

Constructing Your Own

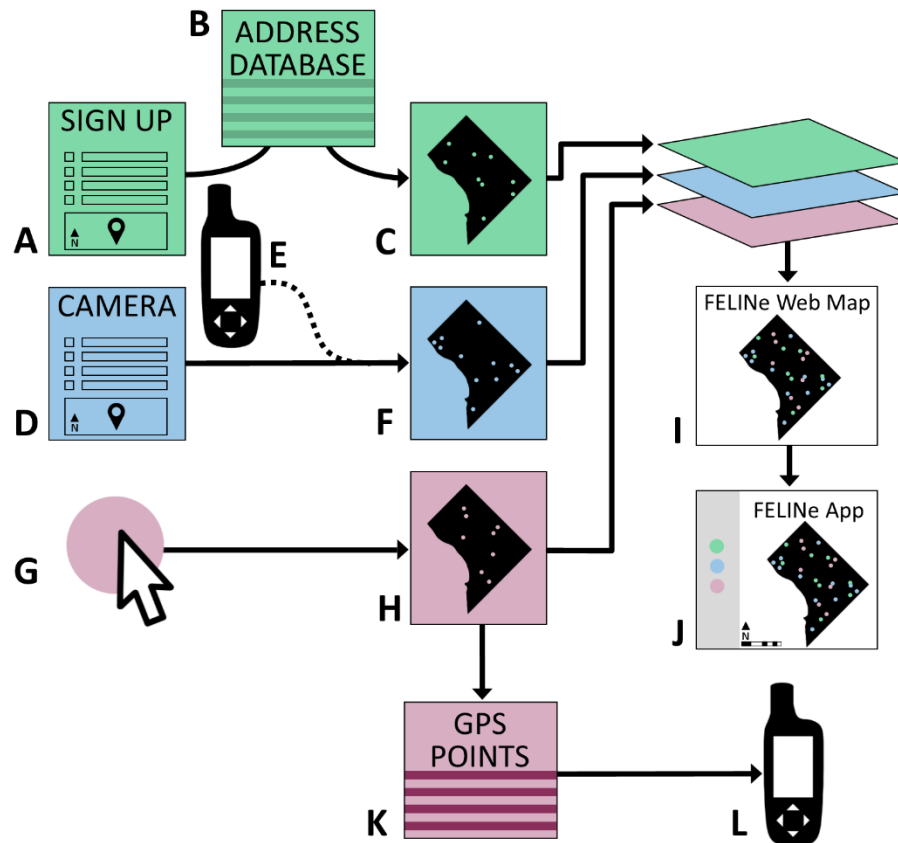


A product of the DC Cat Count

Necessary software and subscriptions: ArcGIS Online, Survey123 Connect, DNRGPS

Welcome to Field Equipment Location and Information Network (FELINE), the asset tracking system developed by the DC Cat Count Project for camera trapping logistic management. This document is intended to provide an overview of the application and guide users in creating project-specific applications. FELINE uses ArcGIS online and Survey123. DNRGPS is required for additional functionality.

FELINE is a form-based application that plots potential camera locations, planned camera locations, and real camera locations. By utilizing a public-facing sign-up form, local residents can sign up to host a camera and their address is added to your project map. Likewise, camera locations and metadata are automatically added to your project map. Each form contributes to what ArcGIS calls a *layer* of data. Though many layers can be simultaneously viewed on the same map, each layer is independent of the others and contains only the data submitted from the form it is associated with. Each survey response adds a single row to each layer's database and a single point to that layer's map. The diagram below includes all the components of FELINE and explains their relationships. Some alterations are necessary to adapt FELINE to your project's geographic region and project needs. Users with sufficient knowledge of Microsoft Excel and a basic understanding of ArcGIS online will be able to make these changes.



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A. Public-facing Sign-up Form

File Name: A

The public-facing Sign-up Form is how members of the public will communicate that they are interested in hosting a camera on their property. It is also the form that project staff should use to add a potential camera site to your map. Of all the aspects of FELINE, this form will require the most customization to fit your project. To set up your public-facing sign-up form, open Survey123 Connect and select “New Survey” and, when prompted, “Advanced.” A spreadsheet will open automatically. Paste the content of file A into the spreadsheet. Make sure you copy the contents of both the *survey* and *choices* tabs.

Survey123 Connect builds surveys off spreadsheets. Each row in the *survey* tab is a question and each column contains information about how that question will be formatted. Choices for questions that are not free-response are stored in the *choices* tab. The list below is a summary of the contents of the code shown in the *survey* tab, what each question does, and how each question should be adjusted to meet your project needs. After publishing your survey, change the sharing settings to “Everyone (Public)” on the Survey123 website.

Row 2

Question Type: select_one

List Name: who

Description: Multiple choice question that determines who is filling out the form (public, organization, staff).

Use: Prompts visibility of subsequent questions.

Row 3

Question Type: note

Description:

If *staff* is selected in Row 2: Nothing

If *public* or *organization* is selected in Row 2: Greeting, project description, and disclaimer are printed. ***Needs editing to meet project needs:** Insert a project-specific message if desired. <p> denotes a paragraph break. Edit text in *label* column.

Use: Provides user with project background

Row 4

Question Type: text

Description:

If *staff* is selected in Row 2: Free-response text box appears to enter property name.

If *public* or *organization* is selected in Row 2: Nothing.

Use: Records property name.

Row 5

Question Type: text

Description:

If *staff* or *organization* is selected in Row 2: Free-response text box appears to enter organization name.

If *public* is selected in Row 2: Nothing.

Use: Records organization name.

Row 6

Question Type: select_one

List Name: category

Description: Multiple choice question that determines the property type. This question defaults to residential

Use: Records property type.

Row 7

Question Type: integer

Description: Numeric text box that records address number for property. ***Needs editing to meet project needs:** If your municipality includes a direction within the street address. If that is the case, a free-response text box may be appropriate but introduces opportunity for variance in address input.

Use: Records street address.

Row 8

Question Type: select_one

List Name: street

Description: Multiple choice question that determines the street at which the property is located. ***Needs editing to meet project needs:** replace list of Washington, DC streets in choices tab with a list of local streets. This list can be obtained via your Public Address Database (B).

Use: Records street name.

Row 9

Question Type: select_one

List Name: quad

Description: Multiple choice question that determines the city quadrant (NE, NW, etc.). ***Needs editing to meet project needs:** This row can be removed if your municipality does not operate in quadrants.

