DATA COLLECTION: ESII FIELD APP

OVERVIEW

This section describes how to prepare for and carry out field data collection using the ESII Field App (or ESII App). The ESII App is your remote interface to the ESII Tool. It enables you to collect spatially-explicit ecological data, make maps, collect survey data, take photos, and record notes about your observations. With a Wi-Fi connection, the ESII App can upload and download information stored on the ESII Project Workspace, where final analyses and reports are generated.

Because sites may be large and may include several different types of habitats, each Site to be assessed using the ESII Tool is divided into smaller areas called *map units*, and field data is collected on a map unit basis. Map units may vary in size, depending on the Site's diversity of attribute conditions and the level of ecological analysis desired. In the ESII Tool, map units are "housed" in a Data Collection Effort (DCE); a DCE is housed within a Site. To conduct data collection, you must first download the Site, DCE and map unit information that was previously created in the ESII Project Workspace. Once the Site package has been downloaded, you can create additional map units and collect data for each of them.

DOWNLOAD SITE PACKAGE(S)

Before heading out into the field, you need to download the Site information onto your iPad. Log into the ESII App using your username and password (Figure 1).

Figure 1. Login screen

The first screen you see will be the main Sites page (Figure 2), which displays the Sites and DCEs that were created in the ESII Project Workspace. This page shows the Sites that are assigned to you, the DCEs associated with each Site, and map download options.

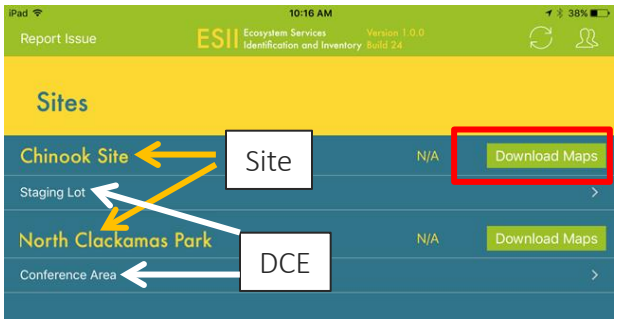
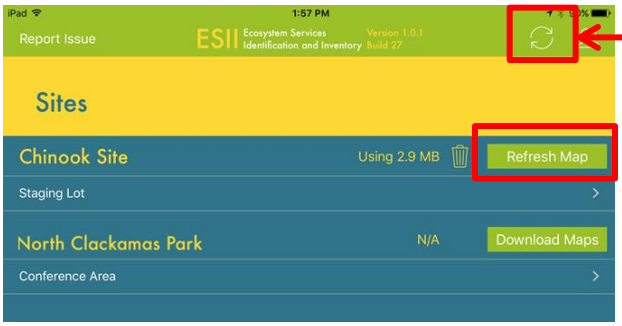


Figure 2. Site and DCEs

Download the Site maps for the areas you will be working by tapping Download Maps for each Site (Figure 2). You may download map packages for more than one Site depending on the memory capacity of your iPad or the number of Sites you intend to visit.

If you already have a map package but need to update it with new base map data from the ESII Project Workspace, you will see a Refresh Map button (Figure 3). Tap that button to download the latest data. Larger data packages will take longer to download.



Refreshing the map only imports the latest map data for respective sites. If you need to refresh the data for map units in all sites loaded on your iPad (i.e., update with new data from the Project Workspace or send your data up to the Workspace), select the Sync option at the top right of the screen (Figure 3).

Figure 3. Refresh Map

TIPS & TRICKS

If you no longer need the map package, or need to clear some space on your device, you may remove the map package by tapping the trash can icon associated with a specific Site.

OPEN SITE MAP PACKAGE

Tap a DCE listed on the Sites screen to see all map units that were previously created (by yourself or another user) in the ESII Project Workspace (Figure 4). On this Map Units screen, tap the green Map button (Figure 4).

Figure 4. Opening a map

The Site boundary is marked in black; the DCE boundary is marked in blue; the boundaries of map units previously created (by yourself or another user) in the ESII Project Workspace will be marked in green (Figure 5).

