# NATURAL CAPITAL AND ECOSYSTEM ASSESSMENT

# ENGLAND ECOSYSTEM SURVEY

# ESRI SWEET FIELD DATA COLLECTION APPLICATION USER GUIDE

## 2023 DRAFT VERSION V1.3

**Authors:** Josh Bowler, Matilda Dixon. Rosie Nicoll (Low Resolution Capture Tool)

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| 1.1 | 13.04.2023 | Draft 1.1 for Training and consultation | |
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| 1.3 | 18.07.23 | Draft 1.3 for External surveyor use and consultation | Added Appendix 4 for the inclusion of supplementary updates. Added a section on changes screen 'Themes' (p.25). Added list for when high resolution GPS data is required (p.12) Removed Geode Connect troubleshooting guidance to separate document. Added Simplified trouble shooting guide (Appendix 3) |

| APPROVALS | | | |
|---|---|---|---|
| **Group/Person** | **Role** | **Recommendations** | **Date** |
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| Joel Dixon | Senior Adviser | | 02.06.23 |
| Joel Dixon | Senior Adviser | | 18.07.23 |
| | | | |

# 1. INTRODUCTION

The Natural Capital and Ecosystem Assessment (NCEA) programme is a comprehensive and long-term programme that aims to transform landscape decision-making in England. The programme will gather and integrate data to address critical evidence gaps. It will provide high quality data to assess the state and condition of biodiversity, ecosystems, and natural capital assets in terrestrial, freshwater, and marine environments. The data will provide information on:

1 what we have and how much of it we have,
2 where it is and what it does,
3 what condition it is in and why it is changing.

## 1.1 THE ENGLAND ECOSYSTEM SURVEY

The England Ecosystem Survey (EES) collects data on the condition of terrestrial habitats, ecosystems, and natural capital assets. This will be the main data source for the NCEA to assess the quality of assets and how quality changes over time. The EES will collect field data on land, landscape, soil, ecosystem processes, ecological communities, and some species.

## 1.2 ABOUT THE ESRI SWEET USER GUIDE

Esri, a lead Geographic Information System (GIS) software development company have designed a bespoke EES survey application using the Esri Sweet platform. It can be used on iPad or Android devices and is currently the primary data collection tool for EES. This document is a user guide for the EES survey application.

Some knowledge in the use of handheld touch screen devices is required prior to using this user guide, as is a basic knowledge of GIS software. Android devices may differ slightly from iPads in their operating behaviour. Currently, only iPads are used for EES data collection.

> **NOTE:**
> Soils and England Peat Map (EPM) survey currently use different Esri data capture software. User guides for these are available separately.

Additional documents that are referred to in the field manual, for example, complimentary videos and written resources can be found in the 'Surveyor Library' section of the England Ecosystem Survey SharePoint site.

Press the hyperlink text below to access the SharePoint Surveyor Library. Alternatively, copy and paste the text into your web browser if the hyperlink does not work:

https://defra.sharepoint.com/sites/WorkDelivery3549/Surveyor%20library/Forms/AllItems.aspx

**Amendments to Sweet not yet complied into this document can be found by pressing, or copy and pasting the link below:**

https://defra.sharepoint.com/sites/WorkDelivery3549/Surveyor%20library/Forms/AllItems.aspx?id=%2Fsites%2FWorkDelivery3549%2FSurveyor%20library%2FWider%20EES%20only%2FSweet%20App%20Guidance&viewid=60c4b893%2D694c%2D4386%2Db22b%2Dd8da77190997

## 1.3 WHAT IS ESRI SWEET

The following is Esri's description of Sweet:

> Sweet for ArcGIS is an application or 'app' for data collection with built-in configurable data quality checks, helping users capture and edit accurately. Create, edit, and explore spatial data in the browser or across multiple devices (Android, iOS, and Windows) whether out in the field or in the office - even when disconnected. Sweet is fully integrated with the ArcGIS system, meaning everyone benefits from using the same secure data for better-informed decision making. (*EsriUK 2023*).

For the habitat surveyor, this translates to a data capture tool in the form of an app installed on a suitable iPad or Android tablet device.

Esri Sweet is a software platform. EES Sweet data capture tools are built on the Esri Sweet platform and are accessed from within the main Esri Sweet app.

You can use Sweet offline to capture survey data without the need for an active data connection once a monad area has been downloaded to your device. Data captured is dependent on the type of survey you undertake. Data may include, geolocated points, polygons, polylines, still imagery, species data and habitat information.

A very basic overview of how you will use the NCEA EES Sweet capture tool is shown below. This does not include any pre-survey preparations such as desktop study.

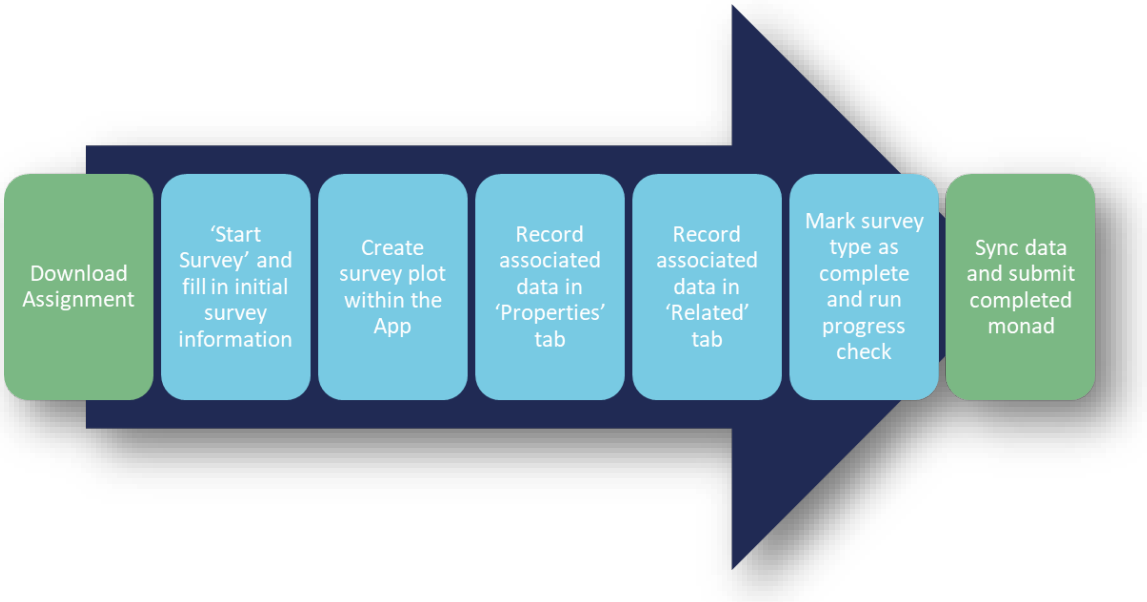



**Figure1.0**: Flowchart showing a very basic overview of EES data capture workflow.

**IMPORTANT:**

The Esri Sweet EES Survey Application is in continual development. Figures within The Sweet User Guide may differ slightly in layout and appearance to your device.

key components and how to access and input survey data should remain unchanged.

The Sweet User Guide will endeavour to remain current as and when Sweet is updated.

## 1.4 TERMINOLOGY USED IN THIS USER GUIDE

Esri Sweet is built upon a GIS platform. A desktop GIS program and the Sweet app share some similarity in terminology and usage.

How to use Sweet is described within this user guide but if you are not familiar with GIS software, you may not be aware of some of the terminology. Below is a brief list of some terms that you may not have come across before.

**Layers:** Are analogous to virtual sheets of paper. A 'layer' is where items can be virtually drawn and added to. See Section 3.3 for a full description of layers and basemaps.

**Node:** Within Sweet a Node is a single point of reference on a survey map layer. When you draw a shape (polygon) or a line (polyline) on a survey map layer it is created by placing two or more Nodes on the map. The Nodes will automatically connect to each other for the item being drawn to create the desired shape or line.

**NOTE:**

A simple line for a straight hedgerow for example may only have two Nodes, one at each end.

A complex shape such as a pond could require many nodes to create the desired shape. There are several ways to 'draw' shapes and lines, refer to Section 3.10 of this user guide for further information.

**Polygon:** Is a closed shape defined by a connected sequence of points or Nodes. Within Sweet this would be an area that can be drawn onto the map such as a pond.

**Polyline:** Is a series of connected points or Nodes that create a line. Within Sweet this would be a line that can be drawn onto the map such as a hedgerow.

## 2. INITIAL SETUP AND FAMILIARISATION

Prior to initial use of Sweet you must have a valid ArcGIS user account and have access to the appropriate GIS surveyor group. If Esri Sweet is not already installed on your survey device, it can be found by searching for 'Esri Sweet' on the Apple store or its Android equivalent. The Sweet logo (Figure 2.0) can be used to identify the correct app in the Appstore this logo will also appear on your device when it is installed.

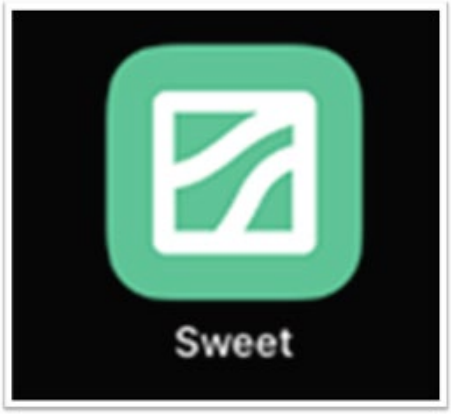



**Figure 2.0**: Esri Sweet logo as seen on the home screen of an iPad.

### 2.1 PRE-SURVEY PREPARATION

Prior to field survey you must download your assigned survey monad area to the Sweet app for offline use. This requires a stable and relatively fast internet connection.

Refer to the EES Survey manual for other aspects of pre-survey preparation.

### 2.2 LOGGING IN

> **NOTE:**
> Your device will need to have an active data connection to log into Sweet.

When you first open Sweet you will see a login options screen. Choose 'Login with ArcGIS Online'. You will then be directed to the Esri login screen to enter your login details (Figure 2.1).

Usually, your device will remain logged in after the initial login and will remain so even when the app is closed. It may only require entering a username and password if you log out or shut down your device completely.

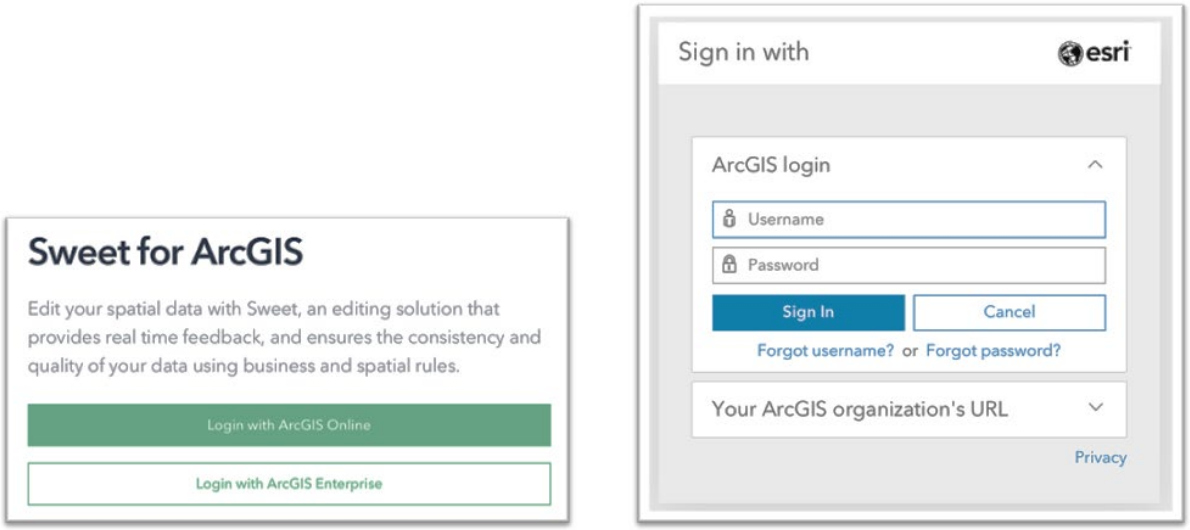



**Figure 2.1**: Image of Esri Sweet login screen (left) and image of ArcGIS login screen (right).

**NOTE:**

At times it may be necessary to log out and then to log back in to 'refresh' the assignments list on your device if it is not showing assignments correctly.

Logging out and restarting the app can also 'fix' some in-app errors you may encounter.

## 2.3 CONNECTING AN EXTERNAL GPS DEVICE

Before you begin a survey, you need to ensure you have an accurate and stable GPS connection.

Global Navigation Satellite Systems (GNSS) receivers (Geode GNS3) will be used throughout the EES to allow high accuracy data point location and relocation.

This guidance relates only to connecting an iPad. The associated screenshots were produced using a Juniper systems Geode external GPS. However, the connection process is similar for other external GPS devices.

Familiarise yourself with the guidance linked below, as it will help you optimise GPS usage in the field:

- Geode Atlas Correction Service: When this service is available it can achieve an accuracy of less than 20cm.
- Geode SBAS Correction Service: If your Geode cannot connect to the Atlas service it will default to SBAS which has a typical location accuracy of between 20cm- 1-5m
- The Geode user manual, which can be found at the following internet location:

https://junipersys.com/data/support/geode/30725-02-gns3-manual.pdf

- Supplementary GPS Information, Appendix 2.
- Trouble Shooting GPS document, Appendix 3.

The Geode is used for the following High Resolution survey components:

- 2x2m vegetation plot
- 2x4m Hedgerow Plot
- 30m Hedgerow section
- 1x10m riparian plot
- Lone trees
- Tree within feature
- Landscape survey
- Ponds - only if accessible/safe to do so

For Low Resolution survey you can use a standard GPS device connected to the secondary iPad or aerial and OS maps to identify survey locations.

1. Power on the external GPS device.

> **IMPORTANT:**
> You should switch the external GPS device on at the beginning of the day and leave it on for the duration of the survey day.
> If you switch it off, it can take 30 minutes or longer to regain coordinate accuracy.

2. Open 'Settings' on your iPad device by pressing the Settings icon. (Figure 2.2)

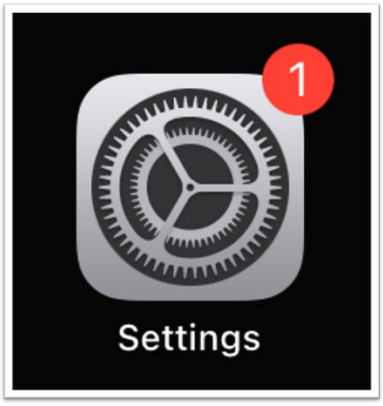



**Figure 2.2**: Image of Settings icon on the iPad.

3. Navigate to the Bluetooth options of your device and ensure that Bluetooth is enabled. If not slide the switch so that it turns green (Figure 2.3).

**NOTE:**

Each GPS device will have a unique device name, this can be found on the bottom of the Geode. In Figure 2.3, the device name is 'Geode 322624'.

4. Look at the 'Other Devices' section. If both the iPad and the Geode are powered on and have Bluetooth enabled, the Geode GPS device should be visible there. Press the Geode you wish to connect to (Figure 2.3).

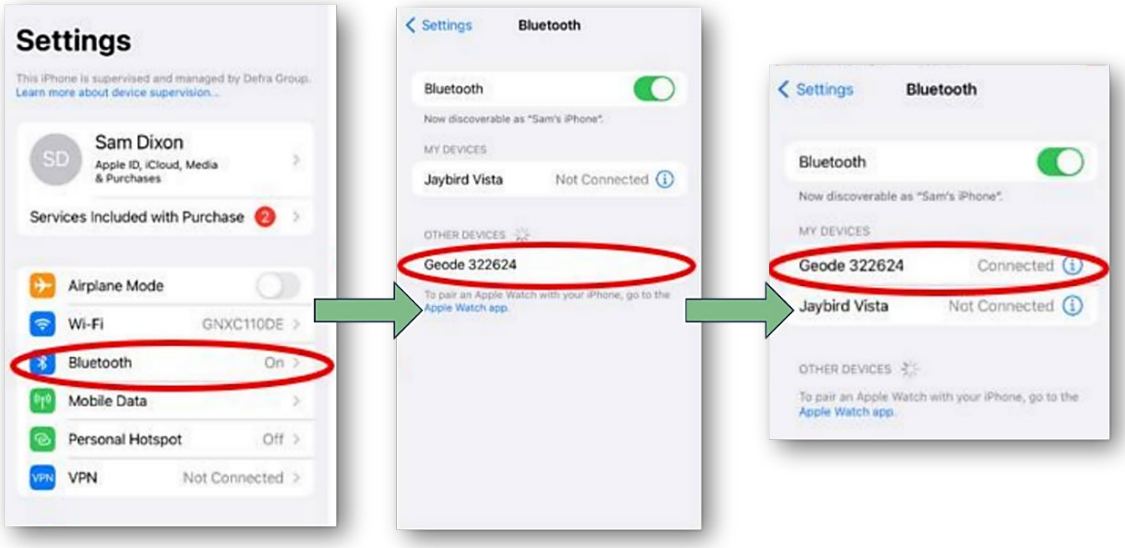



**Figure 2.3:** Image showing the iPad Bluetooth settings menu. Bluetooth is enabled and a Geode GPS device shows within the 'Other Devices' section. The inset image on the right shows the Geode device under the 'My Devices' section once it has successfully connected to the iPad.

5. When the Geode GPS device is connected it will appear under 'My Devices' within iPad the Bluetooth settings. A blue light will illuminate on the Geode (Figure 2.4).


**Figure 2.4:** Image of the Geode external GPS device powered on and its active connection status. Refer to Appendix 2 for further details on the Geode GPS device.

6. Open the Sweet App and select the profile button in the top right-hand corner. Select 'GPS' from the menu (Figure 2.5).

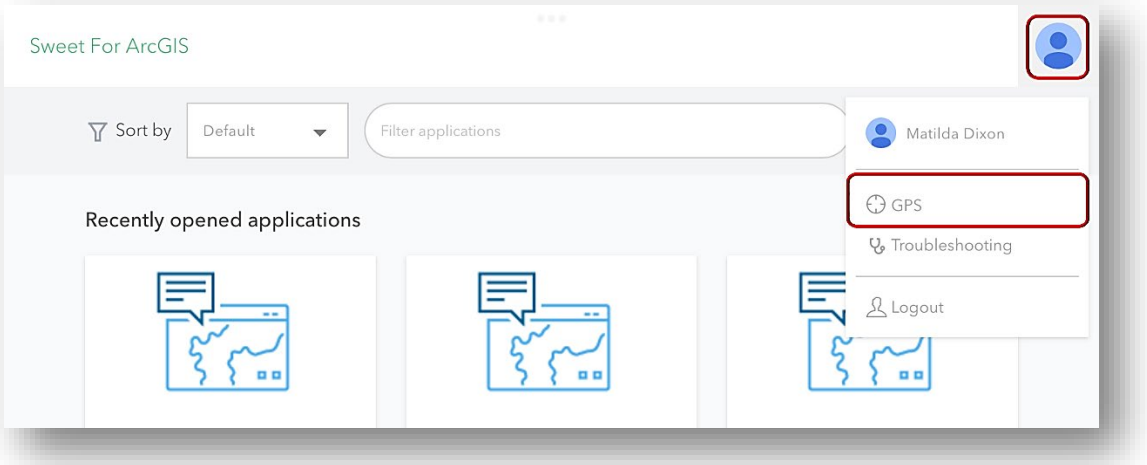



**Figure 2.5**: Sweet App home screen highlighting profile button and the 'GPS' option within the Settings menu.

7. The GPS settings window will appear with the 'Device' automatically set to 'Integrated Devices.' This is the integral GPS within you iPad device.
8. Select the drop-down arrow within the 'Selected Device' field to open a list of device options (Figure 2.6).
9. 'Geode' should appear as an option under 'USB/COM Devices.' You may need to press the 'Refresh' if the Geode device doesn't appear straight away (Figure 2.6).
10. From the drop-down menu select the Geode.

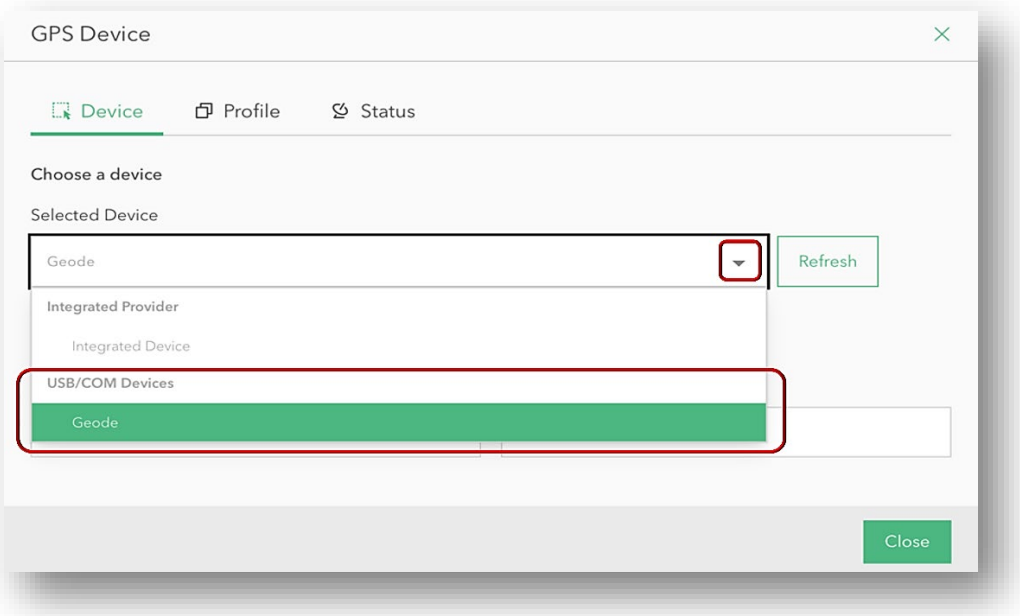



**Figure 2.6:** Image of the Sweet app GPS Device settings menu expanded to view the Geode device present under USB/COM Devices.

11. Use the drop-down menu under ‘Selected Devices’ to access Advanced Settings and input information related to your Geode (Figure 2.7).
12. Press ‘Close’ at the bottom right of the GPS Device screen to exit GPS settings (Figure 2.7).

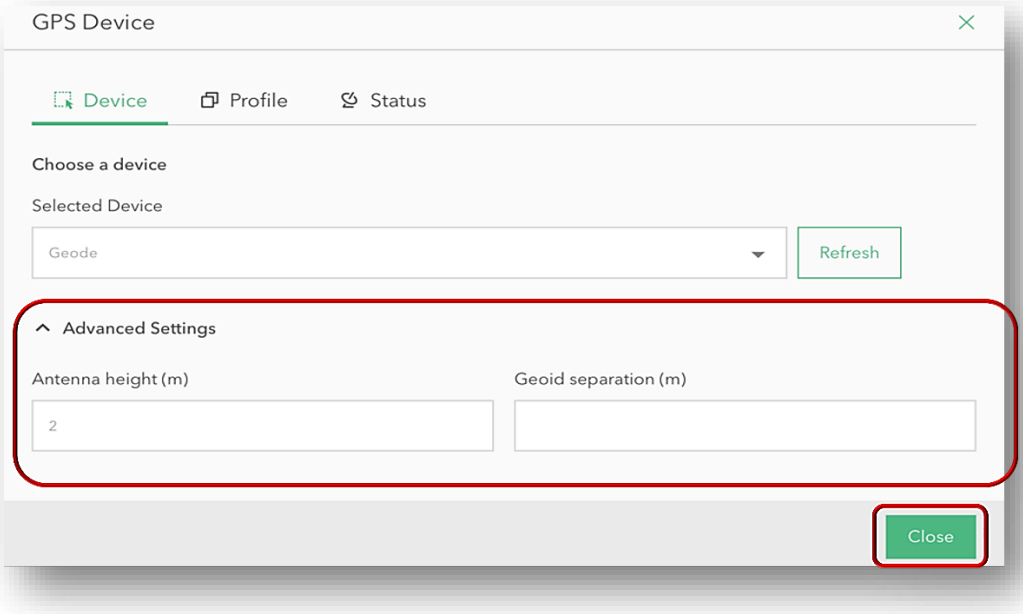



**Figure 2.7:** Image of the Sweet app GPS Device Advanced Settings menu expanded to show additional Geode settings.

**IMPORTANT:**

Antenna height (m) is the height that the Geode is above ground. For example, if the Geode is mounted on a 2m heigh pole you would input a value of '2'.

If you achieve the expected GPS accuracy detailed in Appendix 2, then you have successfully connected to the Geode.

## 2.4 SELECTING AND DOWNLOADING AN ASSIGNED MONAD

Once succesfully logged in to Esri Sweet, you will be able to view the EES Sweet app and possibly other Sweet apps available to you.

To access the monads assigned to you press the 'EES Survey Application' (Figure 2.8).

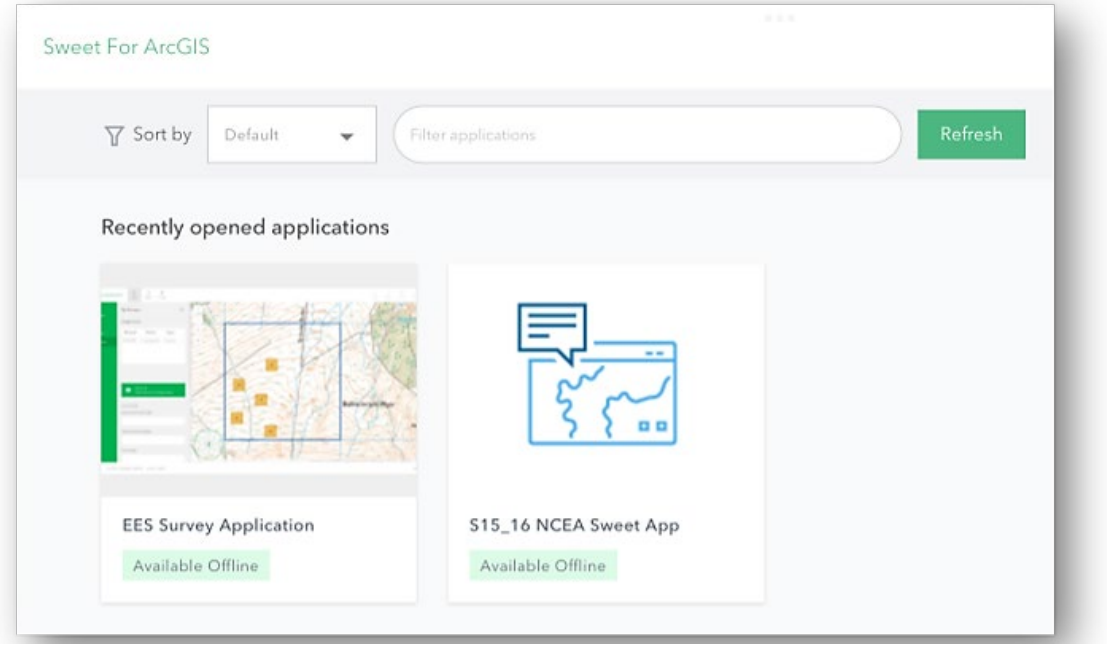



Figure 2.8: Esri Sweet initial screen showing the EES Survey Application and a test application. A field surveyor will likely see only one EES Sweet App.

**NOTE:**

It is likely that most surveyors will see only 'EES Survey Application' on the Sweet home screen.

When the EES Survey Application is pressed you will be taken to the 'Assignments Screen' showing the monads assigned to you. The Assignment screen is where monad data can be downloaded for offline use (Figure 2.9).

Each Assignment refers to a single monad and each has a unique reference number (Figure 2.9). A monad can only be assigned to one user at a time.

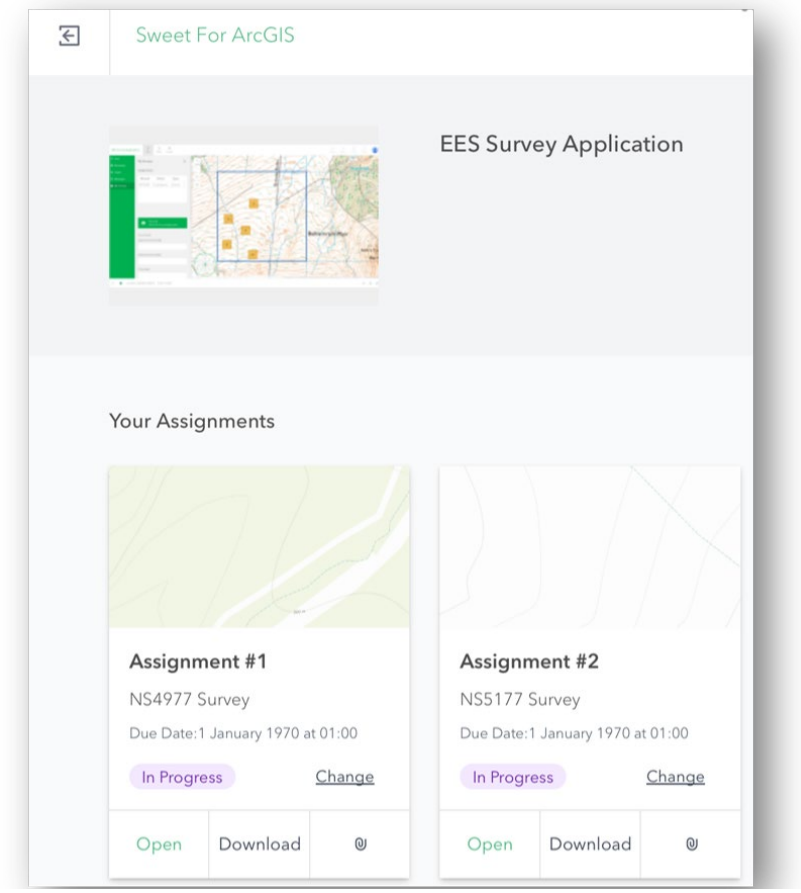



**Figure 2.9**: Image of the EES Survey Application assignments screen

Pick your assignment and press ‘Download’ to open the map screen. This allows the monad area and its associated base maps to be downloaded for offline use.

Pressing ‘Download’ (Figure 2.9) opens the map screen (Figure 2.10).

- If you need to check the correct monad is in view, enter the monad reference number into the search box in the top right-hand corner (Figure 2.10), then press the magnifying glass to search and zoom to the chosen monad. The monad reference number is two digits and four figures and is on the Assignment tab you pressed to enter the map screen (Figure 2.9) e.g., ST6407.

- You can also search using different parameters if required (Figure 2.10). You will need to zoom out until the entire monad (thick blue line) is viewable on the screen.

**IMPORTANT:**

The thick blue line on the map is the entire 1km$^2$ monad, it is aligned with the Ordnance Survey (OS) map grid.

You must manually set the download area (see below) to capture the **entire** monad.

The shaded orange area is the **minimum** offline area size to download.

The smaller orange squares are the allocated survey squares for the assigned monad.

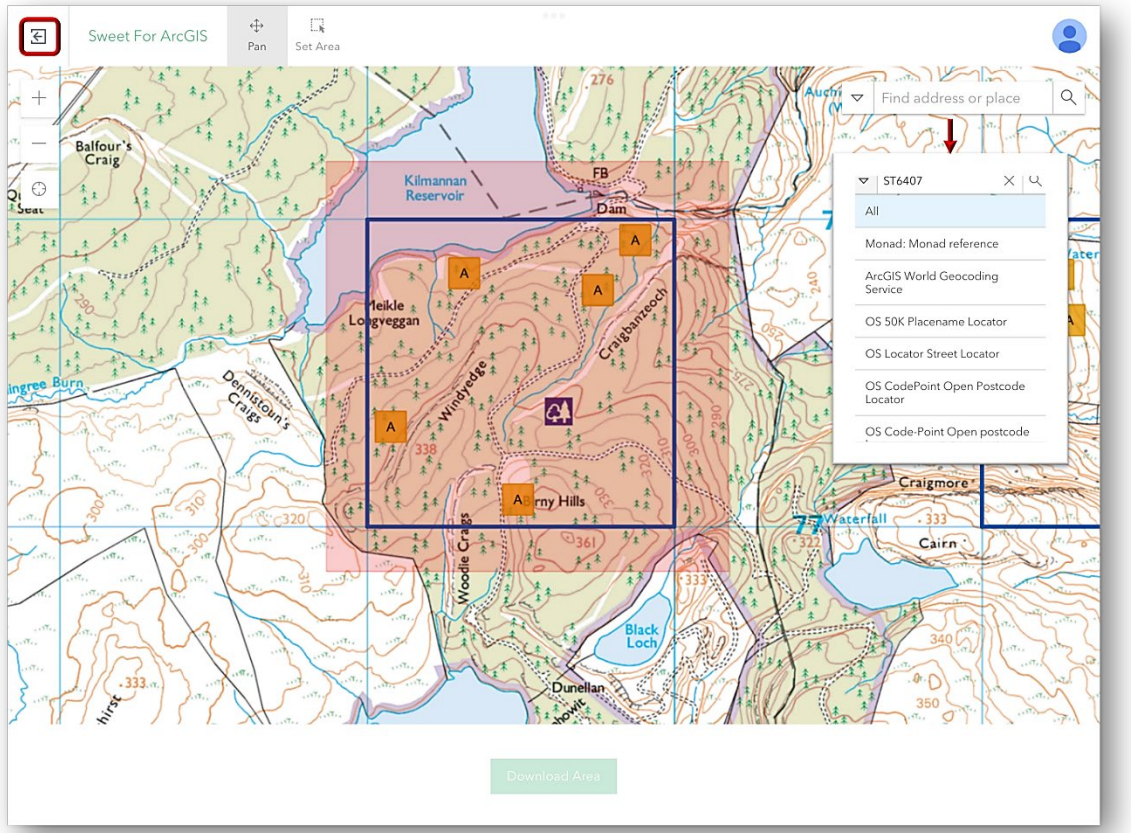



**Figure 2.10**: Image of initial map screen showing the monad as a transparent blue square. There are six smaller 1ha$^2$ solid orange squares inside the blue square. The large orange shaded area represents the minimum area size to download. To the right of the image is the expanded search box used to manually search the map using the monad reference number. The return to Assignments page back arrow is highlighted in red.

Pressing ‘Set Area’ in the toolbar at the top of the screen will allow you to ‘draw’ a polygon around the monad (thick blue line), you will create a shaded blue area, and this will be the area available to view offline. Use the Orange shaded area as a guide for setting the amount of offline area you will download. (Figure 2.10).

> **IMPORTANT:**
>
> Care must be taken to draw an offline area that **fully** encompasses the monad area. Failure to do so will cause a critical error when trying to upload your completed monad.

To move around the map without zooming or selecting an area press the ‘Pan’ icon in the top toolbar.

The offline area can be redrawn until you have an appropriately sized offline area, at which point press the ‘Download Area’ button at the bottom of the screen to begin downloading monad data to your device.

Download times will vary depending on size of download area and data connection speed. The download may appear to ‘stick’ at an arbitrary completion percent for several minutes, this is normal. Typically, the download should take less than ten minutes.

> **NOTE:**
>
> When the monad area is downloading your device must remain powered on and not in ‘sleep’ mode.
>
> Do not use other apps on your device when the download is in progress.
>
> Do not draw an overly large offline area as this will significantly impact download times.

When the monad area is downloaded the assigned monad will be available to ‘Open’ offline from the ‘Your Assignments’ screen (Figure 2.11).

From the ‘Your Assignments’ screen you can also:

- ‘Delete’ which will delete your offline area and ALL un-synced survey data to allow you to download a new offline area.
- View any attached files using the paperclip icon (bottom right of Assignment tab).
- ‘Sync’ your Assignment to the online database. Typically, you would use the Sync button to upload all your survey data at the end of each survey day and when you are in an area with a consistent data connection.

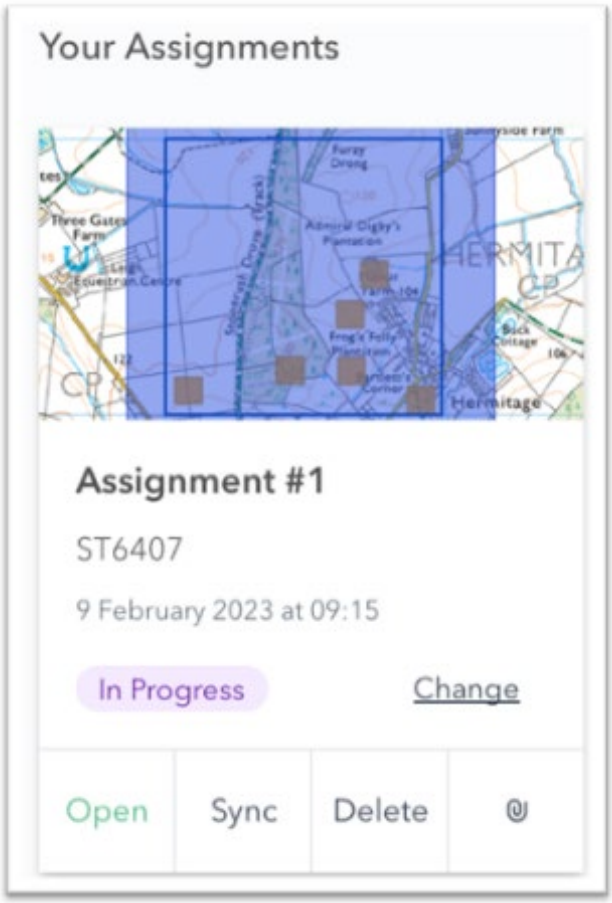



**Figure 2.11**: Image of 'Your Assignments' tab after a monad area has been downloaded, options to Open, Sync and Delete the monad displayed across the bottom of the screen.

**NOTE:**
It is good practice to check your monad after you have downloaded it.

- Open the Monad from the Assignment screen, select 'Work on Survey' from the 'My Surveys' tab (Figure 2.12).
- Return to the Assignment screen and click 'Sync' to check all is working as it should be.

Do this before you start field work.

**IMPORTANT:**
If the sync fails repeatedly this can indicate that the full monad area has not been downloaded, it needs to be deleted and re-downloaded

Press ‘Open’ to open a map centred on the downloaded monad and the tools tabs required for creating plots and entering data.

In the green bar down the left-hand side, press the option ‘My Surveys’ to open the ‘My Surveys’ panel.

At the top of the panel the downloaded monad reference will be listed under ‘Assignments’, along with its status and survey type.  To the right of this are three dots (Figure 2.12). Press the dots and **select ‘Work on survey’** from the list that appears (Figure 2.12).

The ‘My Survey’ panel is also where the overall start date/time and end date/time for the whole monad are recorded. The panel can now be closed by pressing the ‘**X**’ in the top right corner and you are ready to start work.

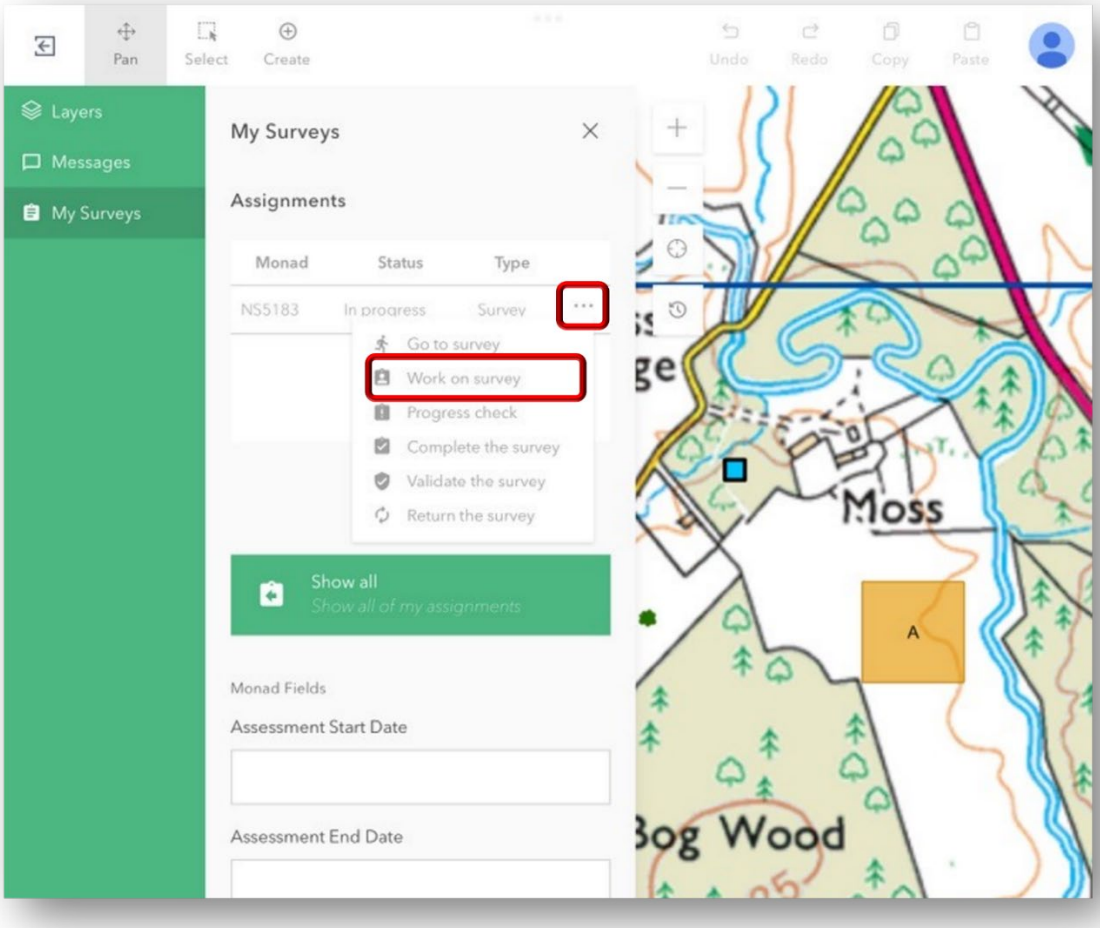



**Figure 2.12:** ‘My Survey’ tab highlighting location of three dots used to access the option to ‘Work on survey’.

Download Trouble Shooting

- Download attempt fails:  Check your internet connection, close all other apps, close, and reopen Sweet then retry.
- Download is ‘Paused’ due to data connection loss:  check device data connection and if appropriate move to an area that allows for a more consistent data connection, then press ‘Resume’.
- Download stuck at ‘xx%’ for more than 10 minutes: press cancel then retry download.
- Downloaded incorrect area: Delete the offline area using the ‘delete’ option on the assignment page.
- Unable to draw download area around monad/zoom out not functioning as expected: Exit the map screen using the arrow in the top left corner of the map screen and try again (Figure 2.10). If the error persists close the app and retry.

