

Appendix C. Golden Field Program - Forester Manual Excerpt

Institute for Environmental Solutions and the City of Golden
UFORE Field Data Collection
June 18-20, 2007

UFORE PDA Step-by-Step Instructions**TEAM**

Your team will be assigned a number of plots in a section of the City of Golden to visit each day (Monday, Tuesday, Wednesday). Each plot will be numbered. You will have a corresponding aerial map and Golden street map to locate the plot. Once the address is located, park your car and walk to the general plot location. If the plot is on vacant land or open space, locate the plot using either guidelines on your plot map, or your GPS unit.

Upon arriving at plot:

DATA COLLECTOR

1. Owner Permission – Follow land owner permission protocol.
2. Take picture(s) of plot and numbered sign.
3. Survey Landowner (if someone is there).
4. Collect tree or shrub sample if they are needed.

RECORDER

Work with team forester: read each requirement as they appear on the screen, and record measurements in PDA.

FORESTER

NOTE: For clarification on the procedures below, please see Appendix A, where each data collection point is explained in detail.

First, **Establish Plot Center**, then follow the steps below to record UFORE data with your PDA.

1. **Start Screen.**

- Turn on the PDA, and click on **Programs** in the upper left corner. This takes you to Programs Screen, where you click on the **UFORE PDA** icon, bringing up the i-Tree-UFORE Screen.
2. Click **Log In**. This takes you to Log In Screen, where you can change the Survey Date, if necessary. Select your assigned team name (Forester 1, 2, 3, or 4), then click **Continue**.
 3. Back on main UFORE screen, click **Plots**. This takes you to PLOTS-SAMPLE screen (below).

The screenshot shows the 'PLOTS - SAMPLE' screen with the following fields and values:

- Plot ID:** 1 (dropdown menu)
- Plot Size:** 0.1 Acres
- Radius:** 37.2 Feet
- % Measured:** 15
- % Shrub:** 0 (dropdown menu)
- % Tree Cover:** 3 (dropdown menu)
- % Plantable:** 0 (dropdown menu)
- Address:** NONE
- Comment:** SAS version 3.0
- Photo:** (empty field)
- Action:** Exit (dropdown menu)
- GO:** (button)

A yellow callout box labeled 'Navigation menu' points to the 'Action' dropdown menu.

4. **PLOTS-SAMPLE Screen** - this screen functions as the home screen: each time you complete a section of data entry such as Reference Objects, you will return to this screen and select a new section using the navigation menu at the bottom.

- **Plot ID:** Select from pull-down menu.
- **Plot Size:** default (.10 entered for you – this is the correct number)
- **Radius:** default (37.2 entered for you – this is the correct number)
- **% Measured:** Percent measured (e.g., if 10% of the plot is obscured from view behind a building or a tall stockade fence on land that you could not get permission to access, you would report % Measured as 90%).
- **% Shrub:** Percent of the plot area covered by shrub canopies.

NOTE: Don't double-count multiple layers of shrubs. Look from above.

- **% Tree Cover:** Proportion of the sky that is obscured by tree crowns within the plot. Range from 0 to 100%.
- **% Plantable:** Plantable soil that is not filled with tree canopies above or other overhead restrictions.

NOTE: If there are no trees or shrubs, check boxes: no trees on plot/no shrubs on plot.

NOTE: – Mid-points of 5% intervals are in the pull-down menus for % Shrub, % Tree Cover and % Plantable (i.e., 3 is mid-point of 1-5%; 8 for 6-10%; etc.).

→ After all data on this page have been entered, click on pull-down navigation menu to the right of Action and select **Reference Objects**. Clicking **GO** takes you to the Reference Objects screen.