Use: Records quadrant.

Row 10

Question Type: note

Description: Performs a concatenation of address components to print address in standard format compatible with Public Address Database (B) ***Needs editing to meet project needs:** Remove \${Quad} if your municipality does not use quadrants (NE, SE, etc.) in addresses.

Use: Creates query term for Address Database (B).

Row 11

Question Type: calculate

List Name: Address Database (B) – here referred to as 'dclist.'

Description: Uses query term created in Row 10 to search the Address Database (B) and print the associated latitude.

Use: Prints property latitude in background.

Row 12

Question Type: calculate

List Name: Address Database (B) – here referred to as ‘dclist.’

Description: Uses query term created in Row 10 to search the Address Database (B) and print the associated longitude.

Use: Prints property longitude in background.

Row 13

Question Type: calculate

Description: Performs a concatenation of printed property latitude and longitude as “x y” (note: no coma between latitude and longitude).

Use: Prints property coordinates in background.

Row 14

Question Type: calculate

Description: Compares values from Rows 11 and 12 against the minimum coordinates of municipal boundaries, ensuring that any calculated location is within the municipal boundaries. Note, however, that we know all of these points are within municipal boundaries already. This row serves to identify addresses that are not inputted correctly

Use: Tests validity or inputted address and prints *valid* or *invalid* in background.

Row 15

Question Type: text

Description:

If *valid* is selected in Row 14: Nothing

If *invalid* is selected in Row 14: Message prompts user to manually reenter their property address in a free-response text box. This allows volunteer addresses to be recorded in the database even if they cannot be mapped. Often this is a result of user error. Project staff can identify these errors by looking in the “Oops” column in the results, and enter these properties themselves using the correct methods.

Use: Ensures data is retained even under user error and flags entries with error.

Row 16

Question Type: geopoint

Description: Plots the location of the volunteered address based on the coordinates from Row 13. This overrides Survey123's default assumption that the user's location at the time of completing the survey is the location to plot on the map. For instance, without Rows 10-14, a user completing the form from their workplace but with their home address in mind will plot at the user's workplace, not their home address.

Use: Plots the property and associated metadata on your project map.

Row 17

Question Type: text

Description: Free-response text box that records the user's primary email address.

Use: Records user's primary email address.

Row 18

Question Type: text

Description: Free-response text box that records the user's primary phone number.

Use: Records user's primary phone number.

Row 19

Question Type: text

Description: Free-response text box that records the user's name

Use: Records user's name.

Row 20

Question Type: text

Description:

If *staff* or *organization* is selected in Row 2: Free-response text box that records the user's title.

If *public* is selected in Row 2: Nothing.

Use: Record's user's title.

Row 21

Question Type: text

Description: Free-response text box that records the user's secondary phone number.

Use: Records user's secondary phone number.

Row 22

Question Type: text

Description: Free-response text box that records the user's secondary email.

Use: Records user's secondary email.

Row 23

Question Type: select_one

List Name: is_me

Description: Allows the user to identify if the secondary phone number and email belongs to themselves, or if they belong to a different member of the household or organization.

Use: Clarifies ownership of contact information.

Row 24

Question Type: text

Description:

If *same_person* is selected in Row 23: Nothing.

If *different_person* is selected in Row 23: Free-response text box that records the name of the secondary contact listed.

Use: Records the name of the secondary contact, if applicable.

Row 25

Question Type: text

Description:

If *same_person* is selected in Row 23: Nothing.

If *different_person* is selected in Row 23: Free-response text box that records the title of the secondary contact listed.

Use: Records the title of the secondary contact, if applicable.

Row 26

Question Type: text

Description:

If *staff* or *organization* is selected in Row 2: Free-response text box that records the property's website, if applicable.

If *public* is selected in Row 2: Nothing.

Use: Records website of organization that owns or manages the property.

Row 27

Question Type: text

Description: Free-response text box that records the user's comments.

Use: Records concerns, stipulations, or instructions from user.

Row 28

Question Type: select_one

List Name: confirmation (note that there is only one choice in this list)

Description: Check box that indicates the user understands that submitting this form indicates their interest in hosting a camera and that they will be contacted to further coordinate. Users cannot proceed without this acknowledgement. ***Needs editing to meet project needs:** Supplement the information listed in the *label* column with project-specific information as needed.

Use: Provides the user with a concrete definition of the implications of this form and the research timeline that will follow.

Row 29

Question Type: note

Description:

If *staff* is selected in Row 2: Nothing.

If *public* or *organization* is selected in Row 2: Text appears prompting users to email the project email with additional questions. ***Needs editing to meet project needs:** Insert correct project email.

Use: Provides users with a way to contact the research unit.

Row 30**Question Type:** note**Description:**

If *staff* is selected in Row 2: Text appears prompting staff to contact the local FELINE administrator with any questions or issues that may arise. ***Needs editing to meet project needs:** Insert email of contact with the greatest familiarity with FELINE within your project.

If *public* or *organization* is selected in Row 2: Nothing.

Use: Provides staff with a way to contact the FELINE administrator.

Row 31**Question Type:** select_one**List Name:** location_status**Description:**

If *staff* is selected in Row 2: Options such as “have not reached out” or “paperwork has been signed” appear for staff to track the progress of each property. This question defaults to “received a verbal yes” since the participant indicated their consent in Row 28. However, when this form is completed by the public or organizations this question is not available. Unfortunately, the incoming value of a question cannot default to a value if the question is not visible. Thus, project staff will need to manually indicate the status of public entries in ArcGIS Online before the point is visible on the map.

If *public* or *organization* is selected in Row 2: Nothing.

Use: Provides staff with easy categories to track the progress of a property, and is the basis of the symbology of the point on the map.

B. Public Address Database

File Name: B_example

In order to override the default assumption that the user’s current location is the desired location, you must use a database that holds the coordinates of every address in your municipality. A complete list of addresses can be obtained from your municipality’s GIS office or tax assessor’s office. ArcMap can easily calculate the coordinates of each of these addresses if they are not included in the list. To be compatible with the Public-Facing Sign Up Form (A), addresses must be uniformly entered under a column titled “address.” Coordinates must be entered separately under columns “lat” and “long.”

To use this list, it must be stored in the survey’s media folder. This folder can be accessed via [USER]>ArcGIS>My Survey Designs>[SURVEY NAME]>media. File B_example is included in this documentation as a reference, and will need to be updated with your local addresses.