Figure 5. Site, DCE and map unit boundaries

CREATE MAP UNITS

It's now time to draw preliminary boundaries for the areas where you will collect data in the field. When collecting data, you will complete a field survey for each unique area of your DCE so that you can capture the unique attributes that will help you understand how that particular area performs. You must create these unique areas as map units so that the data you collect can be tied to the specific location where it applies.

TIPS & TRICKS

If more than one person will be collecting field data using the ESII Field App, each field person should be assigned unique areas of the DCE to work in and a naming convention should be agreed upon so that each map unit has a unique identifier. This coordination should take place prior to the field visit so that everyone is working with the same map unit boundaries.

There are multiple ways to approach dividing a site up into map units, but the two most common ways are to draw map unit boundaries around individual features or start with one large map unit and split it into multiple map units. This latter approach can result in less cleanup work, as it reduces the potential for slivers and gaps between polygons. The "Special Features" section at the end of this document has instructions for splitting a large map unit into multiple units.

Whichever approach you choose, you will draw map units around areas of relatively homogeneous natural features (e.g., grassy fields, forests, shrub/scrub, etc.) or man-made structures (e.g., buildings, roads, etc.). The degree to which you include anomalies in a map unit should be dictated by how much time you have and how precise you want the collected data to be. Lumping areas of moderate heterogeneity into one large map unit will result in a lower level of data resolution than splitting a larger map unit into multiple ones. For expediency, map units may be aggregations of areas that share similar features, for example, a forest with multiple small grassy openings or an office complex including the surrounding landscaped areas.

New map units should be created if they were not previously created in the ESII Project Workspace, and whenever the imagery is inconsistent with what you see in the field.

CONDUCT A PRELIMINARY ASSESSMENT OF THE DCE AND MAP UNITS

Walk around the DCE to the extent this is safe, feasible and practical in terms of work flow (Figure 6). Note potentially unique map units within the DCE and get a general sense for how they relate to the aerial imagery of the DCE. If the map unit boundaries were previously mapped (in the ESII Project Workspace), verify that the boundaries make sense based on what you are seeing in the field. Refine, edit, and add map units as needed, based on your observations.

Figure 6. Walking around a DCE

DRAW ADDITIONAL MAP UNITS

From the Map Units screen (Figure 4), tap Map. On the next screen, new map units can be added by tapping Add Map Unit (Figure 7).

Figure 7. Adding additional map units

Create your first vertex by tapping the screen. Then create the map unit boundary by tapping additional vertices. Each vertex you add will be connected to the previous vertex by a line (Figure 8). Tap on the first vertex a second time to close the map unit boundary.

You will be prompted to type in a name for the new map unit (Figure 9).

Figure 8. Drawing a new map unit

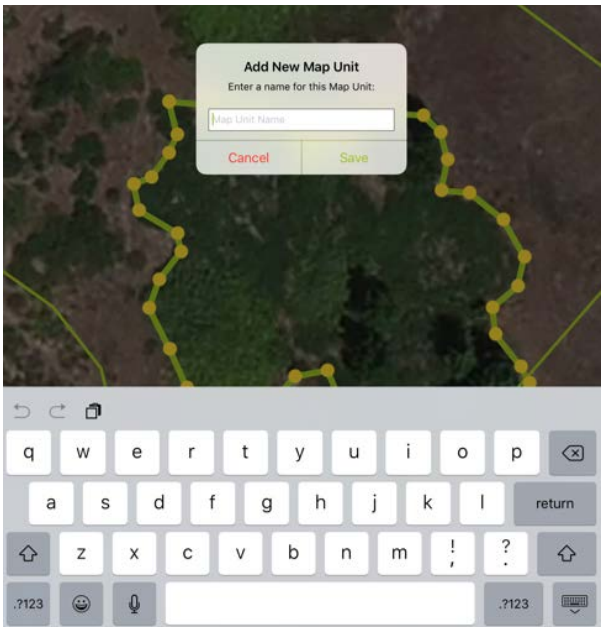


Figure 9. Naming a new map unit

When you are finished creating map units, tap the Close button at the top right of the screen. This will return you to the list of map units. The map units you have created will appear in this list and are ready for data entry (Figure 10).