## 3. BASIC SWEET APP NAVIGATION

You input data to the EES Sweet app by navigating within survey menus using the tool and menu icons that are located along the sides of the screen on your device screen.

**UPDATE:**

See Appendix 5.1 for information regarding updates to the Sweet Symbology.

### 3.1 SWEET TOOLBARS AND MENUS OVERVIEW

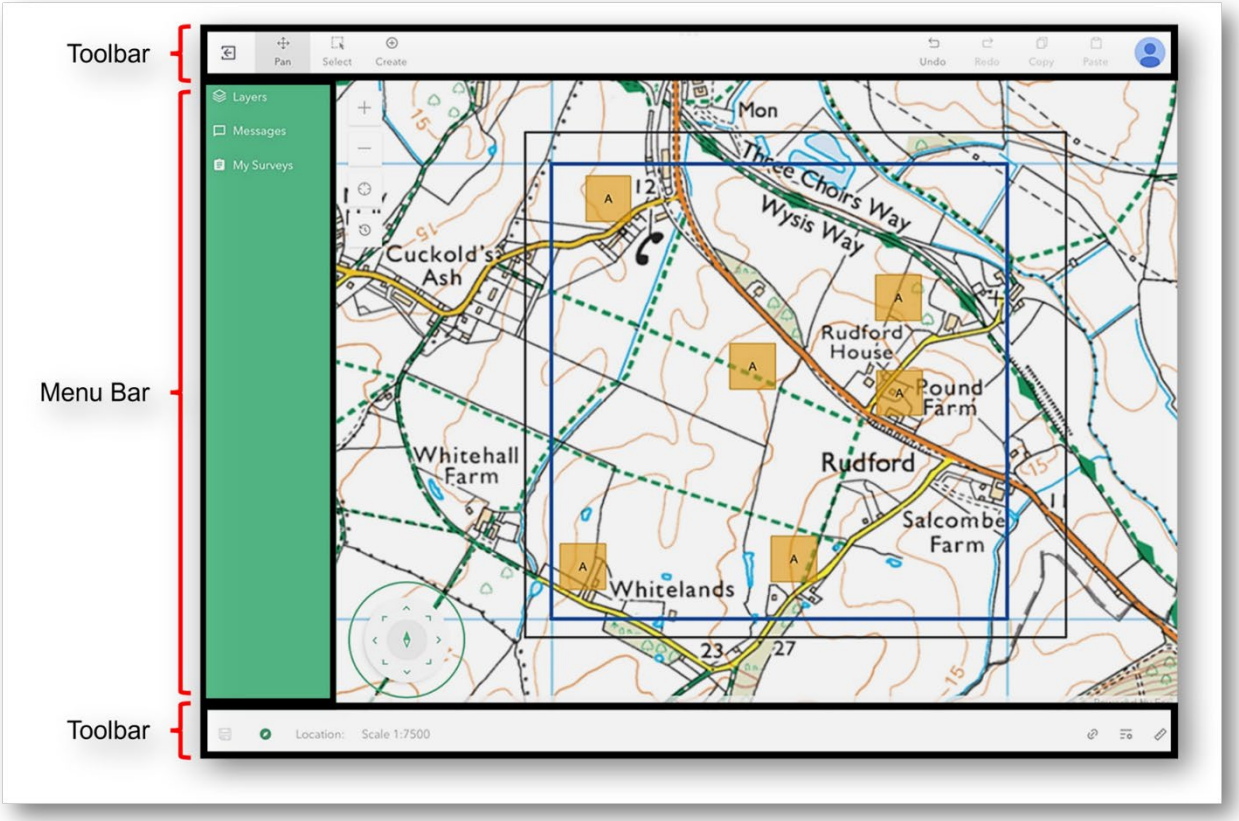



**Figure 3.0**: Image of the display screen after downloading the monad area and reopening your Assignment. Highlighted are the top and bottom Toolbars and the Green Menu Bar along the left of the screen. The blue Profile button icon is in the top right of the screen. For further details on icon functions see Appendix 1 and appropriate User Guidance videos .

Below is a brief description of some of the terminology used within this user guide:

- Toolbar: Is a row of graphical buttons that control software functions, they are grouped by functionality (Figure 3.0) Menu bar: Contains a collection of available menus within tabs. The menu bar provides you with a place to find the program's essential functions. In the Sweet app, the menu bar is the green bar along the left of the screen (Figure 3.0).

- Tab: Is a clickable label used to access a further page or area. When a tab is clicked, the tab's contents are shown, this will minimise or hide other tabs that are open. In Sweet the primary tabs are found in the green menu bar (Figure 3.0). There are also secondary tabs within the various survey data sections of the app.

- Drop-Down Menu: Is a menu that offers a list of options when expanded.

The ‘Properties’ tab in the green menu bar will appear when a survey item is selected (Figure 3.1). It expands when pressed and is used for inputting single fields of data.

The ‘Related’ tab in the green menu bar will appear when a survey item is selected (Figure 3.1). It expands when pressed and is used for inputting multiple levels of data.

The Properties and Related tabs are explained in more detail in Section 3.11.

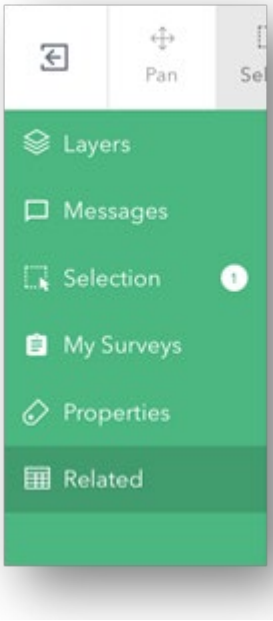



**Figure 3.1**: Image of the green menu bar showing the Properties and Related tabs that appear when a survey item is selected.

Within Sweet you will see a range of symbols that carry out different functions when pressed. These include the following:

- The plus ( **+** ) symbol is used to expand and view contents, sometime pressing this will open a new tab.

- The down arrow ( **v** ) expands a dropdown menu or list the up arrow ( **^** ) contracts it again.

- The left and right arrows ( **<** **>** ) will scroll between a list of items.

- The ( **X** ) symbol is used to close or minimise open boxes or tabs. Open tabs can also be closed by pressing its associated label again.

- Back arrow in the top left corner of the screen: This is the back arrow button which takes you out of the monad map view and back to the Assignments Screen.

- Profile Button in the top right corner of the screen: Refer to Section 3.2 below for a more detailed view of the Profile Button

Some Sweet app specific behaviour

- If you press an item within the green menu bar it will expand a tab to reveal further menu levels. Pressing the item again will minimise it.

- The toolbars along the top and right of the screen are used to access tools to fulfil function such as adding, drawing, deleting, moving, and manipulating data. The toolbar along the bottom of the screen is primarily for accessing measuring tools.

- A toolbar on the right of the screen appears when plot creation and editing tools are available to use.

- A 'Choose' tab appears on the right of the screen when the 'Choose' button is pressed from the top toolbar

- Available tools within the toolbars will change depending on the actions being performed.

**NOTE:**

If at any time your device seems unresponsive or is exhibiting unexpected behaviour look at the bottom of the screen for error or warning messages such as 'Please Wait, Updating Map' or Please Wait, Applying Edits'.

Sometimes error messages and warnings only appear briefly, and you may miss them.

you can also select the 'Messages' tab in the left-hand green menu bar which displays the full history of messages until they are manually cleared (Figure 3.1).

Sweet automatically saves data locally to your tablet device as it is entered, there is no dedicated 'Save' button to press. However, you do need to 'sync' data to the online environment, and it is recommended to do this as soon as you have a stable internet connection. This will often be at the end of each survey day.

**NOTE:**

If your device remains unresponsive after several minutes and a message persists at the bottom of the screen you may need to exit the app and re-open Sweet.

You can usually close and re-open the monad by using the 'Back' button (Figure 2.10) to take you back to the Assignments screen.

If Sweet becomes unresponsive and you need to reload it, or if it crashes, the data will usually be saved locally, but only up to the point before the issue occurred.

## 3.2 THE PROFILE BUTTON

The Profile button is a simple representation of a person in a blue circle located at the top right of the screen. When pressed you will see options to change settings, connect and configure the internal or an external GPS device, sign out of Sweet, add a location bookmark and open the trouble-shooting log (Figure 3.2).

### Settings

Typically, most settings can be left at their default values. However, additional Location Display options when selected, can provide useful imformation on the main map screen (Figure 3.2).

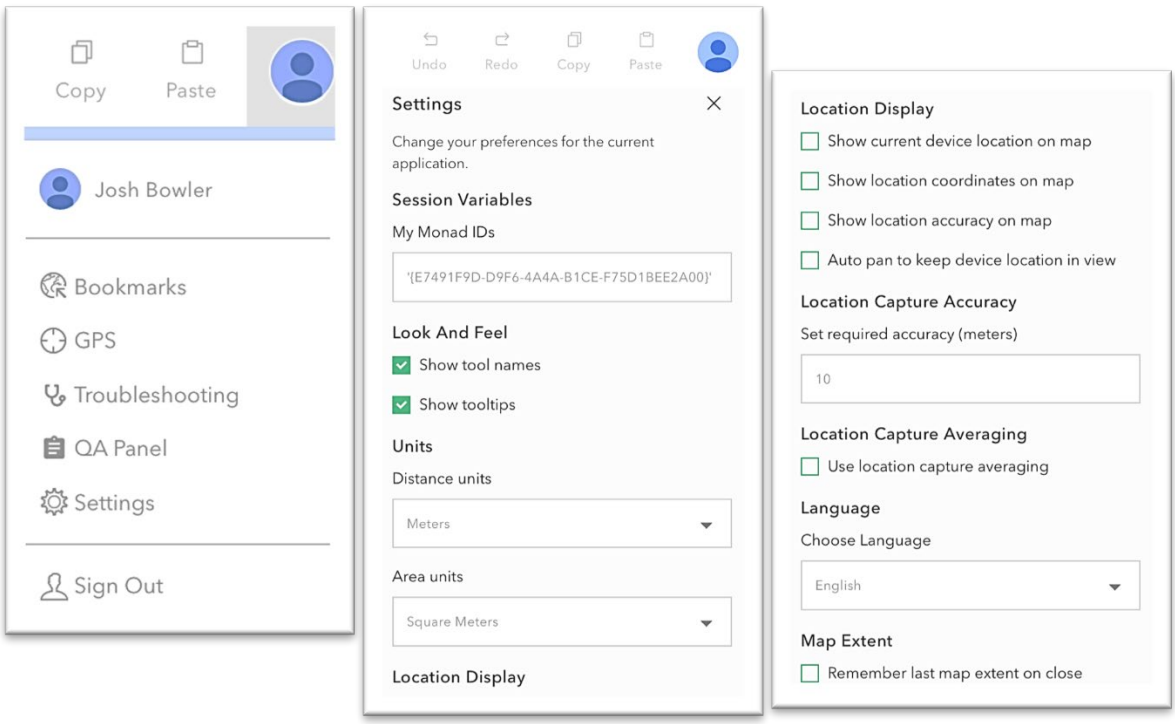



**Figure 3.2**: Image of the Profile button menu and the expanded Settings tab.

In Sweet versions released after the main bulk of this Sweet User Guide was written there is an option to change the' Theme' or look of the screen for better contrast in brighter daylight.

Figure 3.2a below shows an additional 'Theme' dropdown menu under the Look And Feel heading in the Settings tab.

There are currently two high contrast themes available, High Contrast and Caverna. Be aware that created stands may not be viewable in high contrast themes due to a Sweet bug. This may be remedied by the time you read this.

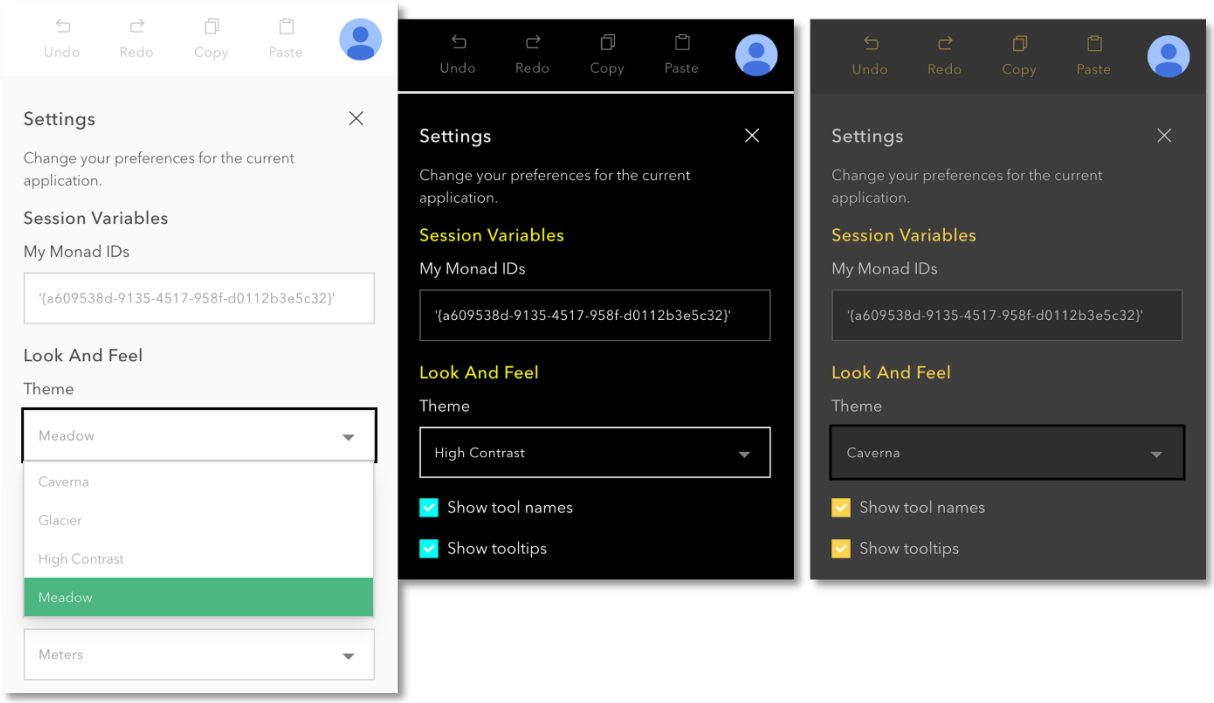



**Figure 3.2a:**Image of theThemes selection dropdown menu with 'high Contrast and 'Caverna' slected to the centre and right

## GPS

Use the GPS tab to select the integrated iPad GPS device or an external device (refer to Section 2.3 and Appendix 2) to connect an external device. You can also check the raw GPS data for accuracy by pressing the Status tab (Figure 3.3).

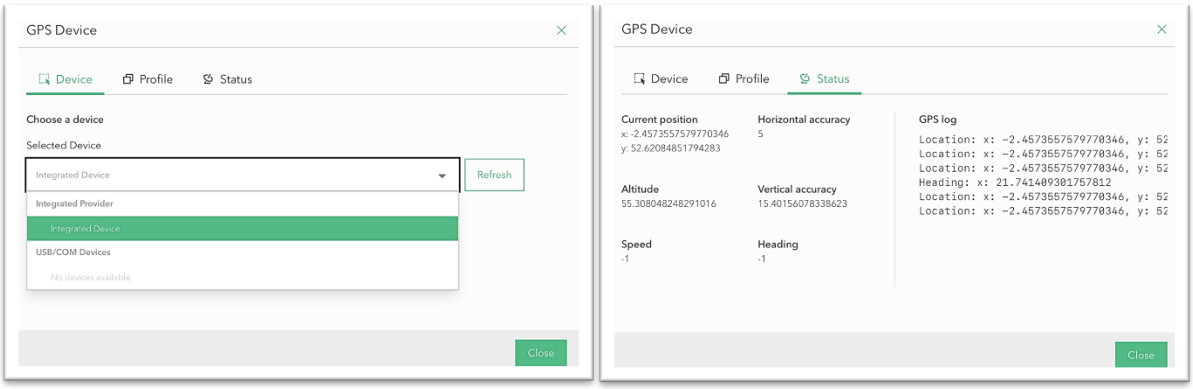



**Figure 3.3**: Image of GPS tabs showing options to select a GPS device and to the right, the GPS status screen

## Bookmarks

Bookmarks that relate to specific map views and configuration settings can be saved and recalled at a later time. You can choose what configuration settings are saved with the bookmark. There is a free text box to name the saved bookmark (Figure 3.4).

To recall a bookmark press a saved bookmark from the bookmark menu (Figure 3.4)

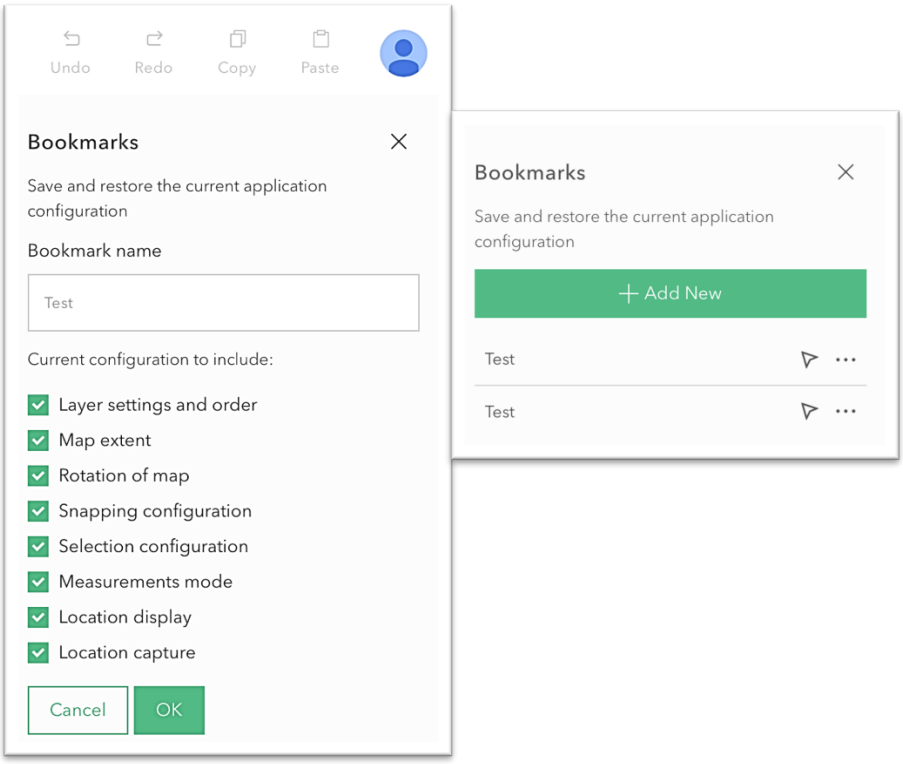



**Figure 3.4**: Image of Bookmarks tab showing the range of configuration settings that can be saved with a bookmark. Inset is the bookmarks tab showing saved bookmarks.

## Troubleshooting

The Troubleshooting tab is used to access system logs. In the event you are having significant issues you may be asked to access this and forward the logs accordingly (Figure 3.5).

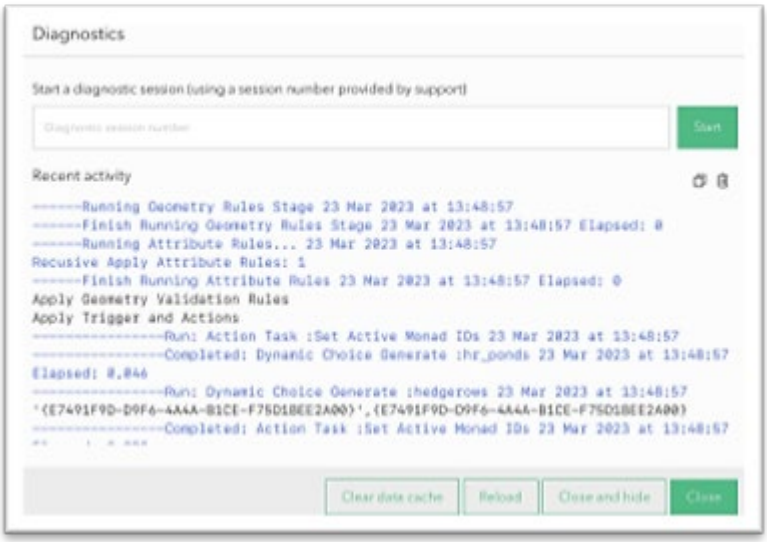



**Figure 3.5**: Image of Diagnostics screen which is accessed form the Troubleshooting tab.

Sign Out

Use this button to sign out of Sweet and your Esri account.

> **IMPORTANT:**
> If you sign out of Sweet you will not be able to sign back in without an internet connection.

The QA Panel is only used for Quality Assurance Survey.

## 3.3 LAYERS AND BASEMAPS

A layer in Sweet is analogous to a single sheet of paper, it is a 'layer' on which information relating to a specific sub-survey type is written.

At the top of the green menu bar on the left of the screen is the 'Layers' tab. When pressed it expands to show all the survey types, each type has its own layer, and if you scroll to the bottom (depending on screen orientation some of the items may not be visible unless you scroll down), you will see the base-map layers. By default, all items will have a green tick next to them, this means mapped information relating to those items can be seen on the current screen (Figure 3.6).

A basemap is the base layer over which all other layers are placed.

Layers can be switched on or off to show or hide them, they can also be reordered so that one layer is above or below another. Basemaps can only be reordered with other basemaps and not with survey layers.

- To reorder a layer: press and hold the three dots to the right of the layer you want to move and whilst still pressing, move it up (above) or down (below) the other layers.

The opacity of survey layers and basemaps can also be changed.

- To change the opacity of survey layers and basemaps: press the half-shaded circle at the top of the layers tab (Figure 3.6) so that the appearance of otherwise solid images can be merged with other layers (0= solid, 100=invisible).

For example, satellite imagery can be overlaid on an OS map and then its opacity reduced to reveal the OS map beneath. The OS and satellite basemaps can now be viewed at the same time (Figure 3.6).

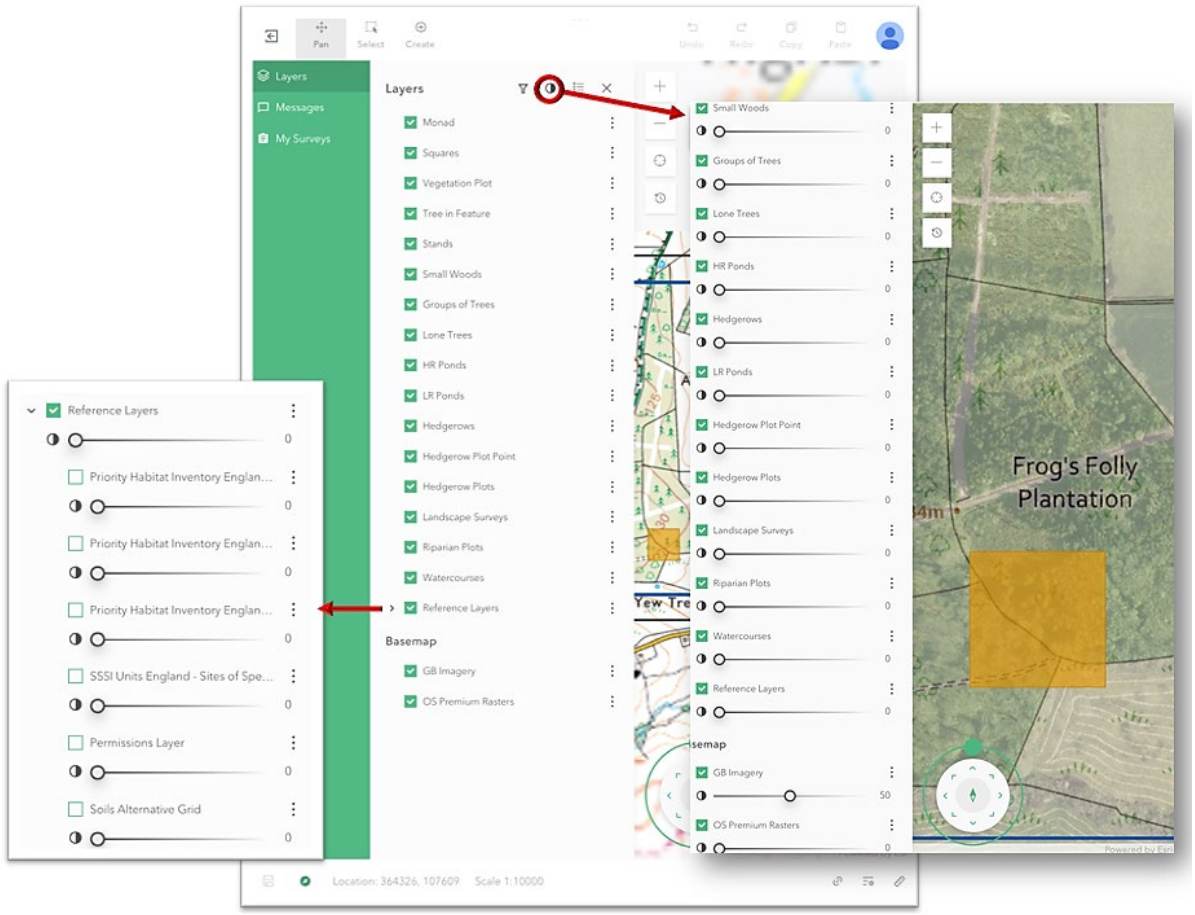



**Figure 3.6**: Image of EES Sweet App showing the layers tab and the transparency tab. A map is in view with a partly transparent OS map revealing the satellite imagery beneath. A view of the Reference Layer expanded is at the left of the image.

**NOTE:**

Within the Layers tab is a layer called 'Reference Layers'. Expand this layer to reveal the Priority Habitat Inventory (PHI) layer, a Sites of Special Scientific Interest (SSSI) layer, the Survey Permissions layer, and the Soils Alternative Grid layer (Figure 3.6).

By default, these layers are not visible, but as with other layers they can be switched on and off and their transparency adjusted.

Types of basemap available:

OS Scale, 1:25,000 – Useful for:

- Identifying features such as ponds, water courses, public footpath, topography (contour lines).

Satellite Imagery, APGb7 AGOL– Useful for:

- Identifying features such as ponds, water courses, trees, hedgerows, buildings.

> **TIP:**
>
> If you temporarily deselect all basemaps you can more easily view what survey elements are present (Figure 3.7).
>
> Don't forget to reselect basemaps again, your map screen will look like the right-most image in Figure 3.7 until you do so.


**Figure 3.7**: Comparison of monad view of three linear hedgerow plots using Satellite imagery, OS map and no basemap.

## 3.4 GEOLOCATING YOUR POSITION ON THE MAP SCREEN

You can use Sweet to locate you position on the map screen. The accuracy of your location will depend on the accuracy of your GPS signal.

**Note:**

If your Geode is not working, you will need to manually select the internal GPS option from the menu as a GPS source.

Once selected open the 'Status' tab and let the GPS log run for 10 seconds before clicking geolocate (Refer to Section 2.3 for further details).

To locate your position and use the geolocate tools within the Sweet map screen. Refer to Figure 3.9 below.

- Pan Tool, located in the left of the top toolbar: Press this to move around the map without selecting anything (Figure 3.8).
- Plus, and Minus buttons: Use **+** and **–** to zoom in and out of the map.
- Geolocate button: Press this to locate your position on the map screen.

**NOTE:**

Location accuracy is dependent on GPS signal strength.

Expand the Extents button below the Geolocate button to reveal more buttons:

- Left and Right arrows: The Left arrow jumps you from the current extent to the previous extent. The Right arrow jumps to the 'Next' extent.

The number of levels of 'Next' and 'Previous' extents are dependent on how many times you have changed the view on your map screen.

- House button: When pressed this will revert the map view to the default extent.
- World button: When pressed this will jump to a bookmarked location.

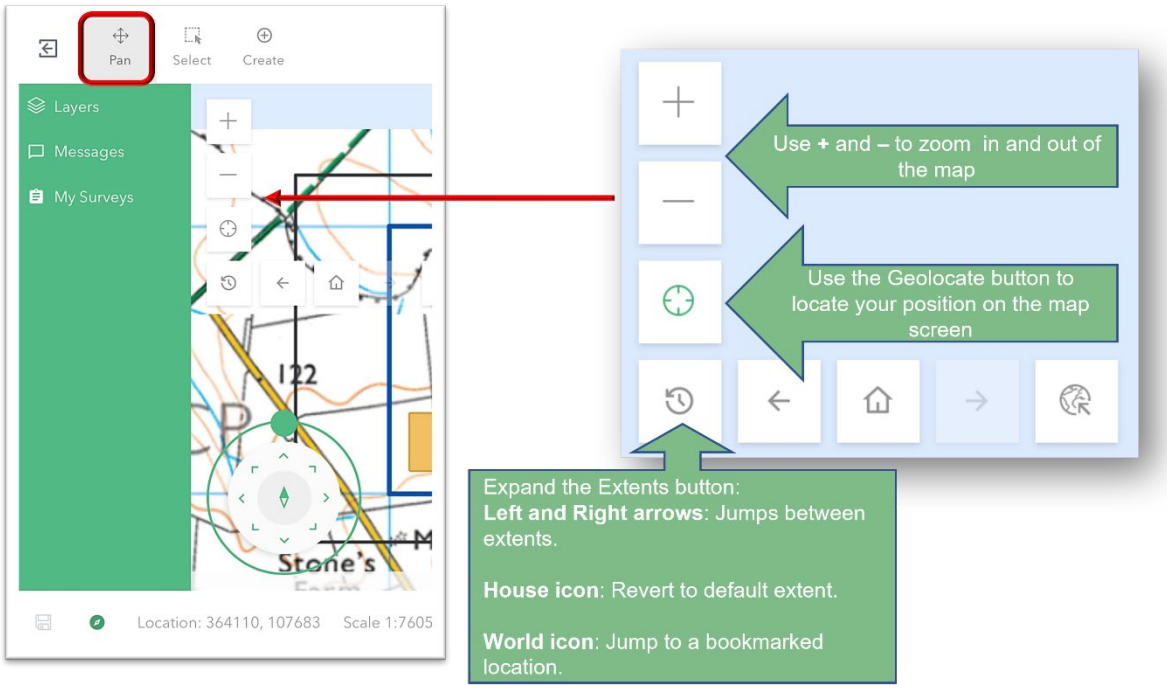



**Figure 3.8**: Image of Geolocate tools with brief descriptions of their use. The Pan is highlighted by a red box.

## Compass Tool

The Compass tool located at the bottom left of the map screen can further aid survey navigation (Figure 3.9)

- Green Ball: the green ball at the top of the Compass, when pressed and held, can be used to rotate the map.

- Direction Arrows: The eight direction arrows positioned around the compass can be used to move the map incrementally in the direction of the arrow. This is particularly useful if you need to scroll the screen while in the process of drawing a survey plot as you won't lose what you've already drawn.

- Compass symbol: The Compass symbol at the centre of the Compass tool is used to reorientate the map screen to its default view.

- The Compass can be toggled on or off by pressing the small button at the bottom left of the screen (Figure 3.9).

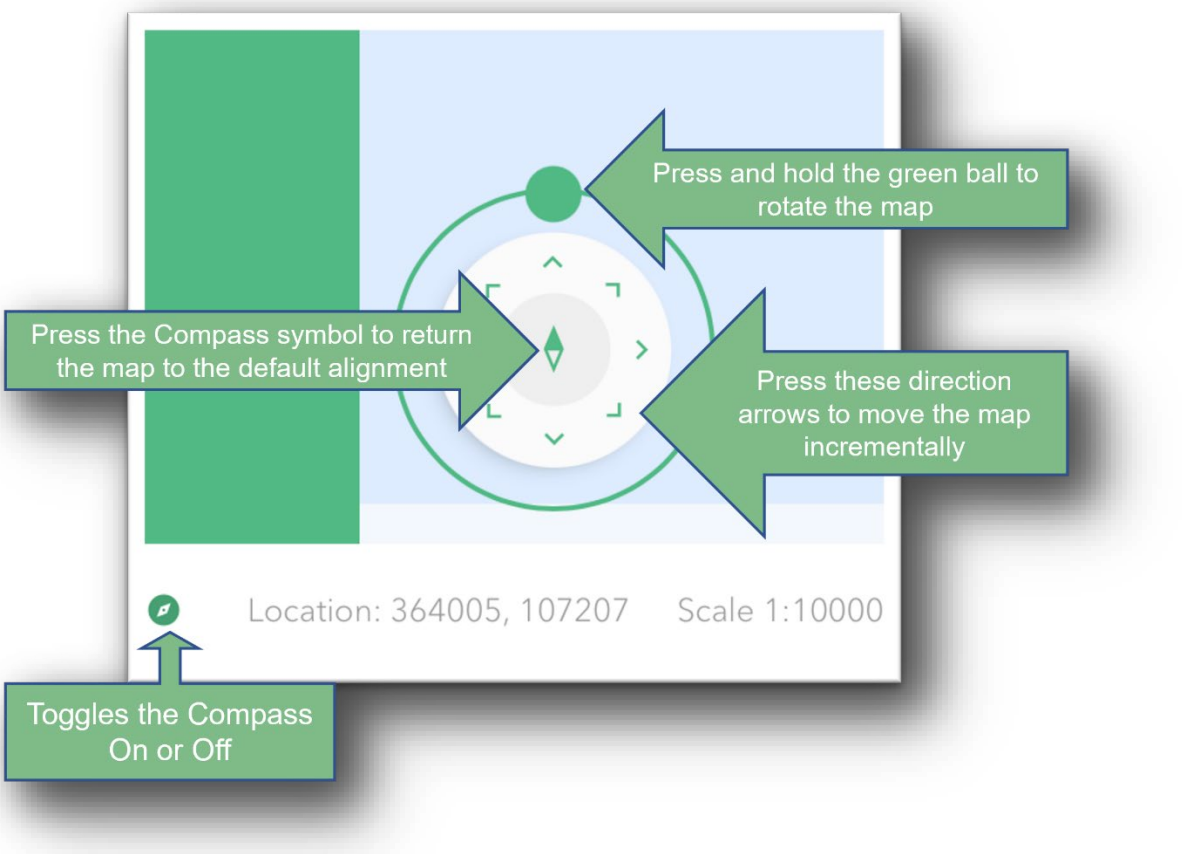



**Figure 3.9**: Image of Compass tool with arrows pointing to its functions.

## 3.5 THE SNAPPING TOOL

Snapping allows you to create features that closely follow existing data. It can help create more accurate polygons and polylines.

When snapping is turned on, your drawing tool will try to jump, or 'Snap' to, adjacent edges, vertices, and other geometric elements.

At the bottom right of the screen are three small tool icons. They can be used to toggle on or off the Snapping tool, Snapping options, and the Ruler tool.

When you toggle on the Ruler or the Snapping tool the icons will change from grey to green. (Figure 3.10)

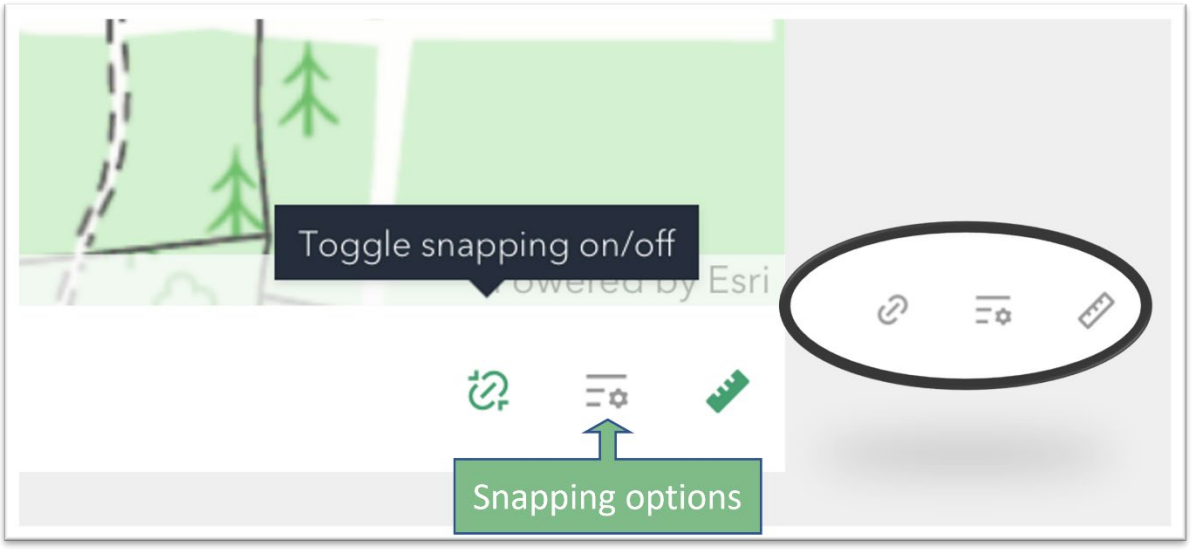



**Figure 3.10**: Image of Snapping and Ruler tools. Inset is a view of them showing them as grey to indicate they are not active.

The middle of the three icons is the Snapping options tool (Figure 3.10). You can use it to choose what layers and Survey features Snapping will be available on and the Snapping behaviour. Refer to Guidance Videos for more details.

When the Snapping options button is pressed, it will open into the ‘Layers for Selection’ tab. You can select that all layers have Snapping, deselect/reselect individual layers, or, if you press the small circle icon (Figure 3.11) to the left of a layer name, it will deselect all other layers.

Press the Snapping tool icon at the top of the tab to switch to the Snapping Options tab (Figure 3.11). The Snapping Options tab also has ‘Layers for Selection’ options.

