FIELD SURVEYS WITH FIELD UPDATE LAYERS

Tutorial for Data Owner and Field Technicians

SOUTHERN AFRICAN
WILDLIFE COLLEGE
TRAINING BEYOND BOUNDARIES

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Contents

Field Surveys with 'Field Update' layers

Creating separate layers for field updates is an alternative approach to having field technicians update source datasets directly while they are in the field. By using separate layers, the appropriate data owner can review the field observations, perform quality assurance, and determine how to update the SAWC File Geodatabase Library (SAWC FGDB Library) and ArcGIS Online (AGOL) content. If desired, this same workflow can be applied to any hosted feature layer so that it can be edited in the field. However, a clear plan is necessary for identifying and reviewing updates that don't use an intermediary field, to be captured in the SAWC FGDB Library and prevent conflicting data sources.

Use Cases

- Identifying damaged equipment or new critical infrastructure in the field.
- Conducting surveys and field research.
- Reviewing field observations and determining appropriate reference library updates.

Instruction Overview:

These instructions cover:
- Creating new Field Update layer in ArcGIS Pro (data owner).
- Adding a Field Update layer to Field Maps and sharing access (data owner)
- Using the Field Update layers to make observations in field (field technician).
- Viewing field observations and making updates (data owner).

## Creating new Field Update layer in ArcGIS Pro (Data Owner)

- Create a new project in ArcGIS Pro.
- Right click on the map in the Contents Pane and select 'Properties'.
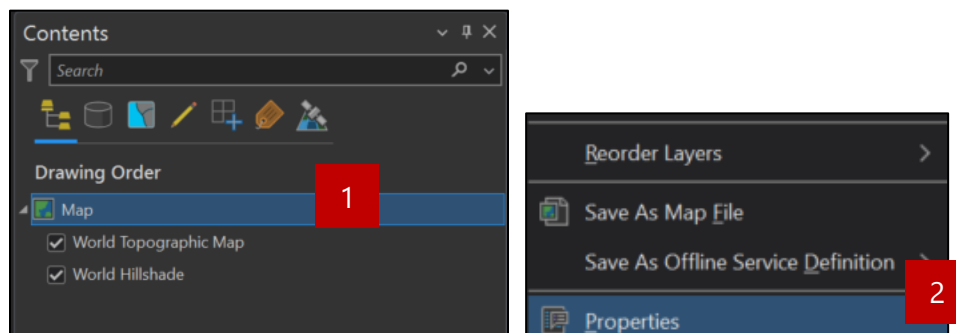
- In the 'Coordinate System' tab, set the coordinate system to WGS 1984 Web Mercator. This is the spatial reference that should be used when planning on using data in ArcGIS Online and in Field Maps. You may have to use the search bar.
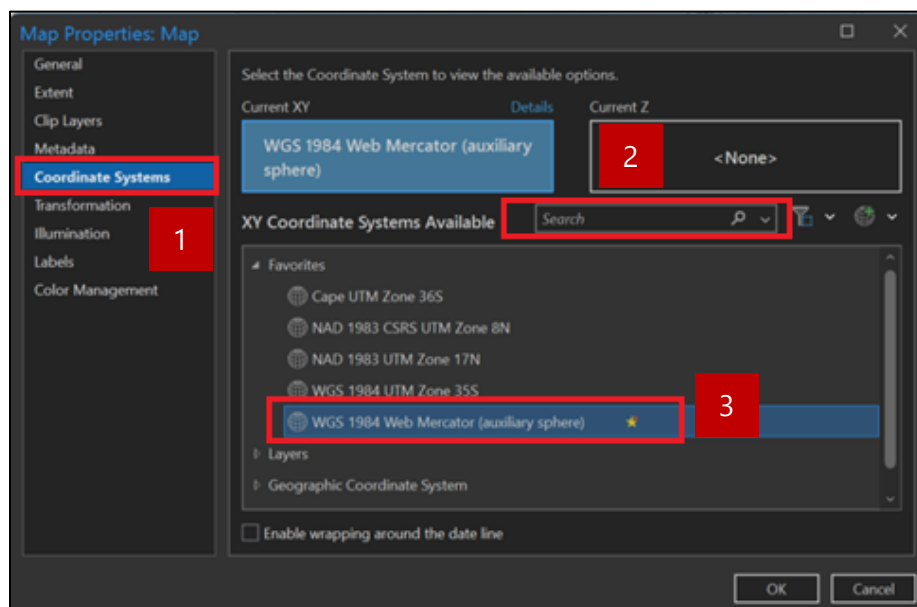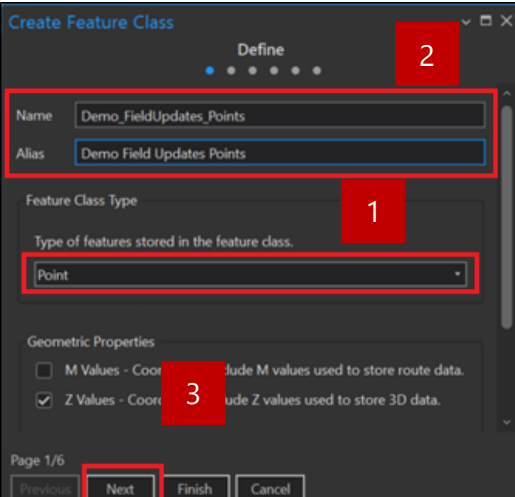

- Expand the databases section of the Catalog pane, right click on the local geodatabase, and select 'New', then 'Feature Class'.
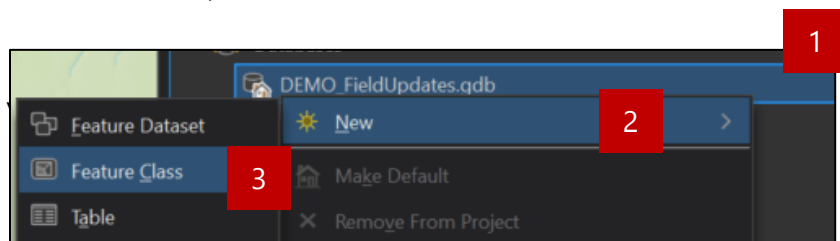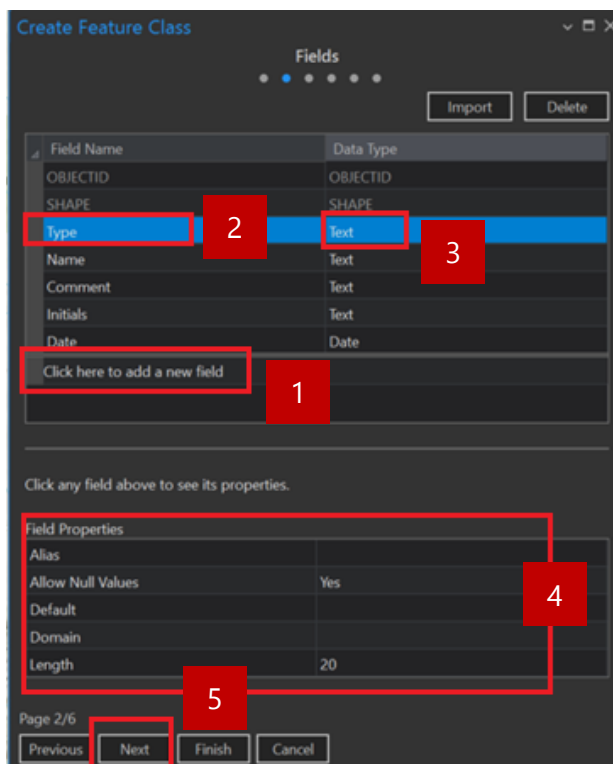
If the observations are for a specific survey or project, this information can be communicated in the name (e.g. 'Termite_Surveys_Mar2023', or 'Pipe_Inspections_Apr2024'). In this example, we will set up a point feature class. This process can be repeated for lines and polygons.

- Select the type of feature (point / line / polygon) and provide the feature class with a name and alias.
- Select 'Next'
- Add the appropriate fields and data types that are relevant. In this example, we will set up the fields 'Type', 'Comment', 'Initials' and 'Date'.
- Select next and ensure that the correct Spatial Reference is set.
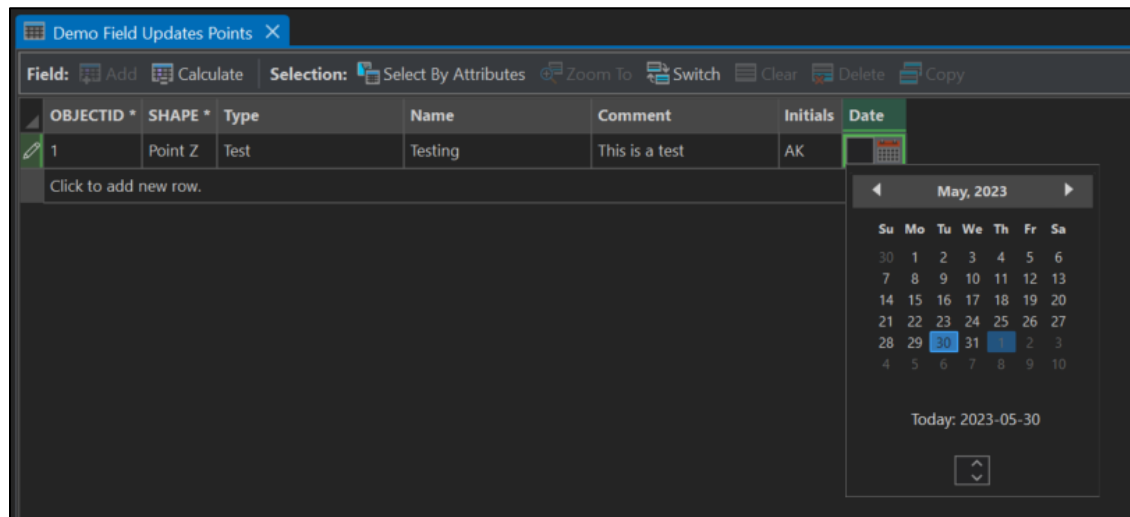- Select 'Finish'.