Plot ID 1

Object Type
▼ 13-Utility

Direction 120

Distance 85

Comment
1452BGTT

Type	Direction	Distance
13	120	85
1	120	85

Add Edit Delete

Save Changes Exit/Done

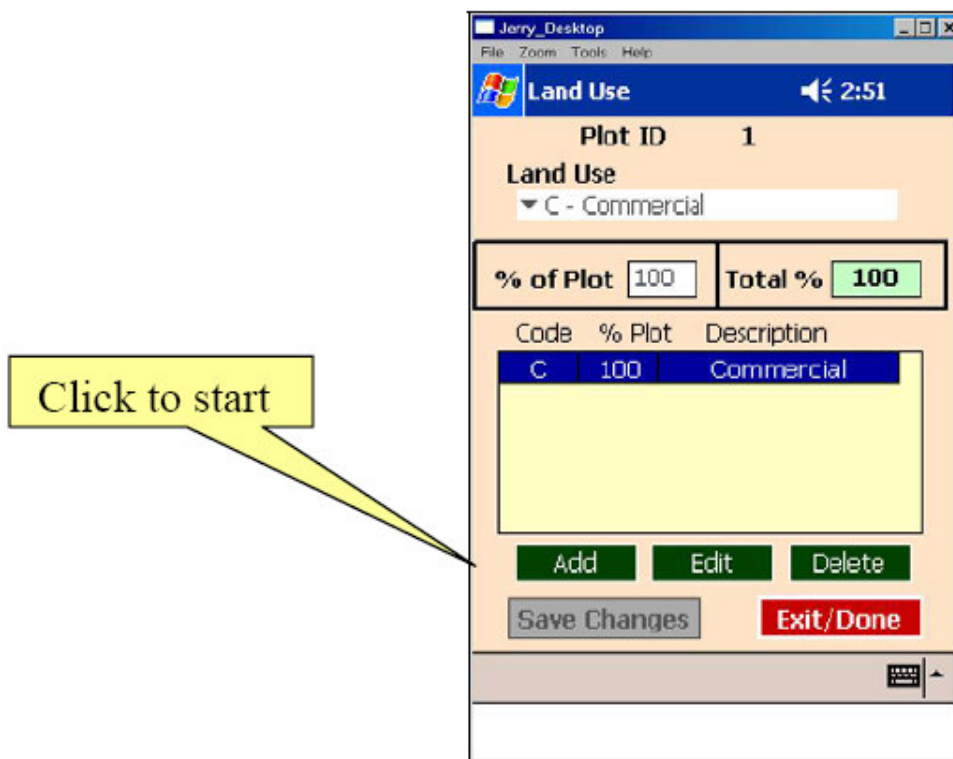
A Reference Object is used to identify the plot (a light pole, mature tree, or building that is likely to remain for a long time).

5. Reference Objects Screen - you must click **Add** to be able to start adding data. This is also true for the Land Use, Ground Cover, Shrubs, Stems and Tree Building Interactions screens.

NOTE: After clicking the Add button, its name changes to Abort. If mistakes are made in data entry, click Abort, and the button name changes back to Add. Clicking Add now erases all entered data, allowing correct data to be entered. This toggle operates the same way in the Land Use, Ground Cover, Shrubs, Stems, and Tree Building Interactions screens.

One reference object is required, If possible, record two.

- If **Object Type 01 –Tree** is selected, DBH is required in the DBH box.
- If **Object Type 15 –Other** is selected, make sure to enter unique description in Comment field.
- After data for one reference object have been entered, click **Save Changes**. Screen refreshes and data are displayed in the review pane. You can choose to **Add** another reference object, or **Edit** or **Delete** data for reference object displayed.
- If you choose to describe another reference object, click **Add**, enter data, click **Save Changes**, then click **Exit/Done**. This takes you back to home PLOTS-SAMPLE screen.
- After all data have been entered, use navigation menu to go to **Land Use**.