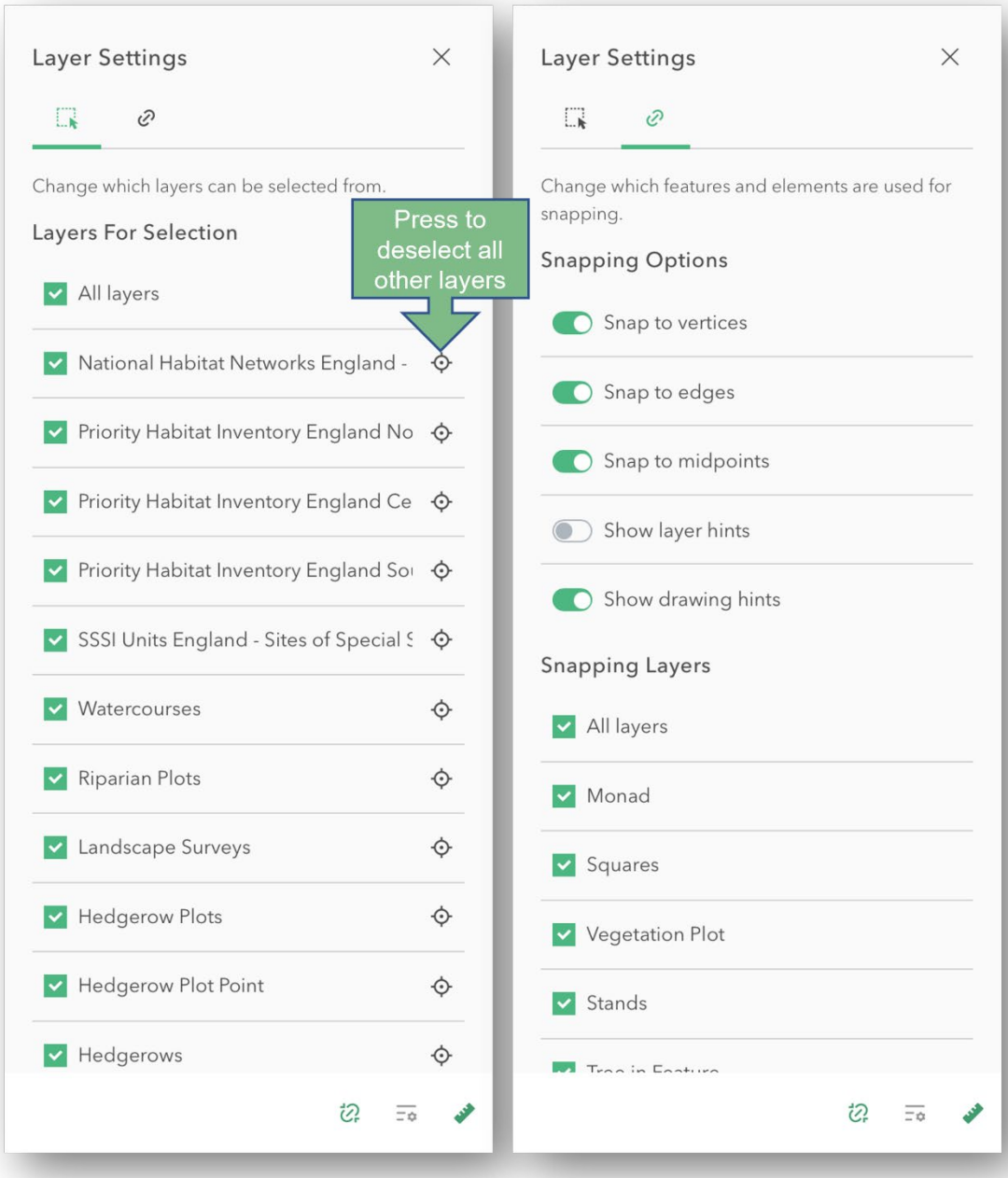



**Figure 3.11:** Image of Snapping Layer Settings options tabs.

## 3.6 THE RULER TOOL

Press the Ruler tool (Figure 3.10) on the bottom right of the screen to activate a ruler along the top and left of the map screen.

The scale value and delineation of the ruler will change depending on the level of zoom you have chosen to view the map screen at (Figure 3.12).

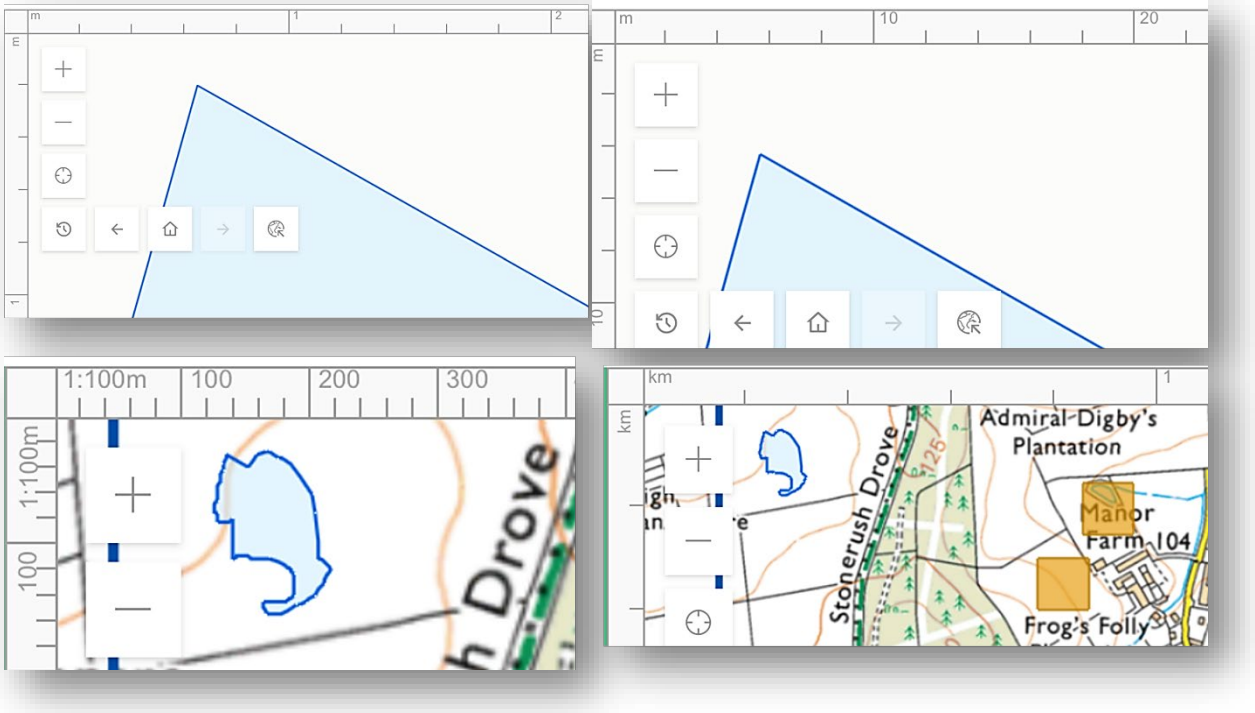



**Figure 3.11:** Image of the Ruler tool at varying levels of zoom.

## 3.7 INITIAL SURVEY DATA PARAMETERS

Once your assigned monad is downloaded to your device you can begin working on it by pressing ‘Open’ on the monad Assignment (Figure 2.11).

First you must input some initial data about the survey.

1. From the green menu bar on the left side of the map screen choose ‘My Surveys’. The toolbar will expand to show a tab with your assigned monads and their current status.

When working ‘online’ i.e., with an active data connection, you will see all monads assigned to you. When working ‘offline’ you will only see the assigned monad you opened, even if you have downloaded several assigned monads.

2. Press the 3 dots to the right of ‘Survey’ to open a new tab with several options. Press ‘Work on survey’. This should make the pre-drawn Squares and Stands visible if they weren’t already. The ‘Create’ button will also appear in the top toolbar if not already present.

Whilst in the ‘My surveys’ tab you will see the ‘Monad Fields’ section below the green ‘Show all’ tab.

3. Enter the ‘Assignment Start Date’ and time in the appropriate box (Figure 3.12).

4. Scrolling down will reveal all the EES survey elements, each has a drop-down menu where the status of that survey type can be picked as: ‘Not Completed or ‘Survey Completed’. Press the X in the top right of the ‘My Surveys’ tab to minimise it.

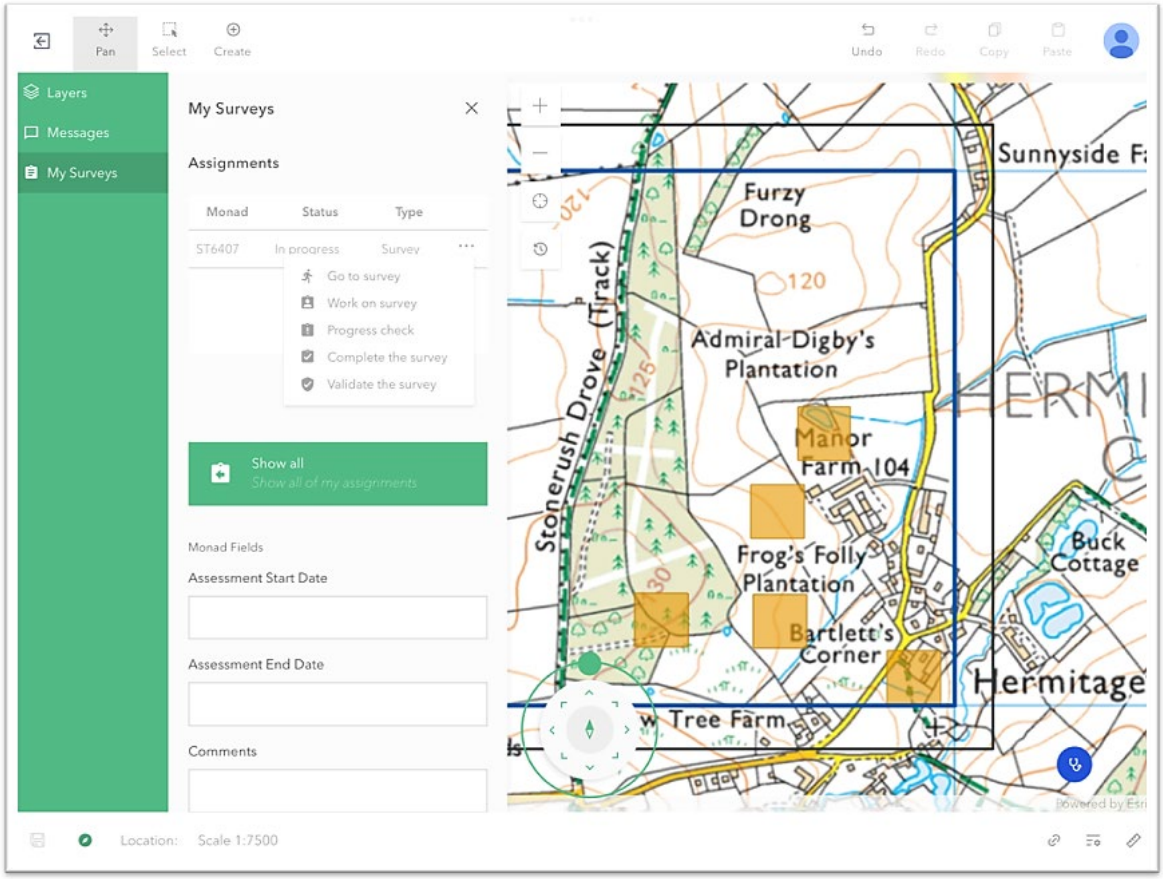



**Figure 3.12**: Image of the Sweet App map screen with the ‘My Surveys’ tab expanded from the green menu bar options tab along the left of the screen.

## 3.8 USING THE SELECT TOOL

The Select Tool (Figure 3.13) can be used to ‘draw’ around and select individual or multiple survey elements on the map. In fact, when several survey elements are in close proximity it is difficult not to ‘grab’ multiple items.

When single or multiple items are selected all selected items can be viewed by expanding the ‘Selection’ tab located on the green menu bar at the left of the screen. The number in the white circle next to ‘Selection’ tells you how many items are selected so you can see at a glance if you’ve selected more items than intended.

Some functionality is only available with a single item selected (and the ‘merge’ tool only becomes available when multiple stands are selected). All selected items will have a bright blue ‘halo’ around them (Figure 3.13).

You can deselect items individually or use the quick deselect option.

To deselect items individually:

- Press the Select tab to expand it and reveal all selected items (Figure 3.13).

- Press the X at the right of any survey element you wish to Deselect (Figure 3.13).

This function is useful in situations such as when several Stands have been drawn within a Square and you wish to isolate a specific Stand to view or input data.

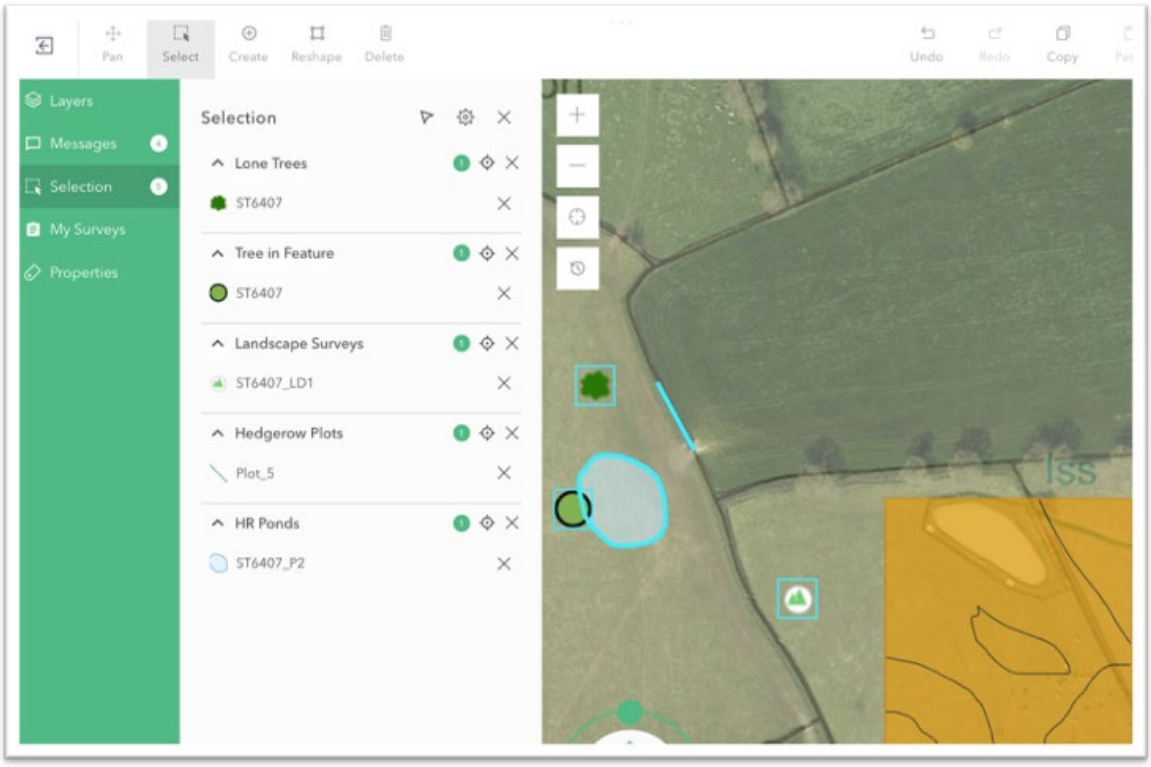



**Figure 3.13**: Image of the Selection tab expanded to reveal several selected survey elements that can also be seen on the map screen with a blue ‘halo’ around indicating they have been selected.

There is a quick way to deselect all but a single survey item from a multiple selection.

To use the quick deselection option:

- Press the item you want to remain selected from the expanded selection tab.

- When a red halo appears around the desired item on the map release your finger, once released all other items will be deselected (Figure 3.14).

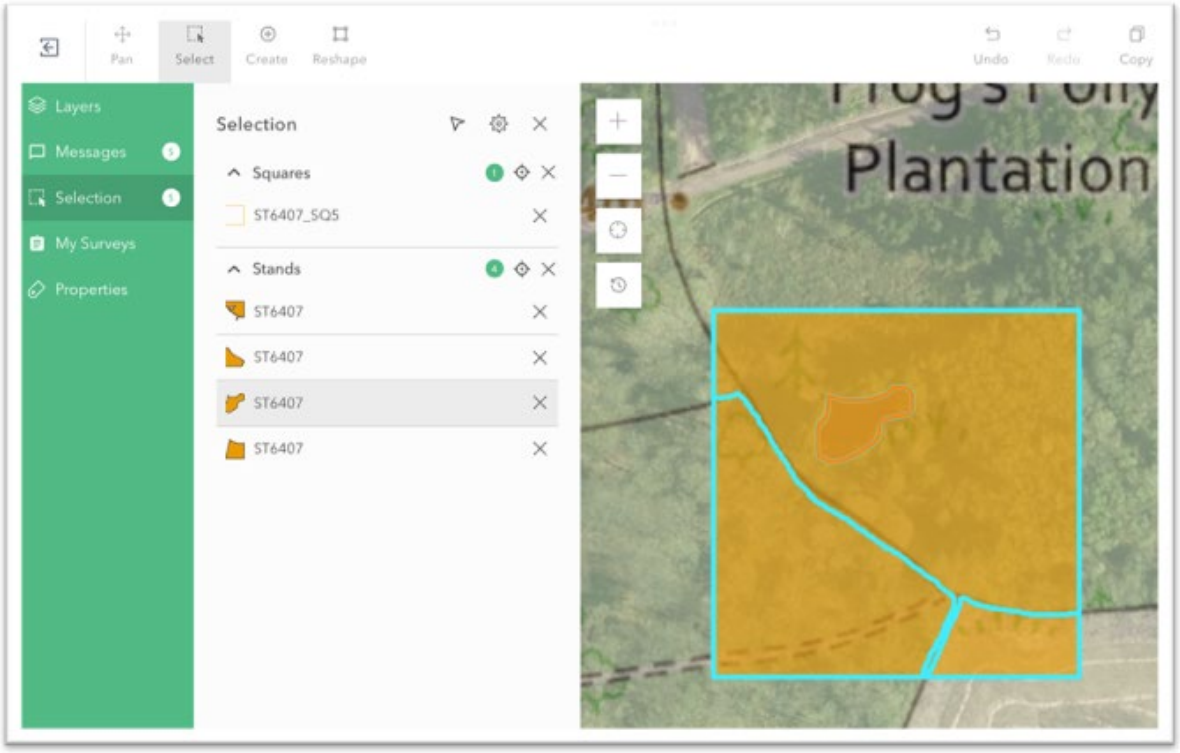



**Figure 3.14**: Image of the Selection tab expanded to reveal several selected survey elements. An item in the centre of the screen has been 'pressed and has turned red prior to all other items becoming deselected.

## 3.9 SELECTING A SURVEY TYPE

Once you have input the initial survey information, which is the survey start date and possibly some monad related comments in the free text box, you are ready to add survey data into the relevant sections.

> **NOTE:**
> You must have a survey object selected before survey data can be added.

In the example below let us assume you wish to undertake one of the two High Resolution (HR) EES pond surveys.

To create a new survey type (Figure 3.15):

1. Press the 'Create' button located towards the left of the top toolbar.
2. A 'choose' button will then appear to the right of the 'Create' button.
3. Press the 'Choose' button to open the 'Choose' tab at the right of the screen.

4. From the ‘Choose’ tab select the survey type you wish to undertake. (In this example it will be HR ponds, P1.)

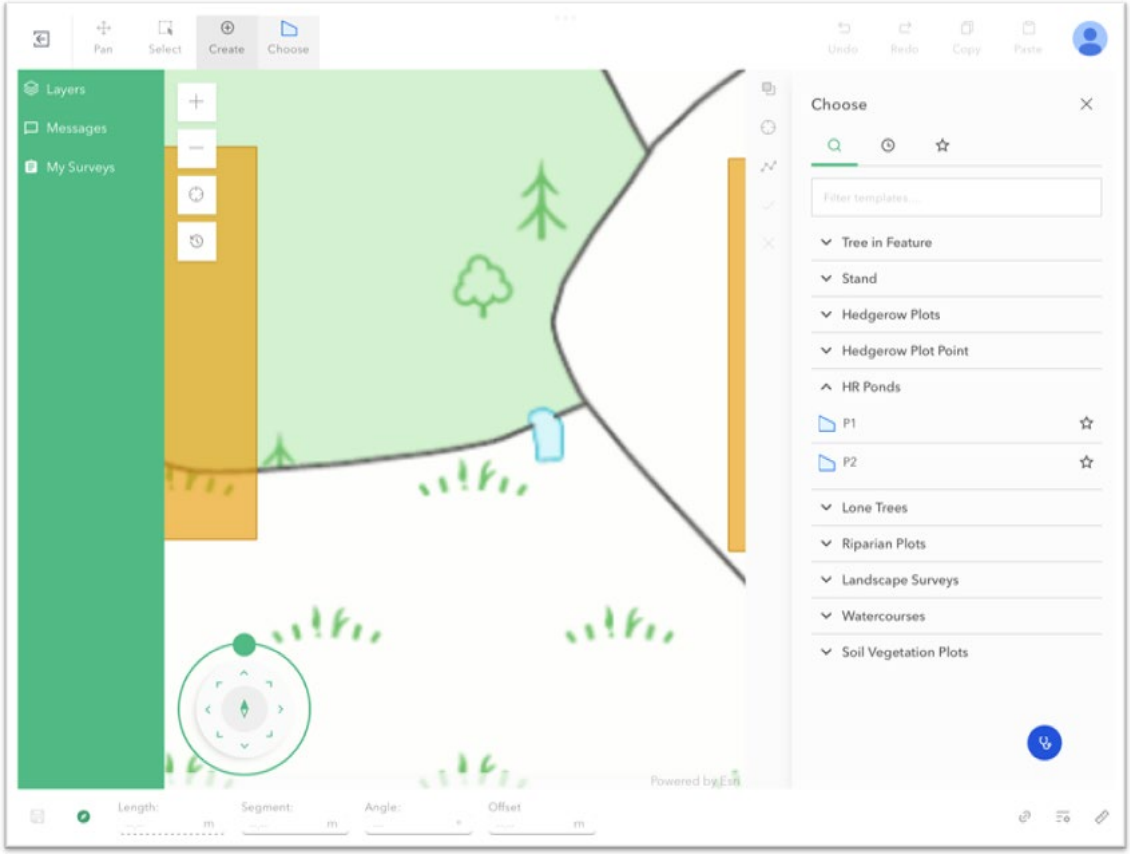



**Figure 3.15**: Image of the map screen with the ‘Choose’ survey type tab in view on the right of the screen.

When you have selected a survey type you will be able to draw survey extents onto the map. The basemap can be used as a point of reference for your ground-truthed input. In this example it will be a polygon to show the extent of the pond surveyed.

## 3.10 DRAWING TOOLS

To add or ‘draw’ or modify an item on the map screen you must first decide how you want to draw or modify the item. You then choose what drawing tool to use.

- Add Tool: Used to add or enlarge an area to an existing polygon. Within Stands, it can be used to change the size of a Stand already created and merge it with the Default Stand in one operation (refer to Section 4 drawing Stands).

- Split Tool: This is the default tool to use for the creation of most stands as it allows you to split the original 1ha$^2$ Square into as many stands as are required.

- Subtract Tool: When used for drawing Stands, it behaves in a similar way as the 'Split' tool. When used to resize an existing polygon it will remove the area drawn from the polygon.

- Reshape Tool: Allows individual nodes already drawn to be manipulated allowing small accurate edits to be made. When used to modify a Stand, the boundaries that align with the perimeter of the 1ha$^2$ Square cannot be changed.

- Delete Tool: You can select a polygon, polyline or a point plot then press the Delete tool to remove it.

> **NOTE:**
> The Delete tool cannot be used on Stands refer to the Stands section for details on using the 'Merge' option to remove Stands.

Before drawing onto the map choose the most appropriate drawing tool from a pop-out tab on the right of the screen. A zig-zag line with nodes is the drawing tool icon (Figure 3.16). Draw tools once a drawing option has been selected. These are: Create, Subtract, Split, Add and Reshape options. They are described below.

Drawing tools available include:

- Freehand drawing tool: this will likely be most frequently used drawing tool. It is useful for complex polygon shapes and polylines.

- Standard drawing tool: Used to create straight lines between polygon or polyline nodes. It is useful for making simple shapes or lines where a structure is well defined.

> **NOTE:**
> A long press on the screen whilst using the Standard drawing tool will magnify the node you are pressing on (Figure 3.16). A good way to understand how they work is to try them out then press the X button on the toolbar on the right to delete and try again (Figure 3.17). Alternatively, refer to relevant Guidance Video.

- Follow tool: When used, this will attempt to 'Snap' to and 'follow' existing node or grid data on the map, such as the boundary of a Square

- Curves tool: Can be used to draw curves: To draw a curve, select the tool and place two points on the map. At the centre of the two points, you will see a small square. Press to hold the square and drag it in the direction of the curve you want to draw. Release your finger to place the curve on the map.

**NOTE:**

While drawing, the ‘undo’ tool can be used to delete one node at a time, but once a polygon or polyline is complete using this tool will undo the whole entry.

If you need to pan the screen whilst drawing, the arrows on the compass icon can be used to do this.

Using the Pan tool from the top left of the screen will cause you to lose the polygon you are drawing.

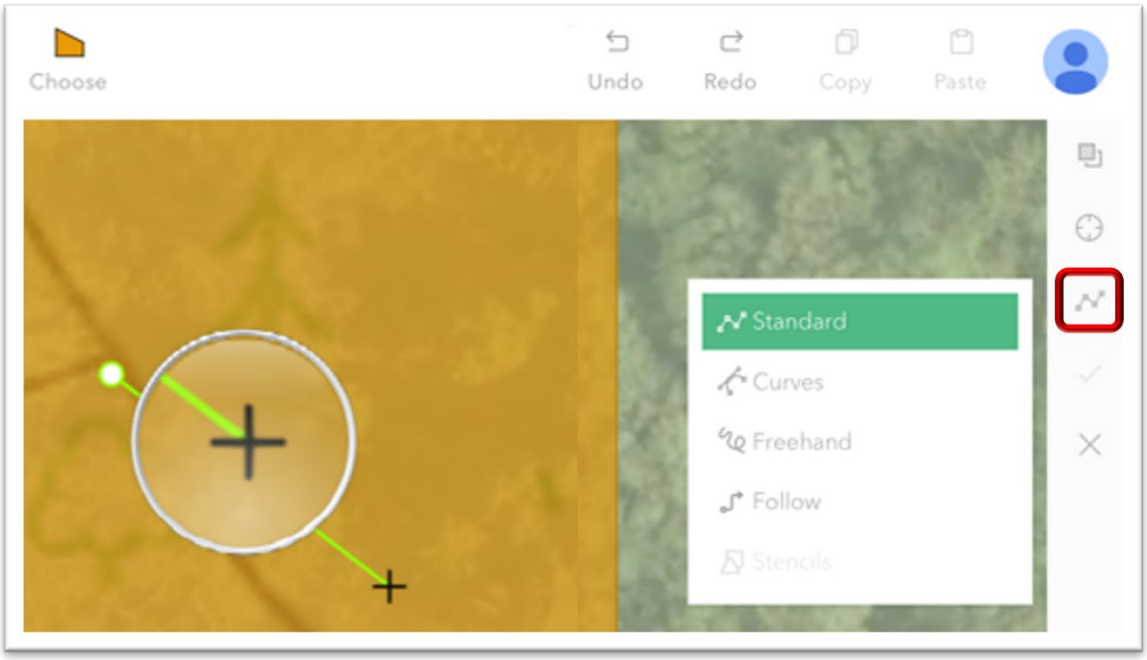



**Figure 3.16**: Image of available drawing tools accessed from the pop-out drawing tool tab located on the vertical toolbar on the right of the app screen. Image of magnified node when long pressing whilst using the ‘Standard’ drawing tool.

**IMPORTANT:**

Sweet will automatically draw a straight line to connect your first and final node and 'finish' the polygon when you are finished.

Do not cross the line you are drawing as this will result in an invalid shape and your polygon will not be saved. This is likely to happen if you try to join the ends of a polygon exactly. To avoid this, stop slightly short of joining the two ends and allow Sweet will join them for you.

Below, Figure 3.17 shows a pond drawn using the freehand polygon tool. As you can see, pond area is displayed once drawing is complete. Use the X button found on the toolbar on the right to delete your polygon or polyline. Press the tick button above the X when you are satisfied with your polygon or polyline.


**Figure 3.17**: Image of a pond polygon with nodes visible. Pond area data is shown at the top right of the screen.

If you wish to delete a drawn item after you have pressed the tick, use the select tool to draw around the item you want to delete. Take care to only have the item you wish deleted selected. The green menu bar at the left of the app screen has a 'Selection' tab, you can expand the 'Selection' tab to confirm your selection (Figure 3.13). Press 'delete' from the top menu to delete the selected item or items. Undo and Redo buttons can also be found to the right of the top menu.

**IMPORTANT:**

Undo and Redo only works during an active session. These functions are reset each time you return to the Assignments landing page or close the app.

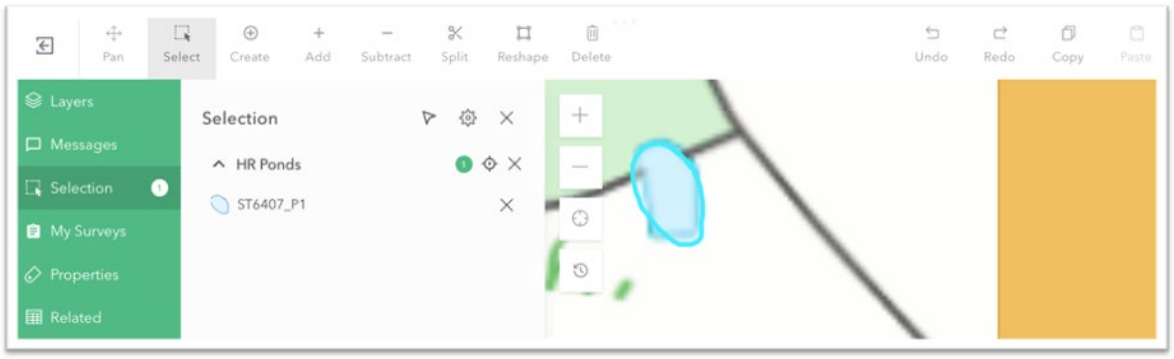



**Figure 3.18**: image of 'Select' tab with a pond selected and a pond the view on a map to the right of the screen. The toolbar along the top of the screen shows a range of tools used to add and modify polygons.

**NOTE:**

Some toolbar icons may be obscured when your device is in portrait orientation. If so, press the three dots icon to expand the toolbar (Figure 3.19).


**Figure 3.19**: Image showing the top toolbar in portrait mode with addition tools revealed when the highlight 'three dots' icon is pressed on the top toolbar.

## 3.11 RELATED AND PROPERTIES TABS

The 'Properties' and 'Related' tabs are the main areas where survey data is entered.

**NOTE:**

In the properties tab, the input fields change based the data you input. For example, different fields options will appear depending on the Accessibility level you select.

In the related tab all fields are always in view. Refer to the EES manual to determine the relevant survey fields to in input.

Properties is used to input single responses such as entering one measurement or selecting one option from a drop-down list.

Related tables are used where multiple responses may be needed, such as listing all the species present in a plot, or all the types of management applied to a feature. It's also used to add photographs.

For this reason, when working through the metrics in the order specified in the EES Field Manual a surveyor will need to switch between the Properties and Related tabs.

If you can't find a metric in 'Properties', try looking in 'Related' and vice versa. Remember to return to the Properties tab to record the end time for each sub-survey.

Properties tab

The 'Properties' Tab is on the green menu bar on the left of the screen, this will only show when a survey item is selected (see section 3.8 Using the Select Tool). Remember, if you are zoomed out a long way you may not be able to select a survey item.

- To input survey data into your device, press the 'Properties' tab to expand it. You will then see a table of attributes for the selected survey type (Figure 3.20).
- Fill in each field. Some fields require an option to be selected from a drop-down list, others will open an alpha-numeric keypad to type the response. Some input boxes have a 'look ahead or autocomplete' typing feature so that you only need to type a few letters for information to appear (see Figure 3.20 below).
- Press the X button at the top right of the 'Properties' tab to exit the tab (Figure 3.20).

**IMPORTANT:**

Some fields restrict the data that can be entered, for example, using only whole integers or values within a certain range.

If invalid data is entered a pop-up 'Review' box will appear with the options 'Cancel' or 'OK' and an explanation of the validity requirement. Selecting 'Cancel' deletes the data entered and allows you to re-enter valid data. Selecting 'OK' leaves the warning visible but does not delete the invalid data or force the user to correct it.

You can continue entering data in subsequent fields, **but this will not be saved.**

To avoid losing and having to re-enter data, always correct invalid data immediately when the 'Review' warning appears. To avoid losing, and having to re-enter data, always correct invalid data immediately when the 'Review' warning appears. Once valid data has been entered you can select 'OK' and the pop-up will disappear.

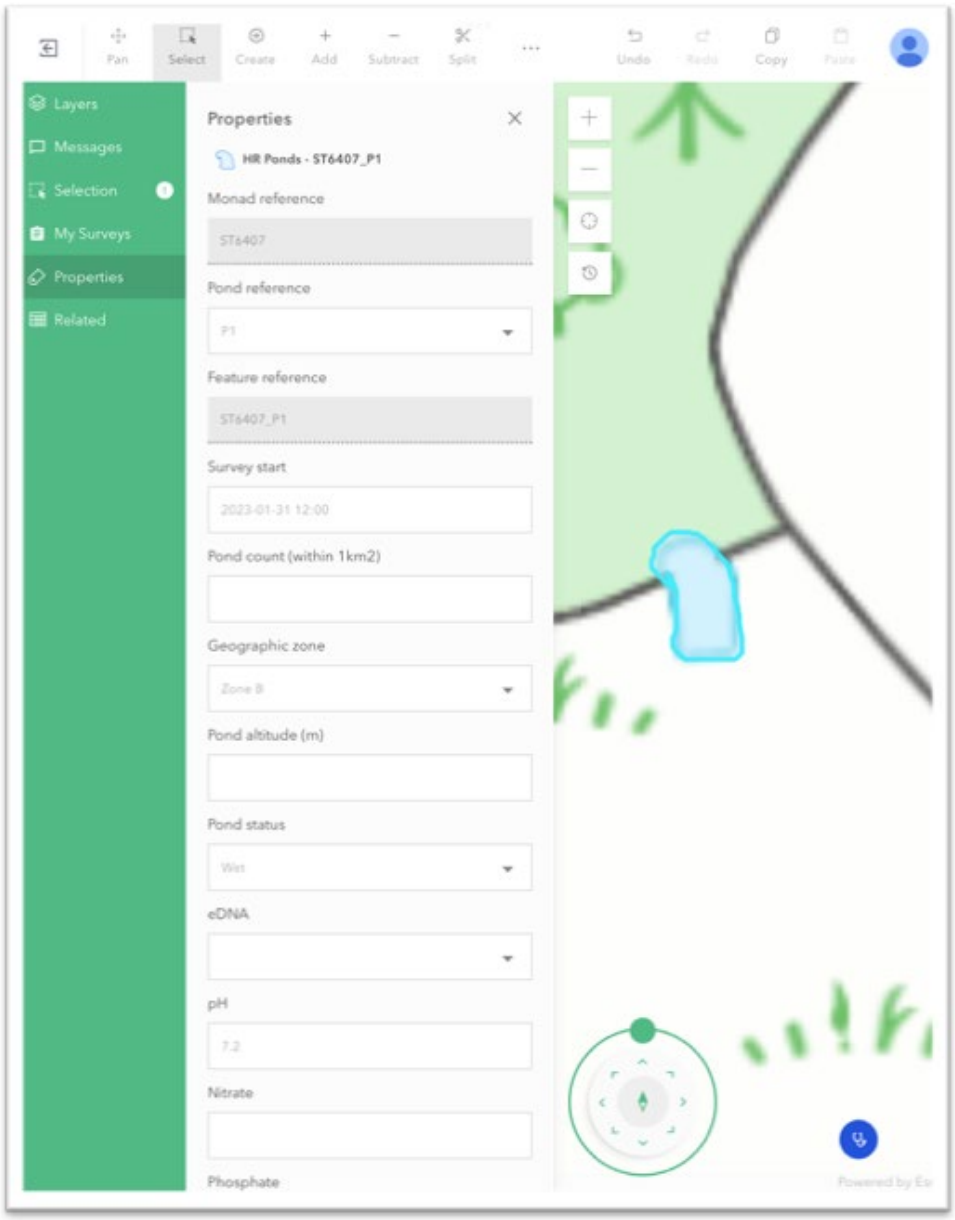



**Figure 3.20**: Image of Properties tab expanded to show survey attributes for HR Pond Survey.

<u>Related tab</u>

Pressing the 'Related' tab from the green menu bar on the left of the screen when a survey object is selected will reveal further survey data variables to be completed for that object. Each variable has a + sign to expand it (Figure 3.21). Once a variable is expanded you have the option to add multiple records such as species lists or photographs under each of the listed variables.

- Press the + button at the right of the 'Related' variable you want to work on to expand it and reveal the data to collect.

For example, you can input multiple invasive species, sward structures, management, and photographs, in accordance with the specific requirements of the survey type you are working on.

A Review box will popup each time a ‘Related’ variable is expanded. It will prompt you on the type of data to input (Figure 3.21). The review box will only disappear when you begin entering data into the input field box (pressing ‘OK’ on the review box will have no effect).

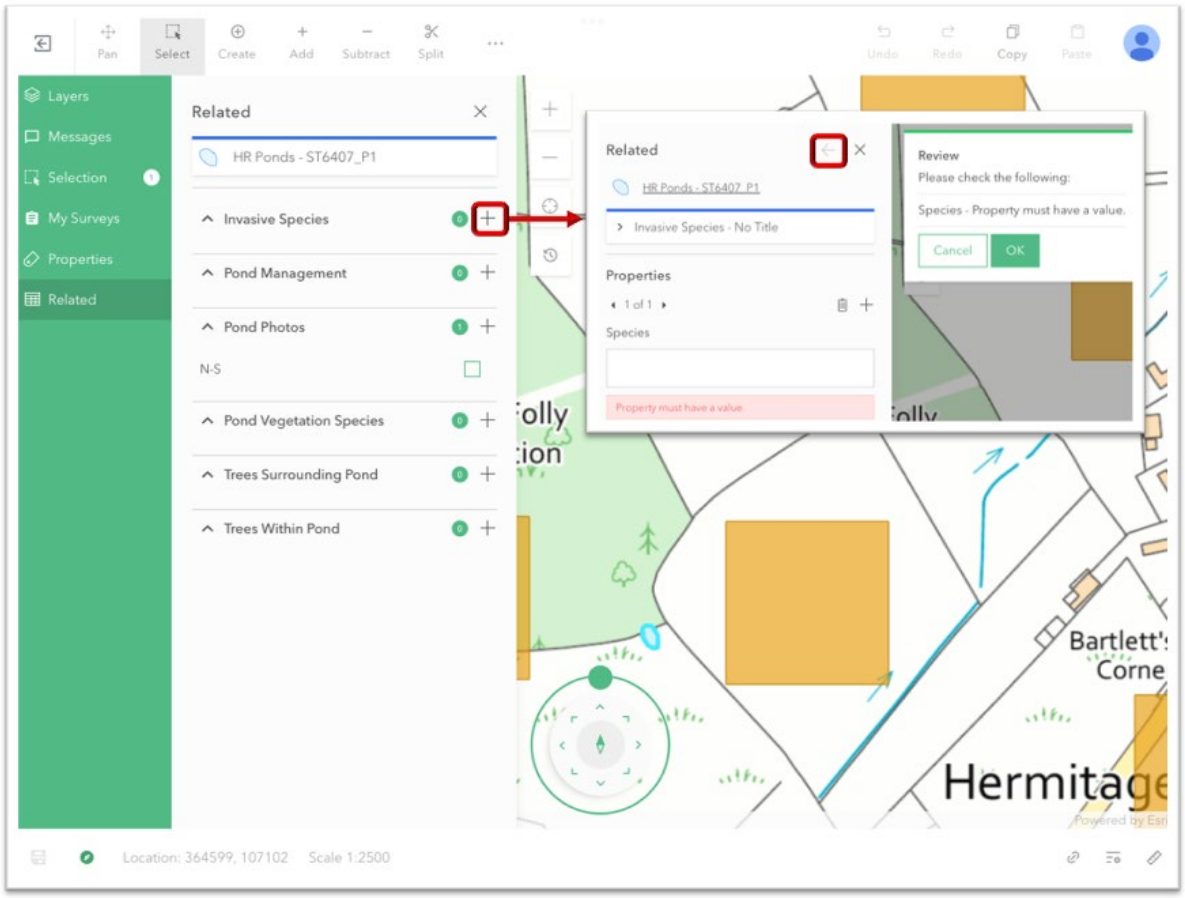



**Figure 3.21:** Image of the ‘Related’ tab with a Related a survey variables tab expanded using the highlighted **+** button to the right of a ‘Related’ variable. A back arrow is highlighted on the secondary ‘Related’ survey tab, it is used to exit to the primary ‘Related’ tab. There is a ‘Review’ prompt box at the right of the image. The exit the map screen back arrow is at the top left of the image.

Many input boxes have a ‘look ahead or autocomplete’ typing feature so that you only need to type a few letters for information to appear (Figure 3.22).