C. Camera Host Interest Layer

This layer will automatically be created and can be found in your ArcGIS Online content folder. Data can be manipulated by opening the layer in the ArcGIS map viewer. In the table of contents click on the layer, then the spreadsheet icon. A table for the layer will appear and entries can be edited. This is where you will manually select “Received a verbal yes” for public and organizational entries.

D. Camera Metadata/Deployment Form

File Name: D

The Camera Metadata/Deployment Form is how project technicians will record deployment metadata and plot cameras in FELINE. This form will require some customization to fit your project. To set up this form, open Survey123 Connect and select “New Survey” and, when prompted, “Advanced.” A spreadsheet will open automatically. Paste the content of *D* into the spreadsheet. Make sure you copy the contents of both the *survey* and *choices* tabs.

Survey123 Connect builds surveys off spreadsheets, in which each row in the *survey* tab is a question and each column is information about how that question will be displayed. Choices for questions that are not free-response are stored in the *choices* tab. The list below is a summary of the contents of the code shown in the *survey* tab, what each question does, and how each question should be adjusted to meet your project needs. After publishing your survey, change the sharing settings to “Everyone (Public)” on the Survey123 website, but do not share the link to this form. Alternatively, field technicians can download the Survey123 application on a phone or tablet. This form is most useful when completed in the field at the time of the camera deployment.

Row 2

Question Type: date

Description: Calendar to record deployment date, defaults to today’s date.

Use: Records deployment date.

Row 3

Question Type: decimal

Description: numeric text box that allows decimals to record latitude from a handheld GPS unit. Constraint is set for Northwestern hemisphere.

Use: Provides latitude from a handheld GPS unit.

Row 4

Question Type: decimal

Description: numeric text box that allows decimals to record longitude from a handheld GPS unit. Constraint is set for Northwestern hemisphere.

Use: Provides longitude from a handheld GPS unit.

Row 5

Question Type: text

Description: Free-response text box to record the name of the deployment. ***Needs editing to meet project needs:** Enter naming convention instructions in the *hint* column, if needed.

Use: Records deployment name.

Row 6

Question Type: select_one

List Name: camera_quant

Description: Check box to record the number of cameras being deployed at site. ***Needs editing to meet project needs:** This row can be erased if your project protocol never calls for placing more than one camera at a site. If this row is removed, Rows 10-12 should also be removed.

Use: Records the number of cameras deployed at a single site.

Row 7

Question Type: integer

Description: Numeric text box to record the unique identification number of the camera being deployed at site. ***Needs editing to meet project needs:** This row can be changed from integer to text if your protocol uses letters in unique camera identification numbers.

Use: Records the SD card placed at a single site.

Row 8

Question Type: integer

Description: Numeric text box to record the unique identification number of the SD card being deployed at site. ***Needs editing to meet project needs:** This row can be changed from integer to text if your protocol uses letters in unique identification numbers.

Use: Records the camera placed at a single site.

Row 9

Question Type: select_one

List Name: type

Description: Check box to record if the camera being deployed uses an IR flash or a white flash. ***Needs editing to meet project needs:** This row can be erased if your project protocol only uses one type of camera.

Use: Records the flash type of a deployed camera at a single site.

Row 10

Question Type: integer

Description:

If 1 is selected in Row 6: Nothing.

If 2 is selected in Row 6: Numeric text box to record the unique identification number of the second camera being deployed at site. ***Needs editing to meet project needs:** This row can be changed from integer to text if your protocol uses letters in unique camera identification numbers. If Row 6 was removed, this row should be removed as well.

Use: Records the second camera placed at a single site.

Row 11

Question Type: integer

Description:

If 1 is selected in Row 6: Nothing.

If 2 is selected in Row 6: Numeric text box to record the unique identification number of the second SD card being deployed at site. ***Needs editing to meet project needs:** This row can be changed from integer to text if your protocol uses letters in unique identification numbers. If Row 6 was removed, this row should be removed as well.

Use: Records the second SD card placed at a single site.

Row 12

Question Type: select_one

List Name: type

Description:

If 1 is selected in Row 6: Nothing.

If 2 is selected in Row 6: Check box to record if the second camera being deployed uses an IR flash or a white flash. ***Needs editing to meet project needs:** This row can be erased if your project protocol only uses one type of camera. If Row 6 was removed, this row should be removed as well.

Use: Records the flash type of the second deployed camera at a single site.

Row 13

Question Type: decimal

Description: Numeric text box to record the distance between the camera and the nearest obstruction in meters.

Use: Records the camera's field of view in meters.

Row 14

Question Type: select_one

List Name: place_type

Description: Check box to record the placement type of the camera. ***Needs editing to meet project needs:** Options in this list can be customized to meet your project's needs.

Use: Records a general land use category of the camera's location.

Row 15

Question Type: select_one

List Name: yes_no

Description: Check box to record if the camera site is fenced. ***Needs editing to meet project needs:** Options in this list can be customized to meet your project's needs.

Use: Records if the camera is in a fenced area.

Row 16

Question Type: select_one

List Name: dog_list

Description: Check box to record if a dog is present at the camera site. ***Needs editing to meet project needs:** Options in this list can be customized to meet your project's needs.

Use: Records if a dog is present at the camera site.

Row 17

Question Type: select_one

List Name: bait_list

Description: Check box to record if bait is present or nearby the camera site. ***Needs editing to meet project needs:** Options in this list can be customized to meet your project's needs. If different baits are used, consider adding the various baits to bait_list.

Use: Records if bait is present at the camera site.

Row 18

Question Type: select_one

List Name: trail_list

Description: Check box to record if the camera was aimed at a human trail. ***Needs editing to meet project needs:** Options in this list can be customized to meet your project's needs.

Use: Records if a camera is placed on a human trail such as a path, sidewalk, alley, etc.

Row 19

Question Type: image

Description: Allows the user to upload a photo of the deployment or take a photo in the field and directly upload from a tablet.

Use: Provides further context on camera placement and proof of placement.

Row 20

Question Type: text

Description: Free-response text box to take notes on the camera site, if needed.

Use: Records information not reflected in previous questions.

Row 21

Question Type: select_one

List Name: tech_list

Description: Check box to record which technician placed the camera. ***Needs editing to meet project needs:** Options in this list must be customized to meet your project's needs. As staff turns over, this list will need to be edited in the excel form and republished. Data from previous deployments will not be lost or overwritten.

Use: Records the technician responsible for the deployment.