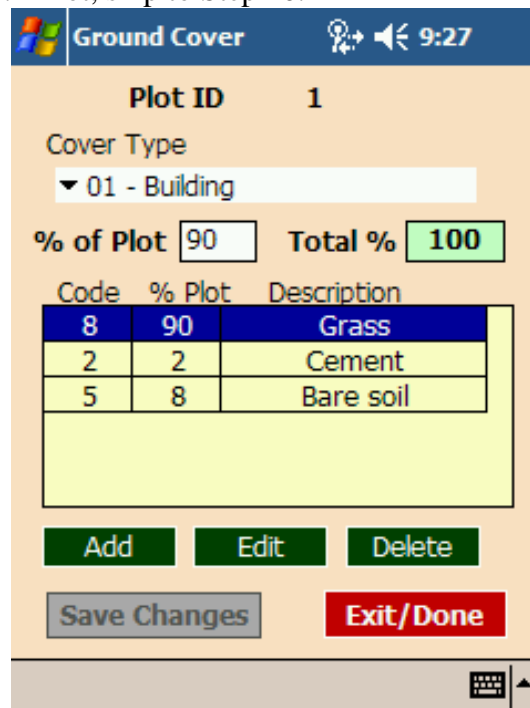
6. Land Use Screen

- Click **Add** to add land use.
- **Land Use** - Select from pull-down menu.
- **% of Plot** - Covered by that land use.
- Click **Save Changes**. Screen refreshes and data are displayed in the review pane.
- You can choose to **Add** another Land Use, or **Edit** or **Delete** data for Land Use displayed.
- If you choose to describe another Land Use, click **Add**, enter data, click **Save Changes**, then click **Exit/Done**. This takes you back to PLOTS-SAMPLE screen.
- After all data have been entered, use the navigation menu to go to **Ground Cover**.

7. Ground Cover Screen

NOTE: The different cover types only need to be recorded once, under one of the land use choices (i.e. land use = cemetery, ground cover can be grass, cement, etc.)

- Select **Cover Type** from pull-down menu
- Click **Add**
- **% of Plot** – Percent covered by selected cover type. (Total is inserted for you – must add to 100%)
- Click **Save Changes**. Screen refreshes and data are displayed in the review pane. You can choose to **Add** another Cover Type, or **Edit** or **Delete** data for Cover Type displayed.
- If you choose to describe another Cover Type, click **Add**, enter data, click **Save Changes**, then click **Exit/Done**. This takes you back to PLOTS-SAMPLE screen.
- After all data have been entered, use the navigation menu as before to go to **Shrubs** or **Trees**, if you have any to enter. If not, skip to Step 16.



Plot ID 1

Species: (Use Search Value for species)

▼ - NOT IN LIST - ENTERED BELOW

Species Search

Shrub ID	Height	Total %
<input type="text"/>	<input type="text"/>	0
% Area	% Missing	
<input type="text"/>	▼	

Shrub ID	Species	Hgt	% Area	% Missing

8. Shrubs Screen

NOTE: Shrub and Tree navigation options will not be present in the pull-down menu if the % Shrub and % Tree fields back on the PLOTS-SAMPLE screen are 0%.

NOTE: Record a maximum of twelve shrub groups. If there are more than twelve, record measurements for the first eleven then lump the remaining shrubs into the twelfth group. Record the predominant species and averages for Height and % Missing for the final group.

Choose one of two options for entering shrub species:

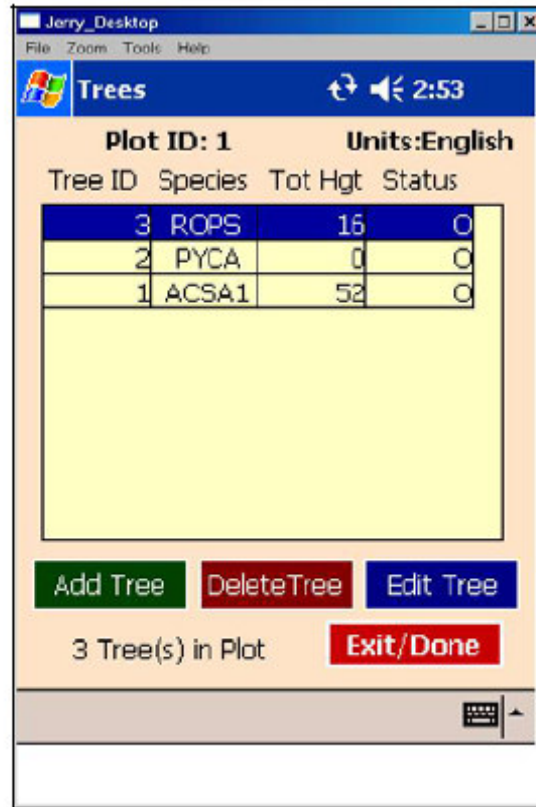
-Scroll through drop down box species list, or **use Search Value for Species** (make sure box is checked).