Optional: Creating a test record

Creating a test record can help simplify the setup and uploading process. You can delete this record at any time.

- *Optional:* Create a test record by selecting the 'Edit' tab then 'Create'.
- *Optional:* Select the update layer, then add a field observation to the map.
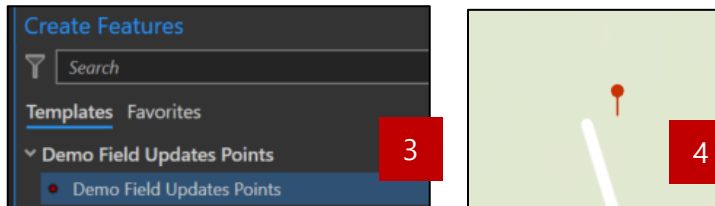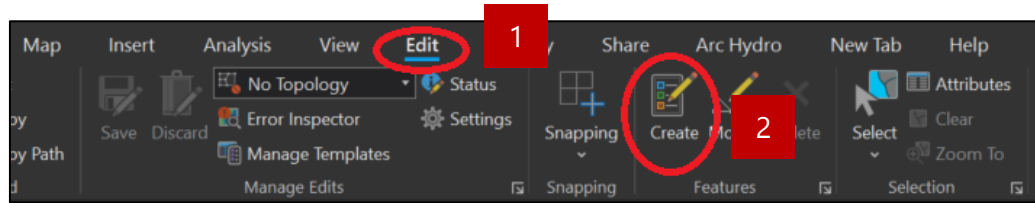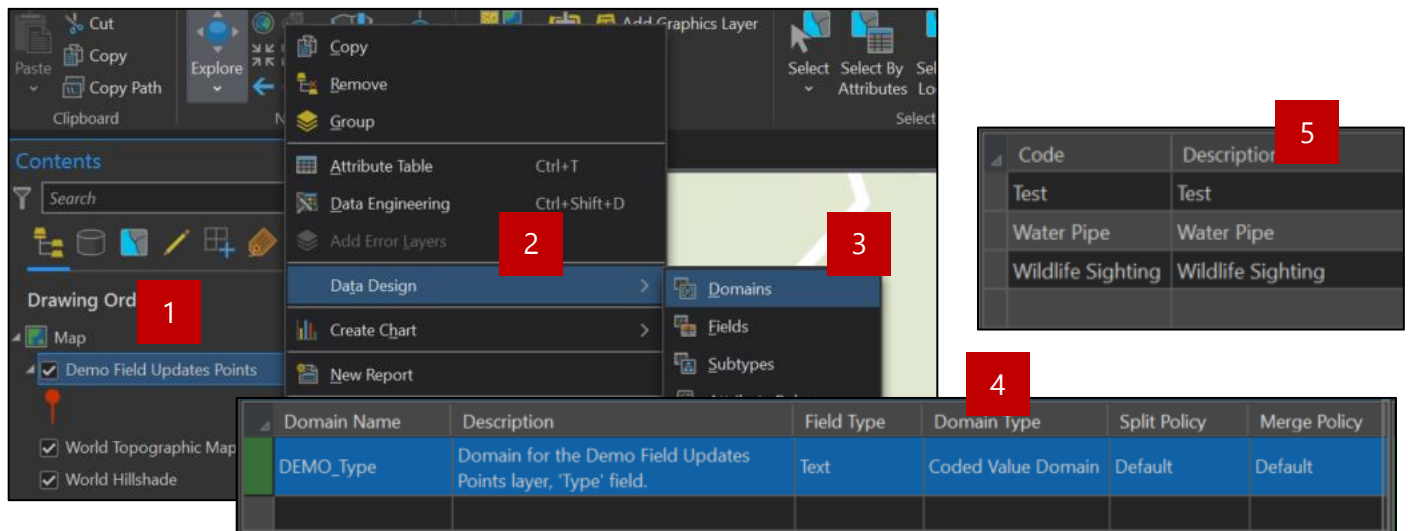
- *Optional:* Add any necessary information to the attribute table.

Optional: Setting up a domain

If a drop-down list of values will improve the data collection process, this can be made possible by creating a coded value domain and connecting it to the Field Updates layer. In this example, we will create a coded value domain for the 'Type' field.

- Right click on the feature, select 'Data Design' and then 'Domains'.
- Fill in the data to define the domain, such as name and description. The 'field type' must match the data type of the field it will be connected to.
- Fill in the 'Code' and 'Description' with the values that will be available to fill in. For our purpose we will leave these identical.
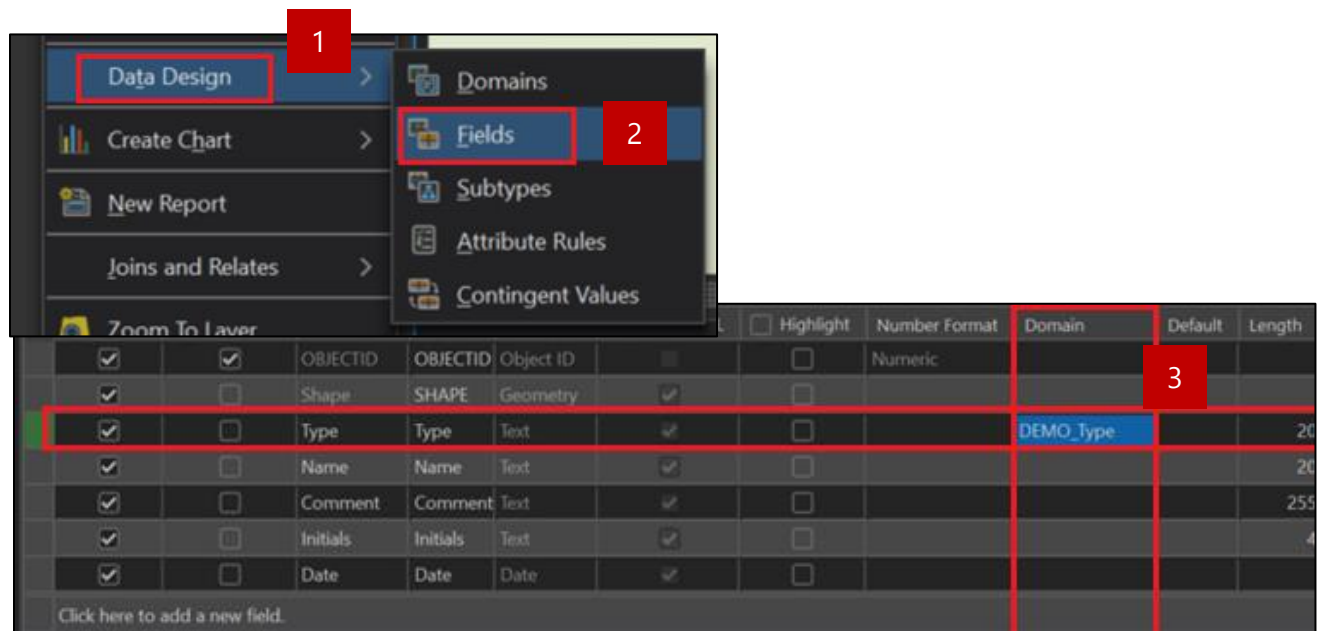
- Connect the domain to the appropriate field. Right click on the desired feature in the Catalog or the Contents Pane and select 'Data Design' and then 'Fields'.
- Find the field you will be adding the domain to, and in the domain column, select your new Domain from the drop down. If you do not see the domain, ensure that the 'Field Type' in the domain matches the 'Data Type' of the field in the feature class. Save once you are done.
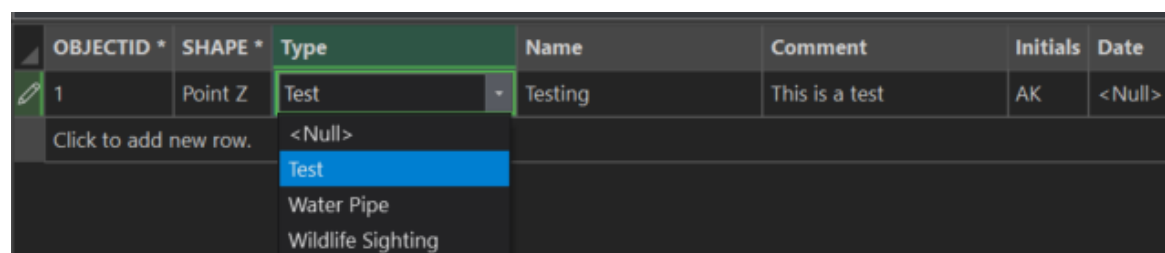

