This guide is intended to support municipal staff and citizen volunteers in using the Rural Roadside Ash Inventory tool. An ash tree inventory will facilitate realistic management of emerald ash borer by assessing a town’s vulnerability to the beetle and providing the information needed to prioritize removal of trees, establish a budget and management timeline, and potentially identify high-value trees suitable for treatment.

The Rural Roadside Ash Inventory tool has been developed by the Vermont Urban & Community Forestry Program (VT UCF) in collaboration with the Vermont Agency of Natural Resources GIS team. The tool utilizes an app, ArcGIS Collector, that can be downloaded to any smart phone or tablet. VT UCF can loan a limited number of iPads to support ash inventories. Please direct questions about the Rural Roadside Ash Inventory Tool to Elise Schadler, Technical Assistance Coordinator, at elise.schadler@vermont.gov or 802.522.6015.
Getting Started

The Rural Roadside Ash Inventory Tool is purposefully adaptable so that towns can collect data in a way that meets their management goals and capacity.

The data fields in the Rural Roadside Ash Inventory Tool are:

- Priority Removal (Yes/No)
- Date
- Count (#)
- Diameter Class (0-12”/12-24”/24”+)
- Condition (Good/Fair/Poor/Dead/Vacant)
- Roadside Type (Right-of-Way/Private/Utility)
- Town
- Comments
- Location (latitude and longitude)

Before you proceed with inventory planning, determine if the Rural Roadside Ash Inventory Tool matches your town’s needs. If you would like a simpler tool, consider our Rapid Roadside Ash Survey; conversely, if you would like to collect more comprehensive data on the ash trees, consider our Public Tree Inventory Tool, which is most appropriate for planted and managed street and park trees. Information about these options is available on our website at vtcommunityforestry.org/ash-inventory.
Downloading the Collector Application

ArcGIS Collector Classic is the app you will use to collect data with the Rural Roadside Ash Inventory Tool. To learn more about the app visit: https://www.esri.com/en-us/arcgis/products/collector-for-arcgis/overview or simply do an Internet search for “ArcGIS Collector”. Once ArcGIS Collector Classic is free and can be downloaded from your preferred source (the App store, Google Play, Amazon, etc.) to any smart phone or tablet.

*Note: we will be transitioning to using the new ArcGIS Collector app (not the Classic version) in the spring of 2019; the updated app has a new user interface that is not consistent with this guide. The guide will be updated in 2019 and the transition to the new app will NOT impact data collected using the Classic version.*

Basic Information

If you are using a loaner iPad from VT UCF, the device unlock code is “9999”

Application name: ArcGIS Collector Classic (blue clipboard icon)
Username for login: FPRPartner
Password for login: W0rktogether (“0” is a zero)

Establishing Inventory Protocol

Before you begin to collect data, the most important step is to establish the protocol that your inventory team will use to guide data collection.

There are five general guiding questions that you will want to decide upon before collecting any data:

1. **What do you consider to be “Priority Removal” trees?**

   Whether or not you indicate that a feature (a tree or group of trees) is a “Priority Removal” will determine how that feature is presented on the map. If it is a priority removal, it will be red; if it is not a priority removal, it will be green. This will allow any resource managers to simply look at the map and know which trees should be removed. **If your town is not in the EAB Infested Area and will not be doing pre-emptive removals, then all features should be green.** If your town is in the Infested Area or will be doing pre-emptive removals and you would like to indicate trees for removal, will you do so by condition (e.g. all ash trees in poor condition)? By location (e.g. all ash trees along specific roads)? It is important to note that you **CAN** edit your ash tree inventory data at any time in the future, so as you continue to monitor and create future work plans, you will be able to change the features from green to red, or vice-versa. You will also be able to delete trees from the inventory map as they are removed.

2. **How do you want to group the trees?**

   Will you be inventorying each individual ash tree as a distinct point, or would you prefer to group the trees by distance (e.g., each 1/4 mile), landmark (e.g., each road intersection), or quota (e.g. each time
you reach a count of 10 ash trees). The “Count” field will default to 1, but you can change the number associated with each feature (i.e., each plotted point).