Figure 10. New map unit in a list

Special Features

Map units may have been previously created in the ESII Project Workspace. See the "Special Features" section at the end of this document for instructions on how to edit pre-existing map unit boundaries, split map units and delete map units.

FIELD DATA COLLECTION

Walk the map unit and verify your estimates of the map unit's attributes as needed throughout the data collection process. Look at enough of the map unit to make consistent estimates of attributes. For example, look at multiple locations within the map unit to evaluate the characteristics of the soil surface (Figure 11).

Data collection may go a bit slowly at first. But as you collect data for more and more map units, your ability to identify and estimate attributes will improve, and the process will go more quickly and efficiently.

Figure 11. Walking around a map unit

ENTER DATA INTO SURVEY

Once a map unit has been selected from the list of map units, the first survey question will always be "Map Unit Habitat Type" (Figure 12). The survey will progress through four categories of questions: habitat, vegetation, surface characteristics, and noise and visual screening. The questions are designed to enable you to select the most appropriate response easily and quickly. Just tap on the answer that best describes the attributes for the map unit you are working in.

Questions for different attributes will have different numbers of choices, so for some questions you may need to scroll to see the full set of responses. Your response will be highlighted in orange. You must tap the forward arrow to advance to the next question. Tap the backward arrow to go back to the previous question (Figure 13).

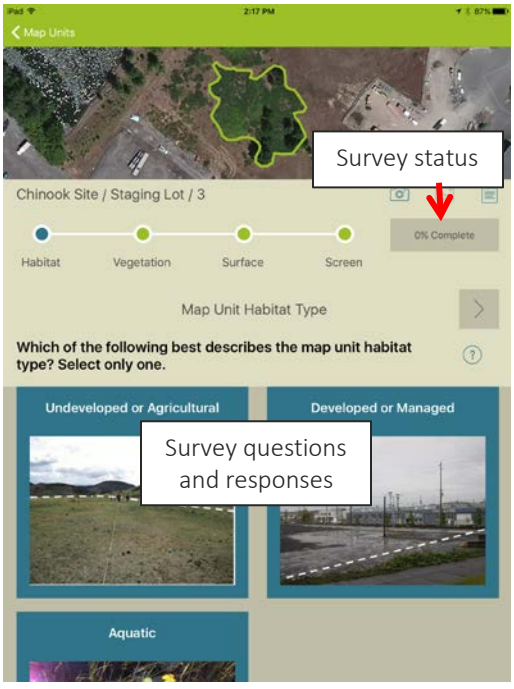


Figure 12. Survey screen

On the map, you may zoom in or out using the two-finger pinch method on the screen or pan across the map by swiping.