Row 22

Question Type: select_one

List Name: deployment_status

Description: Check box to record the status of the camera. When filling out this form the response should always indicate that the camera is deployed. Update this status within FELINE when the status changes.

Use: Records deployment status.

Row 23

Question Type: select_one

List Name: show_map_list

Description: Offers the opportunity to plot the point based on location information entered in Rows 3 and 4.

Use: Overwrites Survey123's assumption that location data should be pulled from the current location of the machine submitting the form and potentially increases location accuracy depending on cell service.

Row 24

Question Type: note

Description:

If *external* is selected in Row 23: Prints the coordinates entered in Rows 3 and 4.

If *internal* is selected in Row 23: Nothing.

Use: Provides coordinates for Row 25.

Row 25**Question Type:** geopoint**Description:**

If *external* is selected in Row 23: Plots the location of the deployment based on the coordinates from Row 24. This overrides Survey123's default assumption that the user's current location at the time of completing the survey is the location to plot on the map. This is especially helpful in areas with poor cell service and thus poor location accuracy.

If *internal* is selected in Row 23: Plots the location of the deployment based on the location information in the machine.

Use: Plots deployment and associated metadata on your project map.

E. Handheld GPS Unit

The Camera Metadata/Deployment Form (D) is best utilized when completed in the field using a smartphone or tablet at the time of the deployment via the Survey123 application. While Survey123 will pull location data from the device you are using to submit the form, poor cellular signal can result in reduced location accuracy. For this reason it is highly recommended you use a handheld GPS unit in conjunction with the form. Doing so allows you to enter coordinates that overwrite the location data pulled from your device, keep a clean list of coordinates for each camera, and save the locations of each camera in the GPS unit. Saving camera locations and reference points (G) on a GPS unit will allow field technicians to more easily locate each camera location during fieldwork.

F. Camera Layer

This layer will automatically be created and can be found in your ArcGIS online content folder. Data can be manipulated by opening the layer in the ArcGIS map viewer. In the table of contents click on the layer, then the spreadsheet icon. A table for the layer will appear and entries can be edited. However, most edits made to this layer should take place in the FELINE application itself (J). Data points will automatically be added to the map layer as forms (D) are submitted.

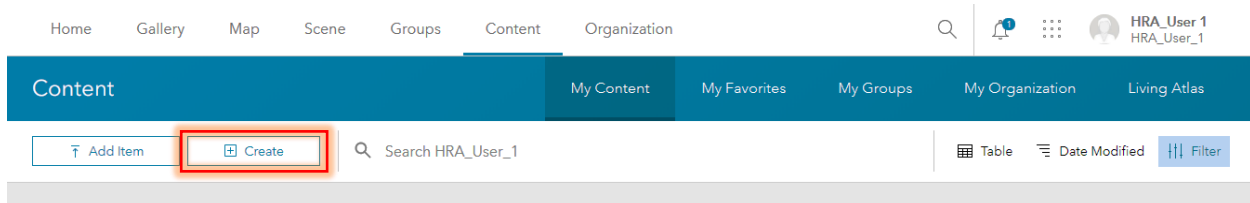
G. Click-based Reference Points

Reference points denote locations where you plan on deploying a camera in the near future. Rather than completing a form, to add a reference point you will simply click on the reference point icon in the legend of the application, then place the point on the map by clicking on the desired location. You will need to name each reference point a unique name in order to later find it in the GPS. Deleting old reference points will help keep the layer and its operations clean. However, the same should not be done for layers C or F.

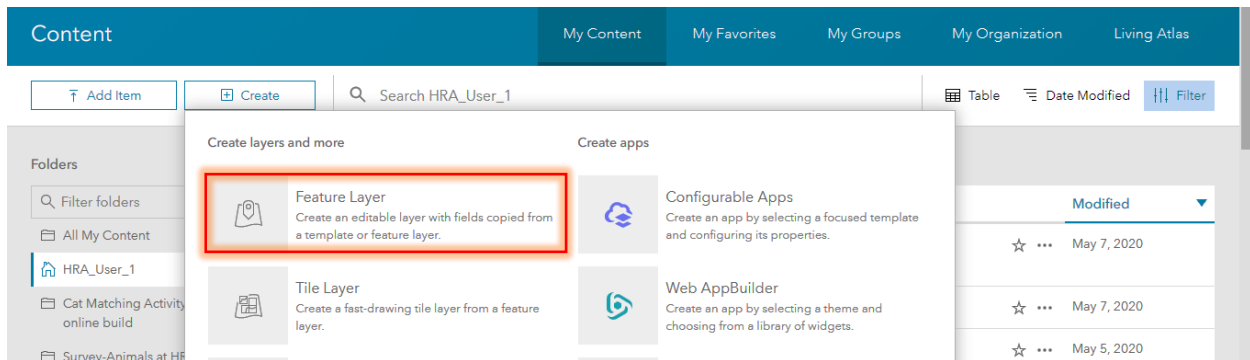
H. Reference Point Layer

To build a Reference Point Layer, complete the following:

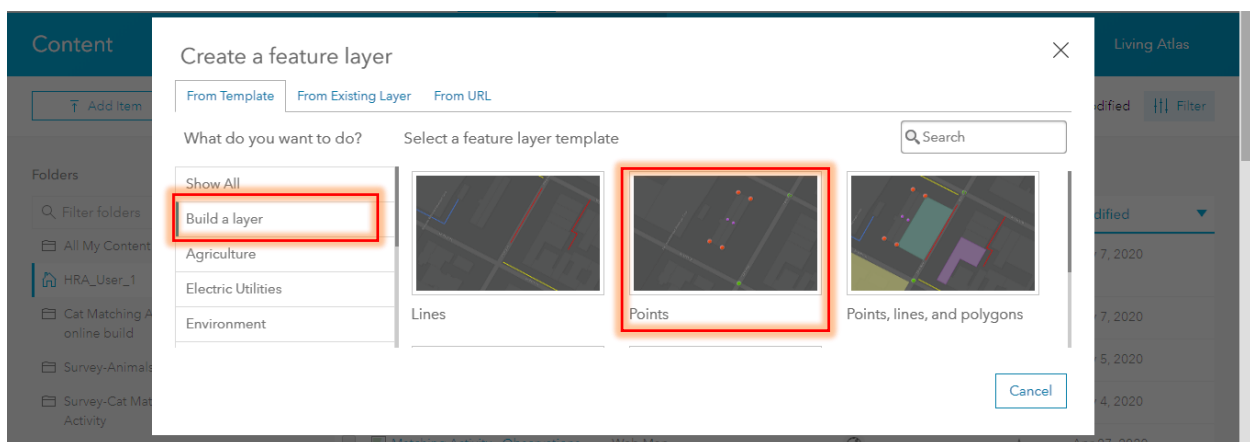
1. Log into ArcGIS online.
2. Navigate to your *Content* folder.
3. Select *Create*.