– Enter known species code in the box next to Species Search. **Do Not** hit the **Search** button. The code will stay in the box.

NOTE: using this option, the program will accept any letter combination. This is good for entering a code that isn't in the pull-down menu, but also increases the chance of entering the wrong code for a species. Be very sure you know the appropriate species code, if you use this option.

- After entering the shrub species, continue with the following data entry steps:
 - **Shrub ID** - Filled in sequentially by the PDA program.
 - **Height** – Height of shrubs
 - **% Area** - Of the total ground area of all shrubs on the plot, record the percent of that ground area occupied by this species/height combination.
 - **% Missing** - Of the volume of this species/height combination, record the percent of the volume that is missing, i.e., not occupied by leaves.
 - **Save Changes**. Screen refreshes and data are displayed in the review pane.
- You can choose to **Add** another Shrub, or **Edit** or **Delete** data for Shrubs displayed.

9. When finished working with shrubs, click **Exit/Done**. This takes you back to PLOTS-SAMPLE screen. If you have trees to enter, use the navigation menu as before to go to **Trees**. If not, skip to Step 16.



10. Trees Screen

- Review pane displays any trees that have been entered for the plot.
- Trees can be added, deleted or edited starting from this screen.
- Click **Add Tree**. This takes you to Trees - Sample screen.

11. Trees – Sample

- Tree ID is generated by the PDA program.
- In pull-down menu, select the land use where trees are located. Unless it is a split plot, there will be only one land use in the menu. The choices will be the land use(s) entered in the **Land Use** option on the PLOTS-
- Enter **Distance** and **Direction** from plot center as well as any comments or Photo information. Click **Continue**. This takes you to **Tree Detail** screen.

The screenshot shows a PDA interface titled "Tree Detail" with a time of 3:48p. The form contains the following fields and controls:

- Tree ID:** Text input field containing "2".
- Site:** Drop-down menu showing "N - Not a street tree".
- Status:** Radio buttons for "Remeasurement" and "Dead", and a drop-down menu showing "O - Initial Sample".
- Species:** Radio button for "(Use Search Value for species)" and a drop-down menu showing "ACNI - Acer nigrum".
- Species Search:** Text input field and a "Search" button.
- Measurements:**
 - Tot. Hgt: 56
 - Live Top: 56
 - Crn Base: 4
 - Crn N/S: 18
 - Crn E/W: 15
 - Crn Miss: 0
 - Dieback: 0
 - CLE: 4
 - %Imperv: 0
 - %Shrub: 0
- Buttons:** "Stems" (green), "Bldg" (dark red), "Back" (blue), "Save" (purple), "Done" (red).

12. Tree Detail Screen

*NOTE: If tree is dead, click on the **Dead** box. You will only be able to enter data for Species and Tot. Hgt., and Crn Miss and Dieback have fixed values of 100. All other fields have an entry of -1 that cannot be edited.*

*NOTE: Clicking on the **Back** button at any point in data entry returns you to the Trees – Sample Screen where data can be re-entered, if a data entry error has been made.*

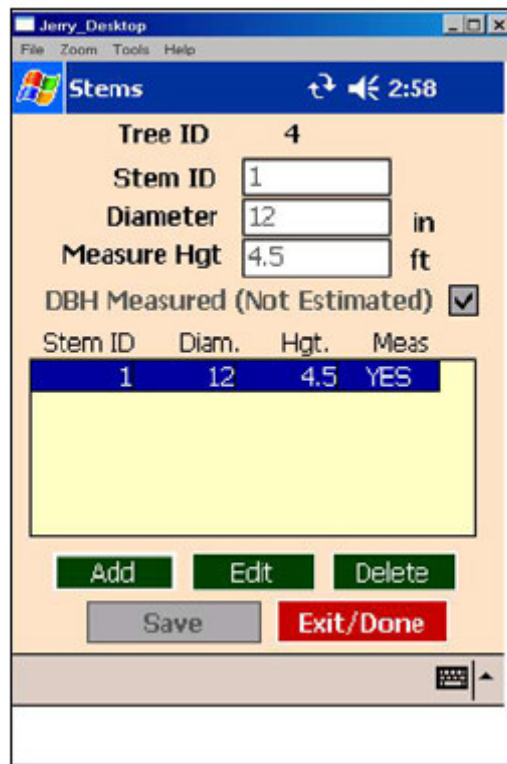
- **Tree ID** is generated by the PDA program.
- **Site** -Identify **Street tree** or **Not a street tree**
- **Status** - If this is the first time trees have been measured, only one option (Initial Sample) will appear in **Status** pull-down menu. If **Remeasurement** box is checked, there will be multiple options in Status menu. (Remeasurements are for QA/QC, do not
- **Species** - Identify species by searching or choosing from drop down box.
- **Total Height** – Height of tree from base to top.
- **Crn Base** - Height to base of live crown measured to closest ft. (Record dead trees as 0. PDA has a default value of -1.
- **Crn E/W** – Width of crown east to west in ft.
- **Dieback** - Dieback - Record 0%, 100% or mid-points of 5% intervals (3, 8, 13, 18, etc.) (record as 100% for dead trees).