In the attribute table, you should now have a dropdown when you click on the field.
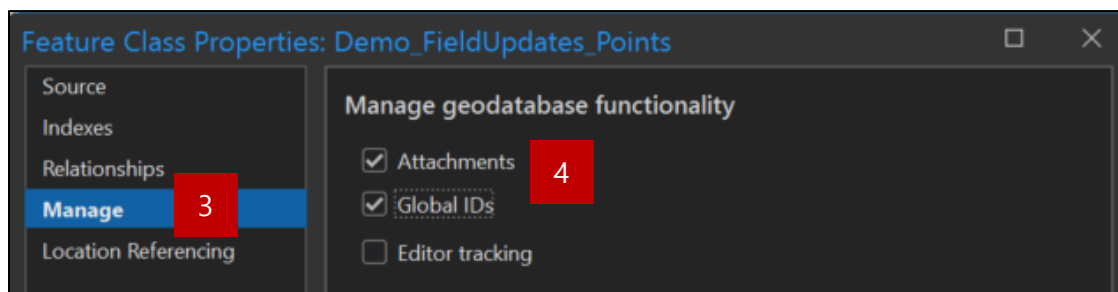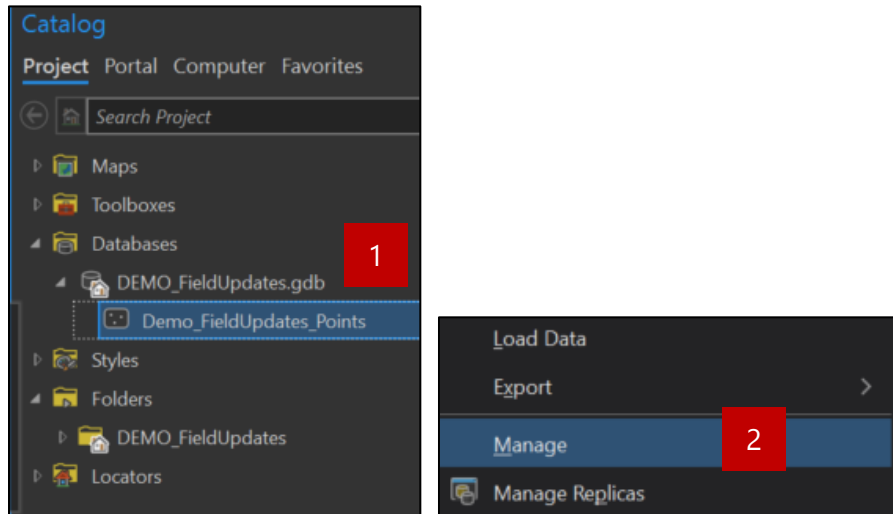
## *Optional: Allowing pictures and attachments, and defining the display field*

- Right click on the feature class in the 'Catalog' pane and select 'Manage'.
- Turn on 'Attachments' and 'Global IDs'. A new table for holding attachments, and a relationship class connecting the table to the feature class will be created.
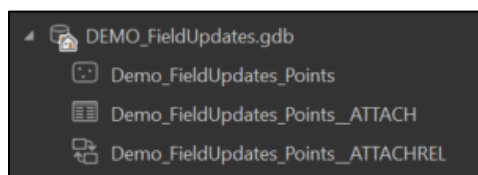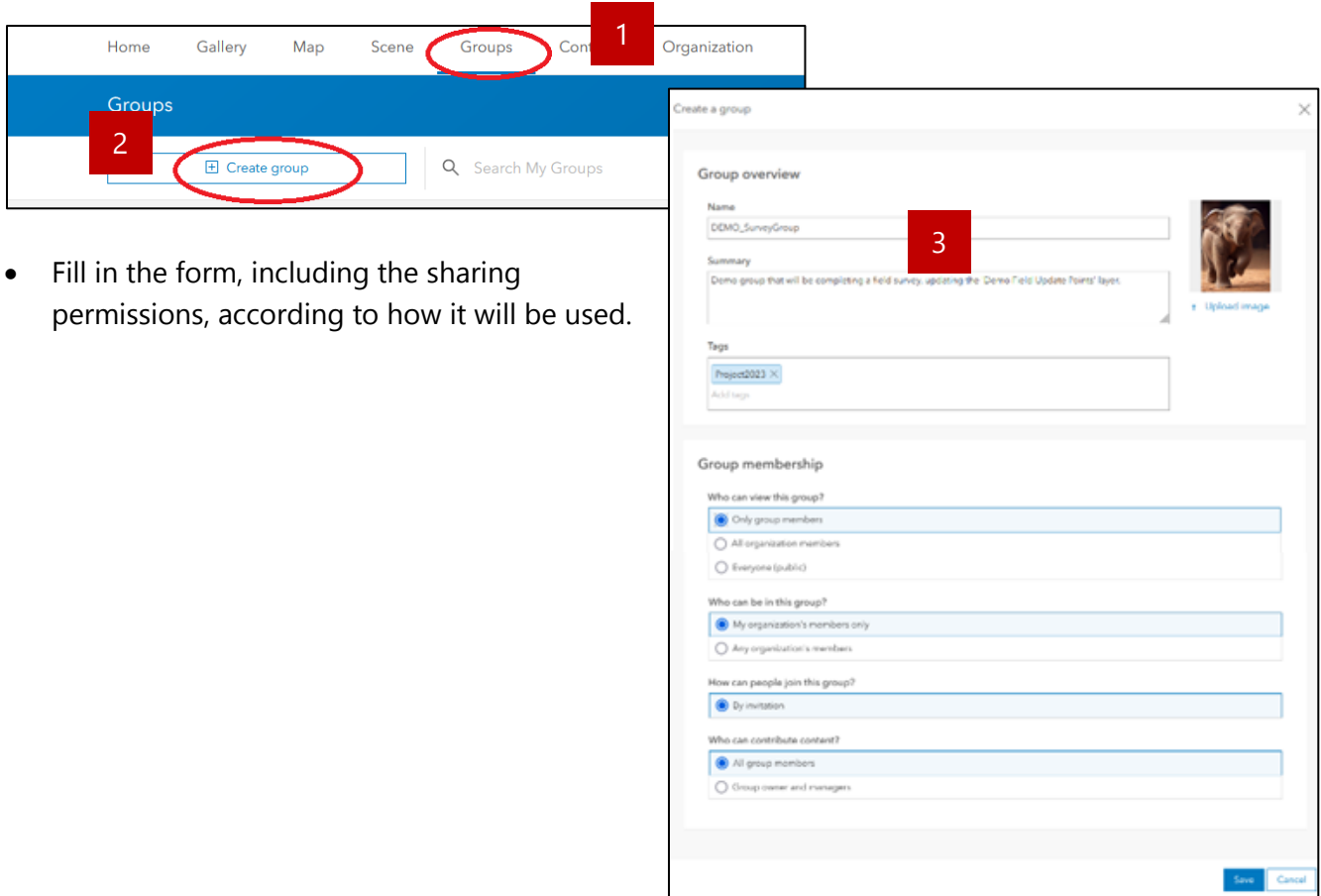

- Right click on the feature class, select 'Properties' and then 'Display. Select an appropriate Display field. This is default information that will show when selecting the feature class in Field Maps.
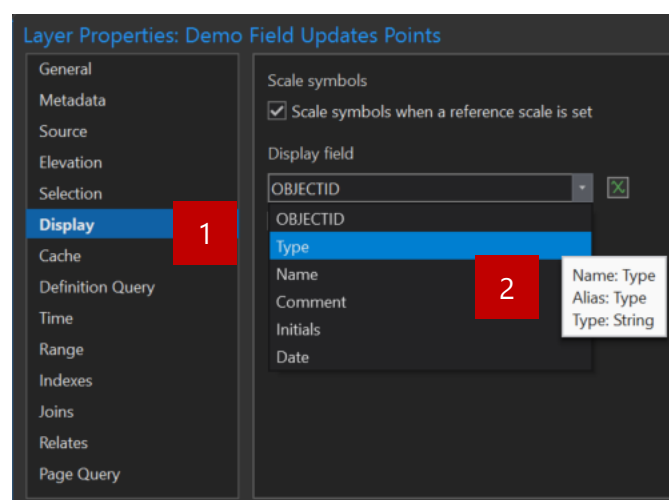
Once you have finished customizing the feature class, use the standard workflow to add it as a new web layer or overwrite an existing web layer in ArcGIS Online (see SAWC GIS Instruction Package – Section 1.4) for more information.