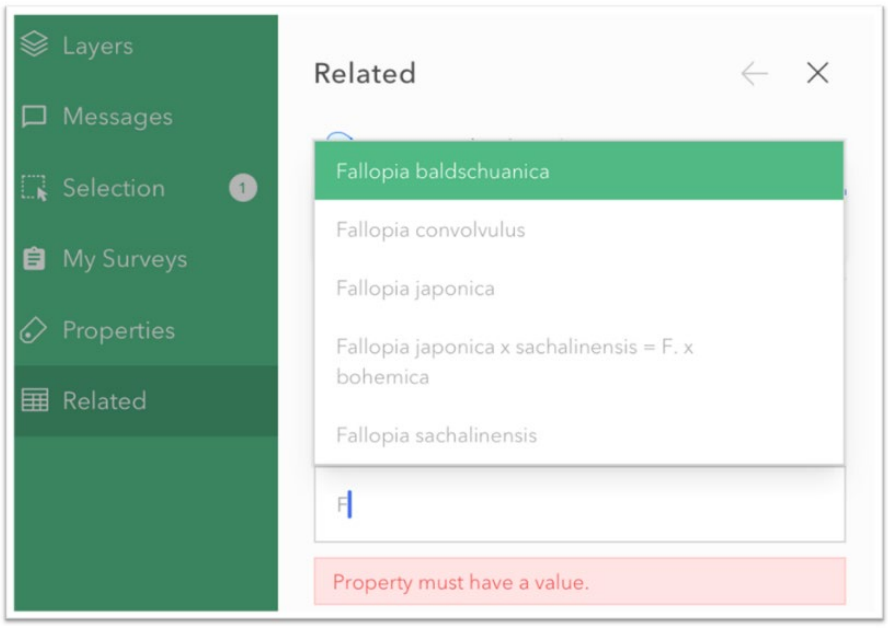



**Figure 3.22**: Image of autocomplete feature when inputting species data into the Invasive Species data field within the 'Related' tab.

Most variables within the Related tab will require inputting multiple entries into the same data field.

- To add further data for a specific variable, press the + button to the right of the bin icon in the properties section of the variable to repeat the process (Figure 3.23). The review prompt may appear each time you press the + button. When it appears, you can only input an entry or press cancel on the review box to remove it.

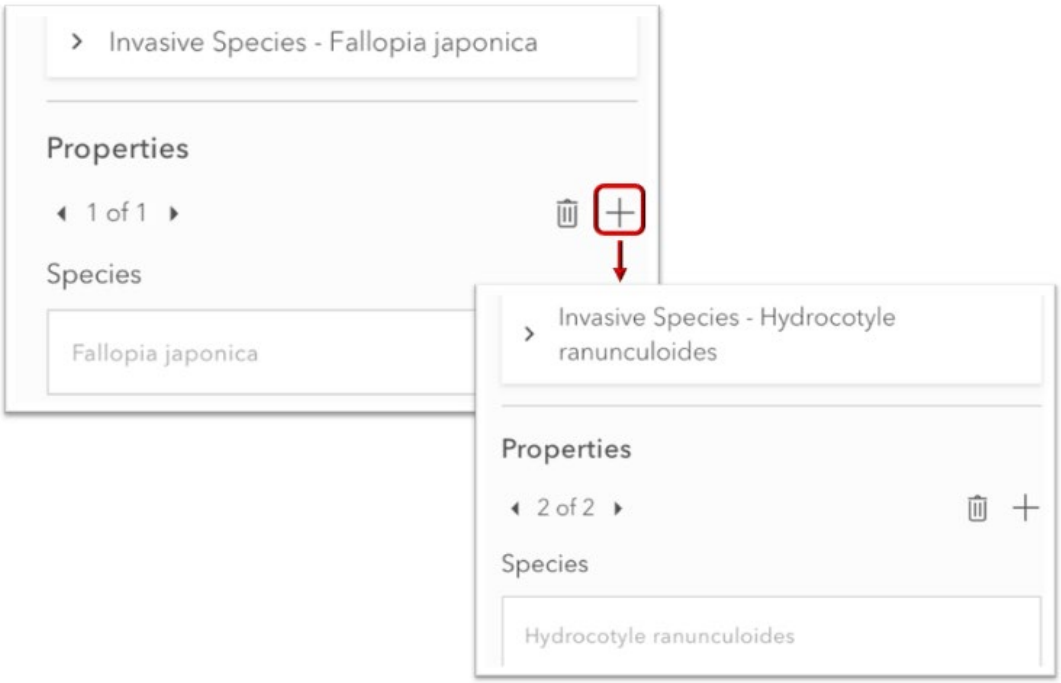



**Figure 3.23**: Image of adding further species to a 'Related' variables list using the + button located to the right of the bin icon in the properties section of the variable.

- You can delete single data entries by pressing the ‘bin’ button to the left of the + button. There are also left and right arrows that can be used to scroll through multiple items (Figure 3.23).

Once all survey data has been recorded for the specific variable, exit the attribute tab in the ‘Related’ section by pressing the back arrow (Figure 3.21).

- To delete multiple items from a ‘Related’ Variables list from the main ‘Related’ tab expand the variable using the down arrow to the left of its name (figure 2.24). Then, use the green boxes to the right of the items you want to delete to select them. When selected, a ‘tick’ will appear in the box. A ‘Delete’ button in a green box above and to the right of the selected items will show the total number of items to be deleted. Press the green Delete button to delete all the selected items (figure 2.24).

**NOTE:**

Items will be deleted immediately without further prompts, but they can be undeleted using the undo button found on the top toolbar (Figure 3.19). The undo feature will not work if the app is closed and reopened.

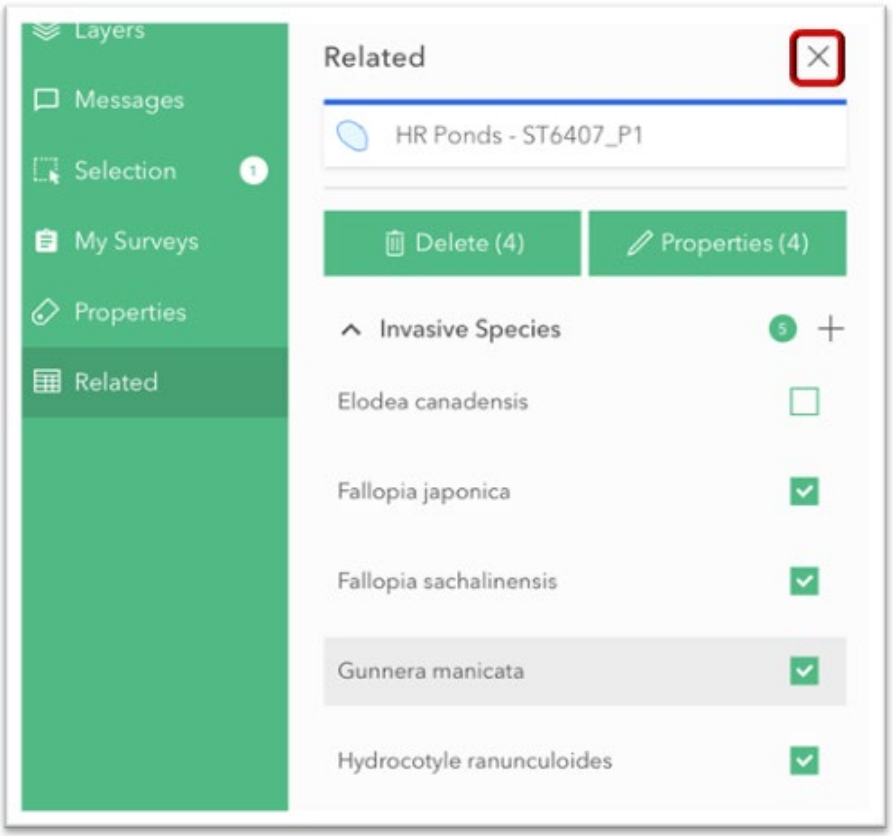



**Figure 3.24**: Image of ‘Related’ tab with several items selected. There is a green ‘Delete’ button towards the top of the tab. The exit ‘Related’ button is highlighted near the top right of the image.

Press the X button at the top right of the ‘Related’ tab to exit the tab back to the main map screen (Figure 3.24).

## 3.12 ADDING IMAGES TO A SURVEY FORM

The method of attaching photographs within the Sweet app is uniform across all survey types that require survey photographs. All fields requiring you to attach photographs will be in the ‘Related’ tab. In the following example a ‘HR Pond’ survey is used.

Ensure the survey object selected is the one you wish to attach photographs to (in this example it is survey pond 1 (P1).

- Press the ‘Related’ tab to expand it then press the + symbol to the right of the ‘Pond Photos’ tab in the ‘Related’ menu (Figure 3.21). There is a similar ‘Photos’ tab for all survey types.

- A new screen will appear, and a popup ‘Review’ prompt will guide you further. For pond survey the prompt reminds you to add the aspect you are taking the photograph from to the ‘Aspect’ box (Figure 3.25).

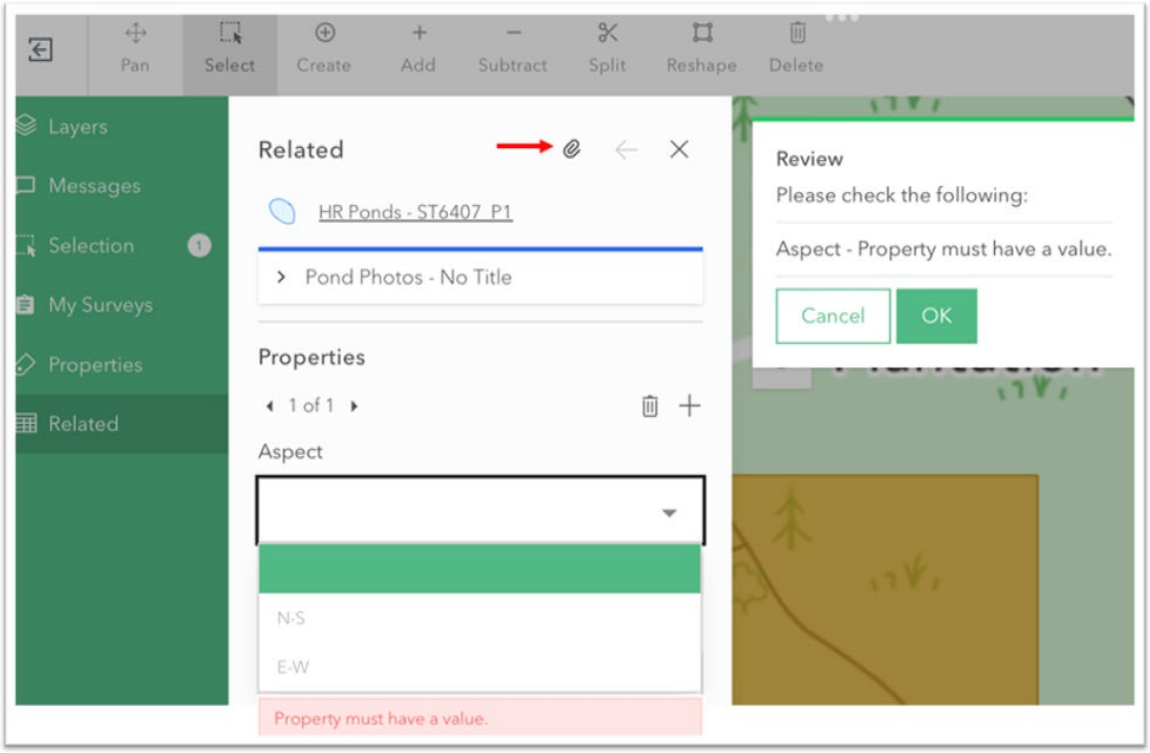



**Figure 3.25:** Image of the ‘Pond Photos’ tab after it is expanded from the ‘Related’ tab with a pop-up prompt to remind the user to add relevant data. A red arrow points to a paper clip icon which is used to attach images to a survey

- Enter data into the data box that corresponds with the ‘Review’ prompt.

For pond survey you need to press the ‘Aspect’ tab then choose the aspect from which you are taking a photograph. N-S (North to South) or E-W (East to West).

When an option is successfully entered the ‘Review’ prompt will disappear.

- Next, click on the ‘paperclip’ icon (see red arrow, Figure 3.25) at the top of the ‘Related’ tab.

The ‘Attachments’ menu will now appear on the right of the screen (Figure 3.26).

- To take a photograph click on the green camera icon near the top right of the ‘Attachments’ screen (Figure 3.26).

> **NOTE:**
> The first time you use the camera function a popup will ask for permission to use the camera (such as the example in Figure 3.26). Press OK to allow the use of the iPad camera.

- Take a photo as per EES manual guidance, and when satisfied press the ‘Use Photo’ button on the camera screen of your device.

After a short time, the image file will appear in the ‘Attachments’ menu (Figure 3.26). it will have a numerical name and be in jpg format, 1234567890.jpg for example.

> **IMPORTANT:**
> Press on the file name to view the image and check that the quality is acceptable.
>
> Press the bin icon to delete and retake the photo.

Do not use options within ‘+ Add New’ tab to add photos from the device’s main camera app or from the device photo library as file naming conventions differ.

- When you are happy with your photograph press the X in the top right of the ‘Attachments’ tab (Figure 3.26) to exit the ‘Attachments’ screen.

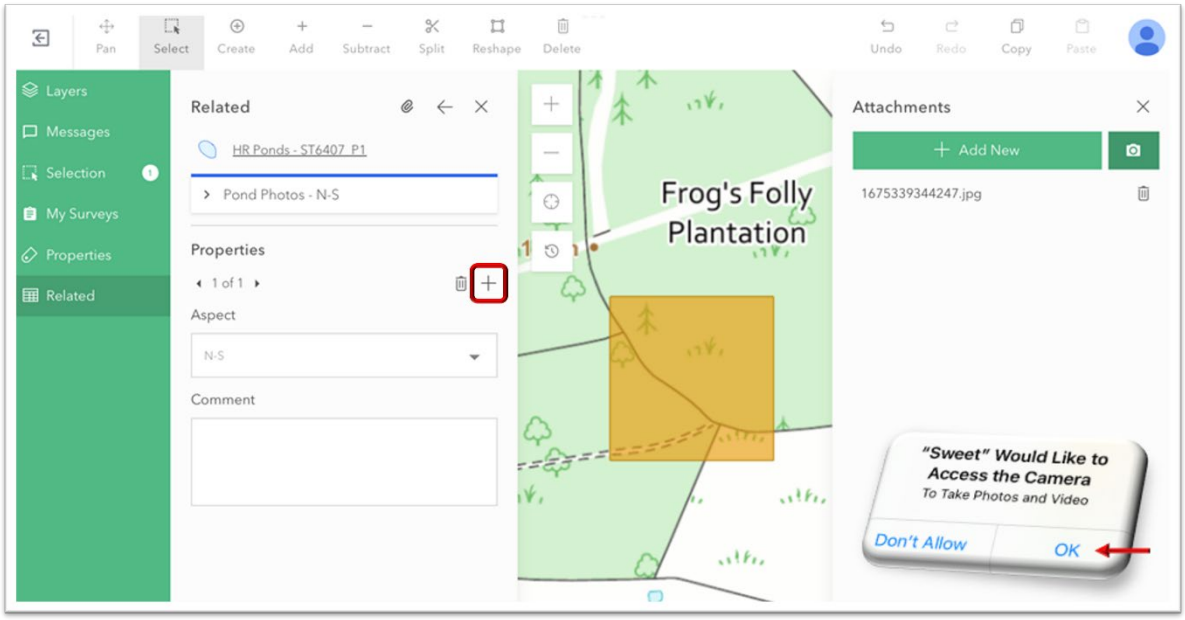



**Figure 3.26**: Image of the 'Related' 'HR Ponds' photos tab expanded. The 'Attachments' tab showing an image file is to the right of the screen. A green camera icon is located towards the top right of the attachments tab. A popup notice asking for permission to use the camera is visible at the bottom right of the image with an arrow pointing to 'OK'.

The survey element you are working on may require several photographs (where it's possible and safe). For example, the HR Pond survey asks that you take two photos from different aspects, N-S and E-W (per pond). So, if for example you have completed the N-S aspect photograph you then need to press the **+** icon (Figure 3.26) again and choose E-W from the drop-down menu. You then repeat the 'Attachments' process for the second aspect photograph.

The Various EES survey elements will differ in the quantity and type of photographs that are requested; however, the principle of attaching photographs remains the same. The EES Survey manual and the 'Review' prompt will provide survey specific guidance.

# 4 SURVEYING THE SQUARE AND STANDS

Vegetation Plot survey and Square and Stand survey are interrelated. It is important to fully understand all three survey methodologies before inputting survey data.

**Before inputting any survey data check that:**

- ✓ You have downloaded and opened your assigned monad
- ✓ You have selected 'Work on Survey'

> **NOTE:**
> Failure to carry-out the Initial Monad Download and Survey Setup steps can lead to survey data loss.

Up to six 1ha$^2$ squares (four standard and two targeted) can be completed within a monad. The minimum number for a viable monad is two standard 1ha$^2$ squares. The appropriate number of 1ha$^2$ squares are already placed at fixed locations in your monad (dependant on the amount of land accessible for survey and the priority habitats present) and can be seen when you first download the monad area (Figure 3.0).

> **NOTE:**
> Initially the Square is filled with a single Stand called the Default Stand, it covers the entire 1ha$^2$ Square.
>
> Default Stand is split into the required number of stands which is determined during the survey.

Within the Sweet app the 1ha$^2$ perimeter Square is defined by a dark orange line, the Stand is the lighter orange shaded area within the Square (Figure 4.1).

> **NOTE:**
> It can be hard to differentiate the dark orange Square boundary from the shaded, lighter orange stand area.
>
> Figure 4.1 more clearly shows the 1ha$^2$ Square as a blue line after it has been selected using the selection tool.

You can sub-divide each 1ha$^2$ Square into multiple broad habitat types called Stands by 'Splitting' the default Stand into multiple smaller Stands.

For example, the 1ha$^2$ Square may predominantly be neutral grassland but have a distinct area of scrub habitat and a wet flush habitat. Within the Sweet app you would split the default stand by habitat type to create two new stands of scrub and of wet flush. The remaining area of the default stand would be a stand of neutral grassland.

If the 1ha$^2$ square is all the same habitat, then the entire Square is one Stand and there is no need to split the default 1ha$^2$ Stand. (Refer to the EES manual for appropriate survey methodology).

> **TIP:**
> Refer to the appropriate Guidance Video before attempting to create your stands.

You also need to place one 2m x2m Vegetation Plot within each 1ha$^2$ Square. The Vegetation Plot survey is a separate protocol (Section 5) but is interrelated with the 1ha$^2$ Square survey.

## 4.3 WORKFLOW FOR 'SURVEYING THE SQUARE' WITHIN THE SWEET APP

Adding data for the Survey Square and Stand elements is a little different than with the other survey elements. See the flow diagram below for the correct workflow. Mapping all the stands and vegetation plot before entering any survey data reduces the risk of having to make changes that result in loss of data.

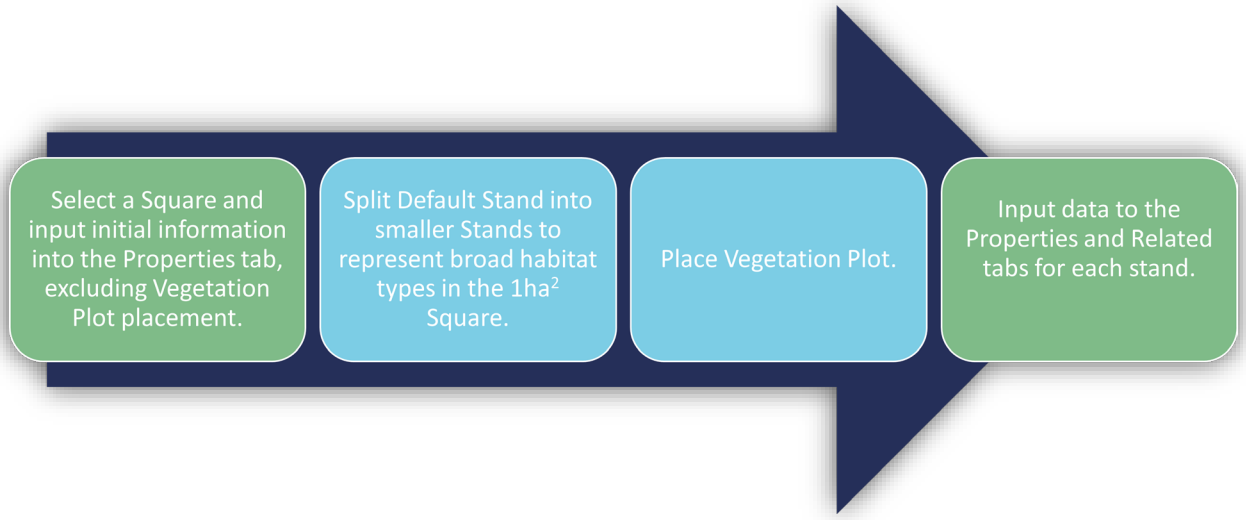



**Figure 4.0:** Image Stand and Square workflow overview

**IMPORTANT**:

All Stands, and the Vegetation Plot should be created within the Square you are working on prior to entering any survey data.

There may be a risk of data loss if stands are edited after survey data has been added. Moving a Vegetation Plot will result in a loss of data for that plot.

To begin 'Surveying the Square':

1. Use the 'Select' tool to select the 1ha$^2$ Survey Square you are working on; this will select the 1ha$^2$ Square and the default Stand.

2. Once selected press and expand the 'Selection' tab from the green menu bar along the left of the screen.

3. Press the Survey Square from the expanded Selection menu to deselect all other items apart from the Square (Figure 4.1).

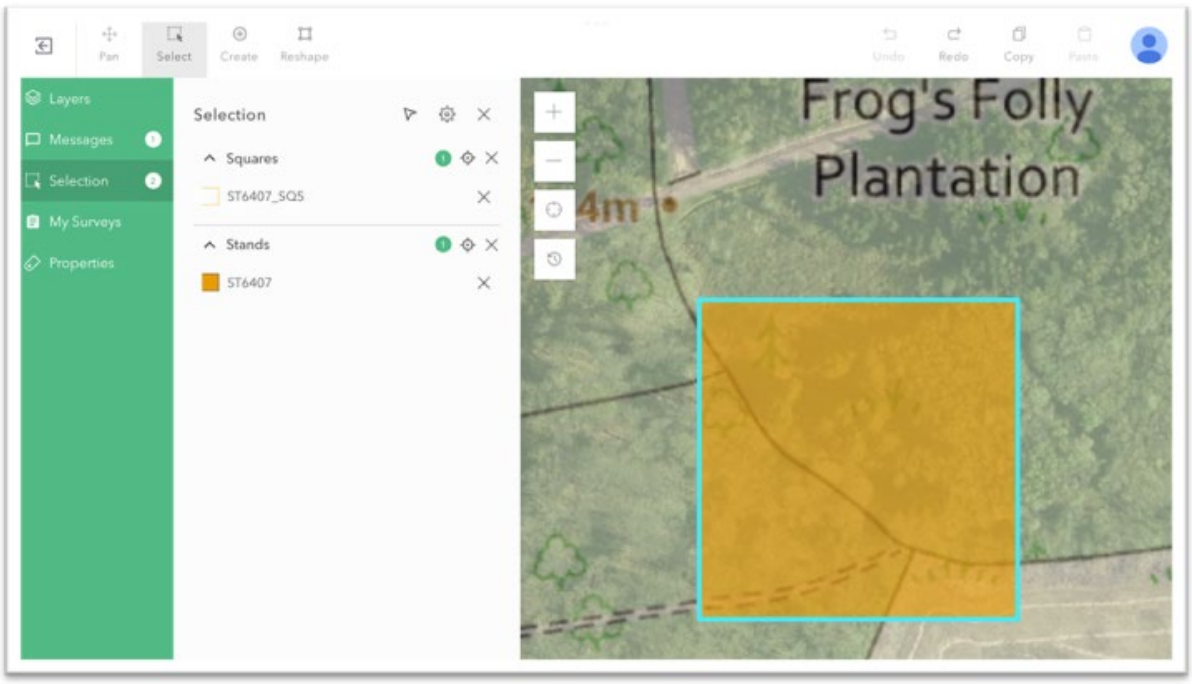



**Figure 4.1**: Image of a 1ha$^2$ Survey Square selected before its associated default stand has been deselected. The orange shaded area is the default stand.

4. Expand the Properties tab from the green menu bar on the left of the screen.

5. Fill out the Properties variables for the Square. It is often simpler to not choose 'Vegetation Plot Placement' yet unless the entire 1ha$^2$ Square is one habitat type and

therefore one Stand. Factors influencing appropriate Vegetation Plot placement may arise when assessing Stand habitats.

> **NOTE:**
> You can also switch off the Vegetation Plot and other layers to help drawing to the map. Remember to switch them back on afterwards if you do.

6. The Related tab for the Square, when pressed, takes you to a combined Properties and Related variables menu for the default Stand. If the entire 1ha$^2$ Square is a single Stand you can use this menu option to input its variables.

## 4.4 DIVIDING THE SQUARE INTO TWO OR MORE STANDS.

> **IMPORTANT:**
> if the Stand's broad habitat is arable, a land use of 'crop' must be set in 'related' and then crop type can be specified. This is a requirement to pass progress checks

There are several tools that can be used to divide a Square into multiple stands and edit stand boundaries. The 'Add', 'Subtract', 'Split', 'Reshape' and 'Delete' tools only appear in the top left of the screen when a single stand is selected. These are the standard tools available in Sweet for drawing polygons but not all are applicable to Stand-drawing because there can be no blank space within the 1ha Square.

> **NOTE:**
> The Split tool is the default tool used to divide a stand into smaller sections. Refer to Section 3.10 for details on the appropriate selection and use of drawing tools.

Another option for Stand-drawing is to use the 'Create tool'. This is useful for drawing 'island' stands where the habitat patch is fully contained within the square. The Create tool can also be used without having to select a single stand first. More detail on the use of tools is in Section 3.9, and in the related Guidance Video.

> **NOTE:**
> There is never 'empty space' within the Square, any area left undrawn will remain as part of the default stand and will require appropriate habitat data input.

Once you have identified how many Stands are present within the 1ha$^2$ Square you need to create the Stand areas within Sweet. The Default stand which covers the entire 1ha$^2$ Square is labelled as Stand 'A' each subsequent stand created is labelled as 'B', 'C', 'D' etc.

**NOTE:**

The minimum mappable area for a stand is 20x20m. Certain 'small habitats' can be mapped even if the area is less than 20x20m.

If you draw a stand below the minimum mappable area, you will only have the option to select one of the 'small habitats' in the 'broad habitat' field.

The primary tool used to create stands is the 'Split' tool. This is used to divide the 'Default stand' into broad habitats. For more details on this process see the associated Guidance Video.

**NOTE:** Base maps can be used as a point of reference for your ground-truthed input.

## 4.5 USING THE SPLIT TOOL TO CREATE HABITAT STANDS:

1. Select the Default Stand.
2. Select the 'Split' tool from the top toolbar (Figure 3.19). You will use the Split tool to create a polygon around the area you want to become a new habitat stand.
3. Select an appropriate drawing tool from the drawing tools tab on the left toolbar (Figure 3.16). Refer to Section 3.10 for more information on drawing tools.
4. Place your first node beyond the extent of the square. Draw your polygon ensuring the shaded element covers the full area of the Default Stand that you want to become a new habitat stand (Figure 4.2).

Refer to the Guidance Video for further information on stand drawing.

**NOTE:**

Care must be taken when drawing within the 1ha$^2$ Square to ensure the Stand area is accurately represented.

5. Complete any polygon by drawing beyond the extents of the square, this does not need any accuracy as Sweet will ‘Snap’ your drawing to the limits of the Square (Figure 4.2).

> **NOTE:**
> It is essential that there is a gap between the first and last node of any polygon drawn. Sweet will automatically complete your polygon.

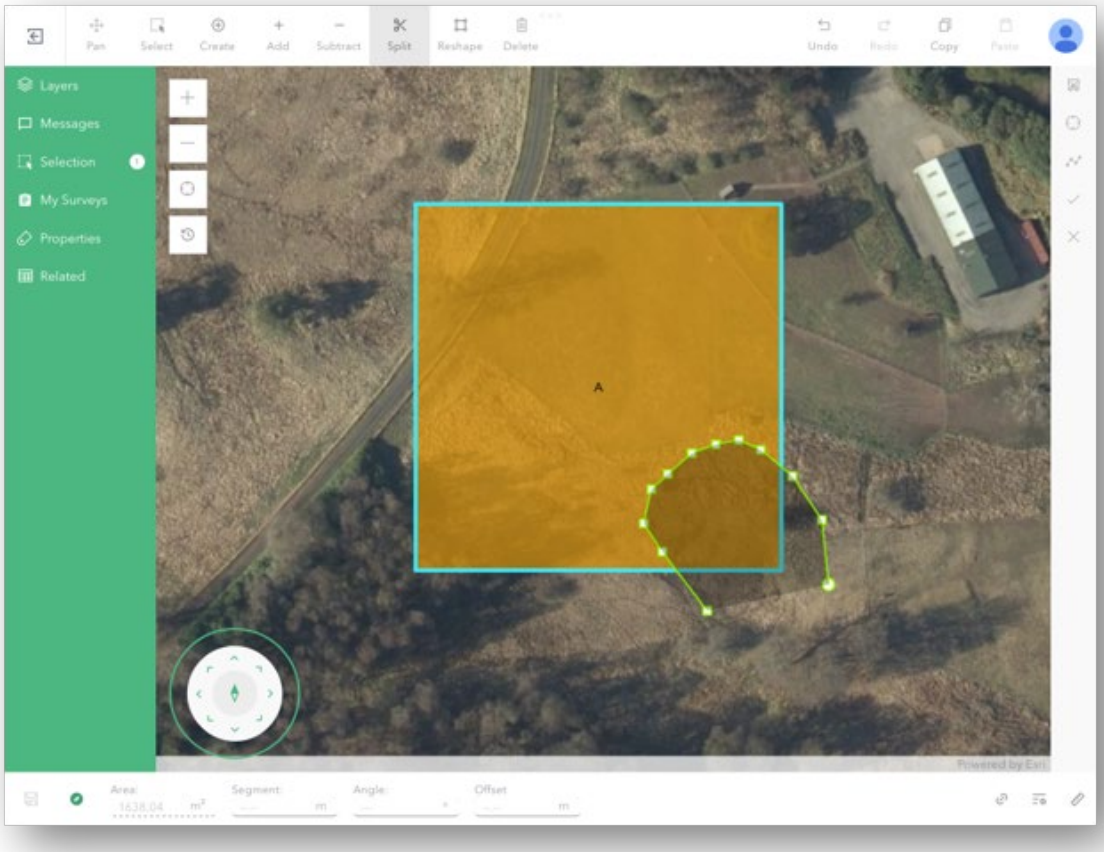



**Figure 4.2:** Using the Split Tool to create a habitat stand. This polygon follows all the geometry rules. Area of the new stand is displayed in the bottom toolbar.

6. Press the Tick button on the left toolbar to confirm your split or press the X symbol to redraw it.

7. Changes will be automatically saved. If required use the ‘Undo’ button from the top toolbar to undo the split.

**NOTE:**

If you draw a Stand that overlaps another Stand, Sweet will ‘Reshape’ the existing Stand based on the overlap you have drawn.

## 4.6 USING THE SPLIT TOOL TO SPLIT EXISTING STANDS:

1. Select the stand you wish to split.
2. Select the ‘Split’ tool from the top toolbar
3. Select an appropriate drawing tool from the drawing tools tab on the left toolbar (Figure 3.16).
4. Draw a polygon that corresponds to the shape of the newly split Stands you wish to create (Figure 4.3).
5. Press the Tick button on the left toolbar to confirm your split.
6. Changes will be automatically saved. If required use the ‘Undo’ button from the top toolbar to undo the split.

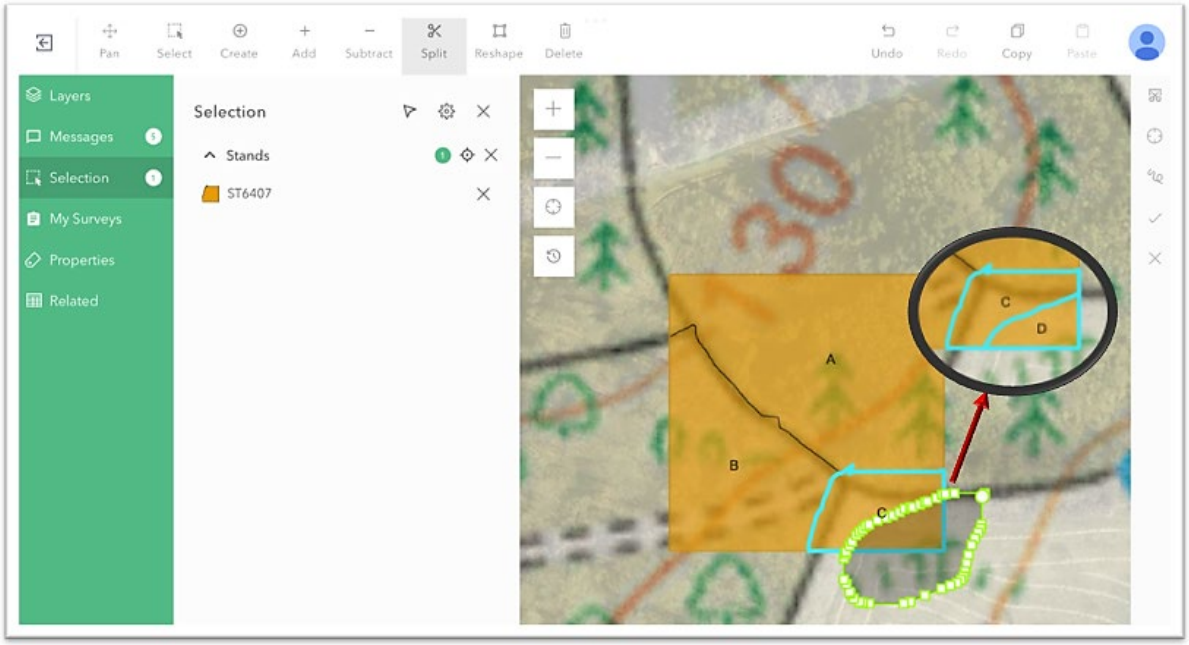



**Figure 4.3**: Image of a polygon created using the Split tool to split a Stand into to two Stands. Inset is an image of the split Stands once the tick button has been pressed to confirm the split.

## 4.7 USING THE CREATE TOOL TO CREATE STANDS

The create tool should only be used to create stands when it is not possible to use the split tool. For example, for drawing an 'island habitat' such as a wet flush in the middle of the square, where none of the habitat touches the edge of the square.

The Create tool is less stable for drawing Stands and could lead to issues within the App.

To create new stands using the create tool:

1. With only the 1ha$^2$ Square selected, press the 'Create' button located towards the left of the top toolbar.

2. A 'Choose' button will then appear to the right of the 'Create' button.

3. Press the 'Choose' button to open the 'Choose' tab at the right of the screen.

4. From the 'Choose' tab expand the 'Stand' dropdown menu. Press the Stand icon to select it.

5. Choose the most appropriate drawing tool from the right-hand tool bar (Figure 3.16).

6. When the Stand icon is chosen the 'Choose' menu will minimise ready for you to draw your stands on the map screen as polygons.

> **NOTE:**
> The following message will appear confirming the creation of a new stand:
> 'Your split has caused additional features to be created and a new feature to be added'.

7. When you have completed a Stand polygon press the 'Tick' symbol to place it or press the X symbol to redraw it. (Refer to Section 3.10 for more detail on the use of the drawing tools).

When all stands have been drawn, select the 1ha$^2$ Square to place the Vegetation Plot from the 'Square' 'Properties' tab.

> **NOTE:**
> If you draw a Stand that overlaps another Stand Sweet will 'Reshape' the existing Stand based on the overlap, you have drawn.

To input survey data from the Selection tab menu, select a Stand you wish to work on, this will deselect all other items and reveal the 'Properties' and 'Related' tabs that require completion for that specific Stand.

## 4.8 REMOVING STANDS

After a Stand has been drawn it cannot be deleted using the Delete tool. However, adjacent Stands can be Merged. You can Merge several smaller Stands to form a larger Stand, or merge all Stands to effectively return the Square to its default single Stand state.

> **IMPORTANT:**
> Merging stands will delete ALL survey data from the Stands that have been merged.

To Merge stands:

1. Use the Select tool to select all Stands within the Square.
2. Expand the Selection tab from the green menu bar on the left of the screen.
3. Deselect the Survey Square using the 'X' icon to the right of the square reference name.

> **NOTE:**
> If you cannot see the Square reference name use the ∨ arrow next to the Squares tab to expand it.

4. Deselect all Stands you DO NOT wish to merge. Use the '**v**' arrow next to the Stands tabs to expand it if necessary.
5. When only the Stands you wish to merge remain in the Select tab press the 'Merge' tool from the top toolbar.

> **NOTE:**
> Note: the merge tool only becomes visible when it can be used, i.e., when multiple adjacent stands are selected and no other feature of a different type (e.g., the Square) is selected.

6. A Popup will appear to warn of data loss from merging Stands. Press OK to confirm the merge.

The merge tool will not appear if you select two stands that can't be merged i.e., if they are separated by another Stand.

## 4.9 RESHAPING STANDS

You can reshape a Stand in the same way as all polygons are reshaped within the Sweet app.

1. Using the select tool as previously explained, isolate the Stand you want to manipulate.

2. Press the' Reshape' button from the top toolbar.

3. Nodes will appear on the selected Stand polygon. Zoom in to see individual nodes along the polygon.

4. Pressing a node will select it and activate a magnifier so that you can more accurately place the node in a new position (Figure 4.4).

5. You can delete a selected node by pressing the Bin icon near the bottom of the map screen at the centre.

6. Use the 'Undo' button from the top toolbar to undo the last moved node.

7. When you have finished reshaping the Stand press the Select tool to exit the Reshape tool.

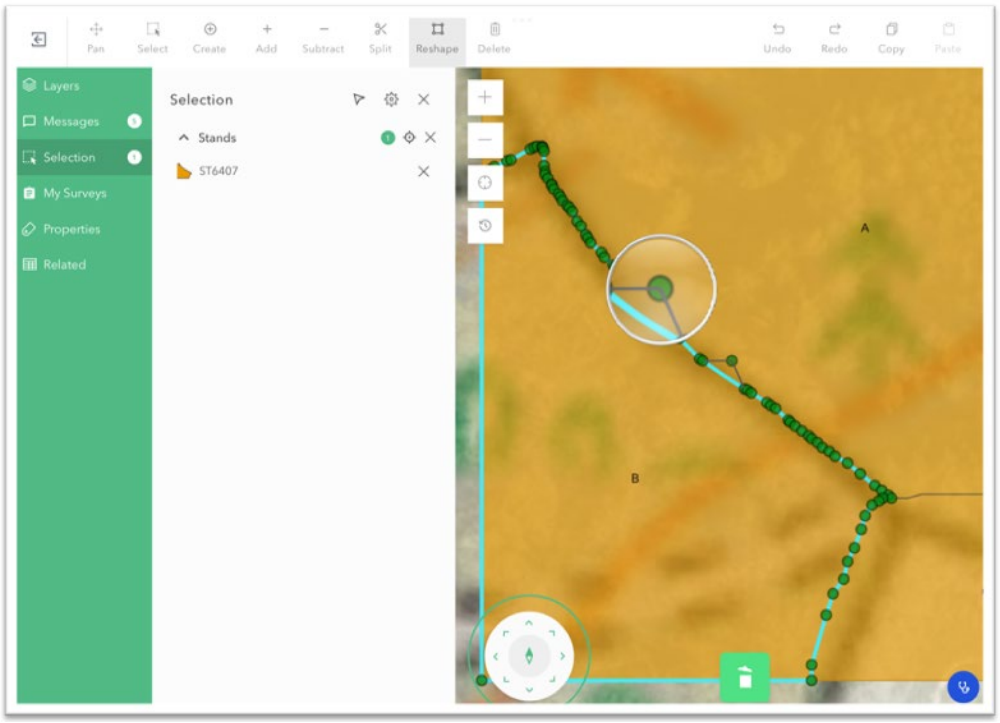



**Figure 4.4**: Image of a magnified node when reshaping a Stand. The bin icon for deleting nodes is at the bottom of the map screen.

## 4.10 INPUTTING STAND DATA

**IMPORTANT:**

Data is inputted to the Square feature and each of the stands separately.

Select each stand in turn, then expand the Properties and Related tabs to input data.

Things to note when inputting Stand Properties and Related data:

- Data input fields within the 'Properties' tab only appears once the Accessibility variable has been completed because the survey data is conditional to Accessibility.
- Data input fields should be filled in sequentially as data inputted will affect subsequent field and attribute visibility.
- The component habitat within the Stands Related tab must always be filled out. If only one habitat type is present, add this habitat as the only component habitat with a cover of 100%.

**IMPORTANT**:

If an area of land within the Square has no access permission and is less than the Minimum Mappable Area (MMA) of 400m$^2$ or 20x20m, you must map this as an inaccessible and not visually assessable Stand.

All land within the Square must be accounted for within Sweet, including areas that have no access permission and are below the MMA.

This is the only exception where data still needs to be inputted for land that is less than the Minimum Mappable Area.

1. Press the 'Properties' tab to expand it from the green menu bar on the left of the screen. You will then see a table of attributes to complete for the selected survey type.
2. Press the X button at the top right of the Properties tab to exit the tab.

