ☰ icon in the bottom left. While in list view, you will only see records that are in the map view. To edit your record, touch and drag it left while in list view.
6. View other surveys
- From the map view, you can see other public surveys. By clicking on a red pin, you can view the answers and pictures submitted with that record.
 - If you wish to toggle satellite or Google Maps, click the  icon in the top right corner of the map.

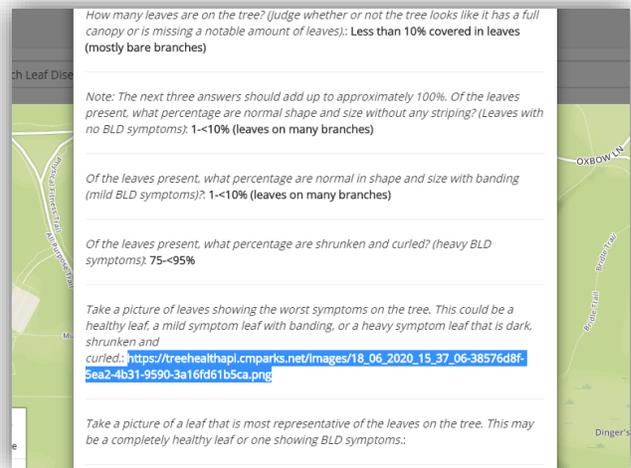
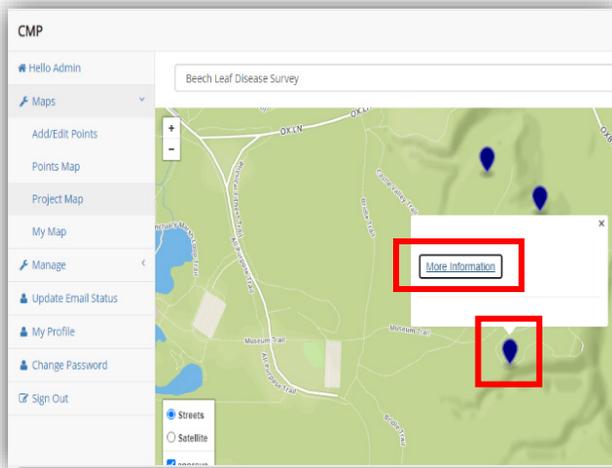
Tree Health Survey Website

1. Visit <https://treehealthapp.cmparks.net/>. Here, you can register for an account as well as submit and view records

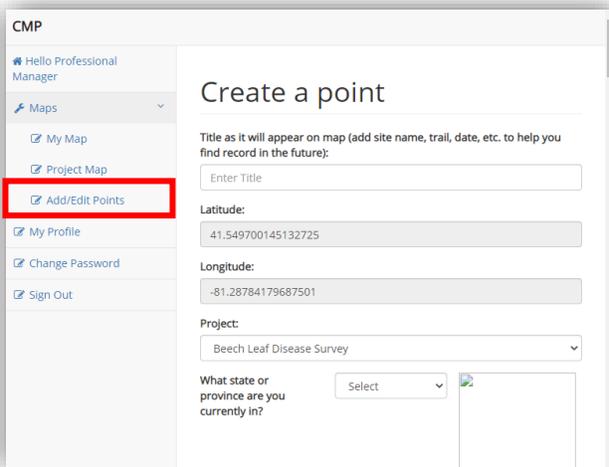
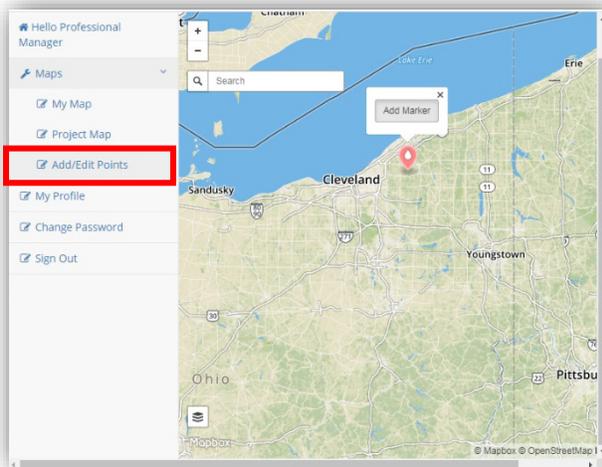