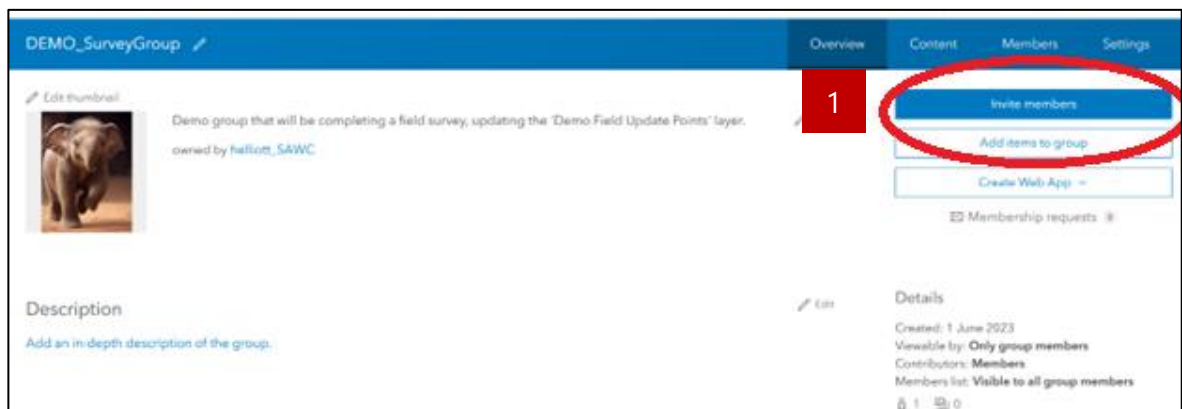## Adding a Field Update layer to Field Maps and sharing access

- Create an AGOL Group to facilitate sharing the 'Field Update' layer. In AGOL, select 'Groups', then 'Create Group'.

- Fill in the form, including the sharing permissions, according to how it will be used.

- Invite the field technicians that will be using the application on their mobile devices, to the new group.

- Open the uploaded hosted layer's item page in the Content section of AGOL.
- Edit the sharing so that it is shared with the group that was just created.
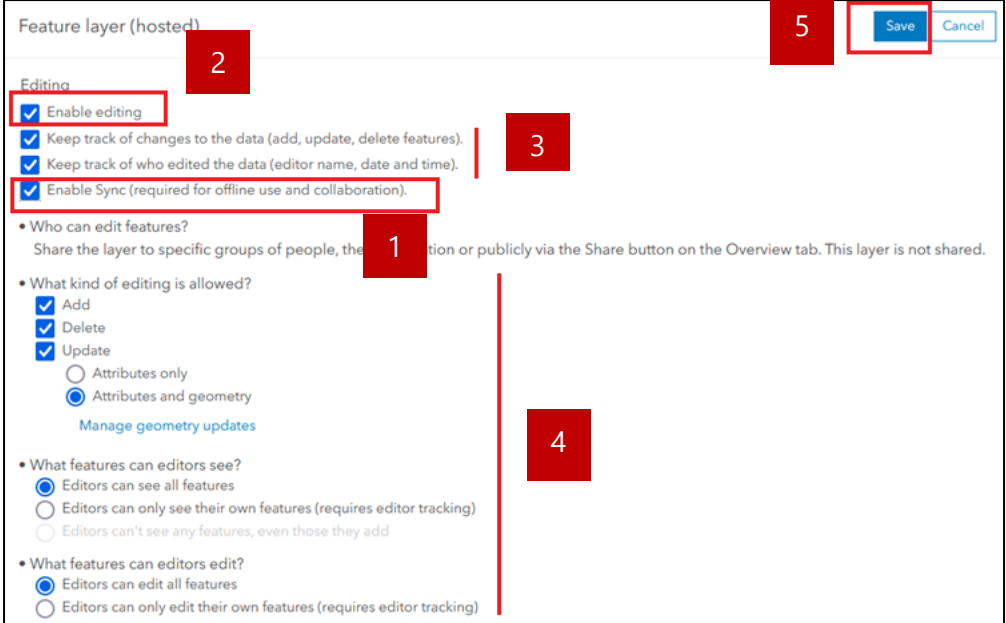
- Select the Field Update hosted layer's 'Visualization' and edit the appearance of the 'Field Updates' layer as required.
- Open settings, and check 'Enable Editing', 'Keep track of changes to the data' and 'Enable Sync'. Optionally you can include 'Keep track of who edited the data'.

- Navigate to the 'Content' section of AGOL.
- If there is a prepared web map that you wish to use, open it with Map Viewer *(if not, alternative below)*.
- Add the 'Field Update' point layer that was uploaded in the previous section (select the 'Layers' tab and click 'Add'). Save once done.

In this example, we will move the new hosted layer to the Critical Infrastructure Map and turn off all but the 'Fresh Water Pipe' 'Fresh Water Line' and the 'Demo Field Update' layers. Link to the 'Operations: Critical Infrastructure Map'.
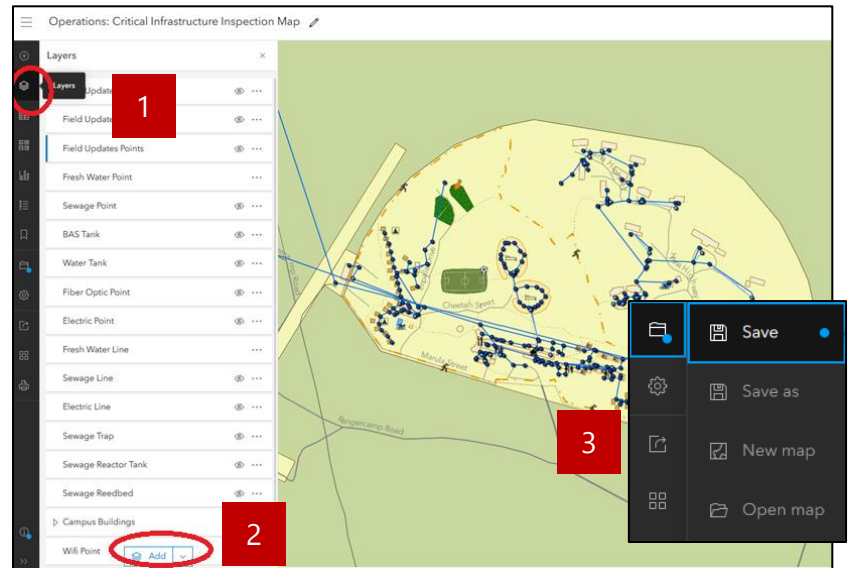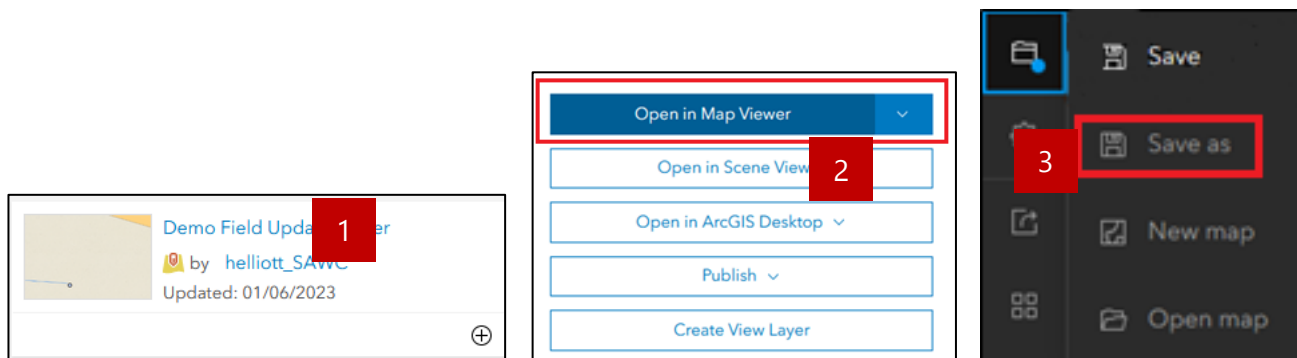

- *Alternative:* If there is not an appropriate web map already prepared, open the hosted feature layer item page, then view it in a Map Viewer. Add any appropriate reference data if applicable (see step above), then 'Save As' a new web map.

- In the 'Settings' page of the web map, ensure the option to 'Use in ArcGIS Field Maps' is selected. If this option is not available, you may need to ensure that 'Enable sync' is checked for each layer within the web map.
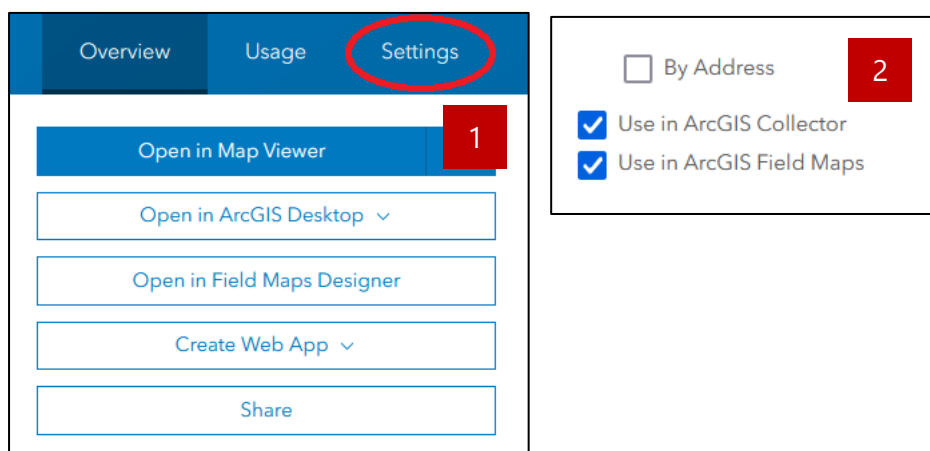
- In the web map's content page, ensure that the sharing permissions are granted to the applicable survey group that you created.
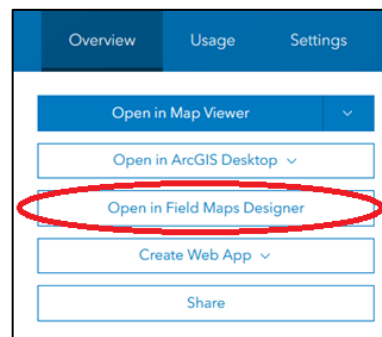
- Open the web map in Field Maps Designer