Refer to Section 3.11 for more complete guidance for the Properties tab

3. Press the 'Related' tab from the green menu bar on the left of the screen to reveal survey data variables to be completed.

4. Each variable has a + sign to expand it. Once a variable is expanded you have the option to add multiple records

5. Press the + button at the right of the ‘Related’ variable you want to work on to expand it and reveal the data to collect.

6. To add further data for a specific variable, press the + button to the right of the bin icon in the properties section of the variable to repeat the process.

7. Once all survey data has been recorded for the specific variable, exit the attribute tab in the ‘Related’ section by pressing the back arrow.

8. Press the X button at the top right of the ‘Related’ tab to exit the tab back to the main map screen.

Refer to Section 3.11 for more complete guidance for the Related tab

For guidance on attaching photographs to your survey form refer to Section 3.12.

Remember to ‘Sync’ your survey data when you have a stable data connection by returning to the ‘Assignments’ screen and clicking ‘synch’ on the appropriate monad.

# 5 VEGETATION PLOT SURVEY

Vegetation Plot survey and Square and Stand survey are interrelated. It is important to fully understand all three survey methodologies before inputting survey data.

**Before inputting any survey data check that:**

- ✓ You have downloaded and opened your assigned monad
- ✓ You have selected 'Work on Survey'

> **NOTE:**
> Failure to carry-out the Initial Monad Download and Survey Setup steps can lead to survey data loss.

## 5.1 VEGETATION PLOT PLACEMENT

One 2m x 2m Vegetation Plot is placed within each of the 1ha$^2$ Squares. There are four standard and two targeted squares per monad (refer to the EES survey manual for detailed guidance).

The default Vegetation Plot location is at the centre of the 1ha$^2$ Square. There is some scope to move the location within predefined parameters, however, in some instances, it may not be possible to place a Vegetation Plot at all.

> **IMPORTANT:**
> It is best practice to draw All Stands and place the Vegetation Plot prior to entering any survey data. There may be a risk of Stand data loss if stands are edited after survey data has been added.
>
> Moving a Vegetation Plot will result in the loss of data for that plot if any has been entered.

To place a Vegetation Plot:

1. Use the 'Select' tool to select the 1ha$^2$ Survey Square you are working on; this will select the 1ha$^2$ Square and the default Stand.

2. Once selected press and expand the 'Selection' tab from the green menu bar along the left of the screen.

3. Press the Survey square from the expanded Selection menu to deselect all other items apart from the Square (Figure 4.0).

4. With only the 1ha$^2$ Square selected, press the Properties tab from the green menu bar on the left to expand it.

5. Navigate to the Vegetation Plot Placement field and press the **v** arrow on the right of the field to expand it

6. From the drop-down menu select the appropriate location point for the Vegetation Plot (Figure 5.0).

7. Two popup messages will appear sequentially. Message one is: ‘’This action will delete any existing vegetation plot in this square’, press, ‘Continue’ to confirm. Message two is: ‘Please fill out the Vegetation Plot and create up to 9 vegetation surface related records’, Press ‘OK’ to confirm.

The Vegetation Plot square will now appear on the map at the specified location within the 1ha$^2$ Survey Square.

## 5.2 VEGETATION PLOT DATA INPUT

Select the correct Vegetation Plot and input survey data to the ‘Properties’ and ‘Related’ tabs.

1. Press the ‘Properties’ tab to expand it from the green menu bar on the left of the screen. You will then see a table of attributes to complete for the selected survey type.

2. Press the X button at the top right of the Properties tab to exit the tab.

Refer to Section 3.11 for more complete guidance for the Properties tab

3. Press the ‘Related’ tab from the green menu bar on the left of the screen to reveal survey data variables to be completed.

4. Each variable has a **+** sign to expand it. Once a variable is expanded you have the option to add multiple records

5. Press the **+** button at the right of the ‘Related’ variable you want to work on to expand it and reveal the data to collect.

6. To add further data for a specific variable, press the + button to the right of the bin icon in the properties section of the variable to repeat the process.

7. Once all survey data has been recorded for the specific variable, exit the attribute tab in the ‘Related’ section by pressing the back arrow.

8. Press the X button at the top right of the ‘Related’ tab to exit the tab back to the main map screen.

Refer to Section 3.11 for more complete guidance for the Related tab

For guidance on attaching photographs to your survey form refer to section 3.12.

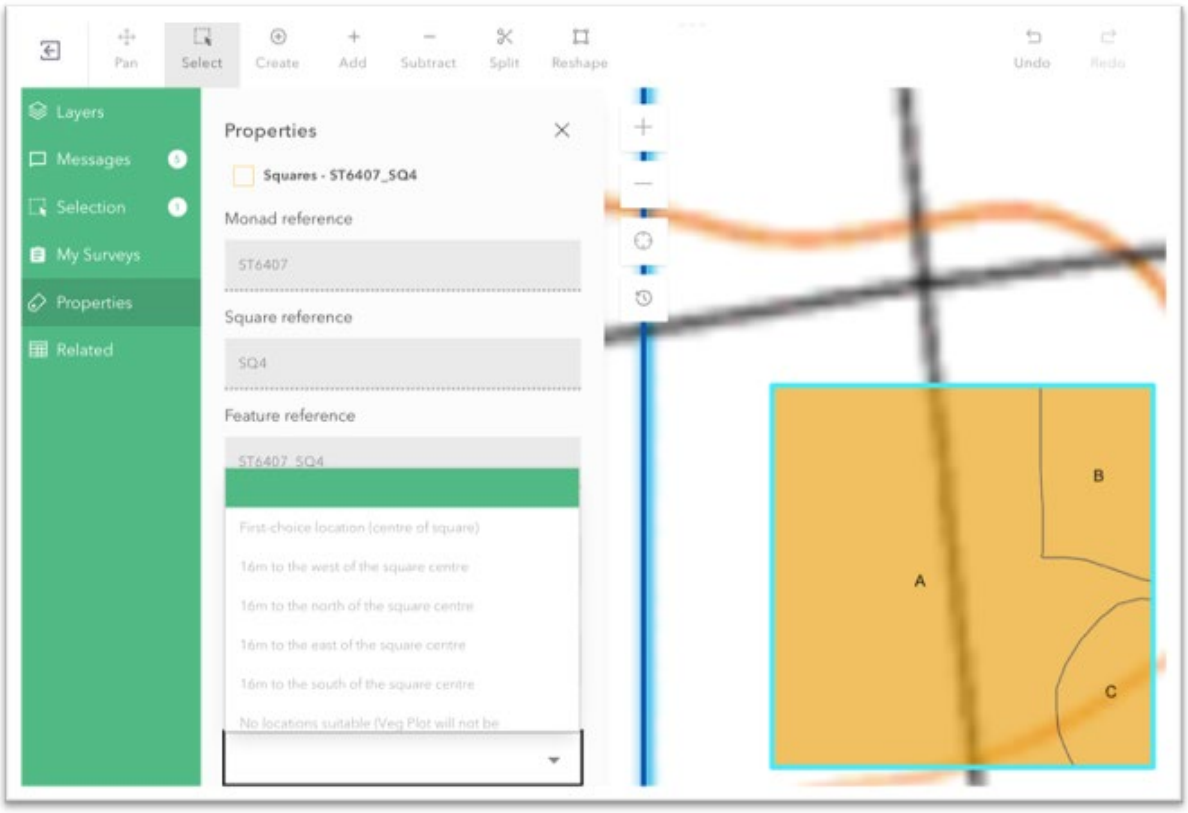



**Figure 5.0**: Image of the Squares properties tab expanded, and the Vegetation Plot chooser drop down menu showing plot placement options

Remember to ‘Sync’ your survey data when you have a stable data connection by returning to the ‘Assignments’ screen and clicking ‘synch’ on the appropriate monad.

# 6 HIGH RESOLUTION (HR) HEDGEROW SURVEY

**Before inputting any survey data check that:**

- ✓ You have downloaded and opened your assigned monad
- ✓ You have selected 'Work on Survey'

> **NOTE:**
> Failure to carry-out the Initial Monad Download and Survey Setup steps can lead to survey data loss.

Up to four HR Hedgerow surveys can be completed within a monad. Each High-Resolution Hedgerow Survey is comprised of two components.

- A 30m linear survey of a section of hedgerow.
- A 2m x 4m vegetation plot survey along the base of the hedgerow at centre of the 30m survey section.

## 6.1 HEDGEROW SURVEY: 30M LINEAR SECTION

1. Press the 'Create' button located towards the left of the top toolbar.
2. A 'Choose' button will then appear to the right of the 'Create' button.
3. Press the 'Choose' button to open the 'Choose' tab at the right of the screen.
4. From the 'Choose' tab expand the 'Hedgerow Plots' dropdown menu. H1 in the submenu relates to plot 1, H2 to plot 2, etc. Press your desired plot number to select it. To place the plot press on the map where you want the start of the Hedgerow Plot to appear. You can place up to 4 hedgerow Plots within a monad (refer to the EES Survey manual for the appropriate placement of plots).
5. Select the appropriate drawing tool (refer to Section 3.10) to draw a linear hedgerow feature at the survey location in accordance with the EES Survey Manual.

> **NOTE:**
> The EES Sweet app preselects whether a polyline or polygon can be drawn, based on the survey type selected.

6. A popup box should appear showing the current plot length to assist with drawing (Figure 6.0). If you have drawn a plot longer than 30m it will automatically be trimmed down from the last point you added to exactly 30m.

**IMPORTANT:**

Do not use the ‘Reshape’ or ‘Split’ tools to move or adjust the Hedgerow polyline, it will lose its 30-metre length accuracy.

If you need to move the polyline delete it and redraw it.

7. From the toolbar on the right, press the tick icon to add the plot or ‘X’ icon if you want to redraw your polyline.

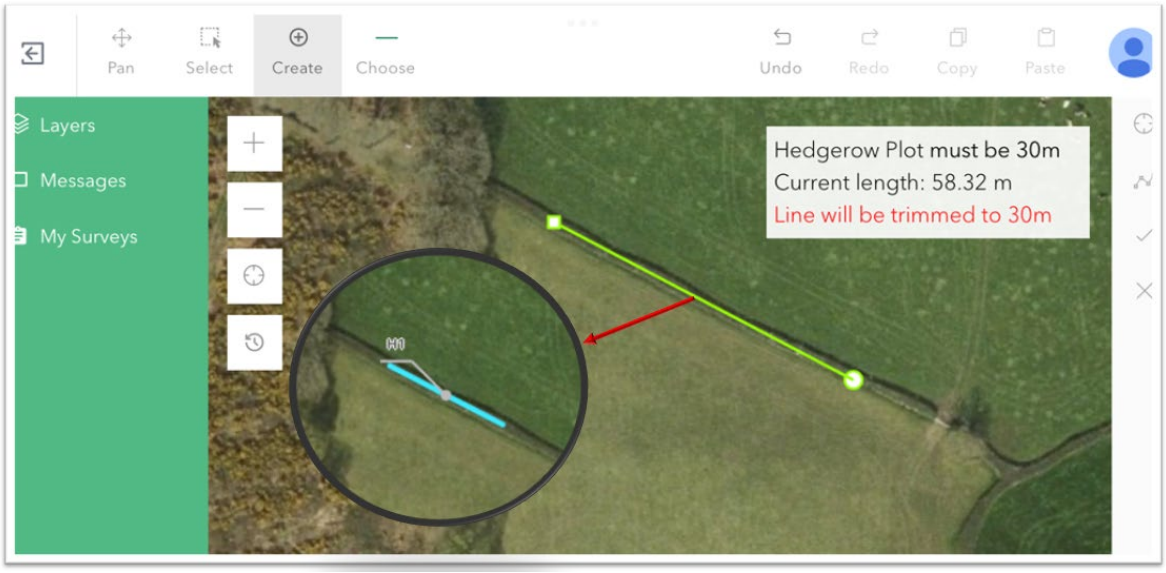



**Figure 6.0**: Image of Hedgerow Plot creation with inset image of polyline automatically trimmed to 30m

When your polyline has been added to the map you will be able to expand and input survey data into the ‘Properties’ tab and the ‘Related’ tab which should now be visible on the green menu bar on the left of the screen.

9. Press the ‘Properties’ tab to expand it from the green menu bar on the left of the screen. You will then see a table of attributes to complete for the selected survey type.

10. Press the ‘X’ button at the top right of the Properties tab to exit the tab.

Refer to Section 3.11 for more complete guidance for the Properties tab

11. Press the ‘Related’ tab from the green menu bar on the left of the screen to reveal survey data variables to be completed.

12. Each variable has a + sign to expand it. Once a variable is expanded you have the option to add multiple records

13. Press the + button at the right of the ‘Related’ variable you want to work on to expand it and reveal the data to collect.

14. To add further data for a specific variable, press the + button to the right of the bin icon in the properties section of the variable to repeat the process.

15. Once all survey data has been recorded for the specific variable, exit the attribute tab in the ‘Related’ section by pressing the back arrow.

16. Press the ‘X’ button at the top right of the ‘Related’ tab to exit the tab back to the main map screen.

Refer to Section 3.11 for more complete guidance for the Related tab

For guidance on attaching photographs to your survey form refer to section 3.12.

## 6.2 HEDGEROW SURVEY: 2M X 4M GROUND FLORA SURVEY

To add a 2m x 4m hedgerow ground flora vegetation plot at the centre of the 30m linear hedgerow survey section you must create a ‘Hedgerow Point Plot’.

1. From the toolbar at the top of the screen press ‘Create’. The ‘Choose’ icon will then appear next to the ‘Choose’ icon. Press ‘Choose’ to expand the Choose tab on the right of the screen.

2. Press ‘Hedgerow Point Plot’ to expand its menu and press the green square next to ‘Hedgerow Point Plot’ to select it.

> **TIP:**
> You may find it useful to temporarily switch off all base layers to get a better view of the 30m hedgerow polyline.

3. Refer to the EES Manual for guidance on how to lay out the plot.

4. Place the Hedgerow Point Plot feature at any corner of the 2m x 4m plot. This is normally the Southwest corner, but it can be another corner if this is inaccessible. Clearly mark which corner on the accompanying sketch map.

5. Sweet shows a green buffer of 2.5m around the mapped 30m linear hedge plot. the Hedgerow Point Plot can only be placed in this area. A labelled point will give a visual guide to the central position.

It is the plot corner which needs to be marked, not the plot centre so ensure you use GPS to mark this accurately and don’t rely on the map visuals.

**IMPORTANT:**

In the current version Sweet, the hedgerow plot will not automatically snap to the centre of the 30m section of Surveyed hedgerow.

If you have the snapping function turned on, your vegetation plot will automatically snap to the linear feature upon placement and not within the buffer zone.

6. With the Hedgerow Point Plot selected, input survey data to the 'Properties' and 'Related' tabs as per Section 3.11. For guidance on attaching photographs to your survey form refer to section 3.12.

## 6.3 DELETING HEDGEROW PLOTS:

To delete a Hedgerow plot do the following:

1. Select the point you want to delete.

2. Press the 'Delete' tool from the top toolbar

   - If you delete a linear Hedgerow Plot that has an associated Hedgerow point plot, that point plot and its related data will also be deleted.

   - When a Hedgerow Point Plot has been placed onto a linear Hedgerow Plot, the linear Hedgerow Plot cannot be relocated unless the point plot is first deleted, this will also delete all Hedgerow Point Plot data for that point.

   - You cannot move a Hedgerow Point Plot once it has been placed on the map. You can delete and replace it, but you will lose any associated data.

**NOTE:**

Deletion is immediate, you will not be prompted to confirm your choice. You can however press 'Undo' from the top toolbar to restore the deleted item.

When you have completed ALL hedgerow surveys for your monad, expand the 'My Surveys' tab from the green menu bar on the left of the screen, scroll to the 'Hedgerow Plots' menu and select 'Survey Completed'.

Remember to 'Sync' your survey data when you have a stable data connection by returning to the 'Assignments' screen and clicking 'synch' on the appropriate monad.

# 7 TREES OUTSIDE OF WOODLAND (TOW) – LONE TREES

**Before inputting any survey data check that:**

- ✓ You have downloaded and opened your assigned monad
- ✓ You have selected 'Work on Survey'

> **NOTE:**
> Failure to carry-out the Initial Monad Download and Survey Setup steps can lead to survey data loss.

Up to twelve Lone Tree point plots for Trees outside of Woodland (ToW) can be surveyed within a monad. A representative selection of trees should always be recorded if present, but the focus is on broad-leaved trees plus Yew and Juniper conifers.

Do not record any tree twice. For example, if a tree has already been recorded as Tree In-Feature, (a tree that can be associated with a hedgerow, Riparian or Pond habitat (refer to Chapter 8, Trees In-Feature) do not also record it as a lone tree. Conversely, if you have already recorded a lone tree next to a feature such as a pond, do not record the same tree again as a Tree In-Feature.

If there are a limited number of trees within a monad, Lone tree recording takes priority over recording the same tree as a Tree In-Feature. (Refer to the EES manual for appropriate survey methodology).

You can choose to record a Tree In-Feature as a lone tree if you feel it would be better represented as a Lone tree within the context of the monad.

## 7.1 TREES OUTSIDE OF WOODLAND: CREATING A PLOT AND INPUTTING DATA

1. Press the 'Create' button located towards the left of the top toolbar.

2. A 'Choose' button will then appear to the right of the 'Create' button.

3. Press the 'Choose' button to open the 'Choose' tab at the right of the screen.

4. From the 'Choose' tab expand the 'Lone Trees' dropdown menu (Figure 7.0). LT1 in the submenu relates to plot 1, LT2 to plot 2, etc. Press your desired plot number to select it. To place the plot press on the map where you want it to appear. You can place up to 12 Lone Tree Plots within a monad (refer to the EES Survey manual for the appropriate placement of plots).

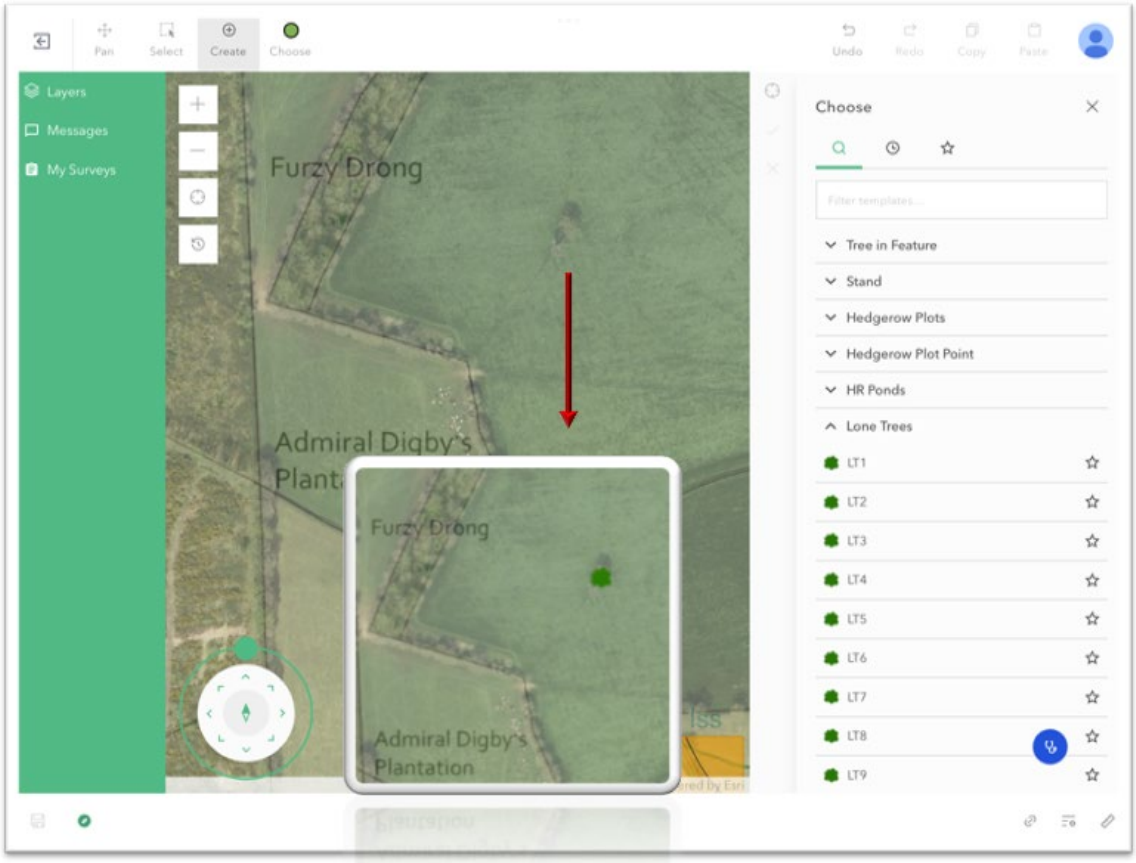



**Figure 7.0**: image of the ‘Choose’ tab on the right of the Sweet map screen, inset is an arrow pointing down to a Lone Tree plot point placed on the map.

With the correct Lone Tree Plot selected, input survey data to the ‘Properties’ and ‘Related’ tabs.

5. Press the ‘Properties’ tab to expand it from the green menu bar on the left of the screen. You will then see a table of attributes to complete for the selected survey type.

6. Press the X button at the top right of the Properties tab to exit the tab.

Refer to Section 3.11 for more complete guidance for the Properties tab

7. Press the ‘Related’ tab from the green menu bar on the left of the screen to reveal survey data variables to be completed.

8. Each variable has a + sign to expand it. Once a variable is expanded you have the option to add multiple records

9. Press the + button at the right of the ‘Related’ variable you want to work on to expand it and reveal the data to collect.

10. To add further data for a specific variable, press the + button to the right of the bin icon in the properties section of the variable to repeat the process.

11. Once all survey data has been recorded for the specific variable, exit the attribute tab in the ‘Related’ section by pressing the back arrow.

12. Press the X button at the top right of the ‘Related’ tab to exit the tab back to the main map screen.

Refer to Section 3.11 for more complete guidance for the Related tab

For guidance on attaching photographs to your survey form refer to Section 3.12.

## 7.2 MOVING AND DELETING LONE TREE PLOTS

To Move a Lone Tree Point Plot:

1. Select the point you want to move.

2. select the ‘Reshape’ tool from the toolbar at the top of the screen.

3. Press and hold on your point then drag and drop it to a new location.

To Delete a Lone Tree Point Plot:

3. Select the point you want to delete.

4. Press the ‘Delete’ tool from the top toolbar. Deleting a plot will also delete all associated data.

> **NOTE:**
> Deletion is immediate, you will not be prompted to confirm your choice. You can however press ‘Undo’ from the top toolbar to restore the deleted item.

When you have completed ALL Trees outside of Woodland surveys for your monad, expand the ‘My Surveys’ tab from the green menu bar on the left of the screen, scroll to the ‘Riparian Plots’ menu and select ‘Survey Completed’.

Remember to ‘Sync’ your survey data when you have a stable data connection by returning to the ‘Assignments’ screen and clicking ‘synch’ on the appropriate monad.

# 8 TREES IN-FEATURE

**Before inputting any survey data check that:**

- ✓ You have downloaded and opened your assigned monad
- ✓ You have selected 'Work on Survey'

> **NOTE:**
> Failure to carry-out the Initial Monad Download and Survey Setup steps can lead to survey data loss.

A Tree in Feature (TiF) is a tree that can be associated with a hedgerow, Riparian or Pond habitat.

There is no set limit for the number of Trees in Feature that can be recorded onto the Sweet app so it is important to refer to the EES manual for further guidance on the appropriate use of this survey metric.

Do not record a tree as a Tree in Feature if it already recorded within the Lone Tree survey protocol (Chapter 7).

## 8.1 TREES IN-FEATURE: CREATING A PLOT AND INPUTTING DATA

1. Press the 'Create' button located towards the left of the top toolbar.

2. A 'Choose' button will then appear to the right of the 'Create' button.

3. Press the 'Choose' button to open the 'Choose' tab at the right of the screen.

4. From the 'Choose' tab expand the 'Tree in Feature' dropdown menu. Unlike other point plots, there is no submenu for Tree in Feature plots. To place the plot press on the map where you want it to appear. Refer to the EES Survey manual for the appropriate placement of Tree in Feature plots.

With a Tree in Feature Plot selected, input survey data to the 'Properties' and 'Related' tabs.

5. Press the 'Properties' tab to expand it from the green menu bar on the left of the screen. You will then see a table of attributes to complete for the selected survey type.

6. Press the X button at the top right of the Properties tab to exit the tab.

Refer to Section 3.11 for more complete guidance for the Properties tab

7. Press the 'Related' tab from the green menu bar on the left of the screen to reveal survey data variables to be completed.

8. Each variable has a + sign to expand it. Once a variable is expanded you have the option to add multiple records

9. Press the + button at the right of the ‘Related’ variable you want to work on to expand it and reveal the data to collect.

10. To add further data for a specific variable, press the + button to the right of the bin icon in the properties section of the variable to repeat the process.

When inputting data to the Tree in Feature a popup ‘Review’ box will appear (pressing ‘OK’ on the Review box will do nothing). You must input the survey habitat associated with the Tree in Feature from the drop-down menu into ‘Related feature reference’ tab before you can complete the ‘Properties’ and ‘Related’ tabs (Figure 8.0).

11. Once all survey data has been recorded for the specific variable, exit the attribute tab in the ‘Related’ section by pressing the back arrow.

12. Press the X button at the top right of the ‘Related’ tab to exit the tab back to the main map screen.

Refer to Section 3.11 for more complete guidance for the Related tab.

For guidance on attaching photographs to your survey form refer to section 3.12.

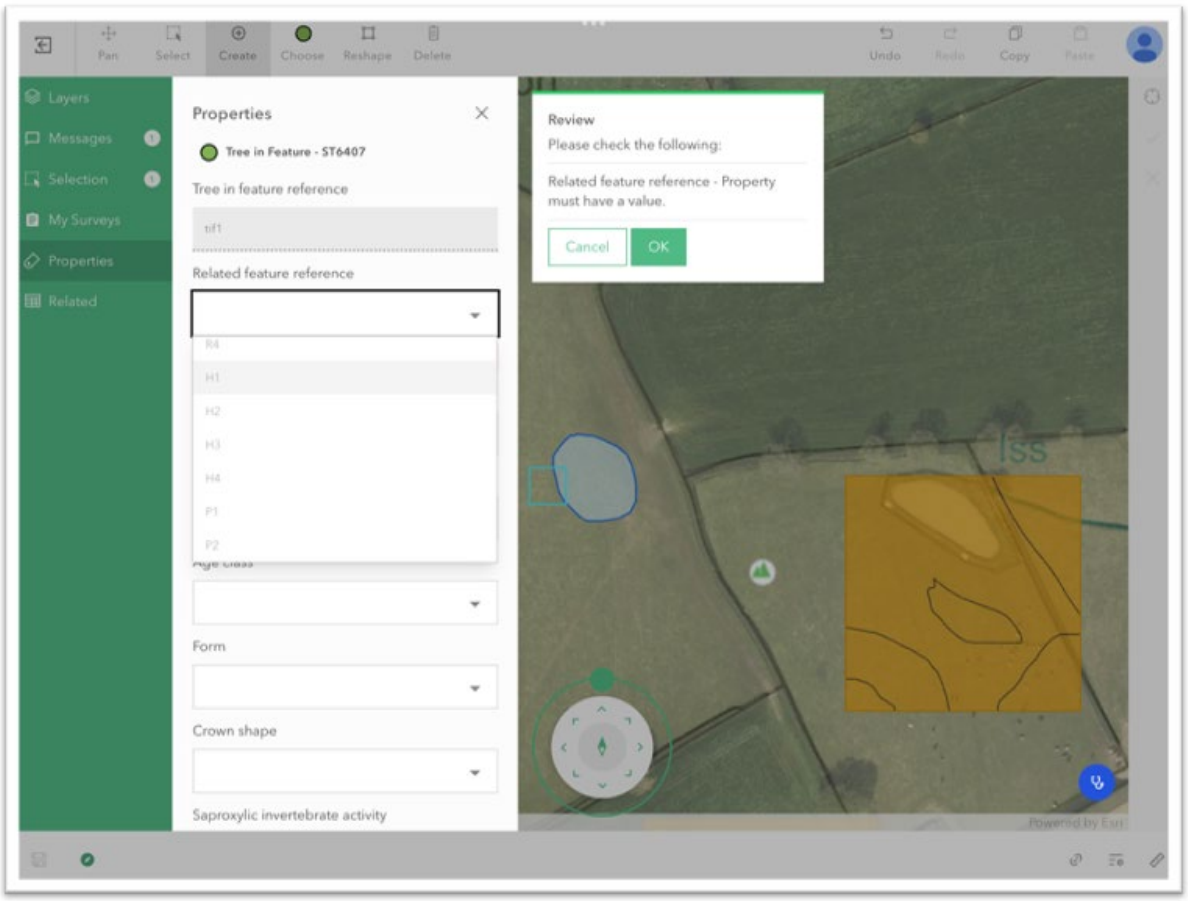


**Figure 8.0**: Image of the Trees in Feature properties tab with the Review box prompting to input data into the Related feature reference tab which is expanded in the image.

## 8.2 TREES IN FEATURE: MOVING AND DELETING PLOTS

To Move a Trees in Feature Point Plot:

4. Select the point you want to move.
5. select the ‘Reshape’ tool from the toolbar at the top of the screen.
6. Press and hold on your point then drag and drop it to a new location.

To Delete a Trees in Feature Point Plot:

5. Select the point you want to delete.
6. Press the ‘Delete’ tool from the top toolbar. Deleting a plot will also delete all associated data!

> **NOTE:**
> Deletion is immediate, you will not be prompted to confirm your choice. You can however press ‘Undo’ from the top toolbar to restore the deleted item.

When you have completed all Trees in Feature survey for your monad, expand the ‘My Surveys’ tab from the green menu bar on the left of the screen, scroll to the ‘Riparian Plots’ menu and select ‘Survey Completed’.

Remember to ‘Sync’ your survey data when you have a stable data connection by returning to the ‘Assignments’ screen and clicking ‘synch’ on the appropriate monad.

# 9 HIGH RESOLUTION (HR) RIPARIAN SURVEY

**Before inputting any survey data check that:**

- ✓ You have downloaded and opened your assigned monad
- ✓ You have selected 'Work on Survey'

The High Resolution (HR) Riparian Survey is a linear survey of a 10m x1m stretch of riparian habitat. You can include up to four HR Riparian Surveys within a monad. Refer to the EES manual for appropriate survey areas and methodology.

## 9.1 RIPARIAN SURVEY: CREATING A PLOT AND INPUTTING DATA

The 10m x 1m linear Riparian plot is mapped using a point feature within Sweet.

Place the Riparian point in the SW corner of the 10m section of habitat you are surveying.

It is essential that this point placement is accurately inputted to Sweet. Use the following point placement location guides:

- ➢ canes
- ➢ markers (if used)
- ➢ A sketch map that reflects the chosen plot corner

**IMPORTANT:**

If the SW corner is unsuitable, you can place the plot in another corner.

It is essential that this alternative plot placement is supported by the placement of canes, markers (if used) and a sketch map.

The point plot must be accurately placed within Sweet.

1. Press the 'Create' button located towards the left of the top toolbar.
2. A 'Choose' button will then appear to the right of the 'Create' button.
3. Press the 'Choose' button to open the 'Choose' tab at the right of the screen.
4. From the 'Choose' tab expand the 'Riparian Plots' dropdown menu (Figure 9.0). R1 in the submenu relates to plot 1, R2 to plot 2, etc. Press your desired plot number to select it. To place the plot press on the map where you want it to appear. You can place up to 4 Riparian Plots within a monad (refer to the EES Survey manual for the appropriate placement of plots).

The 10m x 1m linear Riparian habitat is mapped using a Point Plot within Sweet.

5. Place the Riparian Point Plot in the Southwest corner of the 10m section of habitat you are surveying whenever possible. Refer to Section 9.1 if the Southwest corner is unsuitable.

> **NOTE:**
> Remember to clearly mark which corner the point is place on the plot sketch map.

6. With the correct Riparian Point Plot selected, input survey data to the ‘Properties’ and ‘Related’ tabs as per Section 3.11. For guidance on attaching photographs to your survey form refer to section 3.12.

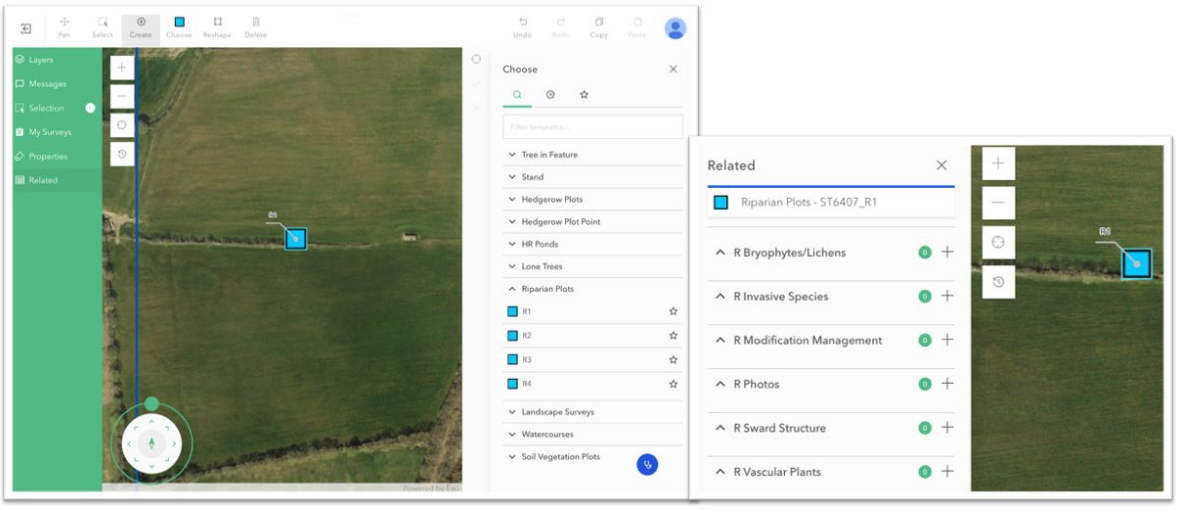



**Figure 9.0**: Image of Riparian Plot placed onto the map screen, to the right is an image of the Riparian ‘Related’ tab expanded.

For guidance on attaching photographs to a survey form refer to section 3.12.

## 9.2 MOVING AND DELETING RIPARIAN PLOTS

To Move a Riparian Point Plot:

7. Select the point you want to move.

8. select the ‘Reshape’ tool from the toolbar at the top of the screen.

9. Press and hold on your point until the magnifier appears then drag and drop it to a new location. The blue square won’t move until you have stopped dragging the point.

To Delete a Riparian Point Plot:

7. Select the point you want to delete.

8. Press the ‘Delete’ tool from the top toolbar. Deleting a plot will also delete all associated data!

**NOTE:**

Deletion is immediate, you will not be prompted to confirm your choice. You can however press ‘Undo’ from the top toolbar to restore the deleted item.

When you have completed ALL Riparian surveys for your monad, expand the ‘My Surveys’ tab from the green menu bar on the left of the screen, scroll to the ‘Riparian Plots’ menu and select ‘Survey Completed’.

Remember to ‘Sync’ your survey data when you have a stable data connection by returning to the ‘Assignments’ screen and clicking ‘synch’ on the appropriate monad.

# 10 HIGH RESOLUTION (HR) POND SURVEY

**Before inputting any survey data check that:**

- ✓ You have downloaded and opened your assigned monad
- ✓ You have selected 'Work on Survey'

> **NOTE:**
> Failure to carry-out the Initial Monad Download and Survey Setup steps can lead to survey data loss.

Up to two High Resolution (HR) ponds surveys can be completed within a monad. Refer to the EES manual for appropriate survey methodology.

## 10.1 POND SURVEY: CREATING A PLOT AND INPUTTING DATA

1. Press the 'Create' button located towards the left of the top toolbar.

2. A 'Choose' button will then appear to the right of the 'Create' button.

3. Press the 'Choose' button to open the 'Choose' tab at the right of the screen.

4. From the 'Choose' tab expand the 'HR Ponds' dropdown menu. P1 in the submenu relates to Pond 1 and P2 is survey Pond 2. Press a pond number to select it.

Ponds are drawn onto the map using a polygon which is automatically pre-selected for this survey type.

5. Use the 'freehand' or 'Standard' drawing to draw around the perimeter of the pond as per the guidance with the EES manual. Basemaps can assist your ground-truthed input.

When a Pond polygon is added you will be prompted to take photographs and undertake the eDNA survey element of the survey. For guidance on attaching photographs to your survey form refer to section 3.12.

6. The 'Reshape' tool in the top toolbar can be used to move or delete single polygon nodes and reshape it if required (Figure 10.0).

> **NOTE:**
> Pressing the 'Reshape' button will reveal the polygon nodes. Polygons drawn with the freehand tool will have many nodes.
>
> Zooming in can help differentiate the nodes more clearly and help create a more accurate polygon.

7. To move a node press and hold it and move your finger to the desired place on the screen.

8. To delete a node, press a node to select it then press the ‘Bin’ icon to delete it (Figure 10.0).

9. When you have finished drawing the pond area press the tick icon to add the pond or press ‘X’ icon if you want to redraw your polygon.

**IMPORTANT:**

Do not use the ‘Split’ tool to adjust a Pond polygon it will create errors. Use the Reshape tool or redraw the pond.

The ‘Add’ or ‘Subtract’ tools can also be used for larger edits if required.

10. With the correct HR Pond selected, input survey data to the ‘Properties’ and ‘Related’ tabs as per Section 3.11. For guidance on attaching photographs to your survey form refer to section 3.12.

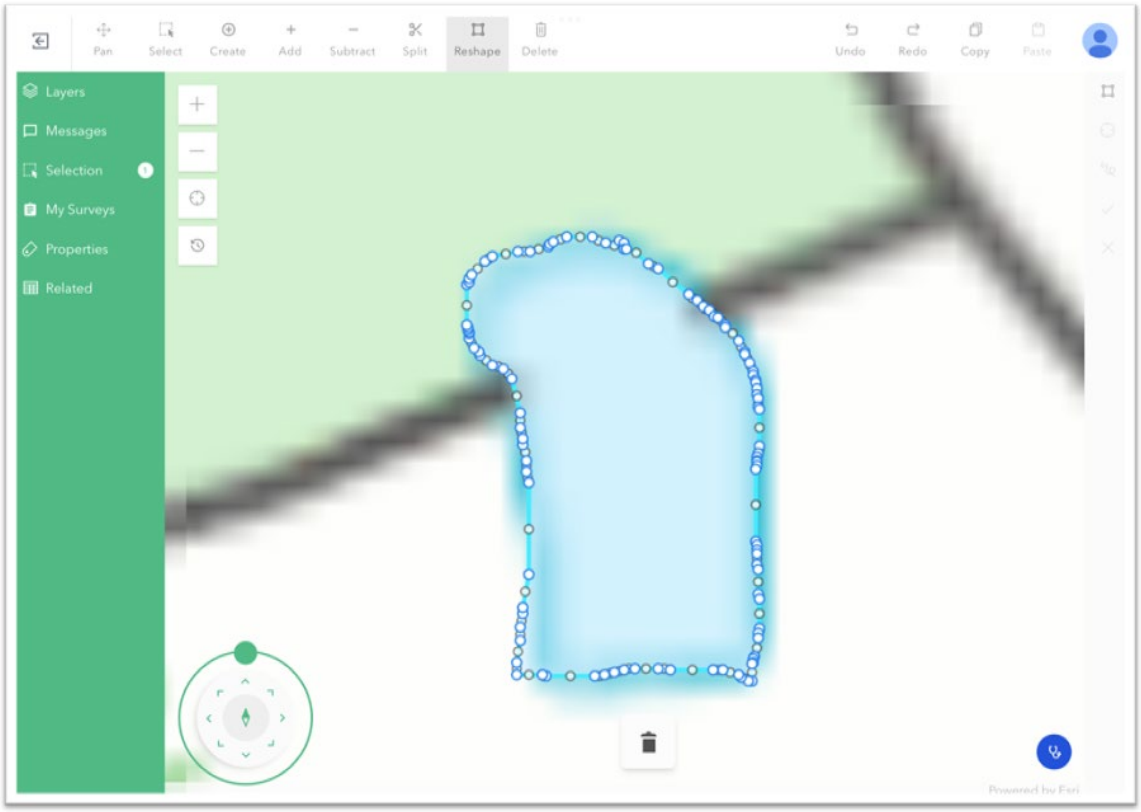



**Figure 10.0**: Image of HR Pond polygon with nodes drawn around a pond on an OS map. The ‘Reshape’ tool is selected and the delete nodes ‘Bin’ icon is below the polygon.

## 10.2 DELETING A HR POND

To Delete a High-Resolution Pond Plot:

1. Use the ‘Select’ tool from the top toolbar to draw around the pond you want to delete.

2. Press the ‘Delete’ tool from the top toolbar to delete the pond polygon. Deleting a plot will also delete all associated data!