2. Create an account
 - If you have not created an account online or through the app, click “Register”. If you already have an account online or through the app, sign in using your email and password. Most users will select Citizen or Professional User for their ‘Role’ and can choose which affiliation is most accurate. All users must be over the age of 14. Once you click “Create an Account”, you will receive an email with a verification link which is active for one hour. You need to click the link in this email before you can log in for the first time. If after five minutes, you have not received an email, send a message to treehealthapp@gmail.com. We will respond as quickly as we can, but this may take up to a day.
3. Navigating the site
 - After logging in, the homepage shows your profile information. The majority of your time will be spent in the Maps section shown in the left menu bar.
 - In Maps, you can view My Map which shows all records you’ve submitted.
 - You can also look at records submitted by other users in the Project Map page. Once you select which project to view, the map appears with all public records. You can zoom in or click the icon on the map to expand the records. For instance, this map shows 20 records near Cleveland, Ohio. If you click on an individual record, “More Information” will show you the data for that record. Picture URLs can be copied and pasted into a browser if you wish to view submitted images.





- Add/Edit points will allow you to add a record. To add a point, navigate to the location where your record was completed. Click on the map to drop a pin at that site. Click on the pin to add a marker and begin recording your observation. You can edit the latitude and longitude later if you have a precise GPS location. Select the project from the dropdown menu and answer all questions. At the bottom of the page, check the box if you want your data to remain private and not be shown on the map. Not all questions have example images, but if you'd like to see the example images in a larger screen, right click and open the image in a new tab.



- Complete the training before you submit records
 - The training exercise shows you pictures to help identify the proper tree and symptoms.
 - This can be done by Adding a point anywhere and selecting the project "Training – Beech Leaf Disease". Read through all the information and view symptoms.

5. Collect data in the Beech Leaf Disease Survey project
 - Record healthy and symptomatic trees that you encounter. See **General Guidelines for Surveys – Survey Priorities** section for more guidance on what trees to record.
 - If you are on private land or do not wish to show your record to other users on the map, select the “Do not make data visible to all others” box at the bottom of the page.
 - Mortality as a result of beech leaf disease is critical to document. Mortality can be captured by saying there are no leaves and no symptoms (0%).
 - To upload an image, you must first click Choose File, then navigate to the file location on your computer. You must then click Upload for each photo to save it in the record.
 - Click Submit to send your record.