- Ensure offline is enabled for the web map.
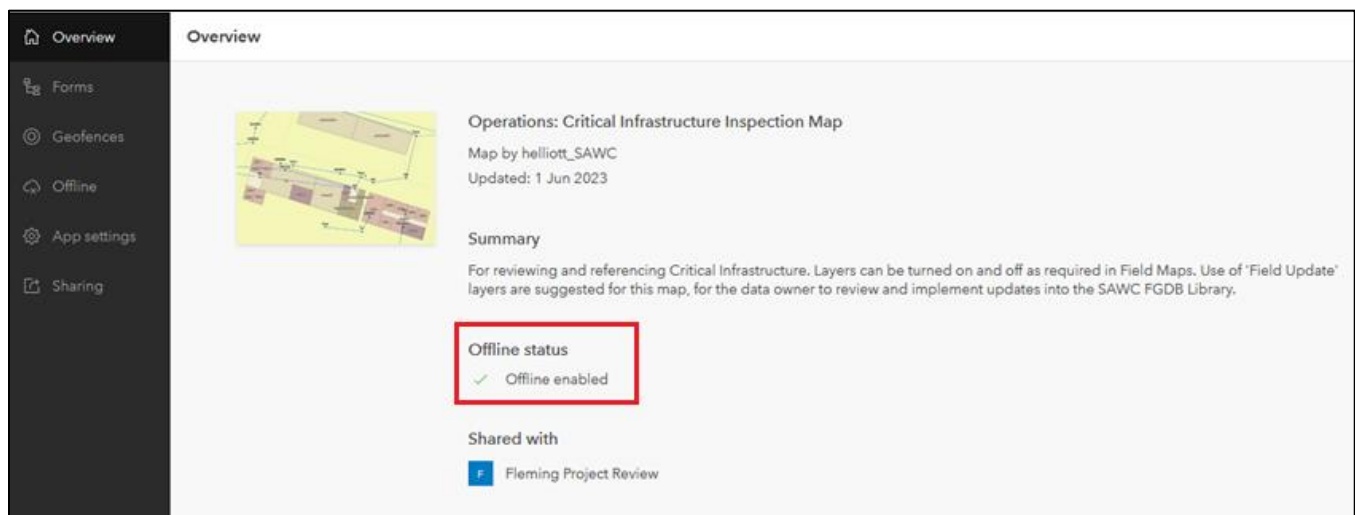
- Select the 'Forms' tab, then select the 'Field Update' layer, and 'Convert pop-up'.

- Organize the form in a manner that will be easy to read and use on the end-user's mobile device. Note that the 'Type' field has a dropdown, because we added a domain when we prepared the data.
- *Hint:* you can use the 'Properties' section of a field to add a description to help clarify what should be included.
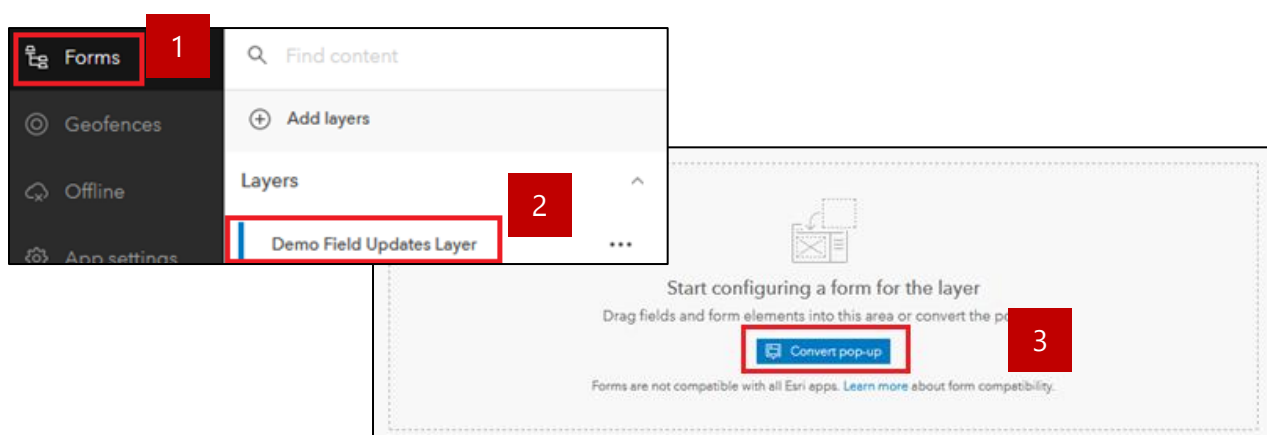- *Hint:* in the 'LAYOUT' section of the Form Builder, you can add and name a 'Group', then drag appropriate fields into the group to help organize your form.
- Save your changes at the top of the page.

The map should now be viewable in the end-user's Field Maps application, if they have been given permission to the group. You can also help them find the layer by clicking on 'Sharing' in Field Maps Designer and providing them with the link or QR code. (You can also double check by clicking 'Set sharing level' if the correct groups have granted permission).
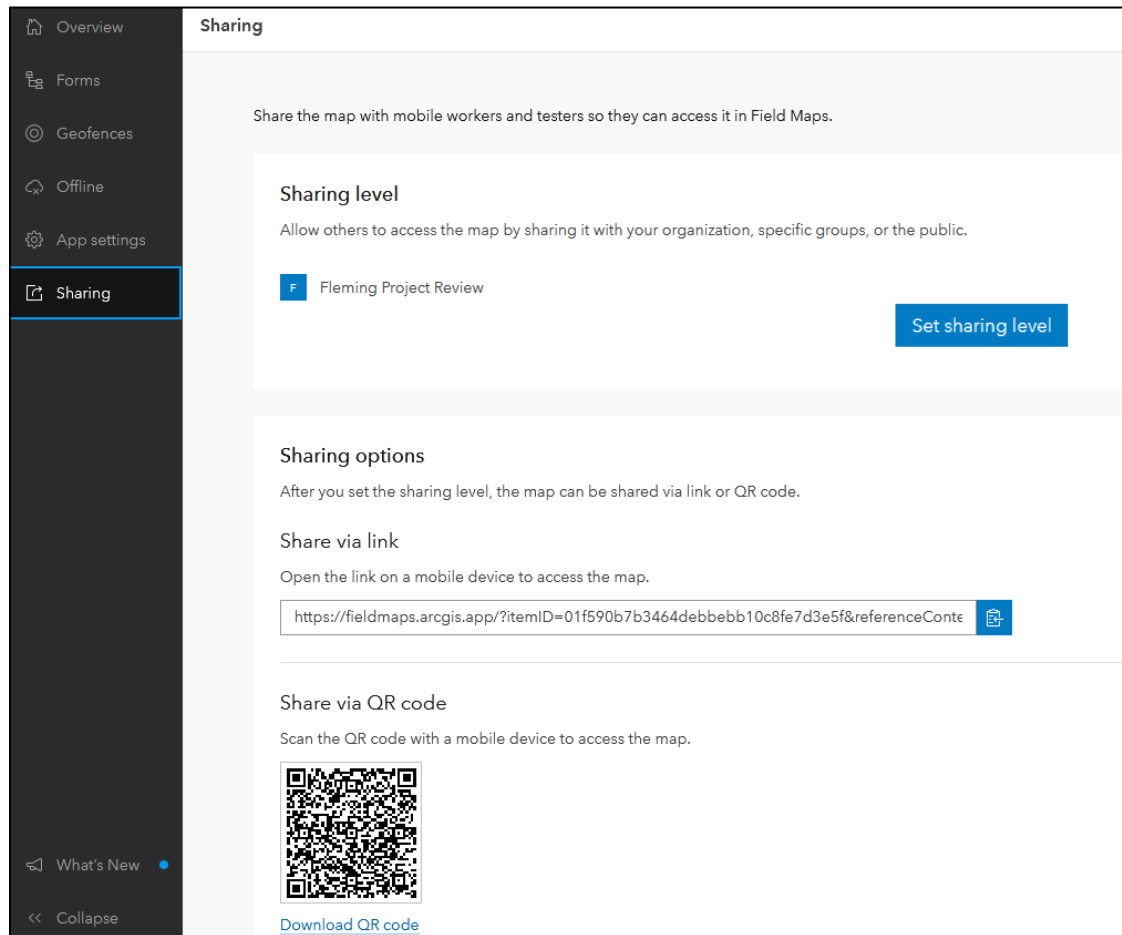
Creating field observations in the field updates layer using Field Maps (Field Technician)

In this demonstration, a field technician will use the field update layer in Field Maps to record information about a broken water pipe, referencing existing data. They also have a vicious wildlife encounter that the safety and the research teams will be eager to have recorded.