> **NOTE:**
> Deletion is immediate, you will not be prompted to confirm your choice. You can however press ‘Undo’ from the top toolbar to restore the deleted item.

When you have completed ALL HR Pond survey for your monad, expand the ‘My Surveys’ tab from the green menu bar on the left of the screen, scroll to the ‘HR Ponds’ menu and select ‘Survey Completed’.

Remember to ‘Sync’ your survey data when you have a stable data connection by returning to the ‘Assignments’ screen and clicking ‘Sync’ on the appropriate monad.

# 11 LANDSCAPE ASSESSMENT

**Before inputting any survey data check that:**

- ✓ You have downloaded and opened your assigned monad
- ✓ You have selected 'Work on Survey'

> **NOTE:**
> Failure to carry-out the Initial Monad Download and Survey Setup steps can lead to survey data loss.

Up to six Landscape Surveys (points that characterise the landscape in the wider survey area) can be completed within a monad. You are required to complete a minimum of four (refer to the EES manual for appropriate survey methodology).

## 11.1 LANDSCAPE SURVEY: DRAWING PLOT AND INPUTTING DATA

1. Press the 'Create' button located towards the left of the top toolbar.

2. A 'Choose' button will then appear to the right of the 'Create' button.

3. Press the 'Choose' button to open the 'Choose' tab at the right of the screen.

4. From the 'Choose' tab expand the 'Landscape Surveys' dropdown menu (Figure 11.0). LD1 in the submenu relates to plot 1, LD2 to plot 2, etc. Press your desired plot number to select it. To place the plot press on the map where you want it to appear. You can place up to 6 Landscape Survey Plots within a monad (refer to the EES Survey manual for the appropriate placement of plots).

5. Place the point feature at the location of your landscape survey.

Ensure the correct Landscape Survey plot is selected and fill out the relevant attributes in the 'Properties' and 'Related' tabs.

3. Press the 'Properties' tab to expand it from the green menu bar on the left of the screen. You will then see a table of attributes to complete for the selected survey type.

4. Press the X button at the top right of the Properties tab to exit the tab.

Refer to Section 3.11 for more complete guidance for the Properties tab

5. Press the 'Related' tab from the green menu bar on the left of the screen to reveal survey data variables to be completed.

6. Each variable has a + sign to expand it. Once a variable is expanded you have the option to add multiple records

7. Press the + button at the right of the ‘Related’ variable you want to work on to expand it and reveal the data to collect.

8. To add further data for a specific variable, press the + button to the right of the bin icon in the properties section of the variable to repeat the process.

9. Once all survey data has been recorded for the specific variable, exit the attribute tab in the ‘Related’ section by pressing the back arrow.

10. Press the X button at the top right of the ‘Related’ tab to exit the tab back to the main map screen.

Refer to Section 3.11 for more complete guidance for the Related tab.

For guidance on attaching photographs to your survey form refer to section 3.12.

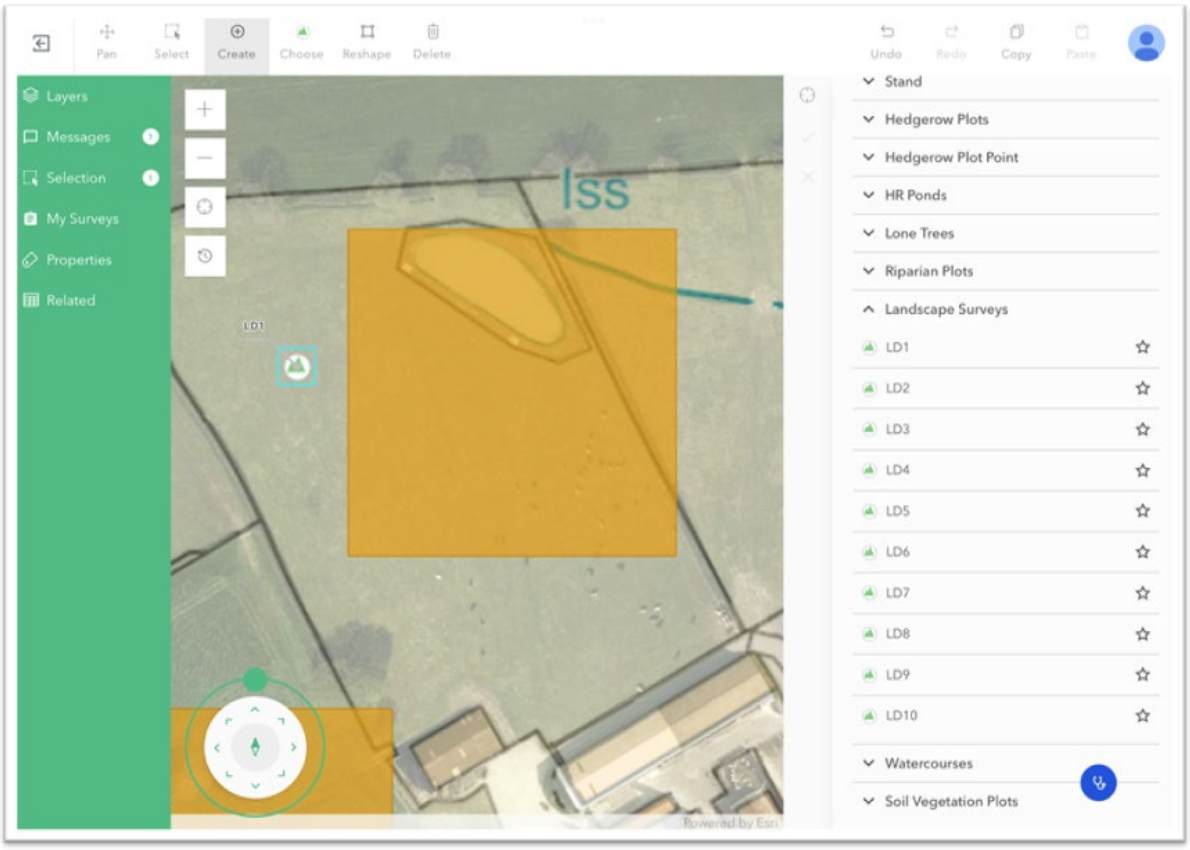



**Figure 11.0**: Image of the Landscape Survey choose menu and to the left a Landscape Survey plot placed adjacent to a Survey Stand on the monad map. Note: this image shows a version of Sweet with 10 possible plot placements, only 6 are required for EES.

## 11.2 PANORAMA PHOTOGRAPHS

You must take 1 panorama image and 4 fixed-point photographs per Landscape point plot.

All images are taken using your iPad device.

**IMPORTANT:**

Refer to Appendix 6 of the EES survey manual for instructions on how to take the Landscape photographs correctly.

The panorama image is taken using the iPad camera app which is accessed from your iPad home screen (Figure 11.1). The iPad camera app has a dedicated panorama setting (EES Survey Manual Appendix 6).


**Figure 11.1**: Image iPad camera app icon on the iPad home screen.

Once taken, the panorama image will need to be renamed and uploaded.

You do not rename or upload panorama images within Sweet. The Survey library has specific instructions for renaming and uploading image files.

**IMPORTANT:**

You must refer to the Survey Library for details on how to rename panorama images, and how to upload them to cloud based storage.

## 11.3 FOUR FIXED POINT PHOTOGRAPHS

The 4 fixed-point photographs are taken from within Sweet.

**IMPORTANT:**

You must closely follow the iPad image capture protocol guidelines within Appendix 6 of the EES Survey Manual.

1. Within the Landscape Survey Plot ‘Related’ tab navigate to a tab called LS Photos.

2. Press the Paperclip icon at the top of the Related tab to open the Sweet image capture tab. Refer to Section 3.12 for instruction on taking pictures and checking their quality within Sweet.

3. Press the + icon above the Comment box and repeat step 2 until you have entered the 4 fixed-point photographs for your Landscape point plot. Use the left and right arrows above the Comment box to navigate left and right if you need to check your images (Figure 11.2).

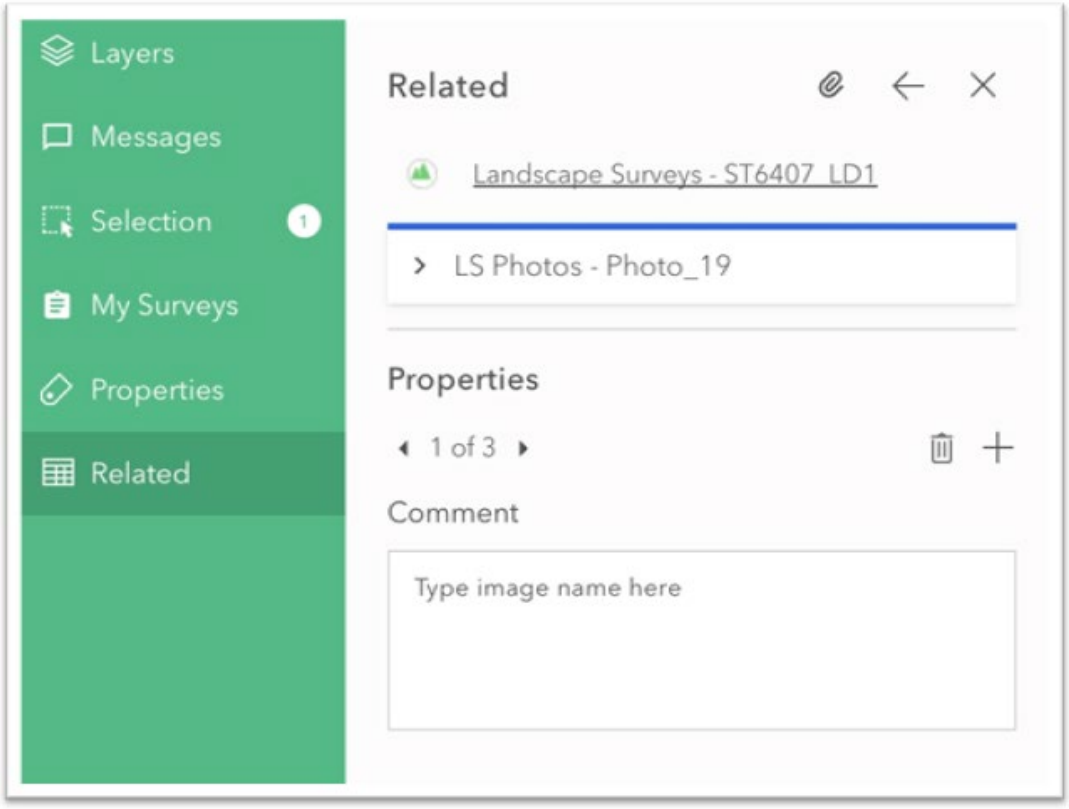



**Figure 11.2**: Image of the LS Photos Related tab. Pressing the 'Paperclip' at the top of the tab opens the Sweet camera options (Section 3.12).

## 11.4 MOVING AND DELETING LANDSCAPE SURVEY PLOTS

To Move a Landscape Survey Plot:

10. Select the point you want to move.

11. select the 'Reshape' tool from the toolbar at the top of the screen.

12. Press and hold on your point then drag and drop it to a new location.

To Delete a Landscape Survey Plot:

9. Select the point you want to delete.

10. Press the ‘Delete’ tool from the top toolbar. Deleting a plot will also delete all associated data!

> **NOTE:**
> Deletion is immediate, you will not be prompted to confirm your choice. You can however press ‘Undo’ from the top toolbar to restore the deleted item.

When you have completed ALL Landscape surveys for your monad, expand the ‘My Surveys’ tab from the green menu bar on the left of the screen, scroll to the ‘Landscape’ drop-down menu and select ‘Survey Completed’.

Remember to ‘Sync’ your survey data when you have a stable data connection by returning to the ‘Assignments’ screen and clicking ‘synch’ on the appropriate monad.

# 12 SURVEY SUBMISSION

When all surveys within the monad have been completed you are ready to submit the Assignment.

> **NOTE:**
> Ensure all required survey specific photographs have been attached and that all applicable fields have been filled out.

## 12.1 SUBMITTING A SURVEY

> **UPATED:**
> Please refer to Appendix 5.1 and 5.2 for updates and clarifications related to passing Progress Checks.

1. Expand the 'My Surveys tab from the green menu bar on the left of the screen

2. Scroll down to each of the sub-surveys and set them to 'Survey Completed' if you have not already done so.

3. Press the three dots to the right of your assigned monad under the 'Assignments' heading (Figure 12.0) to open the survey options dropdown menu.

4. Press 'Progress Check' from the menu. A popup box will appear to the right of the screen to check all essential elements of the sub-surveys have been completed. Clicking anywhere within this box will close it again, or it will automatically close after several seconds. It can be re-opened from 'My surveys'. You may need to scroll to view all the information.

5. If the Progress Check box headline says: 'Not Able to Check', this indicates that none of the sub-surveys are set to 'Survey Completed' under 'My Surveys'. Check that all relevant surveys are set to 'Survey Completed'.

   If the Progress Check box headline is 'Progress Check did not pass' you will need to review the information to see which mandatory elements are missing or incorrect as indicated by red text. Add the information or make corrections to the relevant survey data as required. Green text indicates that the requirement has been satisfied. Once all mandatory requirements have been satisfied the Progress Check box headline will be 'Progress Check passed' and all text will be green.

**NOTE:**
Your monad cannot be completed until the Progress Checks have passed.

6. When all survey types have passed the Progress Check, enter the survey end date in the ‘My Surveys’ tab and check that the start date is also filled in. You won’t be able to complete the monad without valid entries in ‘Assessment Start Date’ and ‘Assessment End Date’.

7. Add any comments relevant to the entire survey in the ‘Comments’ box. Enter N/A or a similar null word or phrase if you have no comments.

8. Press the three dots to the right of your assigned monad under the ‘Assignments’ heading (Figure 12.0) to open the survey options dropdown menu and press ‘Complete the survey’ (Figure 12.0).

The monad and all survey plots should now disappear from the map screen, and you will have no assignments listed in the ‘My Surveys’ tab.

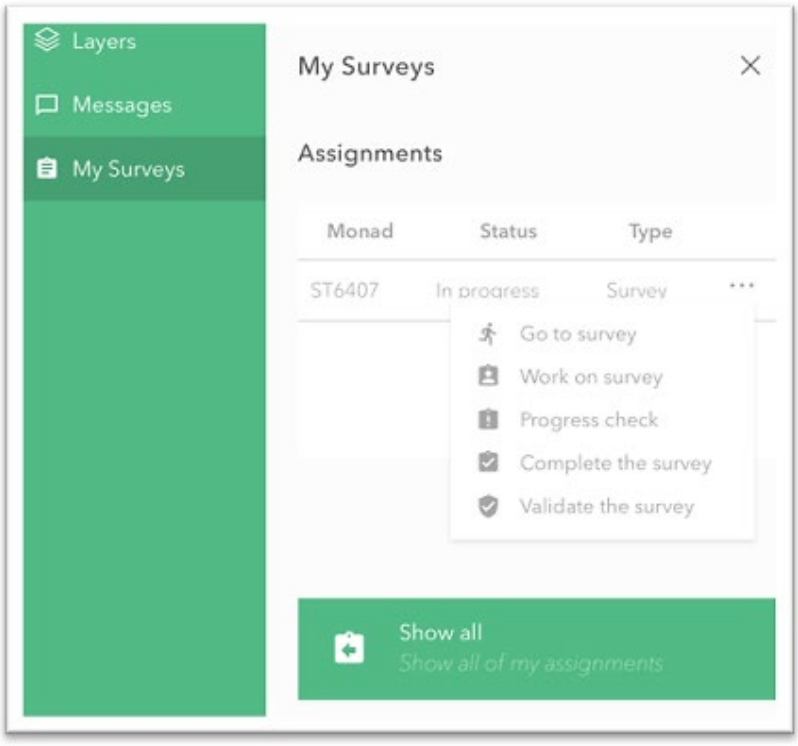



**Figure 12.0**: Image of the ‘My Surveys’ tab expanded with the survey status dropdown menu expanded.

9. Press the ‘Back’ arrow which is the far-left button on the top toolbar to exit the mapping screen and return to the ‘Your Assignments’ screen (Figure 12.0).

10. Using a stable Wi-Fi connection (not a mobile data signal) press the Sync button on your assigned monad (Figure 2.11).

11. Press ‘Change’ then ‘Finish’ (Figure 12.1) to automatically remove the offline area.

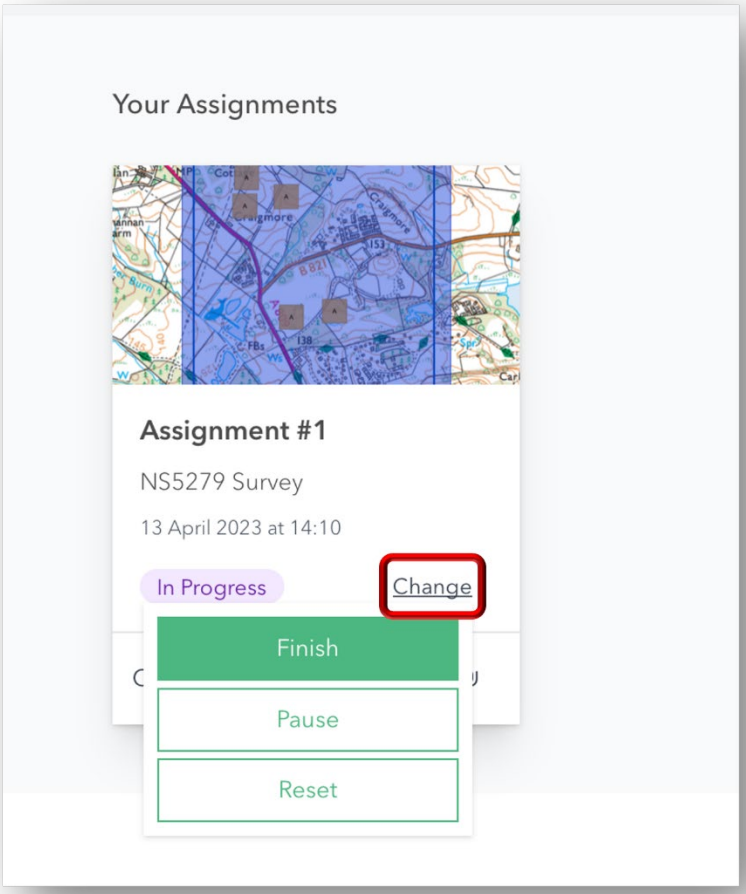



**Figure 12.1**: Assignments screen with the option to ‘Finish’ assignment. This menu is accessed by selecting the ‘Change’ button.

12. Pressing ‘Finish’ should check that the Sync is up to date. A warning popup will appear if it is not (Figure 12.2). If you receive the warning, press ‘Cancel’ and sync your device again, then press ‘Finish’ again.

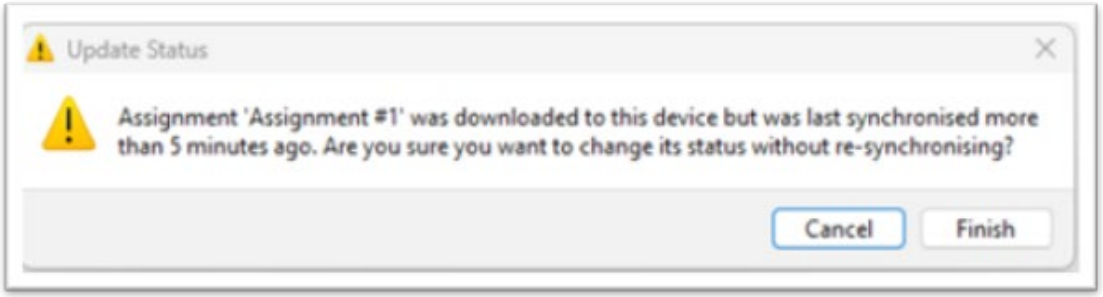



**Figure 12.2**: Image of warning popup that appears if the Sync is not current.

> **NOTE:**
> Pressing the Sync button on the assignment screen after the monad has been marked as completed (step 8) synchronises all monad survey data. This will log the completed status of the monad to the online environment.

13. Pressing ‘Finish’ should also remove the offline are. However, the assignment may still be visible.

14. The survey status will change from ‘In Progress’ to ‘Completed’ (Figure 12.3).

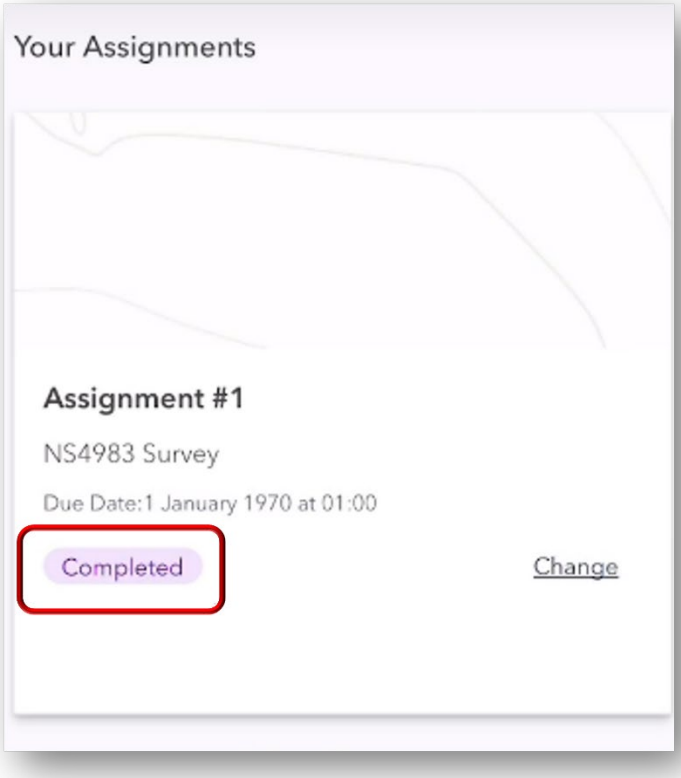



**Figure 12.3**: Assignments page showing assignment status as ‘Completed’.

You have now completed the assignment.

**NOTE:**

The assignment will still be visible, but no further steps are required. There is no need to change the assignment status.

You can now begin working on your next assignment.

# 13 EES LOW RESOLUTION DATA CAPTURE TOOL

To undertake a Low-Resolution Survey within a monad you will need to have the following:

- ✓ Tablet (1 per person).
- ✓ The Sweet app installed on your iPad or Android device.
- ✓ A Sweet Licence assigned to your ArcGIS Online account.
- ✓ Pre-survey preparation completed.
- ✓ Offline area downloaded.
- ✓ Field Manual available for reference.

## 13.1 PRE-SURVEY PREPARATION: GATHERING INFORMATION

It is important gather as much baseline information as possible of onsite features and their locations before going onsite.

> **NOTE:**
> Refer to the EES Survey manual for all pre-survey preparation guidelines.

1. Access the Surveyor Planning Map from a tablet device. https://defra.maps.arcgis.com/apps/webappviewer/index.html?id=af2b0f3b913e47cda8e50088f56c2d84

2. Use your ArcGIS Online account details to log in.

3. Input your monad reference number into the search bar to locate the monad (Figure 13.0).

4. Use the reference layers (Figure 13.0) to gather information about features within the monad and their locations.


**Figure 13.0**: Image of Surveyor Planning Map with the search bar function and Reference Layers menu highlighted.

5. Ensure that all aspects of the survey (including walking around the site) will only be carried out on land where permission is granted. Use the access permission map layers to check! (Figure 13.1).

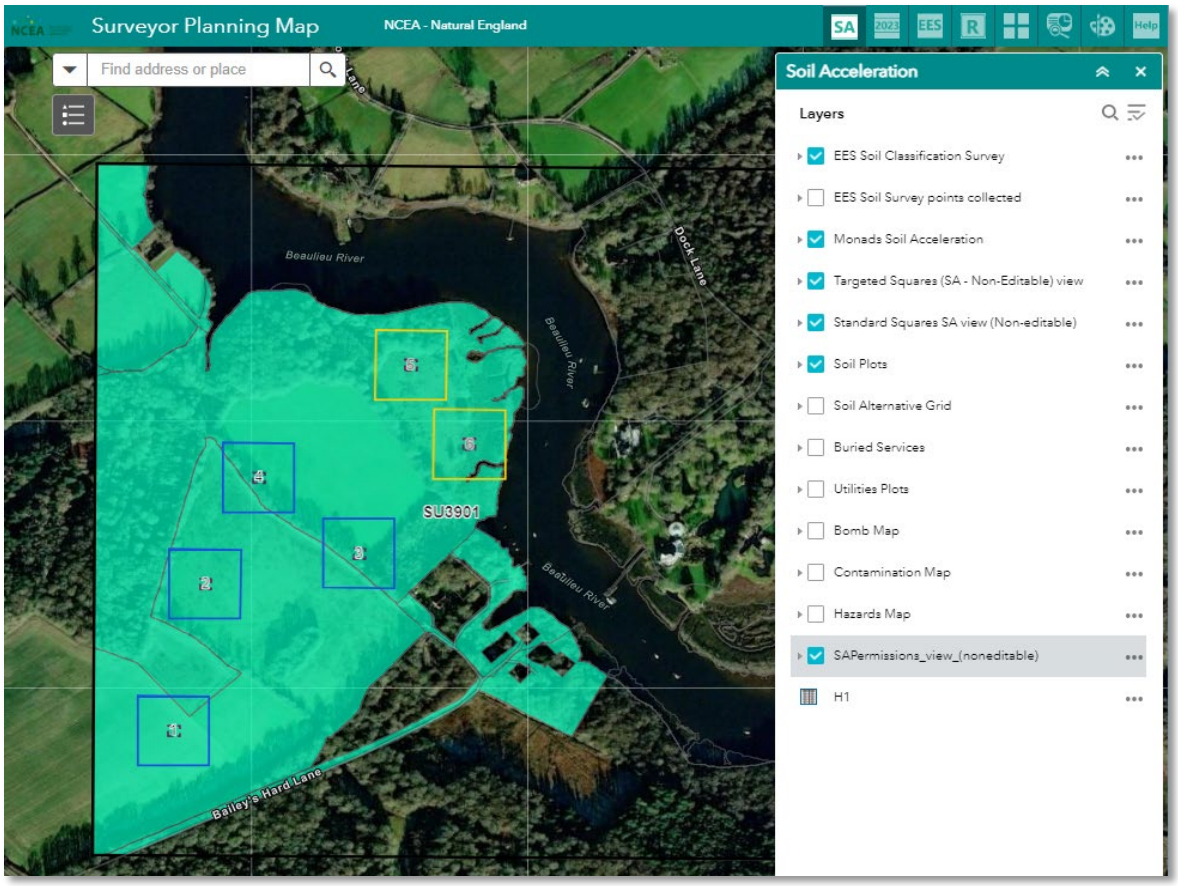



**Figure 13.1**: Image of a monad in the Surveyor Planning Map with the permissions layer showing.

## 13.2 PRE-SURVEY PREPARATION: DOWNLOAD OFFLINE AREA

Prior to field survey you must download your monad area to the Low-Resolution Sweet app for offline use. This requires a stable and relatively fast internet connection.

To download an offline area:

1. Open the Sweet app and login using your AGOL account details. (Refer to Section 2.2 for guidance).

2. Select the 'EES Low Resolution Data Capture Tool' from the homepage (Figure 13.2).

3. Press 'Take Offline' (Figure 13.2) to open the map screen (Figure 13.3).

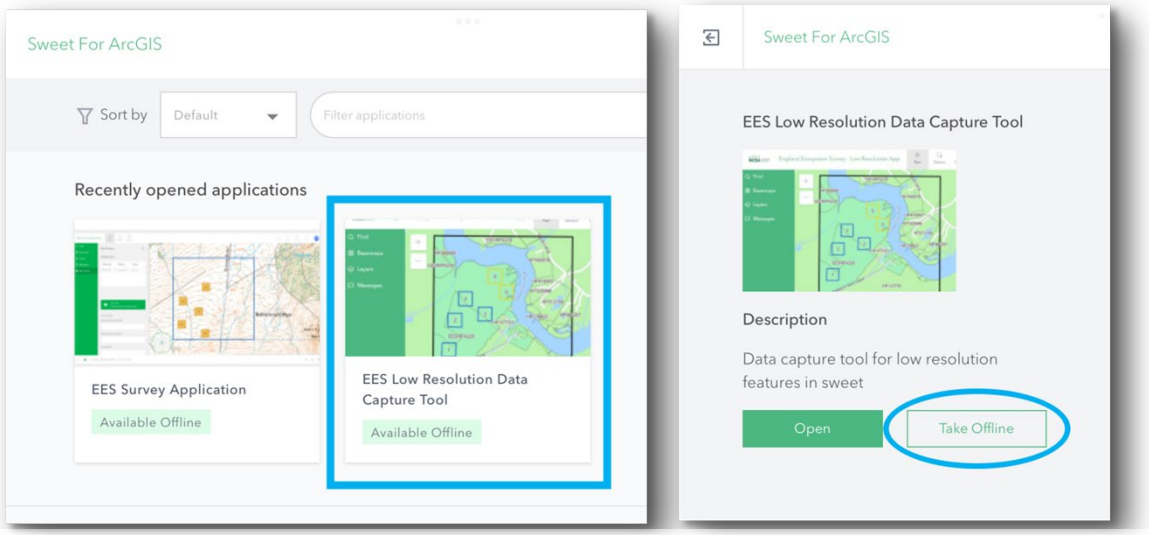



**Figure 13.2**: On the right, an Image of the Sweet homepage with the location of the Low-Resolution Data Capture tool highlighted and on the left the 'Take Offline' option within the app.

4. To locate your monad, enter the monad reference number into the search bar in the top right corner of the screen (Figure 13.3).


**Figure 13.3:** Image showing the location of the search tool. The shaded blue area will be available offline and Download Area function is highlighted.

Following the steps below you must manually set the download area to capture the entire monad area.

5. Select ‘Set Area’ from the toolbar at the top of the screen (Figure 13.3).

6. Draw a polygon around the monad area. You can redraw this polygon until you are satisfied with the download area.

**IMPORTANT**

- The thick black line on the map is the entire 1km$^2$ monad, it is aligned with the Ordnance Survey (OS) map grid.
- You will create a shaded blue area, and this will be the area available to view offline (Figure 13.3).
- Ensure the download area is larger than the monad area but not excessively big as this will result in increased download times.
- Do not download  an area that interacts with other monads.

7. Select the ‘Download Area’ button to download the area to your device (13.3).

8. Once pressed it will return to the Low-Resolution App home screen (Figure 13.2).

9. Download times will vary depending on size of download area and data connection speed.

**NOTE:**

The map download may appear to ‘freeze’ at an arbitrary completion percent for several minutes, this is normal. Typically, the download should take less than ten minutes.

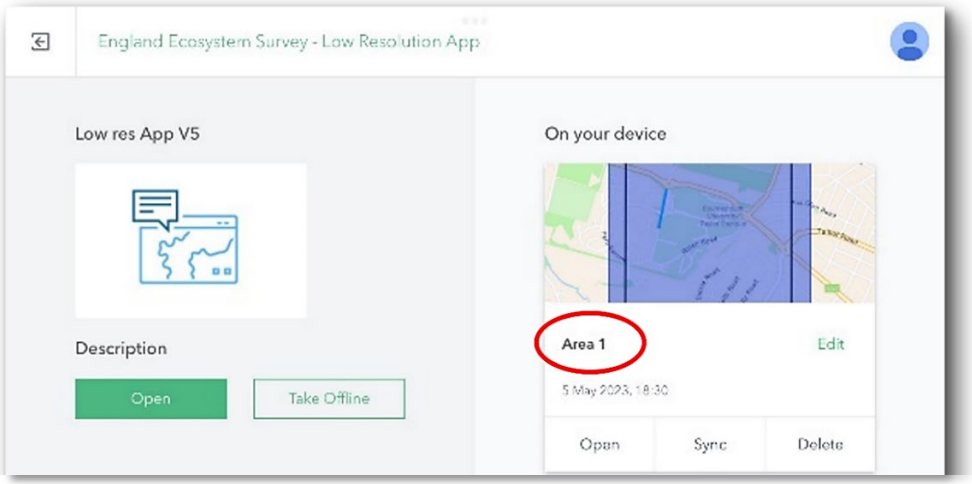



**Figure 13.4:** Image of Low-Resolution app home screen with a successfully downloaded area in the 'On your device' window. The downloaded area highlighted and below this are options to Open, Sync or Delete the area.

10. Successfully downloaded areas will appear in the 'On your device' section of the app (Figure 13.4).

11. Use the 'Edit' button to rename your downloaded offline area to the monad reference number, then press the 'Save' button to confirm changes (Figure 13.5).

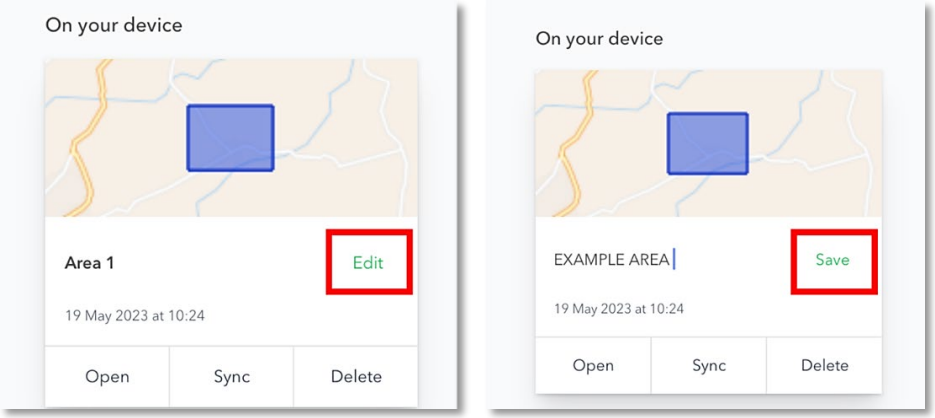



**Figure 13.5:** Image showing the 'Edit' button used to rename a downloaded offline area, and the 'Save' button that will confirm the edit once the area has been renamed.

12. You can Open, Sync and Delete your offline areas from the 'On your Device' tab (Figure 13.4).

13. When you are ready to start inputting data, select 'Open'.

**IMPORTANT**

Do not delete an offline area before you have synced the data. This can result in data loss.

# 14 LOW RESOLUTION DATA CAPTURE TOOL: LOW RESOLUTION HEDGEROWS

The objective is to collect low-resolution data of all hedgerows within the monad, but only where permission is granted and there is a clear view of the hedgerow.

Refer to Section 3 for further information about tool use and how to navigate around the app interface.

## 14.1 LINEAR HEDGEROW PLOT

To create a Low-Resolution linear hedgerow feature:

1. Select the ‘Create’ tool from the toolbar at the top of the screen (Figure 14.0).

2. Press the ‘Choose’ button, and from the ‘Choose tab’ select ‘Hedgerow’ (Figure 14.0).

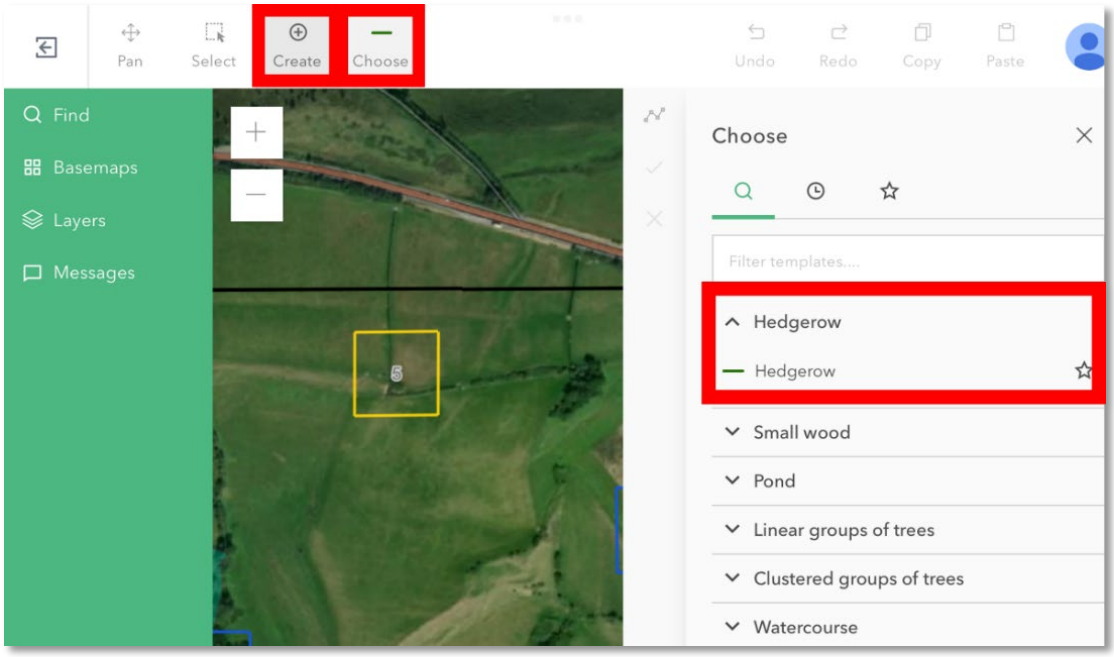



**Figure 14.0:** Image highlighting the ‘Create’ and ‘Choose’ buttons in the top toolbar and the ‘Choose tab’ with Hedgerow plot displayed.

3. Select the appropriate drawing tool (refer to Section 3.10) to draw a linear hedgerow feature at the survey location in accordance with the EES Survey Manual (Figure 14.1).

Only draw what is observed at the time of the survey. This may require walking up to some hedgerows where it is safe to do so, to verify GPS locations on the map.

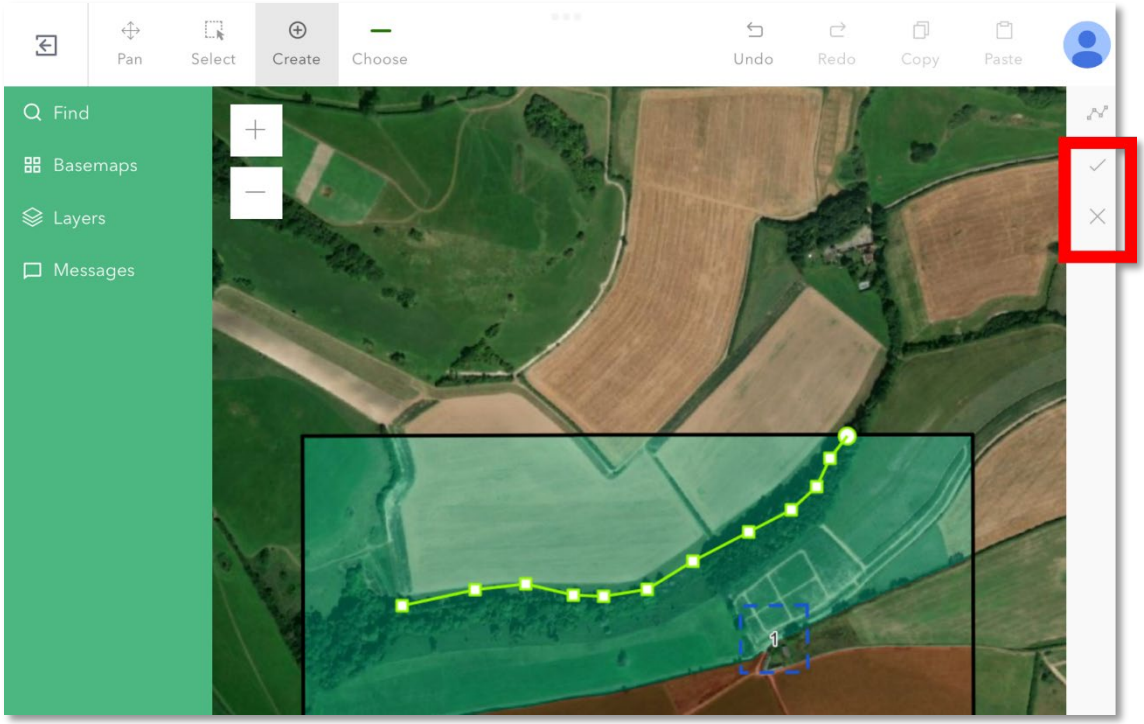



**Figure 14.1:** Image of hedgerow polyline drawn along a section of hedgerow. In the right-hand toolbar is the tick function used to confirm the polyline and an 'X' used to delete and redraw.

The length of the polyline drawn will be visible in the bottom left corner of the map screen.

4. From the toolbar on the right, press the tick icon to add the feature or 'X' icon to redraw (Figure 14.1).

When your linear plot has been added to the map you can input data. Refer to Section 3 for data input guidance.

> **NOTE:**
> Record the Low-Resolution Hedgerow features within the properties table and record and invasive species in the related table.