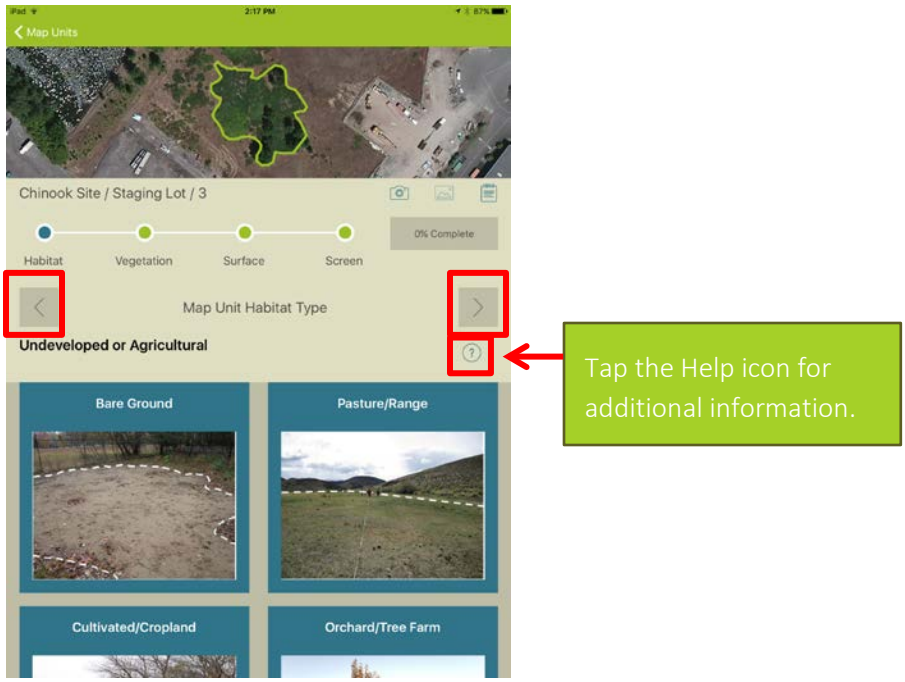


Figure 13. Arrow keys for scrolling through survey questions

When you have answered the last question for the map unit, the forward arrow will no longer be visible and you will see "100% Complete" on the status bar. Tap Map Units at the upper left of the screen to return to the full list of map units, and move on to the next map unit. Your responses for each question are saved automatically within the ESII App as you go, so you will not see an option to save your responses.

UPLOAD DATA TO ESII PROJECT WORKSPACE

Data from the ESII App must be synced to transfer the data from the iPad to the Project Workspace. Once data is synced it can be viewed and edited from the Project Workspace. After syncing occurs, that data can then be downloaded to other users' iPads when they sync their ESII Apps with the Project Workspace.

With access to Wi-Fi, syncing can be completed in two ways:

1. A complete sync downloads data from all Sites to the iPad and uploads all new data from the iPad. This occurs when you tap the Sync icon in the upper right corner of the Sites page, shown on the left in Figure 14. This sync is most appropriate when you need to upload data from multiple Sites or when you log in and need to see all Site data available to you.
2. A Site-specific sync uploads data for a specific Site from the iPad; this occurs when you tap the Upload button on the Map Units screen, shown on the right in Figure 14. Users have the option to upload data while working within an individual Site if other Sites are not ready to be transferred to the Project Workspace.

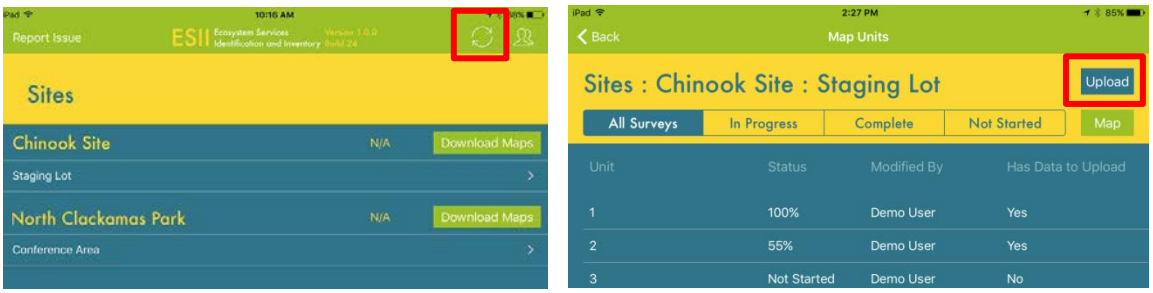


Figure 14. Uploading and syncing data

Because data related to Sites can be accessed in both the Project Workspace and the ESII App, it's a good idea to coordinate with your colleagues who will perform field data collection to determine when data collection will take place for each Site and when that data will be uploaded to the Project Workspace. This ensures that the most recent data is always being accessed.

SPECIAL FEATURES

EDIT PRE-EXISTING MAP UNIT BOUNDARY

Pre-existing map units may be selected by tapping within the map unit boundary. Once selected, the map unit will be highlighted in orange (Figure 15).