3. How do you want to use the “Diameter” and “Condition” fields?

Depending on how you decide to group the ash trees, you may need to decide upon a protocol for using the “Diameter” and “Condition” fields, since you can only assign one diameter and one condition to each feature. Depending on how you are grouping the ash trees, you may want to estimate an average diameter and condition ranking for that particular feature/plotted point.

You may also want to establish a minimum diameter threshold. You may, for example, only want to collect any data on ash trees that are over 6” in diameter. Or, depending on your management goals, you may want to tally every stem since EAB will infest ash trees just 1” in diameter.

4. What “Roadside Types” will you include in the inventory?

Do you want to collect data on all trees within the public-right-of-way? Will that include trees under the overhead utility lines? Will you collect data on any ash trees on private property that could impact the public right-of-way? If collecting data on private property trees, please keep in mind that the inventory database is managed by the Agency of Natural Resources and that the data is in the public domain. What is the extent of the public right-of-way that you will use (default is often 3 rods, or 49.5")? Does the right-of-way change by road/road class in your town, or is it the same for all roads? How specific should the inventory team be regarding whether or not a tree is “public” or “private”?

5. Is there other information that you want to collect?

The “Comment” field is a text box intended for any other specific information that may be helpful on a town-by-town basis. Before beginning to collect data, decide how that field should be used. For example, you may want to include the initials of the person collecting the data if your inventory team is large. You may want to establish a coding system for ash trees that are significantly leaning over the road, or are identified as a hazardous tree. If you intend to contact the property owners adjacent to any specific ash trees or group of ash trees, you may want to include a record of any interactions.

Take some time to consider these five questions. We cannot emphasize enough how important it is to establish your protocol ahead of time and to ensure that each member of your inventory team is aware of the protocol. Use the worksheet on the next page to write down your protocol and make sure that each individual that will be collecting data has a copy when they head into the field.
Rural Roadside Ash Inventory Protocol for the Town/Village of _________________________

What is your protocol for the “Priority Removal” field?

___________________________________________________________________________________

___________________________________________________________________________________

What is your protocol for using the “Count” field?

___________________________________________________________________________________

___________________________________________________________________________________

What is your protocol for accounting for “Diameter” and “Condition” of each feature?

___________________________________________________________________________________

___________________________________________________________________________________

What is your protocol for the “Roadside Type” field? What right-of-way measurement will you use to determine if a tree is within the public right-of-way?

___________________________________________________________________________________

___________________________________________________________________________________

What is your protocol for the “Comments” field? What, if any, other information should be recorded?

___________________________________________________________________________________

___________________________________________________________________________________

Are there any other provisions for your protocol?

___________________________________________________________________________________
Before Data Collection

Downloading a Map for Data Collection:

Once your inventory protocol is established, you’re ready to prep for field data collection. When you are in the field, you will collect data off-line (not connected to WIFI or a network), so it is necessary to download a map that encompasses the extent of the area in which you’ll be working. Dependent on the scale and scope of your inventory, you may need to download a new map each time that you go into the field to collect data.

To download a NEW map:

☐ Make sure that you are connected to a WIFI network or have cellular service.
☐ Open the Collector application (the icon is a blue clipboard)
☐ Click on the “ArcGIS Online” button to sign in
  ☐ The Username is: FPRPartner
  ☐ The Password is: W0rktogeather (“0” is a zero)

Once you are logged in, you will be on the home screen of the Collector application. You will see that there is one “map” included on your home screen: the Roadside Ash Inventory Map. You will notice at the top of the grey area there are two tabs: “All” and “On Device”. Once you download a map of your inventory extent, it will show up on the “On Device” tab, but before you download a map, there will be nothing under that tab.

☐ To download a map, click on the cloud/down arrow button on the Roadside Ash Inventory Map icon.
You want to download a new basemap, so click on “Imagery with Labels” under the heading “or download a new basemap”.

At this point, you may be asked for your login credentials again. They’re the same as before.

The next screen that will appear will allow you to determine the scale and scope of the map that you’re about to download. Here, you will first choose your work area. Zoom in by spreading your fingers so that the entire area that your map to encompass fits inside the blue box on the screen.