5. Select the Hedgerow plot using the 'select' tool from the top toolbar (Figure 14.1).

6. Press the 'Properties' tab from the green menu bar. You will then see a table of attributes to complete for the selected survey type.

> **IMPORTANT:**
> Input data into the fields within the Properties tab chronologically. The table will automatically update accordingly.

7. A ‘Review’ window will appear notifying you of any incomplete fields. Once all fields are complete, click ‘Ok’ and press the ‘X’ button in the top right of the tab to exit (Figure 14.2).

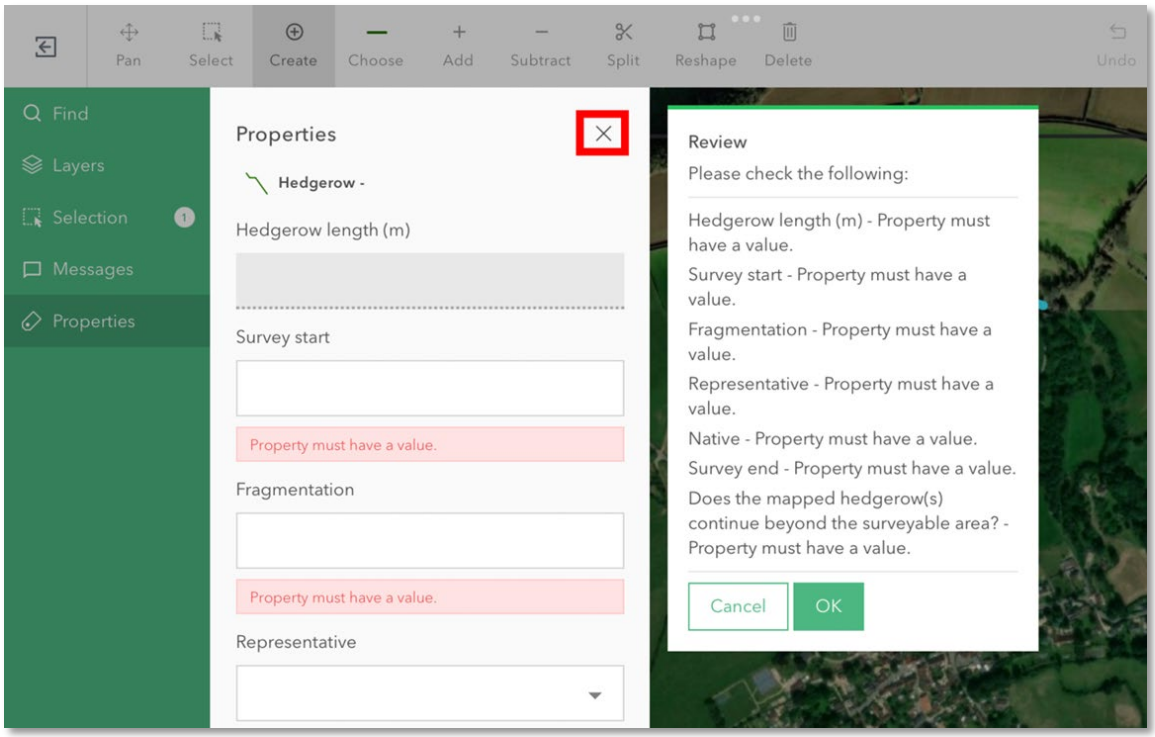



**Figure 14.2:** Image showing the Properties tab with a ‘Review’ window reminding that the data field that must be completed. Highlighted is the ‘X’ used to close the Properties tab.

When you have finished entering data in the Properties tab, press on the ‘X’ (Figure 14.2) to return to your map screen.

## 14.2 HEDGEROW NETWORKS

If your hedgerow is made up of multiple parts, you will need to use the ‘Add’ tool to build a hedgerow network.

1. Follow the steps in Section 14.1 to create a hedgerow plot and input data into the attribute table in the ‘Properties’ tab.

2. With the hedgerow plot selected, click on the ‘Add’ tool in the toolbar at the top of the screen (Figure 14.3).

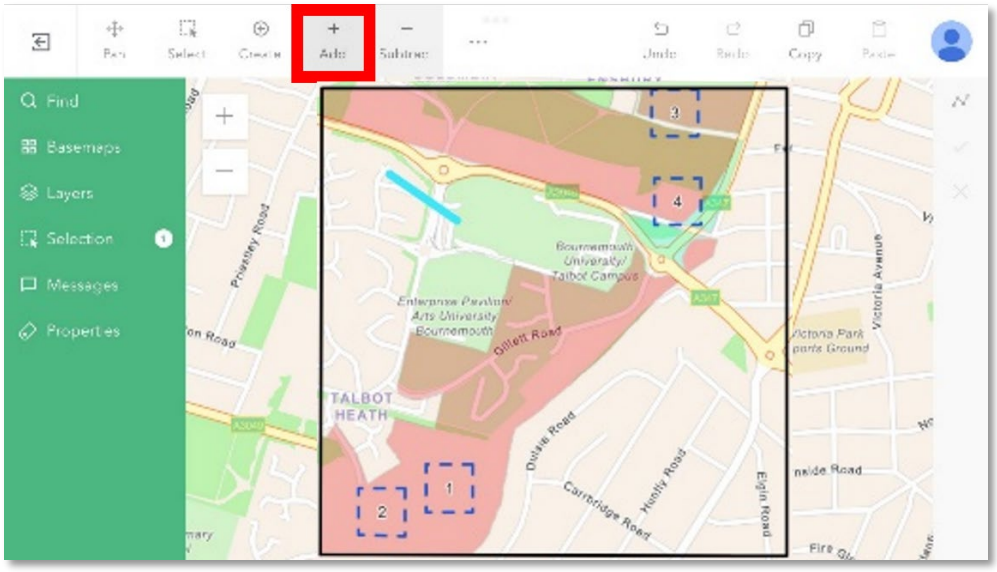



**Figure 14.3:** Image showing a linear hedgerow plot (highlighted in blue) and the 'Add' tool in the top toolbar.

3. Draw the next section of hedgerow that you want to include in the hedgerow network. Confirm by pressing on the tick icon on the right-hand side tool bar.

> **IMPORTANT:**
> Each new linear hedgerow plot will become part of the original plot. You do not need to input more data within the Properties tab.

Once you have completed your hedgerow network, you need to check it has successfully been inputted as a single feature.

1. Use the select tool to select all linear hedgerow sections in the network and press the 'Selection' tab from the green menu bar.

2. Ensure that only one hedgerow feature appears (Figure 14.4).

If more than one feature appears in the selection pane on the left-hand side of the screen use the merge tool to add all the features together.

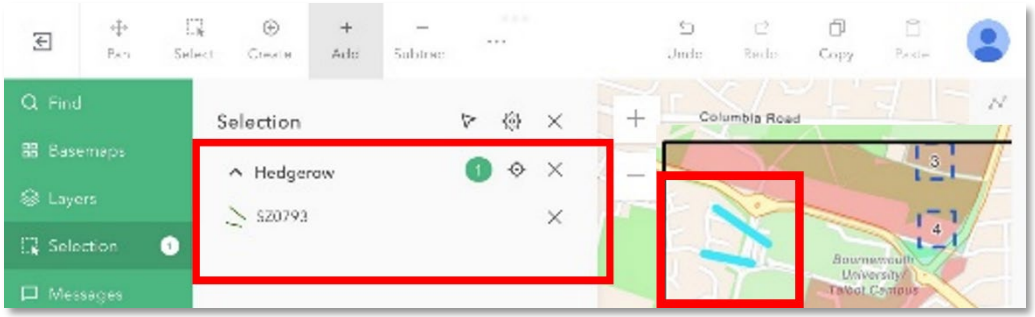



**Figure 14.4:** Image showing a hedgerow network which is a single hedgerow feature made up of two or more linear hedgerow sections.

# 15 LOW RESOLUTION DATA CAPTURE TOOL: LOW RESOLUTION WATERCOURSES

Where present, collect Low-Resolution data along the length of at least one watercourse within the permissible areas in your monad. If time allows and more than one watercourse is accessible you can survey those too.

The following applies when surveying watercourses at low resolution:

- You can include watercourses that pass-through woodland.
- A watercourse(s) should, where possible be representative of your monad in terms of modification and habitat features along its length.
- You can include a surveyed riparian plot within a length of watercourse.
- Do not record lengths of ditches.

> **NOTE:**
> Plot the watercourse(s) in Sweet with the aid of the aerial photograph base layer (refer to section 3.3).
>
> Plot the watercourse whilst walking the length of the feature where it is safe to do so, to ensure accurate plot placement.

## 15.1 CREATING A LOW-RESOLUTION WATERCOURSE FEATURE

To create a Low-Resolution watercourse feature:

1. Select the ‘Create’ tool from the toolbar at the top of your screen.
2. Select ‘Choose’ from the toolbar.
3. Click on ‘Watercourse’ from the tab (Figure 15.0).

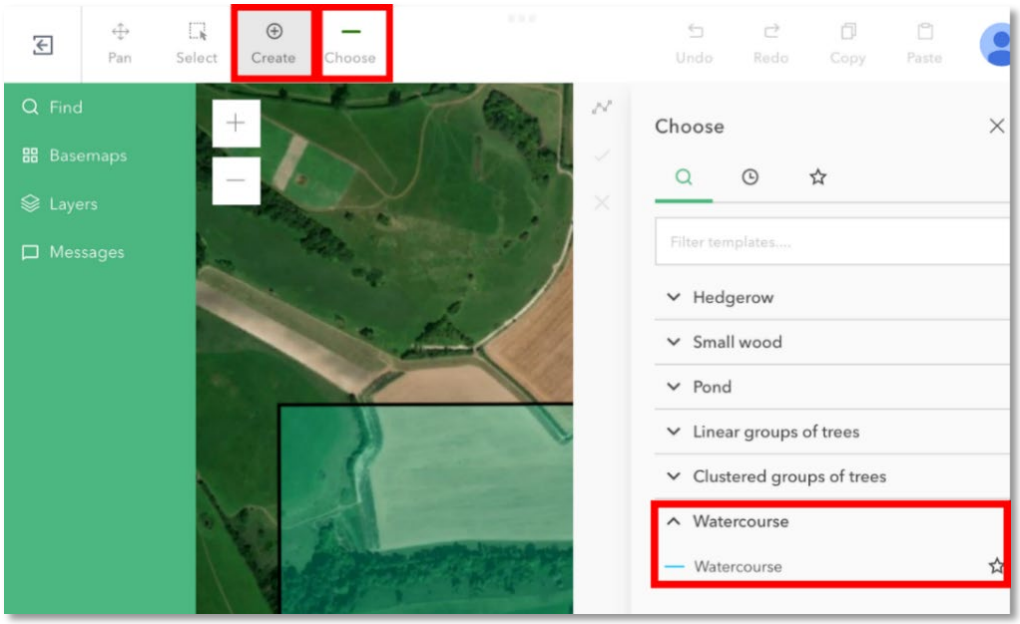



Figure 15.0: Image highlighting the 'Create' and 'Choose' buttons in the top toolbar and the 'Choose tab' with Watercourse plot displayed.

4. Select the appropriate drawing tool (refer to Section 3.10) to draw a linear watercourse feature at the survey location in accordance with the EES Survey Manual (Figure 15.1).

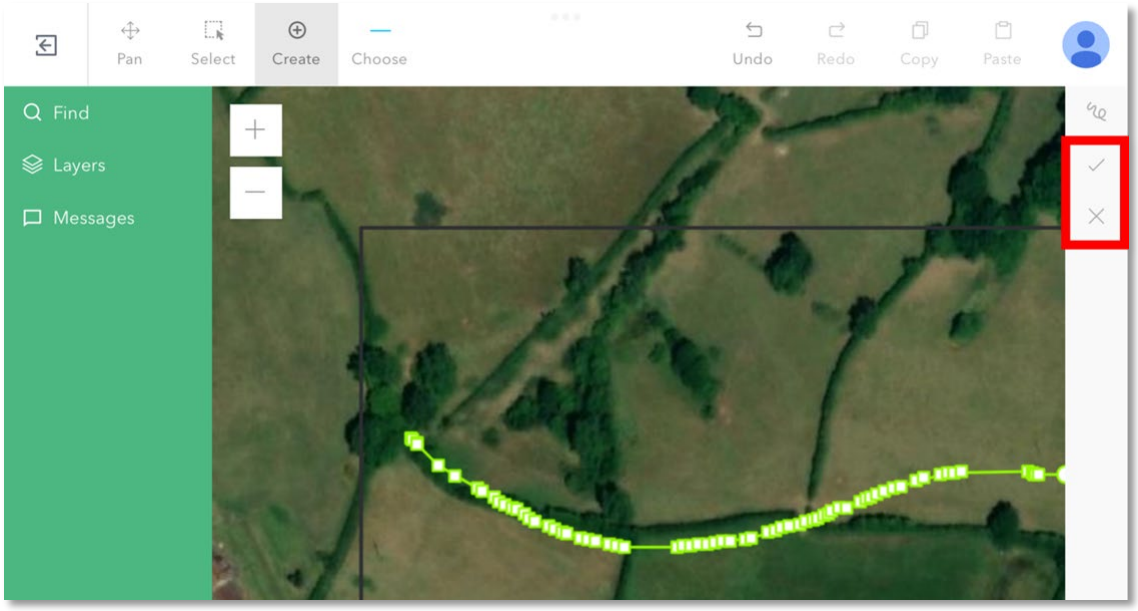



**Figure 15.1:** Image of polyline drawn along a watercourse. In the right-hand toolbar the tick function is used to confirm the polyline and 'X' used to redraw are highlighted.

5. From the toolbar on the right of the screen, press the tick icon to add the feature or 'X' icon to redraw (15.1).

6. Select the watercourse plot using the 'Select' tool from the top toolbar.

7. Expand the 'Properties' tab from the green menu bar and fill in the table of attributes.

**IMPORTANT:**

Input data into the fields within the Properties tab chronologically. The table will automatically update accordingly.

A ‘Review’ window will appear notifying you of any incomplete fields. Once all fields are complete, click ‘Ok’ and use the ‘X’ button in the top right of the tab to exit (Figure 15.2).

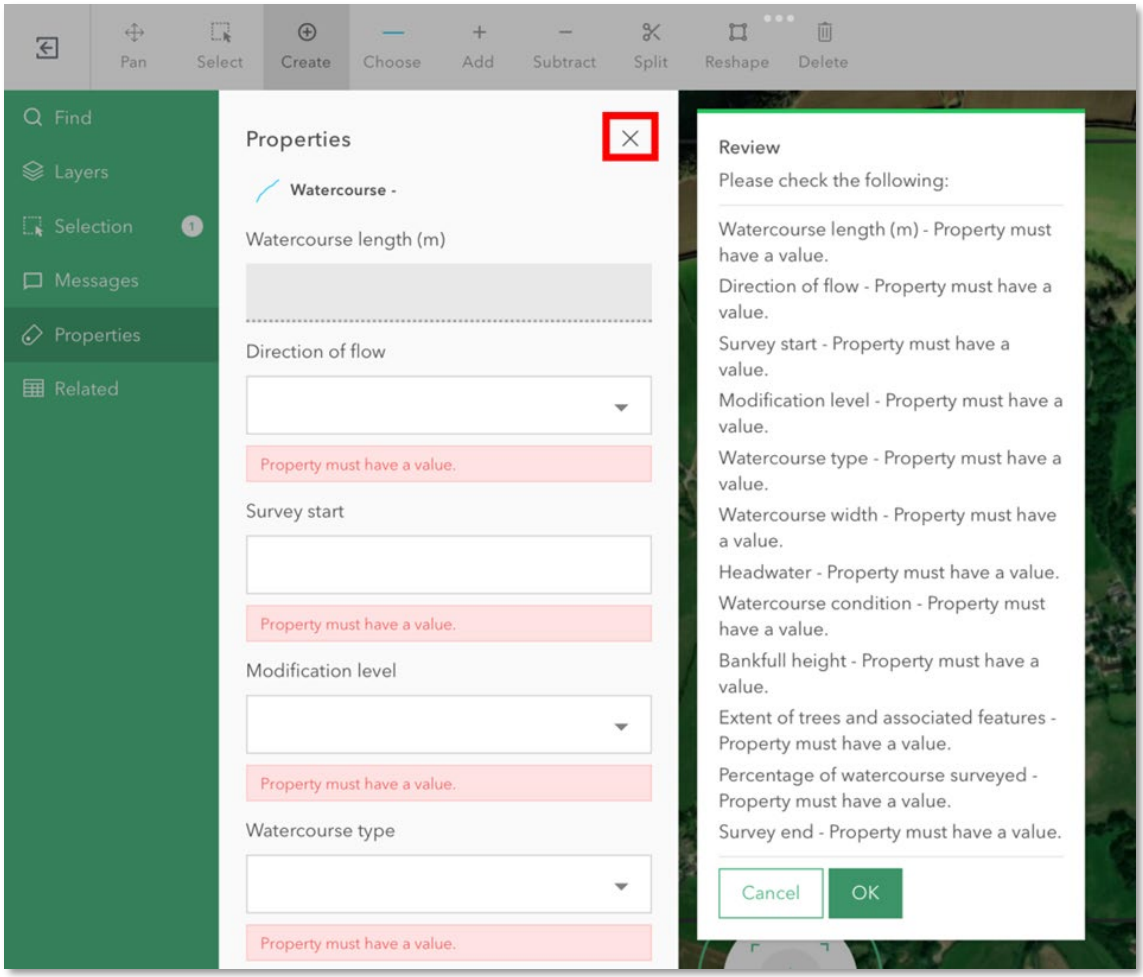



**Figure 15.2:** Image showing the Properties tab with a ‘Review’ window providing a reminder of the data field that must be completed. Highlighted is the ‘X’ used to close the Properties tab.

When you have finished entering data in the Properties tab, you need to complete data entry in the Related tab.

1. Press the ‘Related’ tab in green menu bar.

2. Click on the **+** symbol to add a record to a related table and fill in the appropriate fields.

Select the back arrow to return to the list of related tables, then click on the ‘X’ to return to your map screen.

## 15.2 ATTACHING PHOTOGRAPHS

You need to take a photograph at the beginning and end of the watercourse feature. One of the attributes listed in the Related tab is 'Watercourse – photo', this is where you upload these photographs.

> **NOTE:**
> Refer to section 3.12 for additional guidance on adding images to a survey form.

1. Press the 'Related' tab to expand it then press the + symbol to the right of the 'Watercourse – Photo' tab in the 'Related' menu (Figure 15.3).

2. A new tab will appear, and a popup 'Review' prompt will guide you further.

3. Enter data to the data entry boxes to provide information on the riparian zone habitat.

4. Press 'Add New', then press 'Take photo or video'. The camera app will open for you take the photo.

> **IMPORTANT:**
> Ensure photos are good quality, not blurred and have adequate lighting.

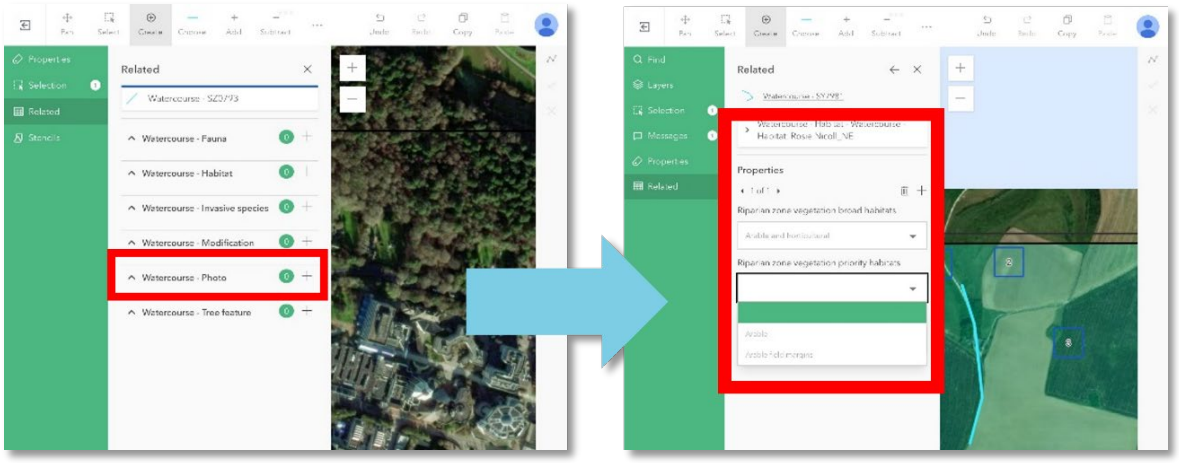



**Figure 15.3:** Image showing location of 'Watercourse – Photos' attribute in the 'Related' tab.

5. Confirm the photo by pressing 'use photo'.

6. You can remove the photo by clicking on the bin icon below.

7. Select the back arrow to return to the Related tab, then click on the x to return to your map screen.

# 16 LOW RESOLUTION DATA CAPTURE TOOL: LOW RESOLUTION PONDS

**IMPORTANT:**

- Do not enter the water.
- Only map ponds within areas where survey permission is granted.

## 16.1 CREATING A LOW-RESOLUTION POND FEATURE

Follow the steps below to create a Low-Resolution Pond feature.

1. Select the 'Create' tool from the toolbar at the top of your screen

2. Select 'Choose' from the toolbar.

3. Click on 'Ponds' from the tab (Figure 16.0).

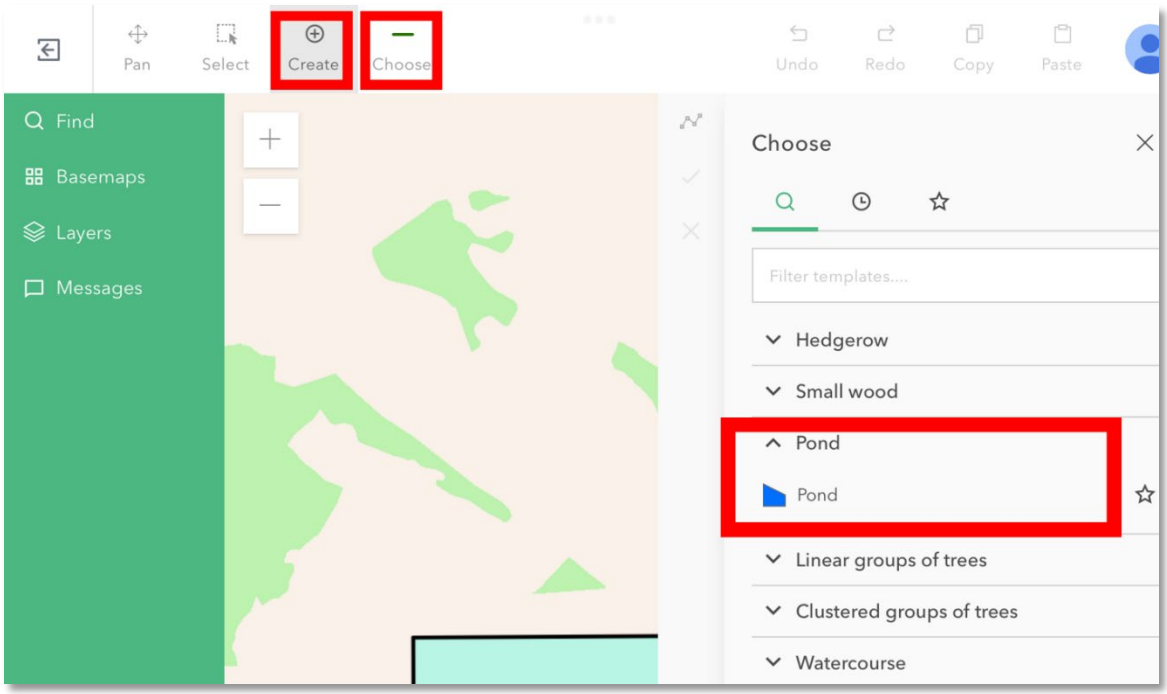



**Figure 16.0:** Image highlighting the 'Create' and 'Choose' buttons in the top toolbar and the 'Choose tab' with Pond plot displayed.

4. Select the appropriate drawing tool (refer to Section 3.10) to draw a polygon around the pond area where the historical high-water level sits (Figure 16.1).

**NOTE:**

Refer to Section 3.10 on 'Drawing Tools' and the 'Ponds (Low Resolution)' guidance video for more information drawing polygons.

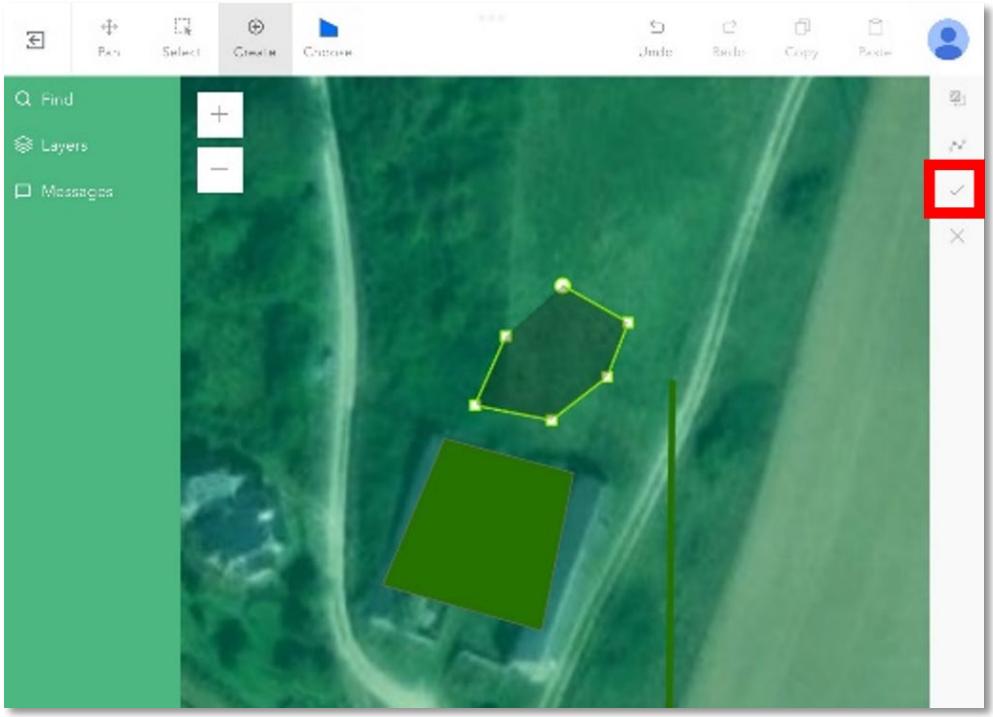



**Figure 16.1:** Image of pond polygon drawn along a watercourse. In the right-hand toolbar is the tick function used to confirm the polygon and 'X' used to redraw are highlighted.

5. Click the tick to confirm in the top right corner (Figure 16.1).

> **NOTE:**
> The polygons you draw may not correspond with the satellite imagery base-map. The imagery is not as current as on-the-ground observation.
>
> Only draw what is observed at the time of the survey.

To input survey data, follow the steps below.

1. Select the Pond plot using the 'select' tool from the top toolbar.

2. Press the 'Properties' tab in green menu bar. You will then see a table of attributes to complete for the selected survey type.

> **NOTE:**
> Record the low-resolution pond features in the properties table and record and invasive species in the related table.

3. A 'Review' window will appear notifying you of any incomplete fields. Once all fields are complete, click 'Ok' and use the 'X' button in the top right of the tab to exit (Figure 16.2).

**IMPORTANT:**

Input data into the fields within the Properties tab chronologically. The table will automatically update accordingly.

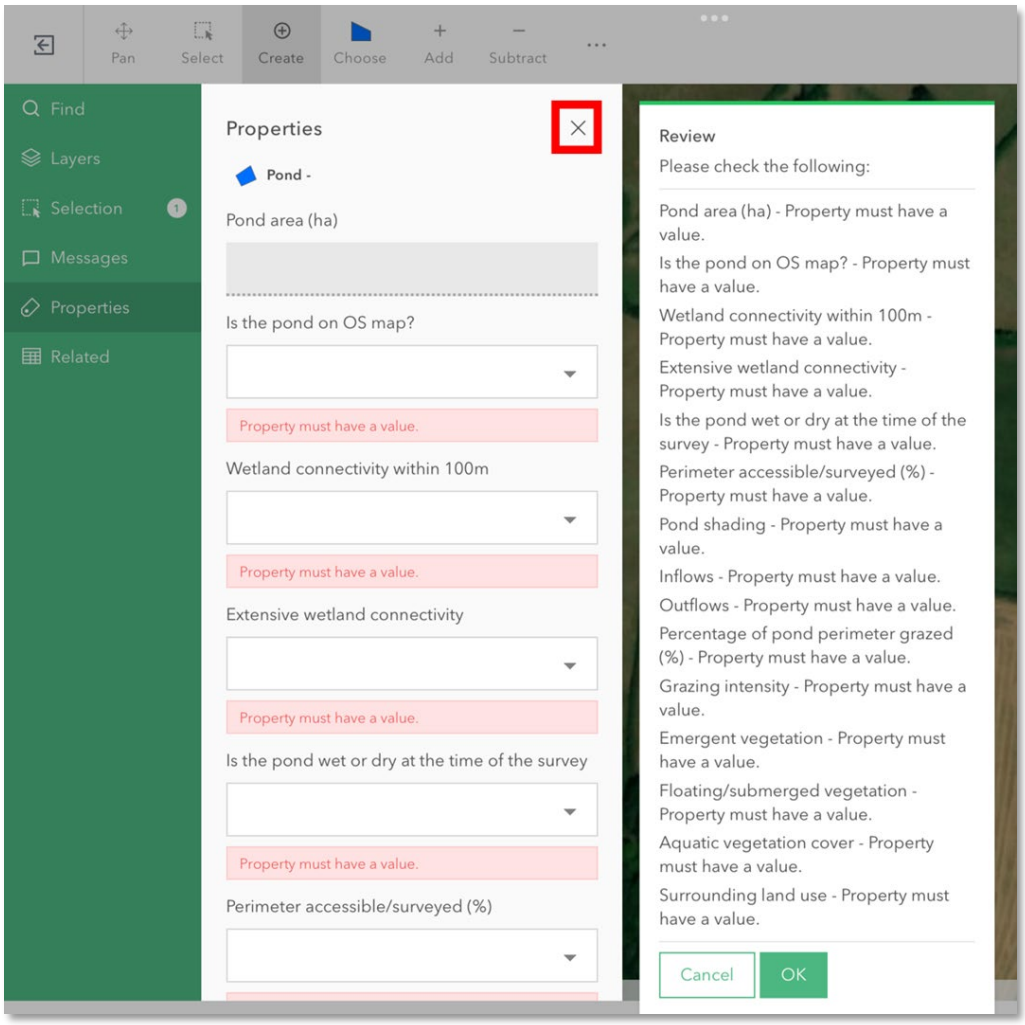



**Figure 16.2:** Image showing the Properties tab with a 'Review' window providing a reminder of the data field that must be completed. Highlighted is the 'X' used to close the Properties tab.

When you have finished entering data in the Properties tab, you need to complete data entry in the Related tab.

1. Press the 'Related' tab in green menu bar.

2. Click on the **+** symbol to add a record to a related table and fill in the appropriate fields.

3. Select the back arrow to return to the list of related tables, then click on the 'X' to return to your map screen.

# 17 LOW RESOLUTION DATA CAPTURE TOOL: LOW RESOLUTION TREES OUTSIDE WOODLANDS (ToW)

Map small woods, clustered of trees and linear groups of trees anywhere within the monad where access permission is granted. Refer to Table 1 for more details on what to record.

> **IMPORTANT:**
>
> Only map Trees outside Woodland in areas where survey permission is granted and whose features fall **entirely** within the monad.

| Trees outside woodland feature | Maximum size | Minimum size | Mapping level |
|---|---|---|---|
| **Small Woods** | 0.5ha | 0.1ha | Monad |
| **Clustered groups of trees** | <0.1 ha | 0.04 ha | 1 ha squares |
| **Linear groups of trees** | No Maximum size | 20m in length with a length to width ratio of 4:1 | Monad |

**Table 1:** table outlining criteria for each of the ToW features.

## 17.1 CREATING A LOW-RESOLUTION TOW FEATURE

Follow the steps below to create a Low-Resolution ToW feature.

1. Select the 'Create' tool from the toolbar at the top of the screen (Figure 17.0).

2. A 'Choose' button will appear in the toolbar (Figure 17.0).

3. Press the 'Choose' button then from the 'Choose tab' select the appropriate ToW feature type using Table 1 for guidance (Figure 17.0).

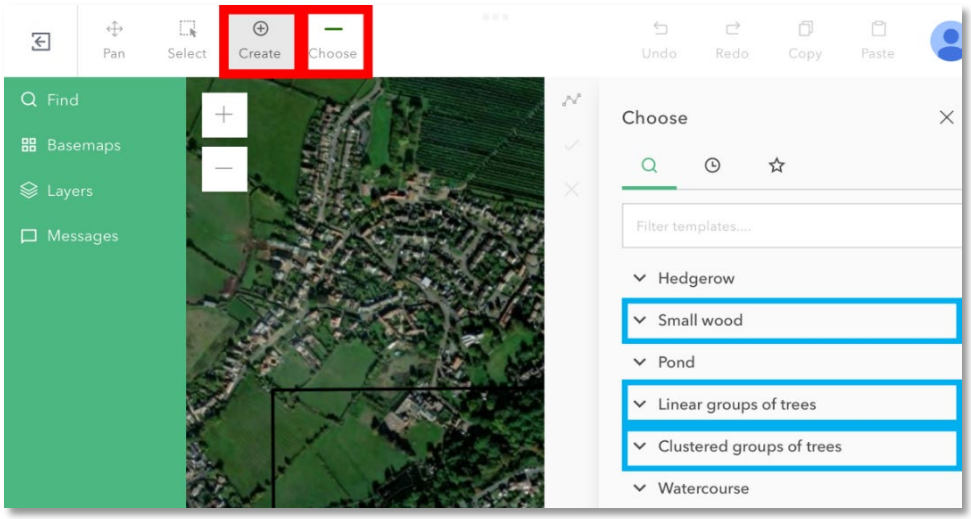



**Figure 17.0:** Image showing the 'Create' and 'Choose' option in the toolbar at the top of the screen. Within the 'choose window'. The three Trees outside Woodland features are highlighted.

4. Using the drawing tools within Sweet, draw the area where the canopy extents to by adding nodes around the feature location. Refer to Section 3 for additional information on drawing polygons.

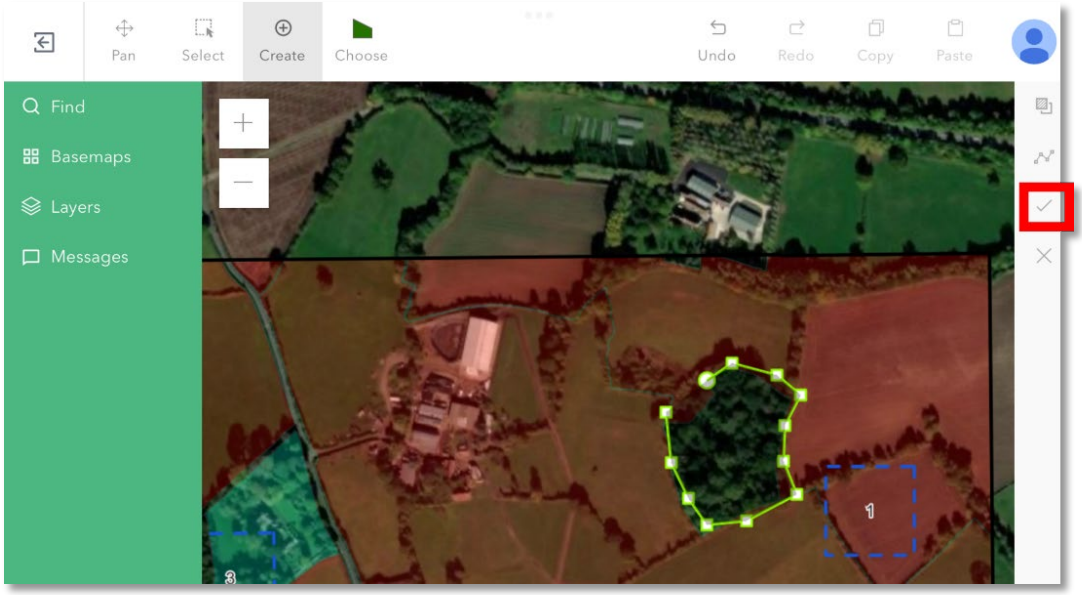



**Figure 17.1:** Image of small woodland polygon drawn around the canopy area. Highlighted is the tick function used to confirm the polygon placement.

5. Click the tick to confirm in the top right corner (Figure 17.1).

6. Record the attributes in the properties table. As you fill in the details the review table will automatically update.

Refer to the survey manual for specific protocol queries.

To input survey data, follow the steps below.

1. Select the relevant ToW plot using the ‘select’ tool from the top toolbar.

2. Press the ‘Properties’ tab in green menu bar. You will see a table of attributes to complete for the selected survey type.

**IMPORTANT:**

Input data into the fields within the Properties tab chronologically. The table will automatically update accordingly.

3. A ‘Review’ window will appear notifying you of any incomplete fields. Once all fields are complete, click ‘Ok’ and use the ‘X’ button in the top right of the tab to exit (Figure 17.2).

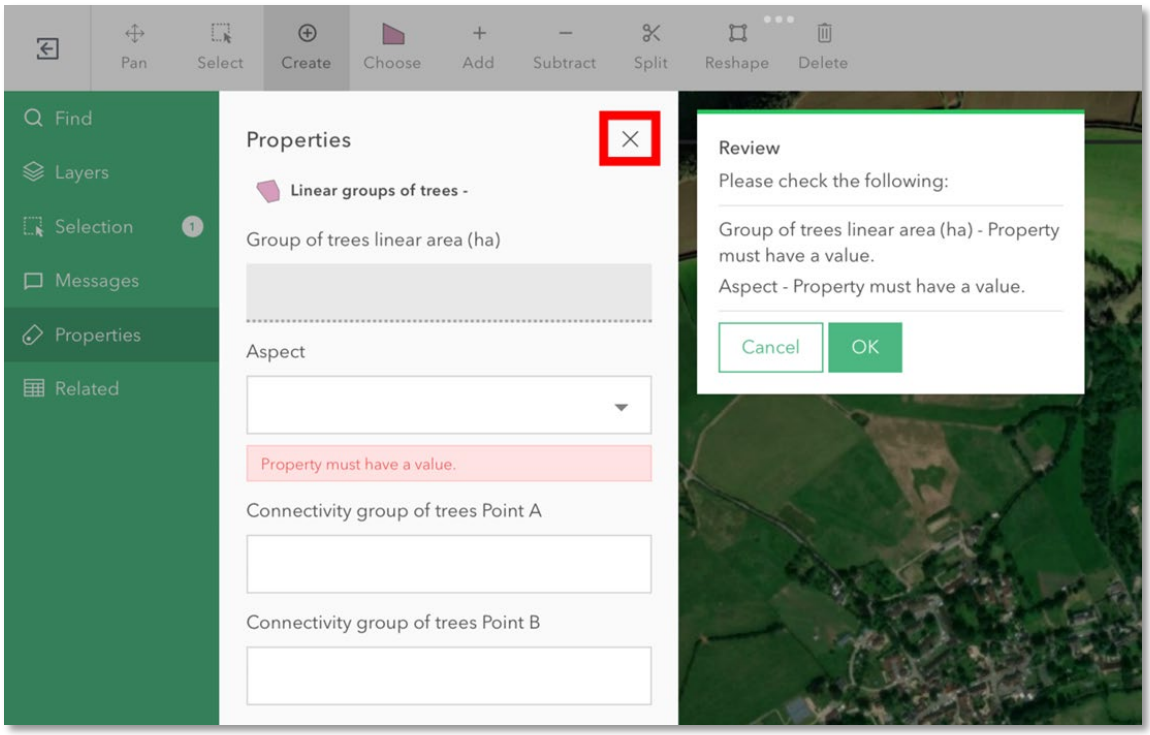



**Figure 17.2:** Image showing the Properties tab with a 'Review' window providing a reminder of the data fields that must be completed. Highlighted is the 'X' used to close the Properties tab.

When you have finished entering data in the Properties tab, you need to complete data entry in the Related tab.

1. Press the 'Related' tab in green menu bar.

2. Click on the **+** symbol to add a record to a related table and fill in the appropriate fields.

3. Select the back arrow to return to the list of related tables, then click on the 'X' to return to your map screen.

## 18 LOW RESOLUTION DATA CAPTURE TOOL: SURVEY SUBMISSION

To complete the Low-Resolution survey, you need to sync your data.

Before syncing, make sure you have:

- ✓ Completed entering data for each Low-Resolution survey feature.
- ✓ Have access to a stable internet connection.

1. Click on the back arrow in the top left corner of the screen (Figure 18.0) to return to the Low-Resolution app homepage (Figure 18.1).