NOTE: Percent crown dieback in crown area. This dieback does not include normal / natural branch dieback/pruning due to crown competition / shading in the lower portion of the crown. However, branch dieback on side(s) and top of crown area due to shading from a building or another tree would be included.

- **% Imperv** – Percent impervious surface under tree
- **Live Top** - Height in ft. will be the same as total tree height unless the tree has leaves and top portion of the crown is dead.
- **Crn N/S** – Height of crown north to south in ft.
- **Crn Miss** – Percent of crown/canopy missing.

Note: Be sure to base Percent canopy missing measurement on the existing crown that you have measured. A third of the crown may have been removed for power line clearance or the canopy could be very lopsided due to presence of a neighboring tree. However, the crown that remains could have a 0% missing value, if the existing crown is very full

- **CLE** – Crown light exposure
- **% Shrub** – Percent shrub cover under tree.
- After data have been entered, click **Save**, then click **Stems** which will take you the Stems screen.



13. Stems Screen

- **Stem ID** - Filled in sequentially by the PDA program.
- Enter **Diameter**. Enter **Measure Hgt** only if not taken at standard DBH height (4.5 ft./1.37m)
- Uncheck **DBH Measured** box if DBH was estimated.
- Click **Save**. Diameter entry will appear in review pane below.
- If there is a second stem to measure, click **Add** and enter values for new stem, click **Save**. When finished with all stem measurement click **Exit/Done**. This takes you back to Tree Detail screen.
- If the tree is >20 ft. tall and there is a building within 60 feet of the tree, click **Bldg**. This takes you to Tree Building Interactions screen. If there are no adjacent buildings, click **Done**. This takes you back to the Trees screen.

Tree Building Interactions 4:13p

Tree ID 2

Bldg ID 1

Direction 34

Distance 12 ft

Bldg ID	Direction	Distance
1	34	12
2	45	23
3	3	5

Add Edit Delete

Save Exit/Done

14. Tree Building Interactions Screen

- **Building ID** is filled in sequentially by the PDA program.
- Enter **Direction** and **Distance** measurements.
- Click **Save**. Building entry will appear in review pane below.
- If there is a second building to measure, click **Add** and enter values for new building, click **Save**. When finished with all Building measurements click **Exit/Done**. This takes you back to Tree Detail screen. Click **Save**, then click **Done**. This takes you back to the Trees screen.

15. Trees Screen

- Review pane displays any trees that have been entered for the plot.
- Trees can be added, deleted or edited starting from this screen.
- If there are no other trees on the plot, click **Exit/Done**. This takes you back to PLOTS – SAMPLE screen.

16. PLOTS – SAMPLE Screen

- If you are completely finished with the plot and feel that plot data are ready to upload, click on the **Mark/Unmark Complete** button and an asterisk will be placed in front of the plot number in the pull-down menu. You will not be able to edit the plot unless you **Unmark** it.

17. Exiting the PDA Program

- Select **Exit** option in pull-down menu from the PLOTS – SAMPLE Screen. Click **Go**. This returns you to the i-Tree - UFORE screen.
- *Click Back up data to storage card.*
- Click **Exit/Done**. This returns you to the Programs Screen. You can now power off the PDA.

QUESTIONS?

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