Next, click over to the “Map Detail” tab at the very bottom of the screen. Now you will decide on how far in you want to be able to zoom on the map when it is downloaded on your device. The estimated size of your map is shown at the bottom in white text. For downloading and data syncing purposes, keep your file size UNDER 100 MB. You may need to adjust your work area or map detail (toggle back and forth) to keep the file size manageable. Remember that you can download a new map each day you are in the field, so you don’t need to fit the entire area of your town on one map.

When you’re happy with your map, click “Download” in the upper right hand corner of the screen.
As the map downloads, you’ll be able to see the progress on the home screen; the blue progress bar will move as the download happens.

Depending on your WIFI or cellular service connection and on the size of your file, the download will take anywhere from 10 seconds to a few minutes. If it doesn’t look like the download is progressing and it’s taking longer than 5 minutes, try cancelling and downloading a smaller file. If you are still having problems, try logging out of the Collector application (sign out is an option when you click on the icon that looks like an up arrow in a box in the top blue header bar) and logging back in and starting over. If the problems persist, contact Elise for technical support.

Once the download is complete, you’ll see the date of the download in the lower left corner of the map icon. You’ll also see that there is a heading in the icon that indicates that the map is now “On Device”, meaning that it has been downloaded to your device and will be available offline once you disconnect from WIFI.

You can switch between the “All” and “On Device” tabs at the top of the screen if you like (this function is useful when there are multiple maps under a single username, but we only have one in the FPRPartner account, so it’s not necessary).

Now you’re ready to get into the field!

Field Data Collection

A Disclaimer on Device Communication

It is very important to recognize that if you are using more than one device to conduct the inventory, you will be collecting data offline on a downloaded map and your devices WILL NOT COMMUNICATE WITH EACH OTHER while in the field. Essentially, think of each separate device as a piece of paper; you won’t see what’s on any other piece of paper (device) until you collect and assess the data at the end of the day. The features collected on your device will not show up on anyone else’s and vice-versa until you sync the data using WIFI, delete that map, and download a new one. This is an important point to recognize so that you are not duplicating data collection efforts. Therefore, communication between any team members collecting data in the same area in the field is essential.
Opening Your Map

- Turn off your WIFI (under Settings on your device) otherwise, your device will constantly try to connect to the closest network. In the field, you may periodically get notices that your location accuracy would improve if WIFI was on. We know that, but we’re still going to keep it turned off.
- To open up your map, click on the icon of your downloaded Rural Roadside Inventory Map.
- Once the map is open, you can zoom out and zoom in, as well as scan around the map using your fingers.

The blue dot on the screen is “you” (your device). As you move, the blue dot will move. The bullseye icon in the top blue header on the screen will center the map on your exact location, if ever you are unable to place yourself.

Once you start to collect data on a feature (ash tree or group of ash trees), the blue dot will become red. So, a red dot is an open record. It is the spot at which that particular feature will be plotted. If you need to move that dot, just tap the screen where you would like the dot to be and it will move.

To Collect a New Feature

- Stand as close to the tree trunk (or wherever you would like the feature to be plotted) as possible
- Click on the “+” icon on the sidebar to expand the data collection pane.
- Since the feature icons are presented on the map based on whether or not they are a priority for removal (No = green, Yes = red), that is the first decision that must be made. Refer to your inventory protocol for guidance. Choose “Yes” or “No”.
- The dot will turn from blue to red (it is now an open record) and the full data collection form will appear in the side pane. You will also notice the coordinates recorded at the top of the form.
You will now click on each field in the data collection form to record the feature’s data

- **Date**: Click “Today”. This field will act as a record for when the data was collected. Any future monitoring or editing of a feature should include an update of the date.
- **Count**: Refer to your inventory protocol for guidance on filling out this numeric field. The default value is 1 (so, an individual ash tree), but your protocol may be to group the ash trees in some manner.
- **Diameter Class**: Each feature needs a size class designation. Diameter should be considered as DBH (trunk diameter at breast height, or 4.5’ from the ground). Choose either 0-12”, 12-24”, or 24”+. The default value is 0-12”. Refer to your inventory protocol for guidance and special provisions.