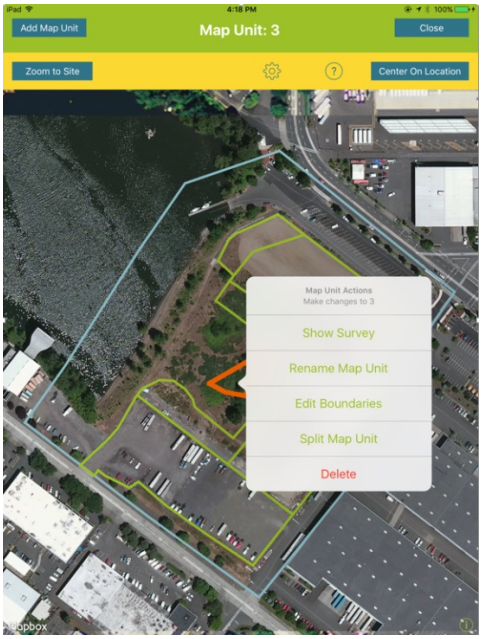


Figure 15. Selected map unit

- Select Edit Boundaries from the popup box.
- Boundaries are defined by a series of vertices connected by lines, and are visible as yellow dots along the boundary.
  To move a vertex, give a long press (press and hold for a second or so) on the vertex, then slide the vertex to the desired location and release it by lifting your finger away from the iPad screen (Figure 16).

Figure 16. Editing a map unit boundary

- Additional vertices can be added by tapping the line between two vertices. A new vertex will be added in the center of the line segment. The new vertex can be moved as just described.
- Once your edits are complete, tap Save (Figure 17).

Saving Changes in the ESII App

Editing map unit boundaries is the only action within the ESII App that requires you to save your changes by tapping the Save button (Figure 17). All other actions that change data (entering survey data, creating new map units, editing map unit names, etc.) are saved automatically. Only the data that has changed since the last sync will be transferred during a sync.

Figure 17. Saving map unit boundary edits

SPLIT A MAP UNIT

You can only split a map unit by drawing lines between existing vertices.
To split a map unit, select Split Map Unit from the popup box (Figure 18).

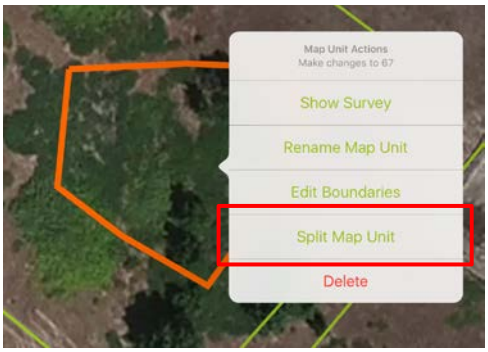


Figure 18. Select the Splitting tool

Tap one vertex as a starting point for the split and another vertex as the end point. A straight line will be drawn connecting the two vertices (Figure 19). Then tap Split. If there is data associated with the map unit that was split, you will be asked to copy the data (i.e., the survey responses) to both map units or to discard it.

Figure 19. Simple split (vertex to vertex)

For more complex splits, you may need to add additional vertices between the starting and ending vertices. Just tap the screen to add vertices at the desired locations (Figure 20), then tap Split.

Figure 20. Complex split (adding vertices between start and end vertices)

TIPS & TRICKS

The splitting tool requires start and end vertices to complete a split. If there are no start and end vertices where you want them on the original map unit boundary, edit that map unit boundary and drop or move vertices as necessary to make the split.

DELETE A MAP UNIT

To delete a map unit, select the map unit and tap Delete in the popup window (Figure 21). You will be prompted to verify that you want to delete the selected map unit. Deleting the map unit will also delete any survey data collected for that map unit.