- Open the appropriate map in the Field Maps application on a mobile device and log into your SAWC AGOL account.
- Select the layers button in the top right-hand corner and select just the appropriate layers that you would like to view.
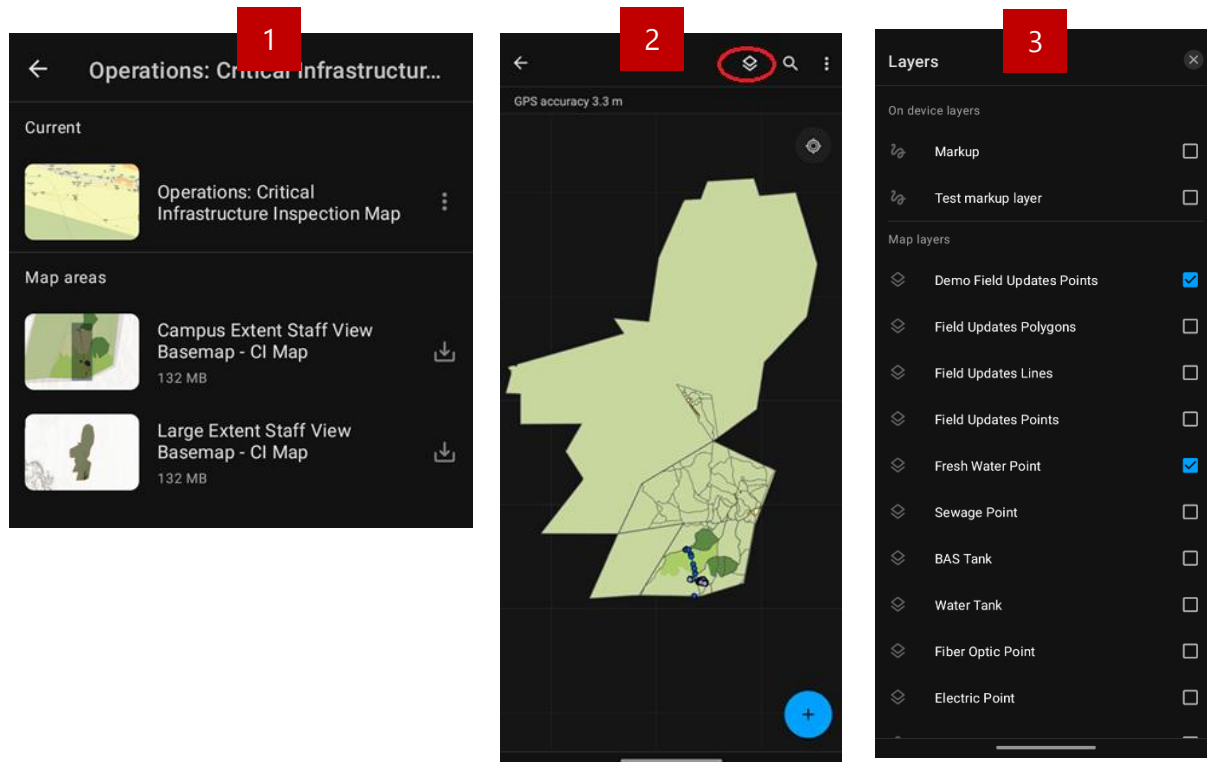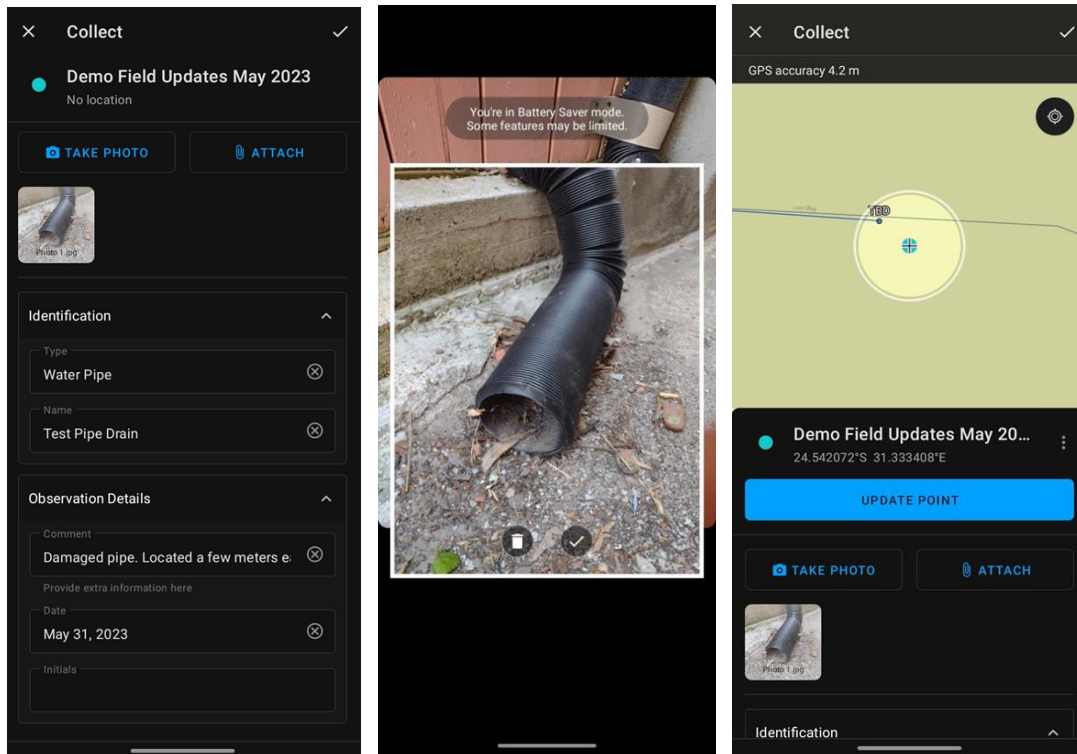
The field technician has identified a broken water pipe and wants to record the observation. They also noted that the current location shown for the pipe is inaccurate.

- Scroll to the applicable location on the map. The button in the top right corner will focus the map on the user's current location.
- Clicking on the blue button in the bottom right corner will allow the user to add a new observation.
- Select the applicable layer (in this case, 'Demo Field Updates Points')
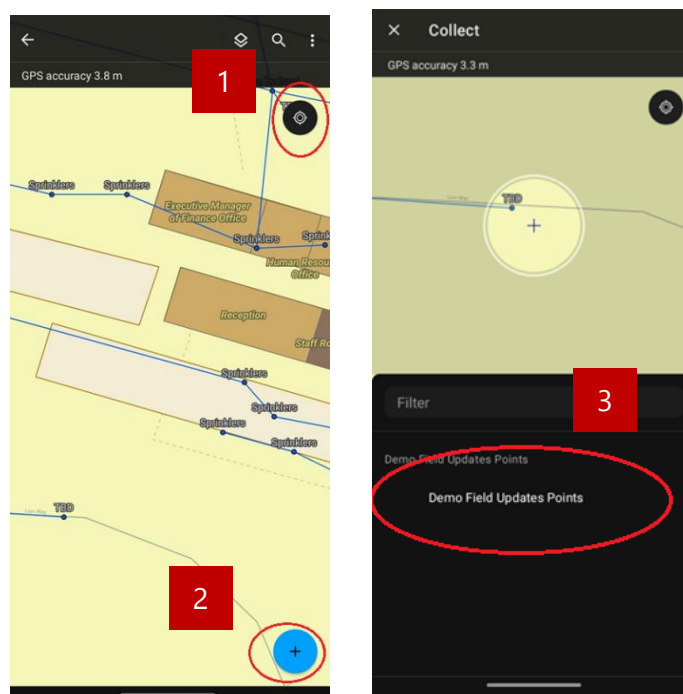
- Place the observation in the correct location, then fill in the form with the applicable information. This form will vary depending on how the layer has been set up.
- When you are done filling in the field, click the checkmark in the top right-hand corner.

Data already created in Field Maps can also be edited and moved.

During their inspection, the field technician encountered an animal sighting that is significant to a research project the school is currently engaged in. They recorded this observation as well in Field Maps. However, upon review, they hadn't placed it quite in the correct spot.

- Find the observed point that needs to be moved in Field Maps, select it.
- Click on the 'Edit' button in the bottom left-hand corner of the screen.
- Drag the observation to the correct location, then select 'Update Point'.
- If required, update any data in the form.
- Click the checkmark in the top right-hand corner when you are done.
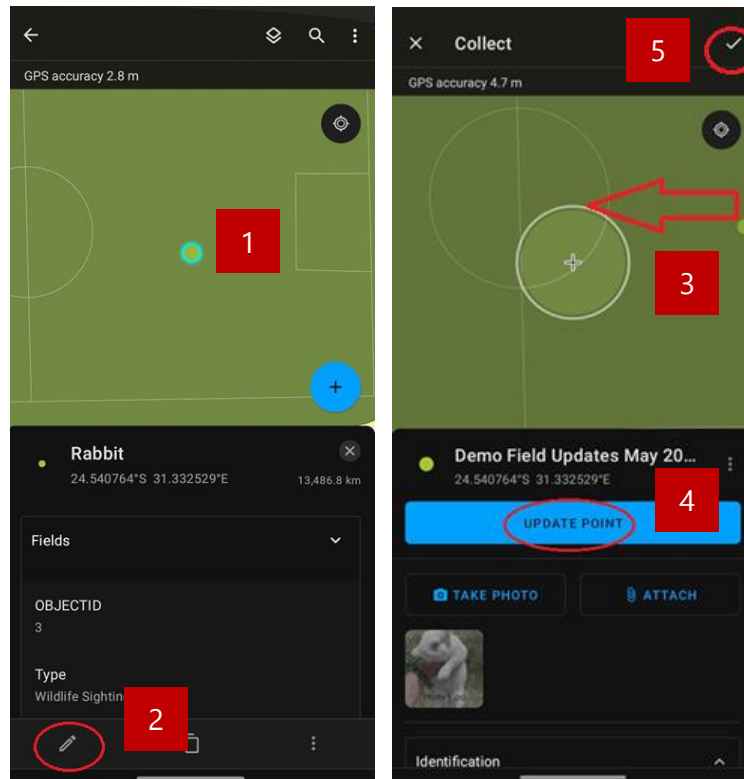
Reviewing field observations (data owner)

In this demonstration, a field technician has already used the demo field update layer in Field Maps to observe a broken water pipe that is located a few meters away from the location listed in the official data source. They also recorded a vicious wildlife encounter. The appropriate data owner now needs to review the field observations and determine how to record the appropriate data for posterity.