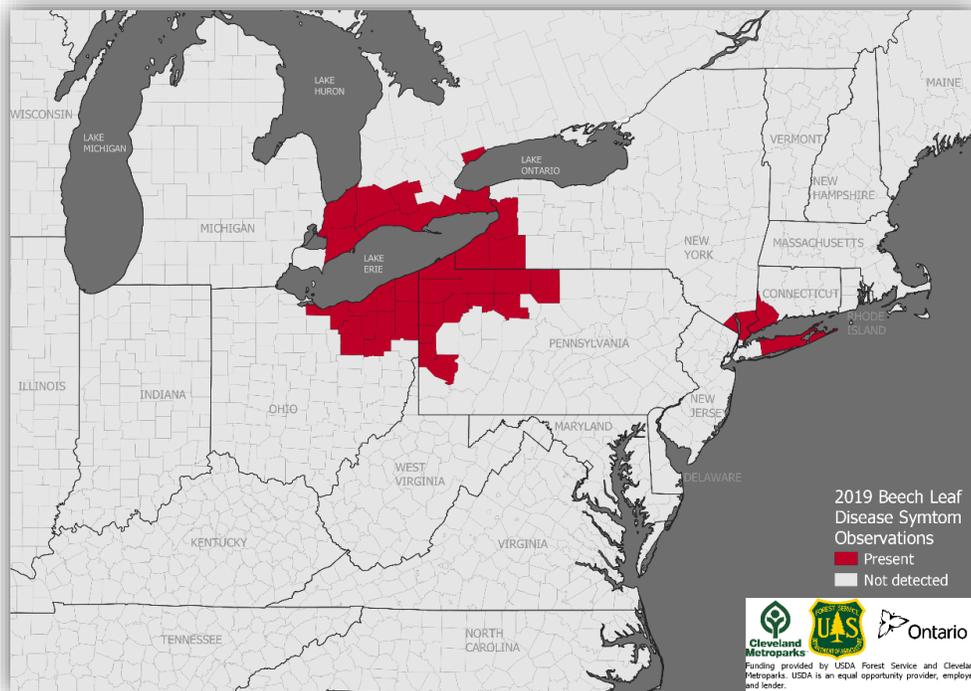
General Guidelines for Surveys

It is important to document tree condition as severity helps determine how long beech leaf disease has been in the area. Amount of canopy present and percent of each leaf symptom give an indication of BLD severity. These guidelines apply to both app and web users and may vary by state. Consult your state forest health officials for additional guidance.

Survey Priorities

Knowing where BLD is present is an important factor in determining how to effectively manage it. Survey priorities will change based on the status of BLD in your county.

- **Early Detection:** Our top priority is documenting beech leaf disease when present. This is especially true if BLD is new to a county or state. Counties immediately adjacent to known infected counties are at higher risk and should be the primary focus areas for surveyors. For information on infected counties, see map below or in training section of Tree Health Survey.
 - *Initial Symptoms:* BLD symptoms are often first found in saplings and the lower canopy of large trees. Saplings are heavily impacted in the first few years and may be the easiest location to find symptoms, while large trees may not decline for several years.
- **Established BLD:** In areas where BLD has been present for >5 years, surveyors may focus on recording a variety of tree conditions including trees with the worst BLD symptoms.
 - *Heavy BLD:* Record trees with the most severe BLD symptoms.
 - *Dead Trees:* It is important to report dead trees in heavily affected stands to indicate potential BLD induced mortality.
 - *Resistance:* If you are in a county with heavy BLD severity already, records can also focus on asymptomatic or mild symptom trees surrounded by heavily affected trees. This may indicate genetic diversity in the stand with potential BLD tolerance.



How to survey

- Once an area is identified as having beech, a thorough investigation is required. In large beech stands, inspect at least 25 trees scattered throughout for BLD. In stands with fewer than 25 beech trees, inspect all of them. For professionals that are familiar with symptoms, BLD inspection can be done by quickly scanning the lower canopy while walking through the stand. For those unfamiliar with BLD symptoms or if in a high risk area, each tree inspection could take up to a minute to look at lower canopy leaves. It can sometimes be difficult to distinguish between BLD and overlapping leaf shadows (circled in photo).
- Use the most representative/average tree in the stand when answering questions. Do this if the entire area surveyed is asymptomatic, or when most of the trees in the area exhibit similar levels of symptoms. Otherwise, refer to the **Survey Priorities** section for guidance on what example tree to use.
- While every record will provide useful information, we want to limit submission of similar size or symptom trees in a given area. Generally, one record can be taken in Tree Health Survey for every 25-50 acres. If you see a diversity of BLD symptoms on different sized trees, you can record additional records even if you are surveying a smaller plot of land.
- Multiple records can be taken if you see a drastic difference in BLD severity more than 50 yards apart. This may include recording different sized trees. For example, larger trees tend to withstand BLD longer before declining while saplings exhibit more severe symptoms and rapidly decline within a few years.
- It is recommended to have binoculars when assessing large trees. Once you decide on the tree to record, observers should thoroughly examine the entire canopy for BLD. Often, this involves walking around the tree to find several vantage points. Take into consideration that the upper canopy of large trees can have asymptomatic leaves even in stands that have been affected for many years.
- When submitting a record, it is important to submit a good photo of leaf symptoms. Each photo is verified to make sure the correct symptoms are being identified.
 - A good photo is taken up close of several leaves and clearly shows BLD symptoms. An example of a good photo shows several leaves with BLD symptoms (below left) while a poor example captures too many leaves and does not clearly demonstrate BLD symptoms (below right). If leaf symptoms are too high in the canopy, it is acceptable to take a photo of leaves on a nearby tree that is more accessible.





- Once a record is verified as potentially being BLD, state officials will be notified to follow up on the record. You may be contacted for additional information or permission to visit your property.

For questions or help with the app or website, contact treehealthapp@gmail.com. We will answer you as quickly as possible, but response may take up to a day.