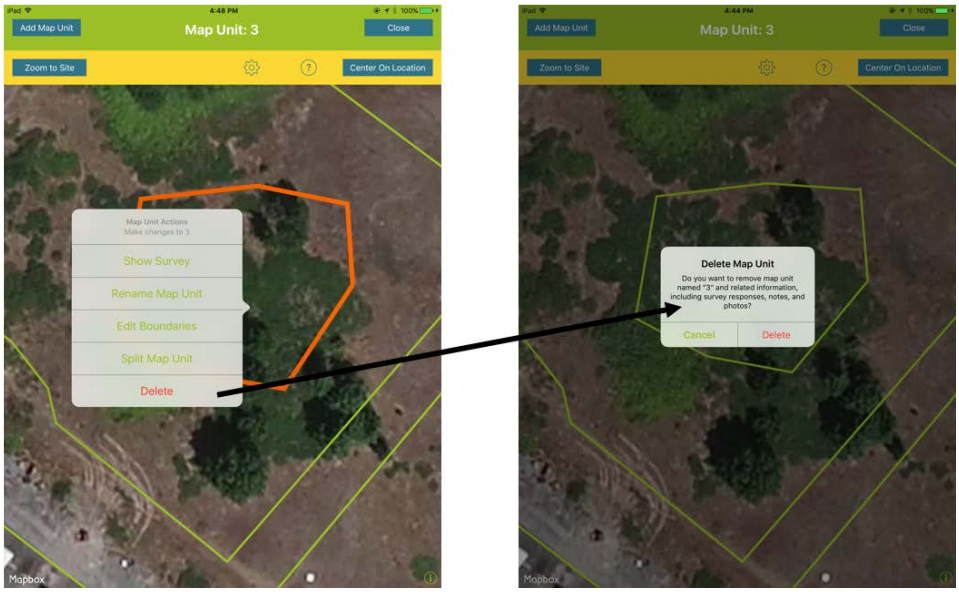


Figure 21. Deleting a map unit

JUMP TO QUESTIONS USING THE STATUS BAR

When you have answered all questions for a map unit, you will see “100% Complete” on the status bar. If you see any other value, you have left at least one question unanswered. Tap the % Complete box to show a dropdown list of all survey questions that have not yet been answered (Figure 22).

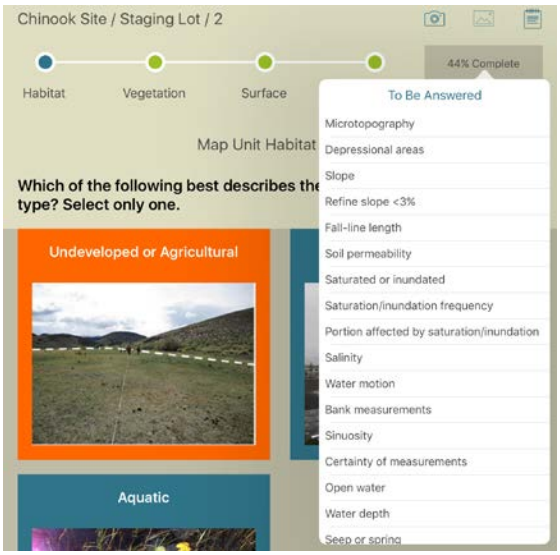


Figure 22. Dropdown lists of survey questions for completed

You may be tempted to skip directly to a specific question using the dropdown list. However, you should answer the questions in the order they are presented. The ESII App includes an auto-skip feature that automatically skips questions that are not relevant for the map unit based on your responses to previous questions. If you skip ahead, you may see questions that are not relevant to the current map unit.

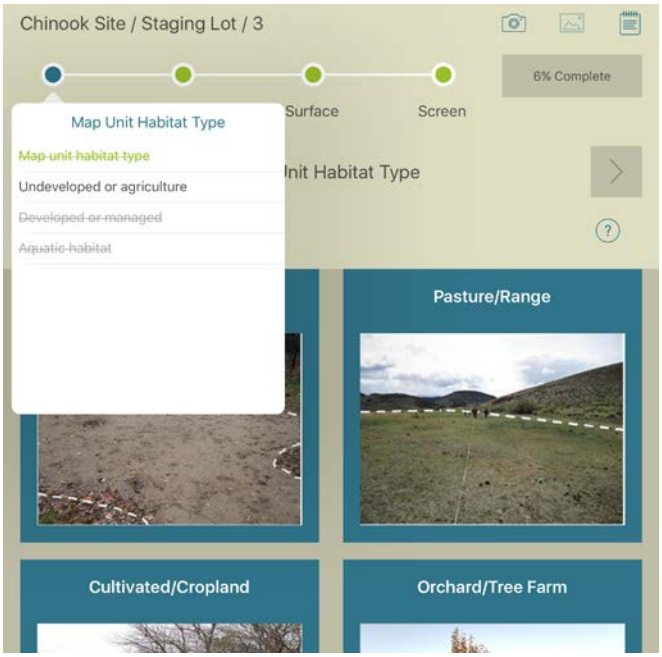


Figure 23. Dropdown lists of survey questions by section

You can also tap a blue or green dot for each category type along the status line. This reveals a list of questions and the status of each one. Crossed-out questions have been answered. Questions in grey type have been auto-skipped. Tapping a question not crossed out jumps you to that question (Figure 23).