4. Select *Feature Layer* in the dropdown window that appears.

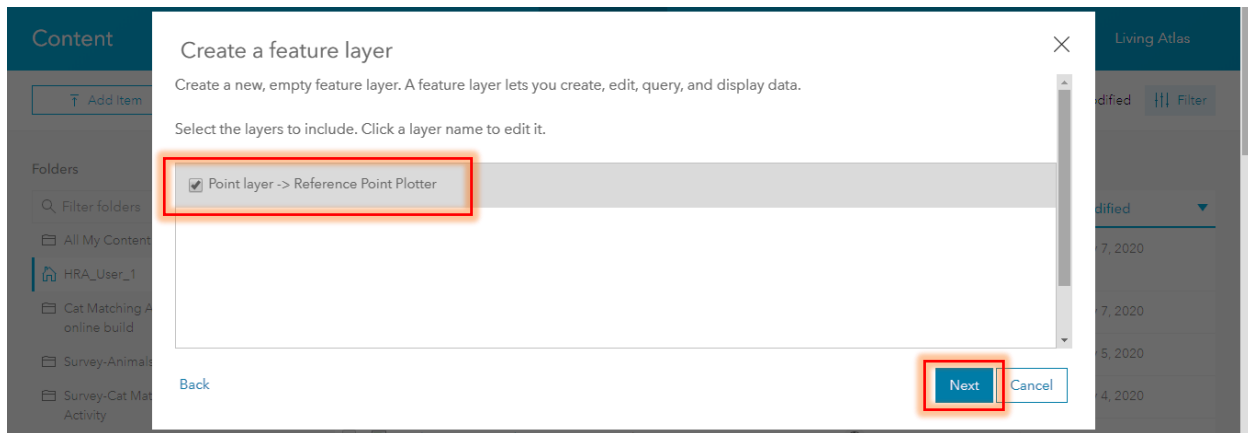


5. Select *Build a layer* and *Points* in the popup window that appears.



6. A sidebar will appear in the window. Select *Create*.

7. A new popup window will appear with a single listed layer, titled *Point layer*. Click on *Point layer* and change the layer name to *Reference Point Plotter* and select *Next*.

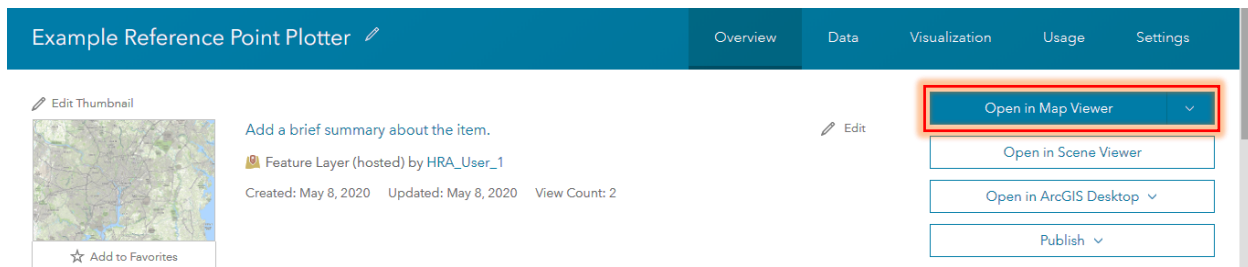


8. A new popup window will appear with a map. Navigate to your project location such that the entire geographic extent of the project is viewable in the map window. Select *Next*.
9. A new popup window will appear. Enter *Reference Point Plotter* as the title. Add tags, summary, and adjust the folder as necessary.
10. Select *Done* and be patient as ArcGIS Online creates a layer.
11. A new page will appear with information about the layer you just created. If you wish to see the layer, select *Open in Map Viewer*. However, be aware that the layer is currently empty, so only a map of your region will be visible.

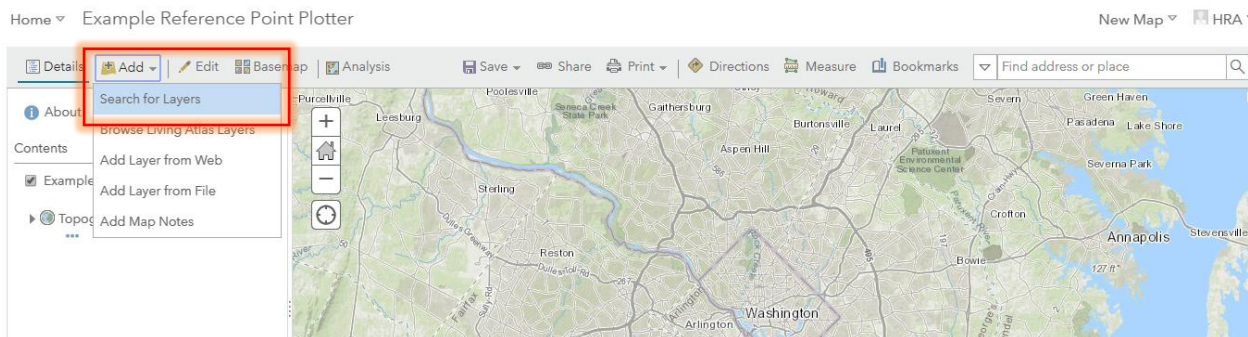
I. FELINE Web Map

The FELINE Web Map is the overlaying of the Camera Host Layer (C), Camera Layer (F), and Reference Point Layer (H). The web map is far more fragile than the web application, as editing privileges are much greater in the web map. To build the FELINE Web Map, complete the following:

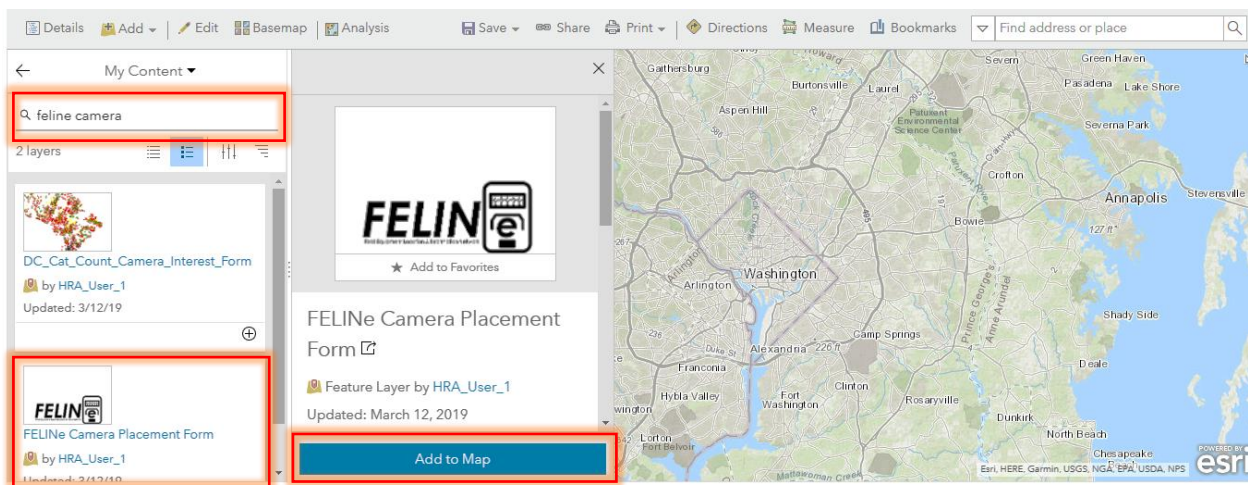
1. Submit at least one record via both the Public-facing Sign-up Form (A) and Camera Metadata/Deployment Form (D). Be sure to note in both forms that this is a test point. Visualization will be easier if at least one dummy point is present for each of these two layers.
2. Log into ArcGIS online.
3. Navigate to your *Content* folder.
4. Select either the Camera Host Layer (C), Camera Layer (F), or Reference Point Layer (H).
5. A new window will open with information on the layer you selected. Select *Open in Map Viewer* (see example on next page).



6. A new window will open with a map of your region and a table of contents on the left. Above the table of contents, select **Add**. A drop-down menu will appear. Select **Search for Layers**.

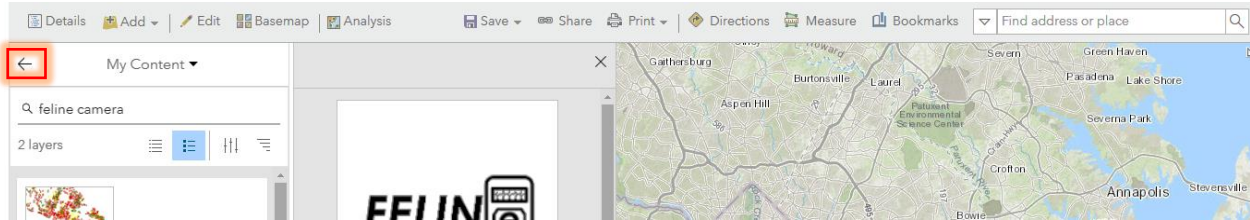


7. A sidebar window will appear where the table of contents was. Use the search bar to search for one of the remaining layers you created for FELINE but have not yet added to the FELINE Web Map. Click on the layer name and select **Add to Map**.

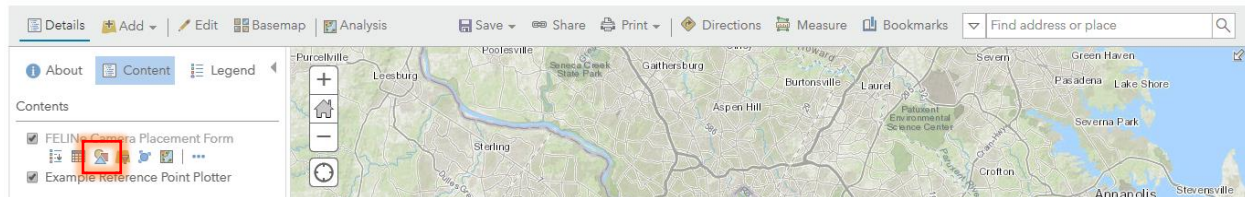


8. Repeat step 7 for the remaining layer, such that the Camera Host Layer (C), Camera Layer (F), and Reference Point Layer (H) are all on the map and appear in the table of contents.