- **Tree Condition**: Each feature needs a condition class designation. Use the guidelines below to guide condition class ranking.
  - **Good** = full canopy (75-100%), no dieback of branches over 2” in diameter, no significant defects
  - **Fair** = thinning canopy (50-75%), medium to low new growth, obvious defects/insects/disease, foliage off-color and/or sparse
  - **Poor** = declining (25-50%), visible dead branches over 2” in diameter, significant dieback, severe defects or decay (over 40% of a major stem or trunk affected)
  - **Dead** = no signs of life, bark peeling; scratch test on twigs for signs of life (green)
  - **Vacant** = potential tree planting location or placeholder for a removed tree (likely not applicable for most towns’ Rural Roadside Ash Inventory)
- **Roadside Type:** Each feature needs a roadside type designation. Choose either ROW (public right-of-way), Private, or Utility (proximate to overhead utility lines). Refer to your inventory protocol for guidance on collecting data for this field. The fault value is ROW.

- **Town:** Each feature needs an associated town. When you open up the “Town” field, you’ll see a dropdown list of every town in Vermont, not alphabetized. Type in the first few letters of your town in the search box to find your town’s name quickly. While this seems like a trivial field, it is **VERY IMPORTANT that you fill this in for each feature:** this is the field that will allow us to create a spreadsheet of all of your town’s rural roadside ash trees once your inventory is complete. If you leave this field blank, the feature will not be associated with your town in the database.

- **Priority Removal:** Since you already assigned the feature a value for this field (Yes/No), you do not need to open this data field. But, if for some reason you’d like to change its value, you can do so at this point.

- **Comments:** This is not a required field; it can be left blank. If your inventory protocol has established any other data that needs to be collected on each feature, use this text box to do so. Or, your team may just decide to leave it at the discretion of each team member to use the comments field as they see fit.
- **Photo (Optional):** You have the option to take a photo of each feature. Keep in mind that adding a photograph to each feature will significantly increase the size of your dataset, which will require more time to sync and also will limit the extent/size of any subsequent maps you download, if they encompass existing features with photo attachments. If you do choose to take a photograph, first make sure that you can get a shot that will encompass the full tree and that it is clear what you are taking a photograph of. Then,
  - Click on the camera icon in the blue header
  - Click “Add” when the Attachments pop-up window appears
  - Click “Take Photo or Video”
  - Take your picture
  - Either click “Retake” at the bottom left or “Use Photo” at the bottom right
  - Either add another or click “Done” in the upper left of the Attachments pop-up window

Whether you decided to add a photo or not, you are now ready to submit your feature.

- Before you submit, make sure that your red dot (aka, your feature) is exactly where you’d like it to be. Adjust if needed by simply tapping on the screen where you’d like the dot to be.
- When ready and happy with where your feature will be plotted, click “Submit” in the upper right of the blue header bar. After you submit, the feature will show up as either a green or red icon, depending on if you indicated that it is a priority for removal or not.
**Using the Copy Function**

The Collector application has a Copy function that increases efficiency and decreases data collection time significantly. This function allows you to copy all the data that was collected at one tree (or group of trees) over to your next tree (or group of trees), allowing you to change specific data fields if necessary. We recommend that you use the Copy function, but that you do so with caution so that you’re attentive to any specific fields that need to be adjusted for each individual feature (tree or group).

To use the Copy function:

- Click on the feature that you’d like to copy (the data you will be copying) so that it is highlighted in a blue outline.
- Walk to your new tree/group as if you were going to plot an entirely new feature.
- Click on the icon that looks like a box with an up arrow in the blue header of the side panel.
- Select “Copy” from the dropdown list.
- Select “Like this one, at my location”.
- You now have an open feature (red dot). Make any necessary changes to any data fields; delete or alter comments if needed.
- Click submit.
Editing Existing data

To edit an existing feature, whether it’s in the field after realizing a mistake or in the future when you are updating your inventory, follow these steps:

- Select the icon of the feature you’d like to edit. Once selected, it will be outlined in blue.
- Click on the icon of the box with the up arrow in the side panel and select “Edit” from the dropdown list.
- You are now in edit mode; the feature will change from an icon back to a red dot, indicating it is an open record.
- If you decide you don’t actually want to change anything about the feature and want to exit edit mode, just click on “Cancel” in the upper left hand corner.
- Make any necessary edits to the data collected on that feature by using the drop-down lists and/or changing the text in the text fields. You can also add a new picture (see page 12 for instructions).
- To move the location of the feature, simply tap on the spot where you’d like the feature to be placed while in edit mode.
- Make sure the “Date” is always set to the current date before submitting any edits so that you are keeping track of when the feature is updated.
- When your edits are finished, click on the “Update” button on the top right corner.