Viewing and symbolizing field observations in Map Viewer
- Open the Map Viewer for the web map connected to the data that was updated in Field Maps.
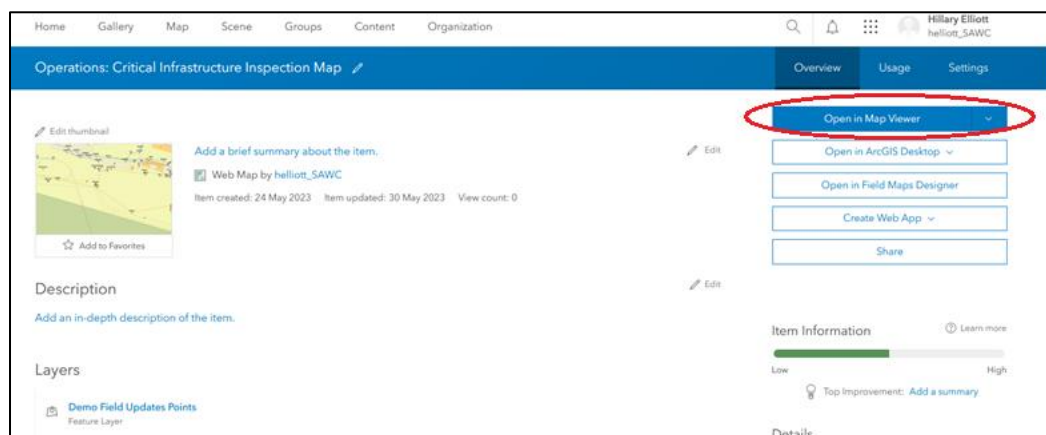
- Filter to the applicable layers. In this case, 'Demo Field Update Points', 'Fresh Water Point' and 'Fresh Water Line'.
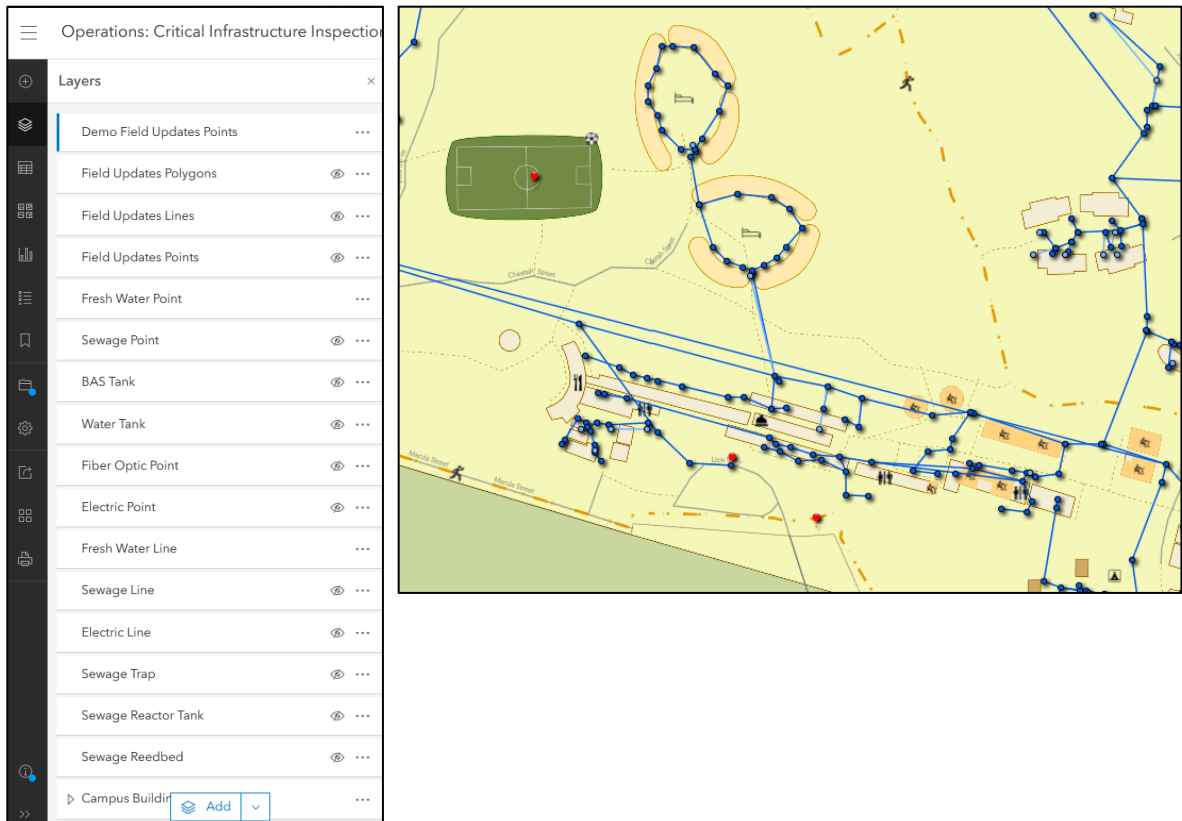

The data is now easier to see, but the field observations could still be a bit clearer.
- Click on this layer and click 'Styles' on the right-side bar.
- Add an attribute Field that makes sense for distinguishing the different data types observed.
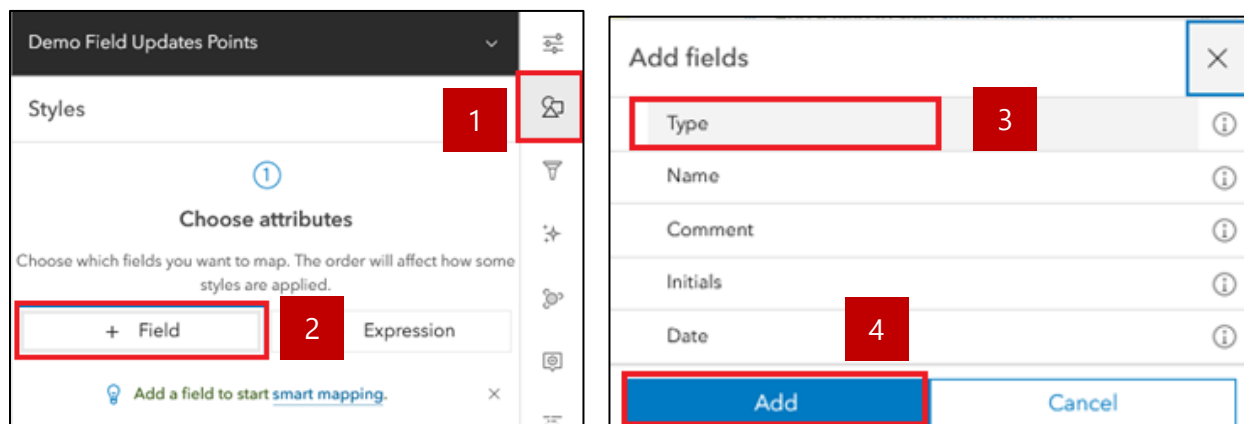
In this case, we used the 'Type' field. Since there are multiple types of observation, we can also pick unique symbols for symbology.