9. Select the back arrow at the top of the table of contents to exit the *Add* menu.

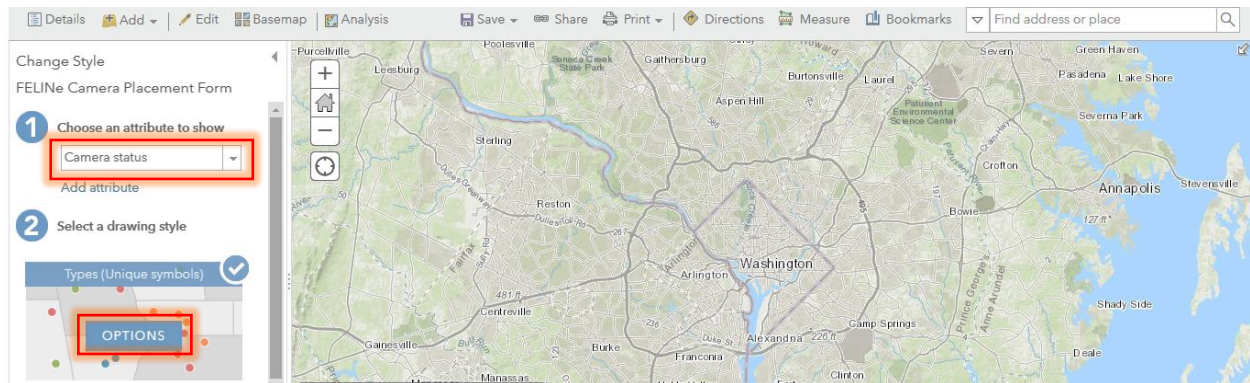


10. Use your mouse to hover over either the Camera Host Layer (C) or Camera Layer (F). Select the symbology button.



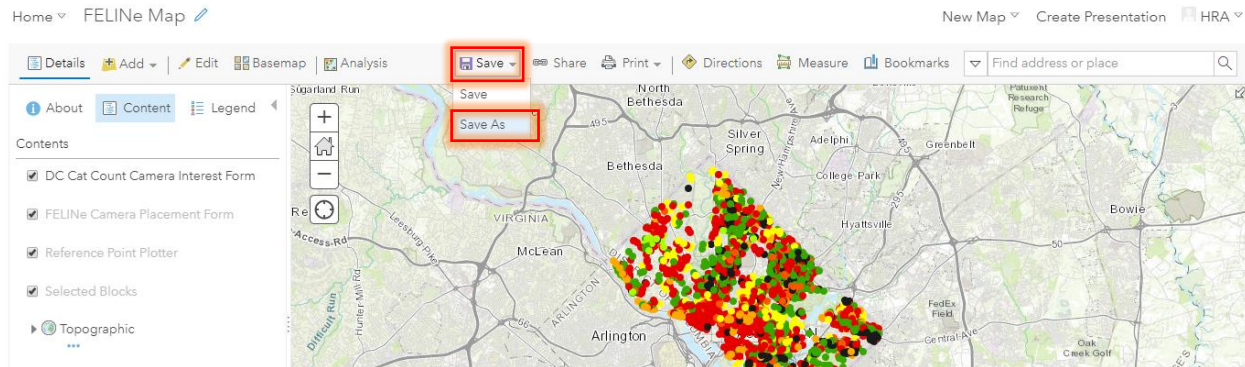
11. A sidebar window will appear where the table of contents was. Under *Choose an Attribute to Show*, select the attribute that shows the object's status.

12. Under *Select a Drawing Style*, select *Types (Unique symbols)*, then select *Options*.



13. A sidebar window will appear where the table of contents was. Each object status will be listed with a symbol next to it. Click on each symbol and use the popup window to select the desired symbol. Save your changes.
14. Repeat steps 10-13 for the other form-based layer (Camera Host Layer [C] or Camera Layer [F]).
15. Navigate to the Symbology tab of the Reference Point Layer (H). Under *Choose an attribute to Show* select *Show location only*.
16. Repeat step 13 for the reference point symbol.

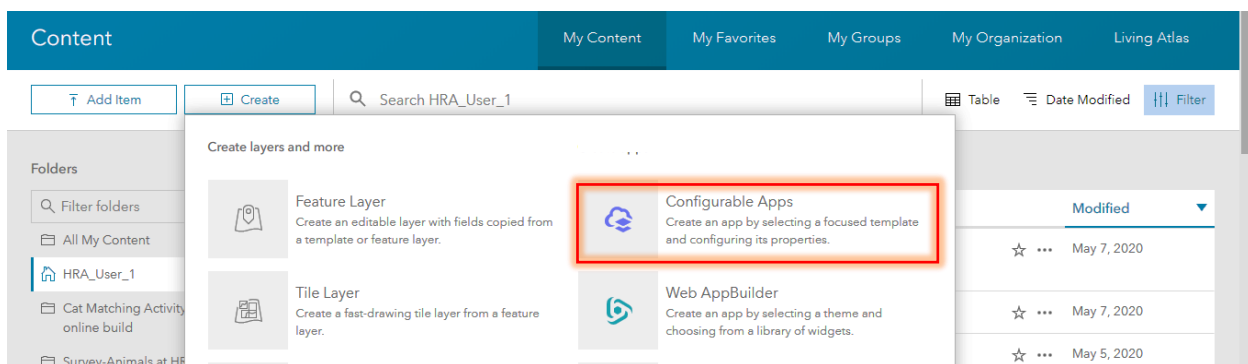
17. Select the *Save* button, then select *Save As*. Title the map. For the sake of continuity, the map will be referred to as *FELINE Map* in this documentation.. Add tags, summary and adjust the folder as necessary.



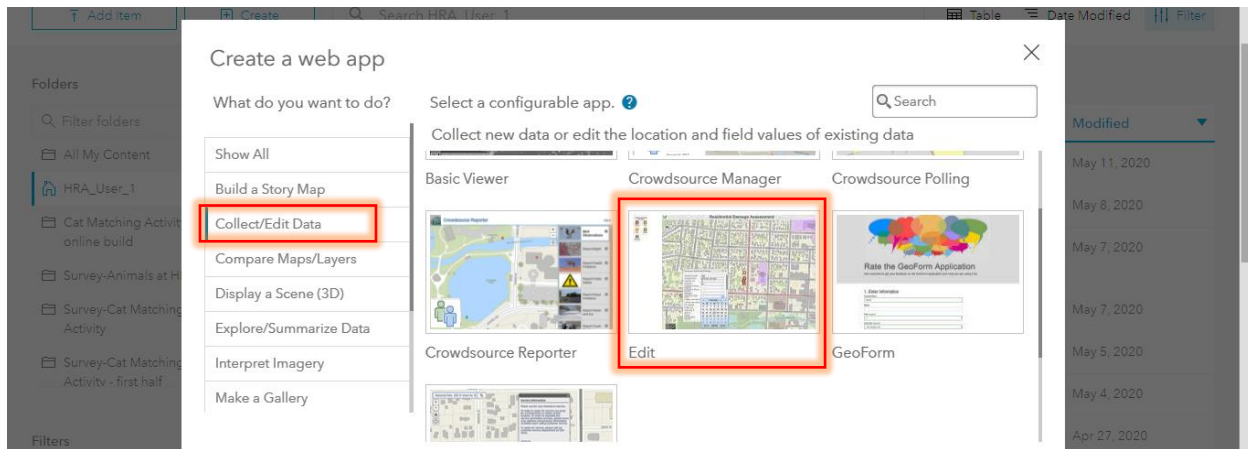
J. FELINE Web Application

The FELINE Web Application is a less fragile configuration of the FELINE Web Map (I) in that the user cannot perform batch edits or batch deletions. It also enables the user to search for specific cameras or properties in the search bar without knowing their address. Users can click on each object in the FELINE Web Application to read and edit information, including status changes. Object symbols will change according to the newly selected status. This application saves in real-time and can be opened and edited by multiple users simultaneously. To build the FELINE Web Application, complete the following:

1. Log into ArcGIS online.
2. Navigate to your *Content* folder.
3. Select *Create*, then select Configurable Apps.



4. A new window will appear with various styles of configurable applications. On the left-hand panel select *Collect/Edit Data*. Of the newly filtered application options, select the template titled *Edit*. Select *Create Web App* (see example on next page).