**Figure 18.0:** Image of the top toolbar with the 'Back Arrow' highlighted

Your offline map and recorded data will be displayed on the right-hand side.

2. Select 'Sync' (Figure 18.1).

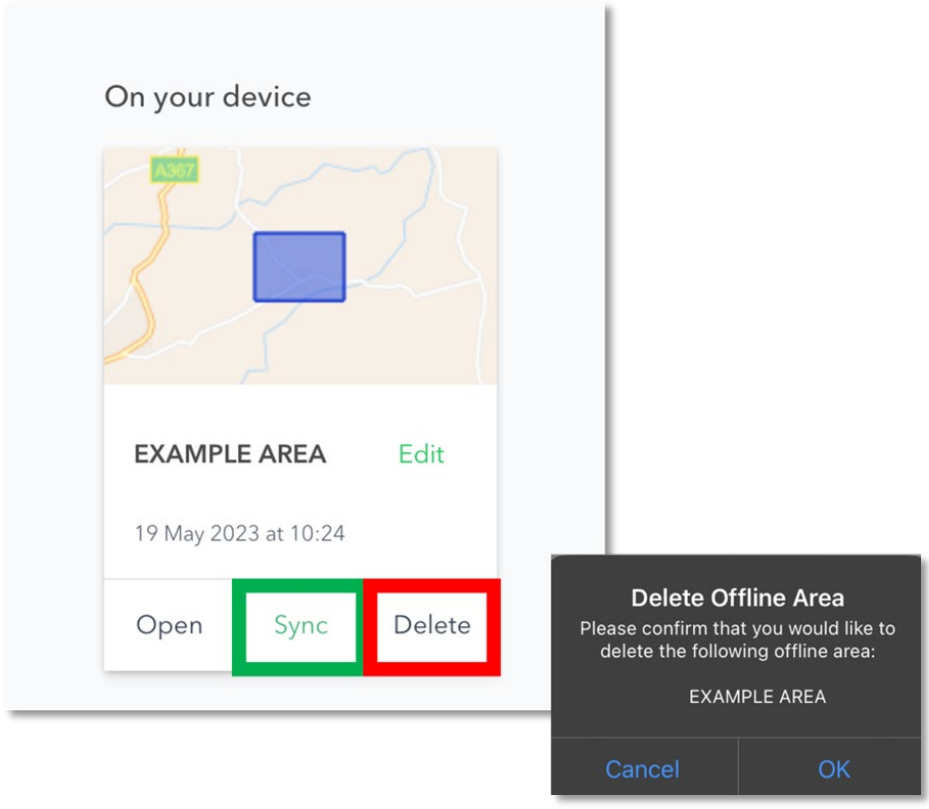



**Figure 18.1:** Image of an offline area in the Low-Resolution app homepage. The 'sync' and 'Delete' buttons are highlighted. Inset is the Delete confirmation box that appears when you press Delete.

3. When you have finished surveying your monad and all files have been successfully uploaded it is good practice to Delete your offline area (18.0).

## APPENDIX 1: PRIMARY TOOLBAR TABLE OF ICONS AND THEIR FUNCTION

TABLE HIGHLIGHTING FUNCTIONS OF THE PRIMARY TOOLBAR ICONS

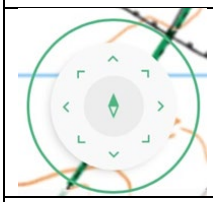
| Icon | Function | Location |
|---|---|---|
|  | Exit Monad back to Assignment's page. | Top Toolbar |
|  | Move around monad. | Top Toolbar |
|  | Select feature. | Top toolbar |
|  | Undo or redo previous action. | Top Toolbar |
|  | Access to the following:<br>• GPS<br>• Troubleshooting log<br>• Settings<br>• Sign Out | Top Toolbar |
|  | Use to move around the monad with the same function as the Pan tool. | Bottom left of monad. |
|  | Displays the location and scale of current display. | Bottom Toolbar |
|  | Snapping function on/off. | Bottom Toolbar |
|  | Layers and Snapping settings. | Bottom Toolbar |
|  | Ruler tool on/off. | Bottom Toolbar |

**Figure A1.0:** Table highlighting functions of the primary toolbar icons

## APPENDIX 2: GPS ADDITIONAL INFORMATION: GEODE DEVICE

This information should be used in conjunction with any updated Geode Troubleshooting documents that may be available within the 'Additional Guidance and Amendments' folder:

https://defra.sharepoint.com/sites/WorkDelivery3549/Surveyor%20library/Forms/AllItems.aspx?id=%2Fsites%2FWorkDelivery3549%2FSurveyor%20library%2FWider%20EES%20only%2FSweet%20App%20Guidance&viewid=60c4b893%2D694c%2D4386%2Db22b%2Dd8da77190997

### 1.0 ADDITIONAL INFORMATION – GEODE DEVICE

1.1 Accuracy Expectations

When connected, the Geode devices SBAS corrections (sub-50cm 65% horizontal error) will be available within 10-15 minutes in most locations.

- Atlas correction will automatically take over when it can enable a better position accuracy than SBAS. This should take approximately 15- 20 minutes.
- Atlas correction can take up to 60 minutes to reach full accuracy of sub 10cm in ideal conditions.

> **NOTE:**
>
> It could take up-to 60-90 minutes for the accuracy to reach the required 30cm the first time you turn it on or after a hard reset.

- Accuracy should be maintained if the Geode remains switched on and mounted on an antenna pole.

### 1.1 GOOD PRACTICE

- Connect Geode device to Sweet App immediately upon arrival at the site.
- There is no need to disconnect the Geode throughout the survey day, maintaining a connection is advised.
- If your iPad automatically locks it can disrupt Geode connections. In your iPad setting, maximise time before locking:

> Settings > Display and Brightness > Auto-Lock > Select longest time frame

- The default refresh rate of the Geodes is one per second so if you move faster, your position marker in that app will be always moving around. Some of the Geode units may have 10Hz refresh rate enabled.

- GPS signal impacted by obstacles such as canopy cover, buildings, canopy cover, nearby pylons, and shading from the south, including shading from yourself.
- Check your position holding the pole steady, stationary, and vertical for a second regularly since this allows the GPS to catch up, thus preventing you from overshooting.
- When recorded a position, use the circular spirit level located on the antenna pole to ensure it is positioned vertically.

## 1.2 THE GEODE DISPLAY SCREEN

The LED status lights on the front of your Geode indicate different status conditions of the device. Figure A2.0 below is an image of the front of the Geode.

**Amber LED:**

- Blinks when a 3D GPS fix is made (four or more satellites).
- Turns solid when a DGPS fix is made, and a correction source is being applied.

**Blue LED:**

- Blinks when no Bluetooth connection is established.
- Solid when the Geode unit is connected via Bluetooth.

**Red LED:**

- Blinks slowly when battery is charging.
- Solid when battery is fully charged.
- Blinks rapidly when battery cannot accept a charge (e.g., from a laptop computer that doesn't have enough power to charge the Geode or other faulty power supply).

**Green LED:**

- Solid when the power is turned on.
- Blinks when the battery needs to be charged.


**Figure A2.0**: Image of Geode front display. The topmost amber light is the Satellite lock status. The power button is to the right of the status LED lights.

**NOTE:**

You may need to wait for up to 30 minutes for the amber Satellite status light to be on constantly. During this time make sure that your Geode is mounted on its pole and extended to 2m to minimise shading. Remember to keep the Geode stationary during this time.

**IMPORTANT:**

Give the Geode enough time to lock on to satellites. Make sure you are in an area with clear views. It may take a further 30 minutes to obtain a satellite fix if the unit is switched off and on.

**NOTE:**

Leave the Geode switched on for the duration of the survey day, even if you have connectivity issues.

Connectivity problems can usually be fixed through iPad settings.

If you need to preserve your iPad battery, you can temporarily disable Bluetooth on the iPad and disconnect from the Geode.

You will need to re-establish a Bluetooth connection and reconnect to the Geode within Sweet again if you do disconnect.

**Disconnecting does not involve switching off your Geode!**

You can disconnect the Geode from the iPad by swiping down from the top right of your iPad to access the quick connect settings. Press the Bluetooth icon and it will turn from blue to grey to indicate it is temporarily disabled. Full Bluetooth settings are accessed from the main iPad settings menu by pressing the iPad settings icon from the home screen.

**IMPORTANT:**

Temporarily switching Bluetooth off and on from the iPad can fix some connectivity options.

Make sure your Geode is listed as the connected device in the iPad Bluetooth setting and within the Sweet GPS settings, and that location data is actively updating within the Sweet GPS settings tab prior to inputting survey data!

## APPENDIX 3: GEODE GPS: SIMPLIFIED TROUBLESHOOTING GUIDANCE

This simplified guidance supersedes much of the troubleshooting guidance found within earlier versions of the Sweet User Guide.

Firstly, check if your Geode appears to be functioning correctly (refer to Section 2.3 of the Sweet User Guide for details of the Geodes physical attributes):

- On first use, a new Geode needs to be in an upright position elevated from the ground and with clear views of the sky for up to 45 minutes. This is so it can globally orientate itself and download local satellite ephemera.

- During this initial start-up time an orange GPS status light will flash on the Geode, this will eventually change to being permanently lit. The Geode is then ready to use.

- If the orange light keeps flashing, move to a different location as there may be interference such as powerlines or buildings. If the orange status light does not stop flashing (+3 hours) even in apparent ideal conditions, then you Geode may be faulty. Allow plenty of time for the unit to try and locate itself before considering it a faulty unit

- If the orange light fails to illuminate after 45 minutes, then your Geode is likely Faulty.

In subsequent use the orange GPS status light should start flashing within a few minutes of being switch on and under clear sky. The status light should then change to solid on within 20 minutes. Provided the Geode is upright and elevated from the ground.

If the orange light seems to be flashing for a long while move to a different location

- If the orange light fails to illuminate at all after 20 minutes, or never stops flashing then your Geode may be Faulty.

**Assuming that your Geodes GPS status light is constantly on, then issues are possibly connectivity related.**

A blue light on the Geode will be constantly on when it has paired with a device. However, this does not necessarily mean that it is able to stream location data to that device.

Data transmission conflicts between the Geode and applications on your device can prevent data sharing even when your device and the Geode appear to be successfully connected.

If the blue light on the Geode is on and your Geode appears to be a connected device within your iPad Bluetooth settings:

- Navigate to the GPS tab with Sweet (Figure A3.5) you will be able to see if location data is being shared. If location parameters remain blank after a few seconds, even after you have fully closed and reopened Sweet, there may be a connection conflict. Follow the guidelines below.

**Most connectivity issues can be solved by following the guidelines below.**

If you have Geode Connect installed on the same iPad that you use for Sweet please fully uninstall it.

If you are required to use Geode Connect it can be installed onto another device or temporarily reinstalled.

To uninstall Geode Connect from an iPad:

1. From the iPad home screen, long press on the Geode Connect app icon until a 'Remove App' tab appears (Figure A3.0).

2. Press 'Remove App' to open the 'Remove Geode' tab (Figure A3.0).

3. Press 'Delete App' (Figure A3.0).

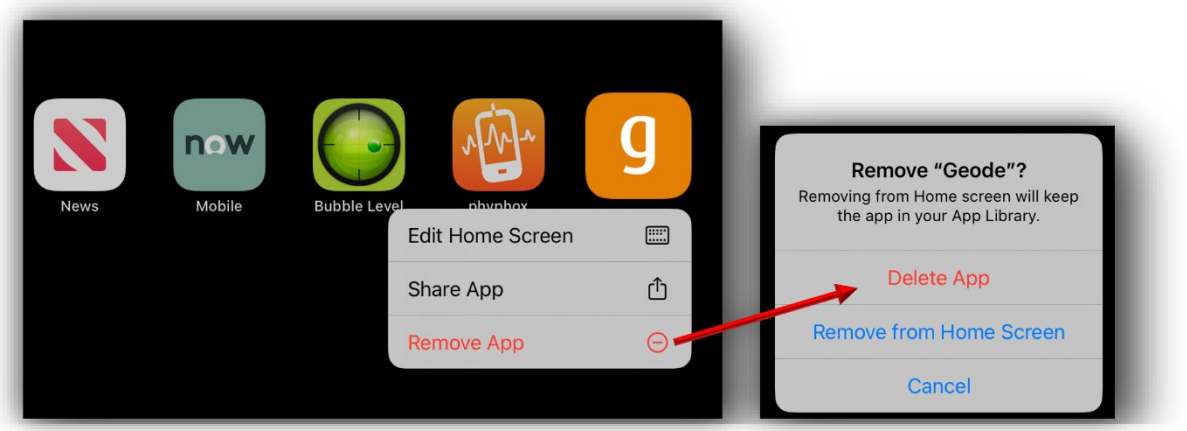



**Figure A3.0**: Image of iPad home screen illustrating the 'Remove App' and 'Delete App' tabs

Uninstalling the Geode Connect app may solve connection issues. If you continue to experience connection issues, ensure you are following the best practice guidance below.

General best practice:

- It is important to have the iPad and Geode within 2m of each other when you first switch the Geode on prior to survey.

- The Geode needs to be upright and on the 2m pole when it is used.

- If the connected iPad and Geode stray too far apart (>~5m) the Geode may become only partially connected – i.e., it seems to be connected but it is not streaming location data. This may also happen if your iPad screen goes off when walking between survey sites.

**IMPORTANT:**

Prior to inputting survey data always check that GPS data is actively updating by checking the GPS Status settings from the GPS tab (Figure 6).

- If your Bluetooth appears connected but no data is streaming to Sweet, first try to disable and reenable Bluetooth from the iPad settings (Figure A3.3).

- If location data still fails, follow the steps below.

**NOTE:**

The following steps assumes your Geode is ON, Bluetooth on your iPad is active, and you can connect to the Geode. If the blue light on the Geode is not illuminated and the Geode does not appear under 'My Devices' proceed to Step 8 first as your Geode may not be connected to your iPad.

**IMPORTANT:**

Leave your Geode ON and within 2m of your iPad.

Fully close Sweet and any other mapping apps during this entire procedure.

1. Make sure Sweet is fully closed and not just minimised.

2. Open iPad Bluetooth settings from the Settings tab in your iPad (Figure A3.1).


**Figure A3.1**: Image of iPad settings tab on the iPad home screen

3. Press Bluetooth from the Setting menu on the left of the screen (Figure A3.2).

4. Under 'My Devices', press the '**i**' icon to the right of the connected Geode (Figure A3).

5. A new tab will appear, press 'Forget This Device' (Figure A3.2).

6. A pop-up box will now show, press 'Forget Device' (Figure A3.2).

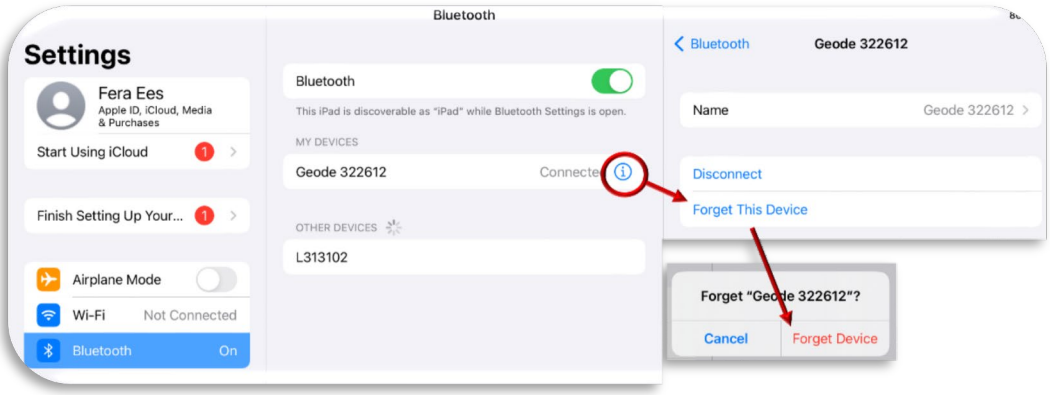



Figure A3.2: Image of iPad Bluetooth settings with directional arrows to show the order in which to 'Forget Device'

7. Immediately after pressing 'Forget Device' press the green Slider to the right of Bluetooth near the top of the screen to temporarily disable Bluetooth on the iPad (Figure A4). The green area of the Slider will turn grey when Bluetooth is off.

**IMPORTANT:**

If you don't disable Bluetooth immediately after you 'Forget Device', your Geode may automatically reconnect and show up under 'My Devices' when you reenable Bluetooth. If it does return to step 3 and try again.

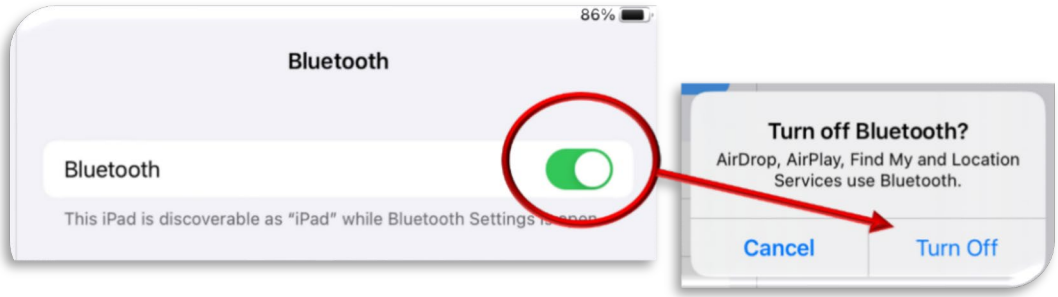



Figure A3.3: Image of iPad Bluetooth slider button, when pressed opens and option to 'Turn Off' Bluetooth.

8. After about 5 seconds press the Bluetooth slider button to reenable Bluetooth on your iPad.

9. Once Bluetooth is reenabled, it may take up to 30 seconds for your Geode to appear under 'Devices' on the Bluetooth settings screen (Figure A3.4). When it appears, press it to create a fresh Bluetooth connection with your Geode. Once connected it will show under 'My Devices' (Figure A3.4).

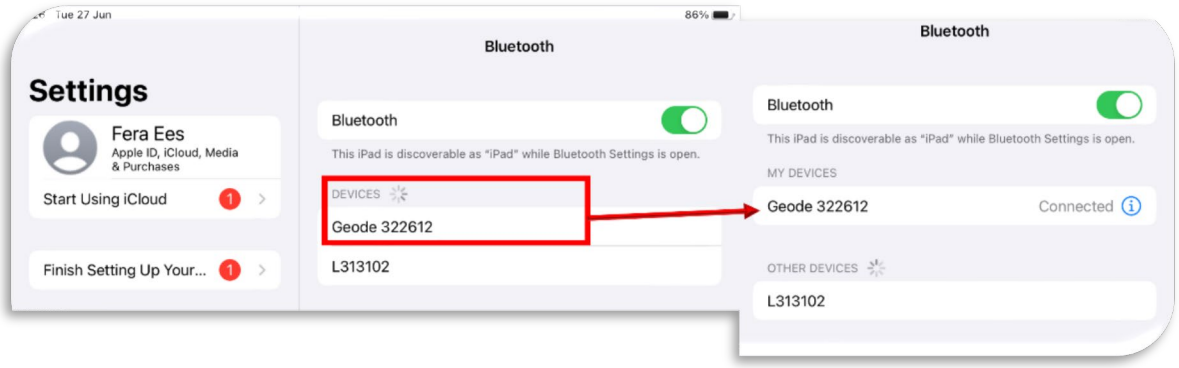



**Figure A3.4:** Image of Geode under the iPad 'Devices' menu. Inset is the 'My Devices' Menu showing the Geode once connected.

10. Once your Geode and iPad have reconnected open Sweet and navigate to the GPS tab from the blue icon in the top right of the Sweet Screen.

11. Check that 'Geode' is selected as the active device from within the GPS device menu.

12. Check that data is streaming to Sweet from the Geode in the Status tab. It may take a few seconds before you see position data and streaming data on the right of the screen under the GPS log heading (Figure A3.5).

Refer to the main Sweet User Guide for a more detailed description of the GPS tab and connecting the Geode.

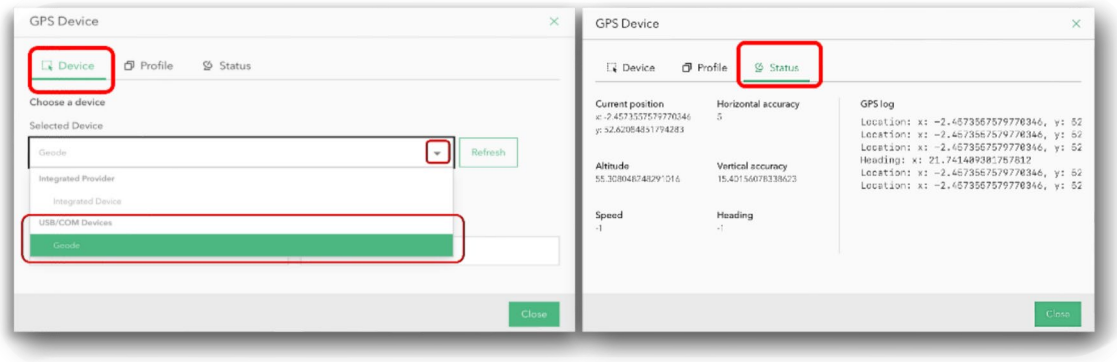



**Figure A3.5:** Image of Sweet GPS settings, on the left is the GPS Device tab, on the right is the GPS Status tab

# APPENDIX 4 – SWEET USER GUIDE AMENDMENTS AND UPDATES

## 4.1 CHANGES TO SWEET SYMBOLOGY

In the latest version of the Sweet EES Survey App, some feature symbols are amended to improve visibility. They are visual changes only, there are no implication on the functionality of the App.

> **IMPORTANT:**
>
> Future versions of the Sweet User Guidance and demo videos will be updated to reflect changes in symbology.

**1. Feature reference labels have been added to all features**. When running Progress Checks this will aid the identification of features that need further information adding. The labels can overlap when features are located close together. Zooming into a feature will allow you to view the associated label. The labels for Squares may be the last to appear.

**2. Square outline colour** - the Targeted Squares and Standard Squares are now differentiated by different coloured outlines (Figure A4.1). This is in line with colour differentiation using the Surveyor Planning App.

- Targeted Square outline = Orange
- Standard Square outline = Blue

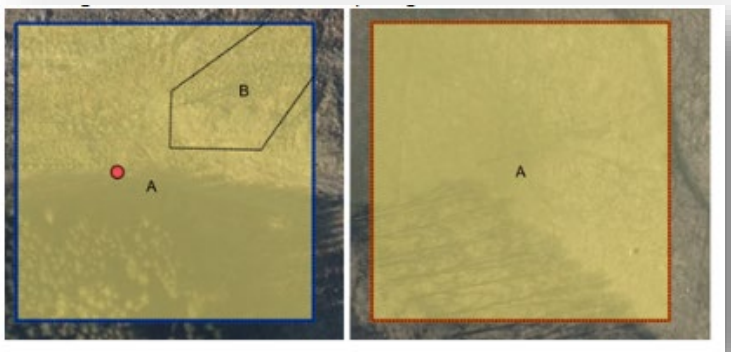



**Figure A4.1:** On the left, an example of a Standard Square outlined in blue and on the right a Targeted Square outlined in orange.

**3. Stand fill colour** - the new Stand fill is a lighter colour and with higher transparency, allowing better visualisation of the basemap and for layering other datasets (Figure A4.2).


**Figure A4.2:** two squares containing single stands, the basemap below be seen due to the lighter colour and higher transparency of the stand feature.

**4. Vegetation Plots** are now differentiated by symbology, so the original Vegetation Plots placed via the Square are shown by a red circle (Figure A4.3). The additional Soil Vegetation Plots that are placed manually when the original vegetation plot is not suitable for the soil survey, are shown by a purple/pink circle (Figure A5.3). The change from a green square to a circle symbol also makes it clearer that the symbol represents a point, not the actual 2x2m square.


**Figure A4.3:** on the left, a list of the Vegetation Survey veg plot symbols. On the right, a list of the Soil Surevy veg plot symbols.

**5. Lone trees** symbology has been changed from a green icon (Figure A4.4) to a blue circle with a thick black outline (Figure A4.4) to provide further contrast against the OS basemap and aerial image. The Tree in Feature symbol is a yellow circle (Figure A4.4a).


**Figure A4.4:** on the left, the green tree icon displayed is the old Lone Tree symbol. On the right, the blue circle icon is the new Lone Tree symbol in the Sweet App.


**Figure A4.4b:** yellow circle icon located within the pond feature, is the new symbol for a Tree in Feature.

**6. Hedgerows** have been changed from dark green (Figure A4.5) to brighter pink (Figure A5.5). This is to improve the contrast between basemaps and the feature. This shade of pink was chosen, as it is not a common colour in OS Basemaps.

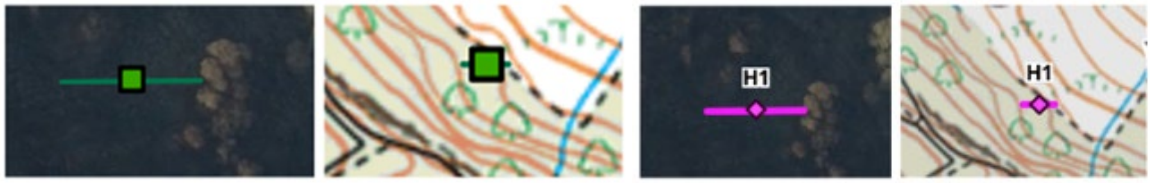



**Figure A4.5:** on the left, the green line icon displayed is the old symbol for a hedgerow feature. On the right, the purple line icon is the new symbol for a hedgerow feature.

**7. Landscape survey** icons have been changed from a mountain icon (Figure A4.6), to an orange circle (Figure A4.6). Symbol size and contrast have been increased to allow easier visibility.


**Figure A4.6:** on the left, the mountain icon displayed is the old symbol for a Landscape Survey feature. On the right, the orange circle con is the new symbol for a Landscape Survey feature.

> **NOTE:**
>
> There have been no changes to the Pond or Riparian plot symbology – Ponds are still blue polygons and Riparian Plots are blue squares.

Figure A4.7 and Figure A4.8, give an overview of the new symbology at the monad level, against the OS basemap or the aerial photograph.

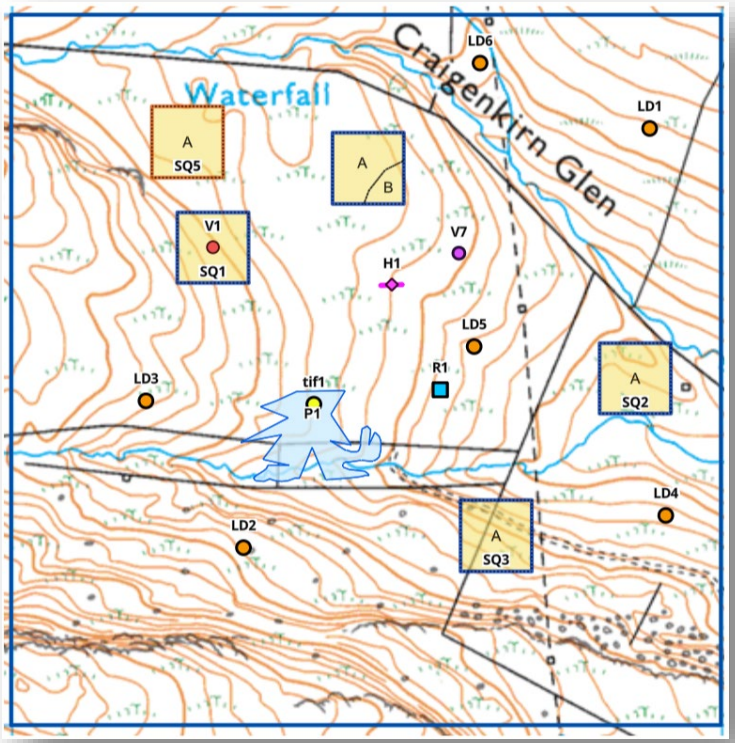



**Figure A4.7:** an overview of the new symbology on an OS basemap.

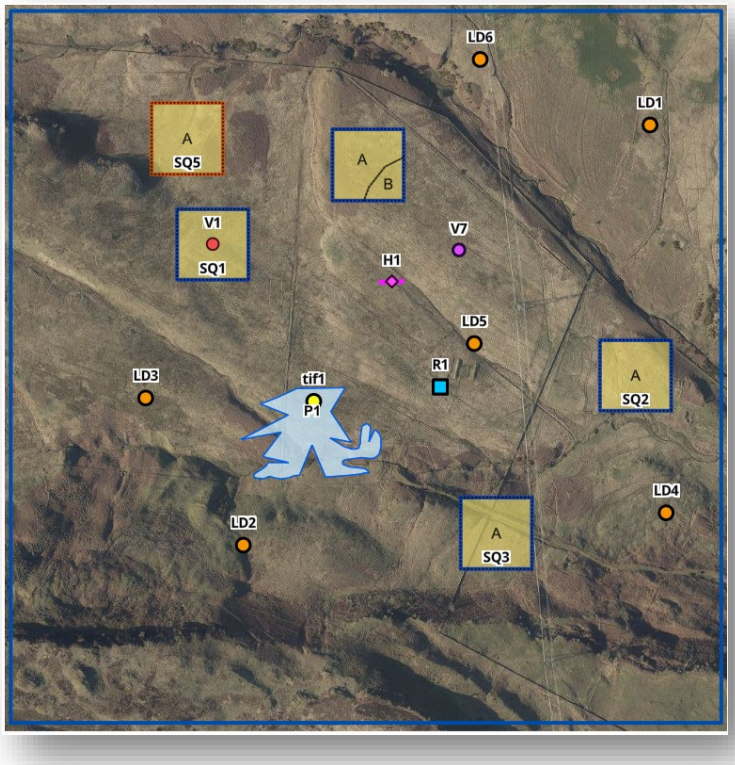



**Figure A4.8:** an overview of the new symbology on an aerial photography basemap.

## 4.2 UNDERSTANDING PROGRESS CHECK OUTPUTS

This section provides further guidance for interpreting outputs of Progress Checks. We will use the example of a simple Square/Stand/Veg Plot with only one stand (Stand A) throughout. The same principles apply across all features.

- **Black text** tells you which monad and feature the information below relates too, in Figure A4.9 this is SQ6.
- **Green text** indicates something that is passing the progress check. No action is required, this can be useful information.
- **Red text** indicates something that fails the progress check, usually missing information. A monad cannot be submitted until all these checks have been resolved. The number in brackets tells you how many required fields are missing information. In Figure A4.9, 'Squares (2)' means Square SQ6 has 2 required fields under 'Properties' which have not been filled in. It doesn't mean there are 2 squares in the monad.

The insetting of text shows the hierarchy of linked features. In Figure A4.9 the following is true:

1. The Square is missing two fields in 'Properties'.
2. The stands linked to this square are missing one field in Properties.
3. All the 'Related' tables for the stands are listed, though these are not missing any required fields so are in green text.
4. The Vegetation Plot associated with this Square is also listed and this is missing 18 required 'Properties' fields.
5. The related tables listed for Vegetation plots are all green, so while the Vegetation Plot is missing 18 'Properties' fields, it is not missing any required 'Related' fields.
6. The photo counts are listed separately and are telling us that for Veg Plot V6 the number of photos recorded is 0 and this is failing because the minimum required is 3 and the max 6. For Stand A (of SQ6) there are also 0 photos recorded and there should be exactly 1 (min: 1, max: 1).

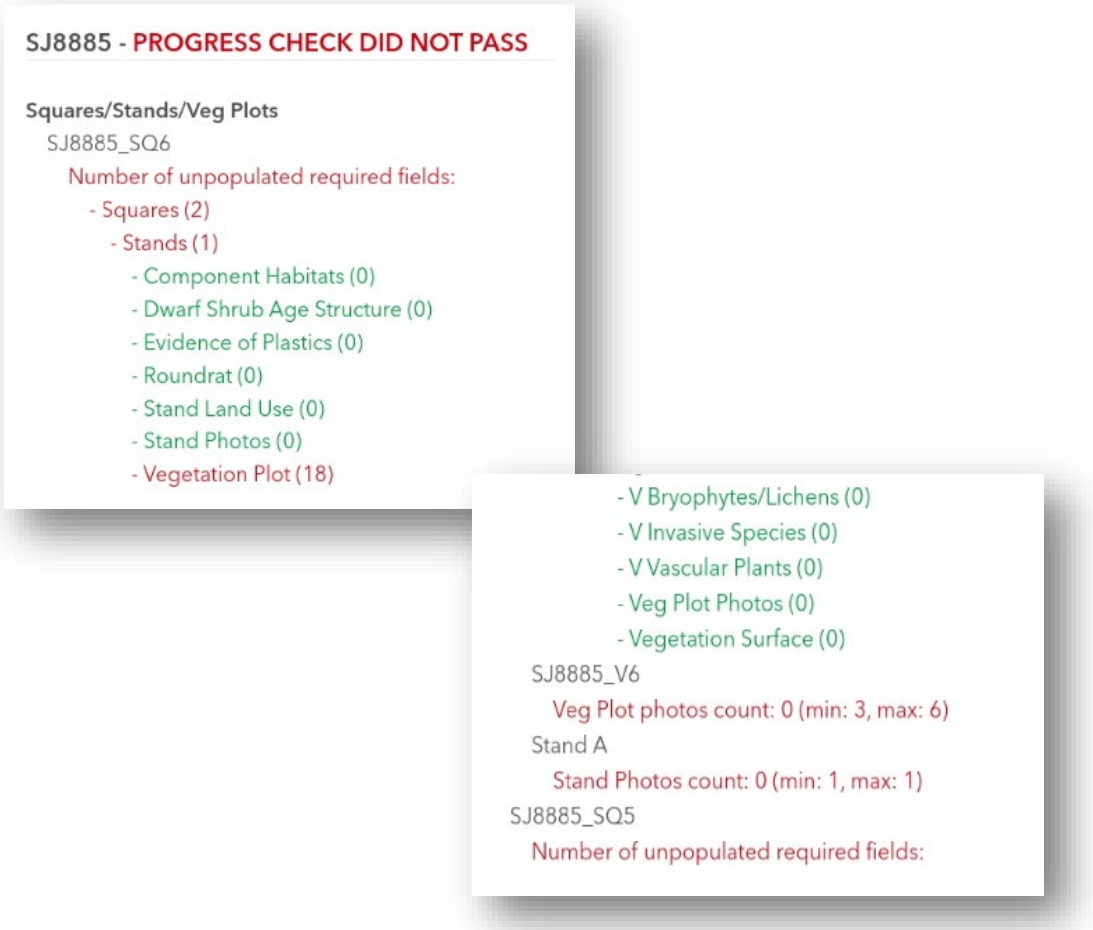



**Figure A4.9:** Progress check output for SJ8885_SQ6.

## 4.3 ARABLE FIELD MARGIN AND HORTICULTURE – PROGRESS CHECK

An error in Sweet has come to our attention which blocks users from passing Progress Checks and submitting a completed monad in certain circumstances. This work-around should be used until a proper fix can be implemented in Sweet.

**When you select the broad habitat type as 'Arable and Horticultural' to pass the progress checks you must input a 'Crop Type' in the Related 'Land Use' table.**

Three 'Priority or detailed' habitat options will appear after selecting 'Arable and Horticultural' as the broad habitat type.

1. Arable
2. Arable Field Margins
3. Horticulture

The 'Crop Type' field will only appear in the Related table if you select 'Arable' as the 'Priority or detailed' habitat.

**Arable Field Margin or Horticulture – below the Minimum Mappable Area (MMA)**

Input the following details, to access the 'Crop Type' field.

- Priority or detailed habitat = 'Arable'
- Component habitat = 'Arable' and 'Arable Field Margin'

**Arable Field Margin or Horticulture – above the Minimum Mappable Area (MMA)**

Work-around steps for field margin or horticulture over min mappable area:

1. Map the stand.

2. In 'Properties' set broad habitat to 'Arable and horticulture' and detailed habitat to 'Arable' NOT 'arable field margin' or 'horticulture' (Figure A4.11).

3. Fill in the rest of the properties fields as normal.

4. In Related, add Component habitat 'Arable' but set cover to 0% (Sweet will check at least one of the component habitats matches the detailed habitat in properties) (Figure A4.12).

5. Add a second component habitat of 'arable field margins' or 'horticultural' and set cover to 100% to reflect what is really in the stand then complete all other 'Related' fields and tables as normal (Figure A4.12).

6. When you get to 'Stand Land Use' add 'crop' and you should be able to set 'crop type' (Figure A4.13). Set it to 'other' if none of the other drop-down options are correct and you can specify what it is in the 'other' free text box. For a margin this may be something like 'wild bird seed mix' or 'wildflower mix' or just 'unsown grassy margin'. For horticultural land there should be an appropriate option or a single crop you can enter.

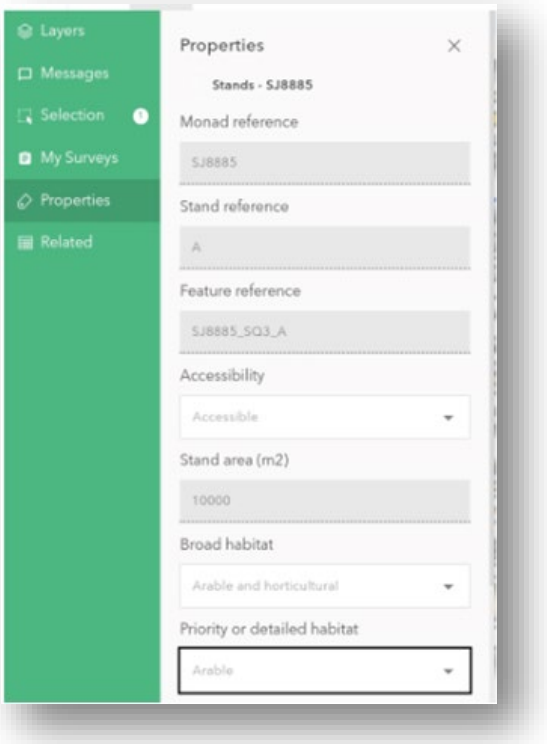



**Figure A4.11:** properties table with 'Arable and horticultural' entered as the broad habitat and 'Arable' entered as the 'Priority and detailed habitat'.

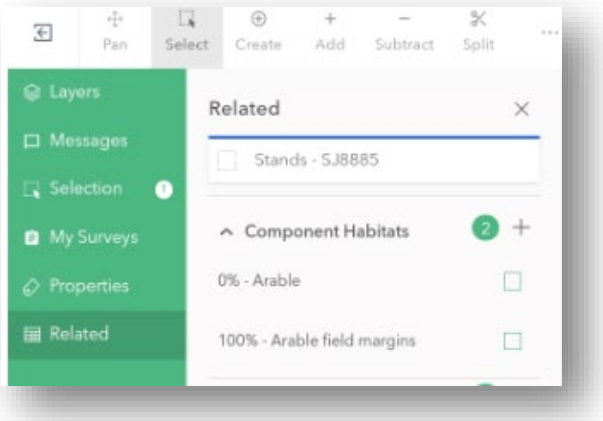



**Figure A4.12:** related table with 'Arable' and 'Arable field margins' entered at the Component Habitats with the percentages cover 0% and 100% respectively.

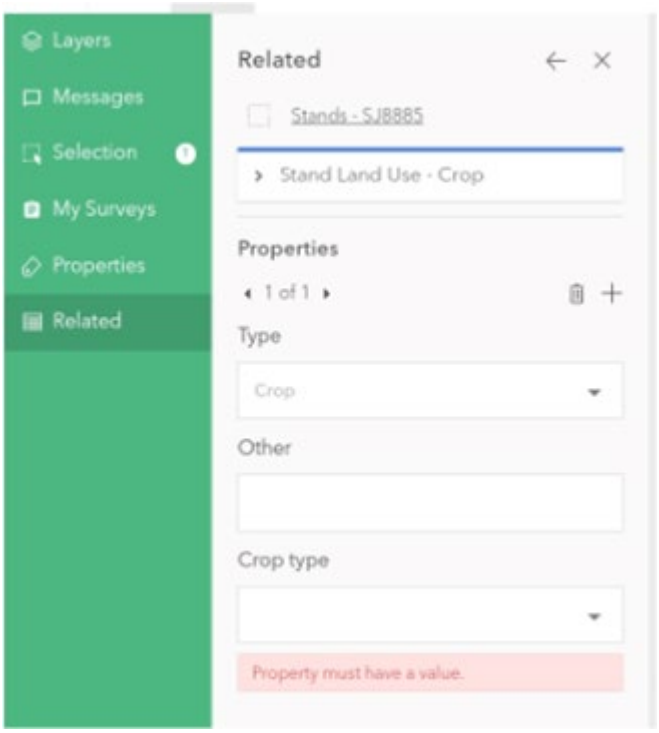



**Figure A4.13:** Stand Land Use field selected from the Related table, field options displayed allow you to enter the Crop Type.