Deleting A Feature

To delete a feature for whatever reason (the tree/group of trees were removed, weren’t actually in the public right-of-way, etc.), follow these steps:

- Select the icon of the feature you’d like to edit. Once selected, it will be outlined in blue.
- Click on the icon of the box with the up arrow in the side panel and selected “Delete” from the dropdown list.
- A pop-up screen will appear to confirm that you’d really like to delete the feature. If so, click yes.
Syncing Data

Once you are done collecting data (for the day/weekend/or entirely), you will need to sync the data with the master database at the Agency of Natural Resources. You do not need to do this at the end of every data collection session, but you do need to make sure to sync the data before you delete the “On Device” downloaded map and download a new one. To be safe, it may be wise to establish a protocol for data syncing and/or to assign the task of syncing the data to one individual. To sync the data:

- Connect to a WIFI network or cellular network (make sure that WIFI is turned back to “on” in Settings on your device).
- Open the Collector application and return to the home screen by clicking on “Maps” in the upper left of the blue header bar.
- You will see a red circle with a number in the lower right hand corner of the Roadside Ash Inventory icon; this indicates the total number of features that have been collected on the downloaded map on the device.
- Click on the red circle/the download button in the lower right hand corner of the Roadside Ash Inventory icon and the sync will begin.
- A blue bar will indicate progress as the sync proceeds.
- When sync is complete, the red circle will go away, the bottom grey banner of the icon will say when the sync occurred, and the day’s work is done!

A note: sometimes Collector will tell you that a sync has failed, sometimes it will say it has synced but the red circle doesn’t go away, and sometimes something else funky happens. General trouble shooting tip: log out, then log back in and try again. If all else fails, contact Elise.
Deleting an Existing “On Device” Map

In preparation for downloading an updated map (that will show all features collected and synced) OR if you want to download a map of a different extent/area, you’ll need to first delete the existing map. Here’s how:

- First, make sure any data that you collected has been synced. If you see a red circle with a number in the lower right hand corner for the Roadside Ash Inventory map icon, that means you have not yet synced your data; do this first (see previous section for instructions).
- You can also check to see if all of the data has been synced by accessing the ArcGIS online account at: https://vtanr.maps.arcgis.com/home/signin.html. Use the same username and password to log in, click on “Gallery” at the top and search for the Roadside Ash Inventory Map, then zoom to your town to see what has been uploaded to the map.
- If your device is all synced up, you are ready to delete the map. Click on the box with the up arrow in the blue header on the Collector app home screen.
  - Click “Manage”
  - Click “Remove” at the bottom right corner of the Roadside Ash Inventory Map icon.
  - On the pop up screen, click “Remove features and basemap”
  - Click “Done”

You are now ready to download a new map of an inventory area. Refer to page 6 of this guide.
Appendix A: Inventory Tools Available on Loan

To aid in community ash inventory efforts, the Vermont Urban & Community Forestry Program has the following items available to loan:

- 10 Apple iPads
- 6 100-ft reel tapes
- 20 10-ft pocket diameter (DBH) tapes
- 10 Nikon 8X42 Aculon binoculars
- 10 Orange safety vests

All loans will need to be coordinated with Elise Schadler, Technical Assistance Coordinator with VT UCF (elise.schadler@vermont.gov; 802.522.6015) and will include a signed contract. Loans will be bound to an agreed-upon timeline (likely 4-6 weeks) and communities will be responsible for returning loaned items to VT UCF, either at the Montpelier office or South Burlington office, at the end of the loan period. Due to demand, VT UCF will limit iPad loans to 2 per community at any given time. Quantities of other loaned items can be decided on a community-by-community basis.