- Click 'Style Options', and apply appropriate symbology.
- We can also use 'Effects' in the right sidebar to add a drop shadow to the symbology.
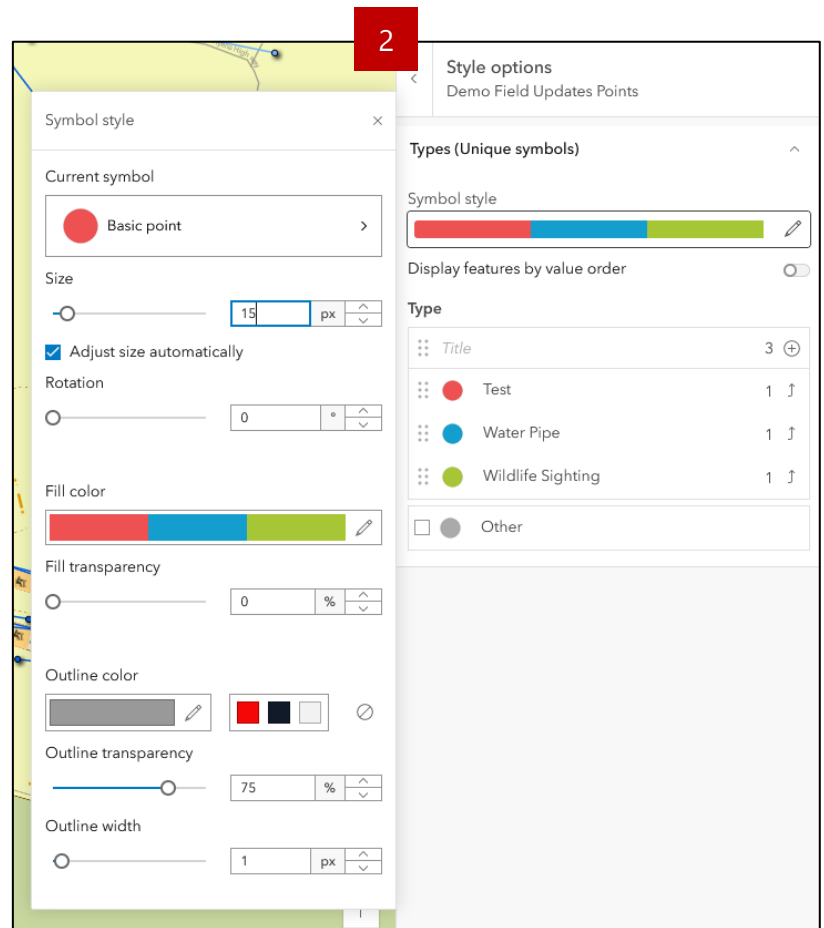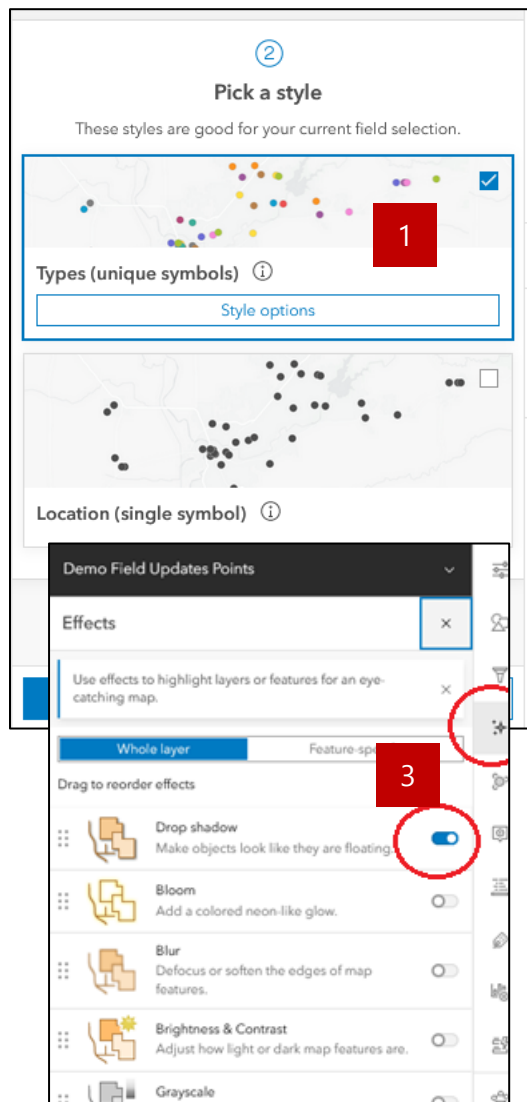
- Now use the web map to identify the data added by the field technician.

Using the edit tab, it is possible to update the data directly in map viewer, referencing the field observations. However, downloading the field observations, and making updates to the reference data in ArcGIS Pro allows for more functionality while making edits and simplifies updates to the SAWC FGDB Library.
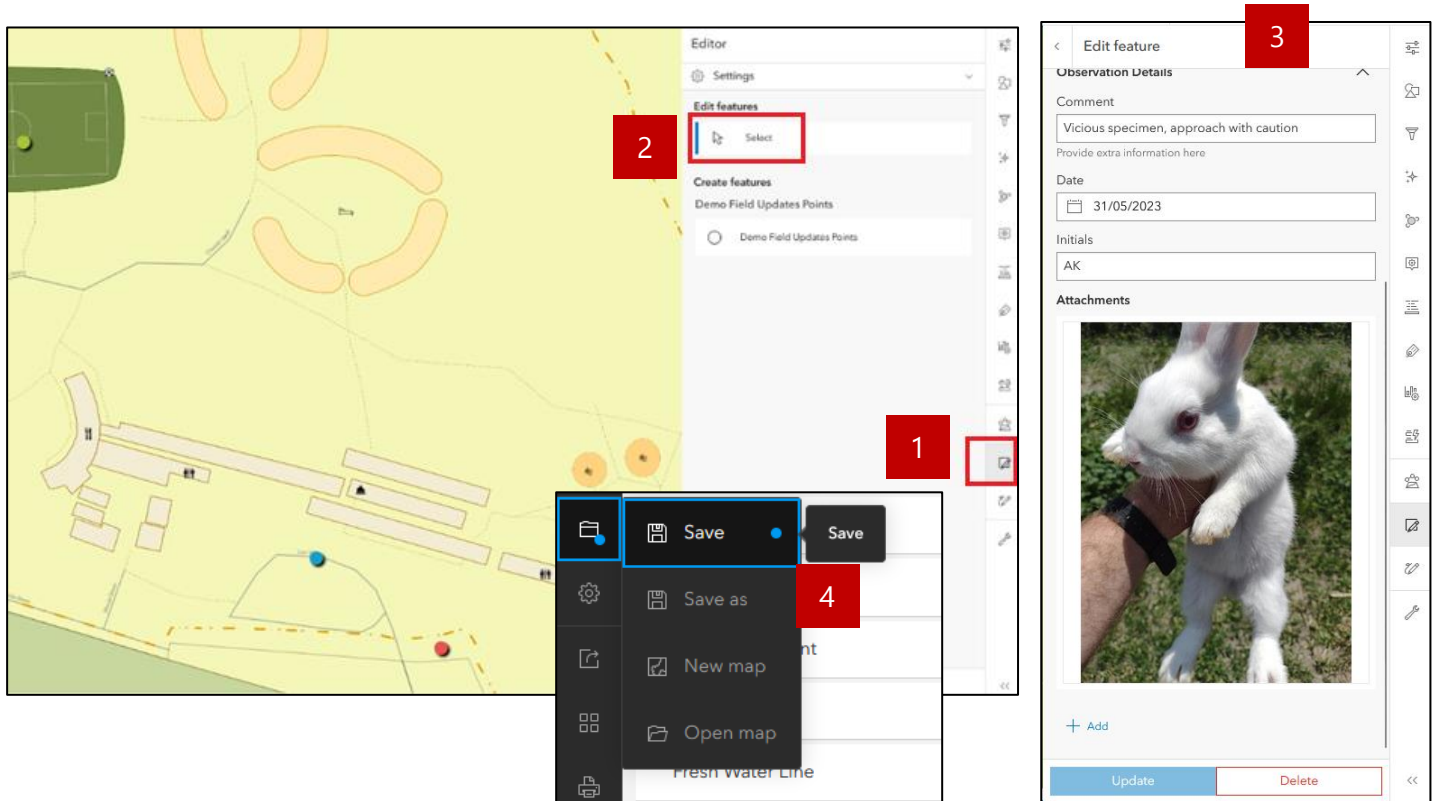
Managing observations in ArcGIS Pro

- Open a new or existing ArcGIS Pro project.
- Following the instructions in the *Importing layers directly from the SAWC FGDB Library* section of the *Preserving Data through Local Projects* document, open the web map containing the Field Update points and applicable reference data in a new map in ArcGIS Pro, and add the files to the local project file geodatabase.

Some observations may require updates the source data in the SAWC FGDB Library. For instance, in the example of this tutorial, water pipe point number #162 needs to be listed as damaged, and its location needs to be moved slightly.

- Referencing the field observations, make the appropriate updates to the source data. The required steps will change based on this scenario. In this example, we may indicate the pipe was broken in the 'Type' and 'Comments' field.
- Use the results to replace the applicable data in the SAWC FGDB Library (*see SAWC GIS Instruction Package – Section 1.1 and 1.2*) for more information.

Applicable projects

Fire Equipment Inspection Field Map:

- *Field Maps Link (for phone)*

- *Webmap item link (SAWC AGOL)*
- *Webmap map viewer link (SAWC AGOL)*

Critical Infrastructure Maintenance Map:

- *Field Maps Link (for phone)*

- *Webmap item link (SAWC AGOL)*
- *Webmap map viewer link (SAWC AGOL)*

Park Navigation and Grid System:

- *PDF links (teams page)*

- *Field maps link (for phone)*

- *Webmap item link (SAWC AGOL)*
- *Webmap map viewer link (SAWC AGOL)*

Other resources

- SAWC Documentation: *SAWC GIS Instruction Package*
- SAWC Documentation: *Preserving Data through Local Projects*
- ArcGIS Pro Documentation: *Data Design [LINK]*
- ArcGIS Field Maps Documentation: *Use Maps*
- ArcGIS Documentation: *Field Maps Tutorials*