TAKE PHOTOS AND NOTES WITHIN MAP UNITS

Photos and notes can be taken for each map units using the icons available on the survey screen (Figure 24).

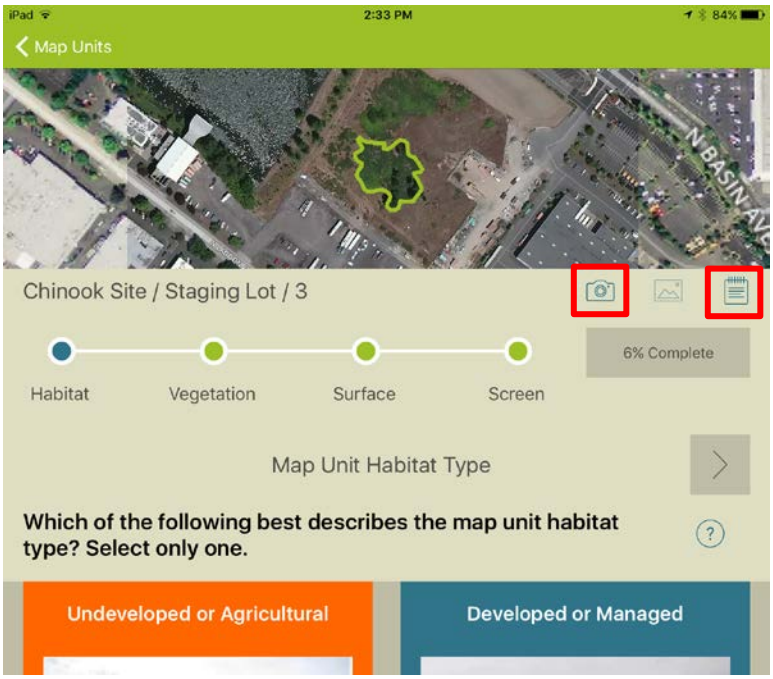


Figure 24. Camera and notes icons

PHOTOS

Tapping the camera icon will activate your iPad's camera (photographs only) (Figure 25). Take photographs of key features or representative areas within the current map unit. Once a photo is taken you can keep the photo or reject it and take another.

Figure 25. Taking photos

NOTES

Notes are tied to specific map units, and they are cumulative, so each new note is added to your previous entries.

Tap the Notes icon to open the keyboard and add notes as needed (Figure 26).

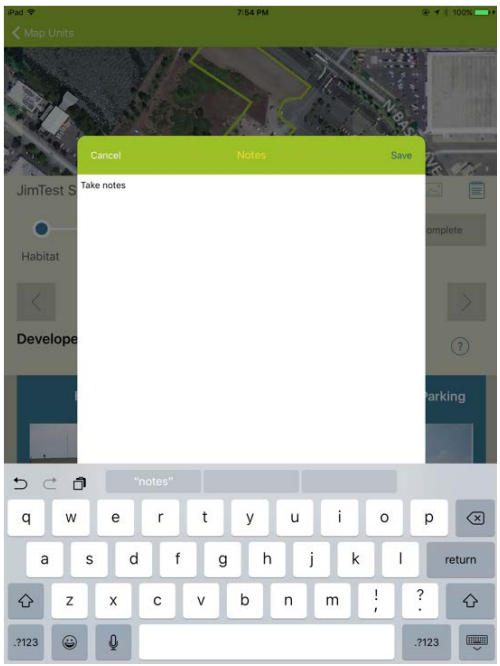


Figure 26. Taking notes