5. A new window will appear. Title your application *FELINE Web Application*. Add tags, summary, and adjust the folder as necessary.
6. A new window will appear with maps that you have previously saved. Select *FELINE Web Map* (I).
7. A new window will appear. The right side of the screen displays a preview of your application, while the left side of the screen holds options to configure the application. Note that the preview may not accurately display your map's table of contents. On the left side of the screen select the Options tab, and enable basemap toggling by clicking the box next to *Basemap Toggle*.

Configure: EXAMPLE FELINE

General Theme **Options** Search

Tools

☐ Display Edit Toolbar

Enable the Locate Button to add a button to the map that allows users to identify their current location. To track the users current location set Locate Button and Location Tracking to true.

☐ Locate Button

☐ Location Tracking

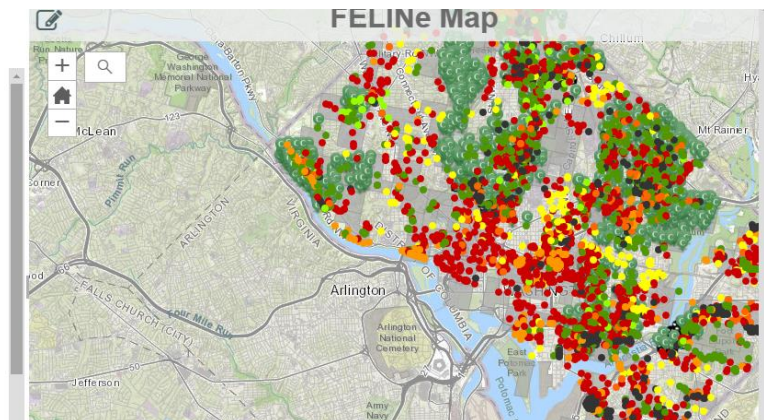
☒ Home Button

☒ Scalebar

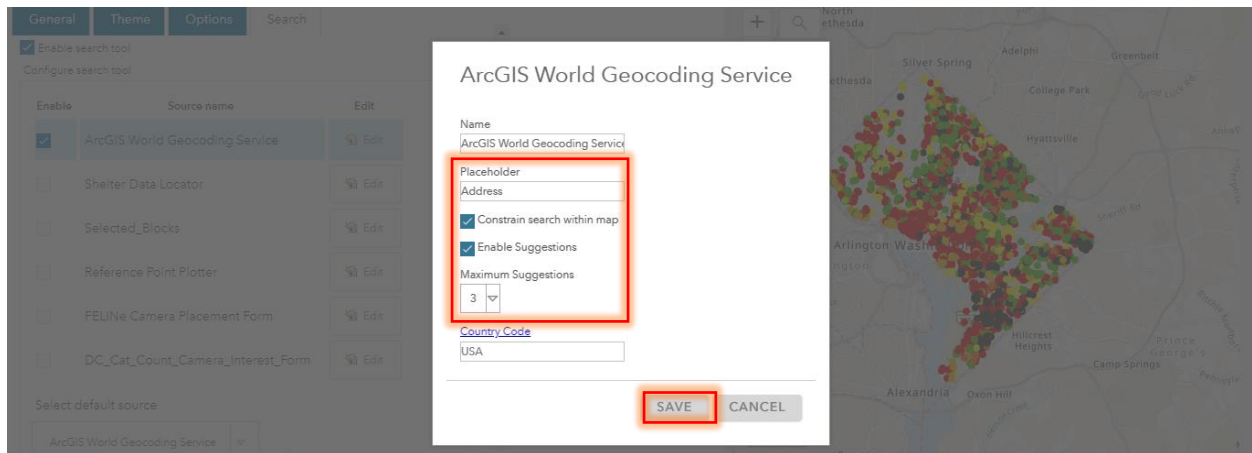
Enable the basemap toggle button. The button will use the web map's default basemap as the map main. Select an alternate basemap from the list to toggle.

☒ **Basemap Toggle**

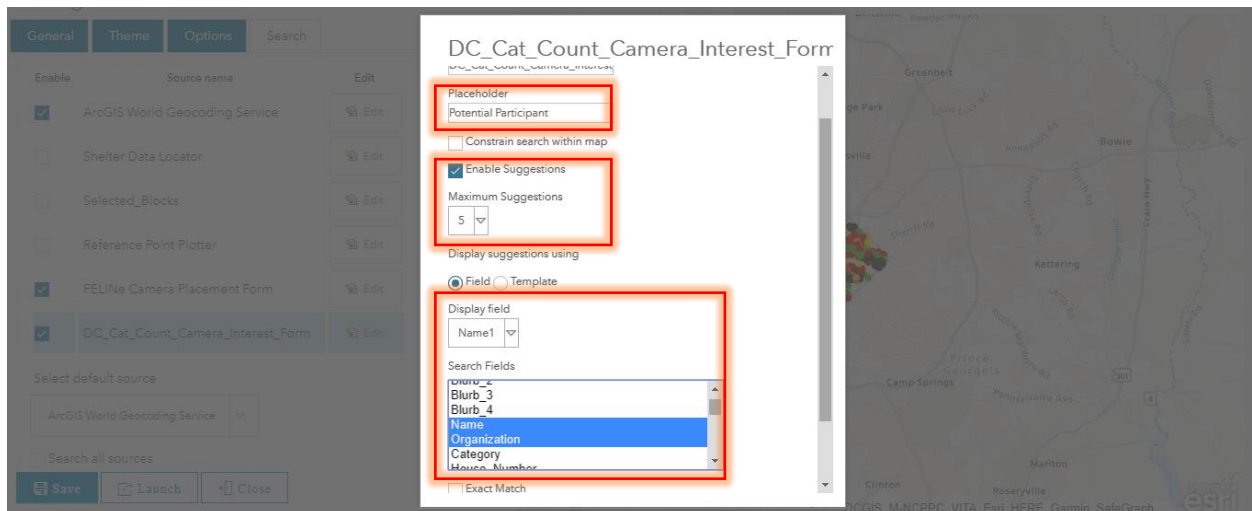
Alternate Basemap



8. Select the *Search* tab and ensure *Enable search tool* is on. If not, click in the box to the left of *Enable search tool*.
9. Under *Configure search tool*, locate *ArcGIS World Geocoding Service* and select *Edit*.
10. A new window will appear. Under *Placeholder* type *Address*.
11. Select *Constrain search within map* and *Enable Suggestions*. Use the dropdown menu below *Maximum Suggestions* to select 3. This will limit the number and range of suggested addresses in the search bar. Select *SAVE* (see example on next page).



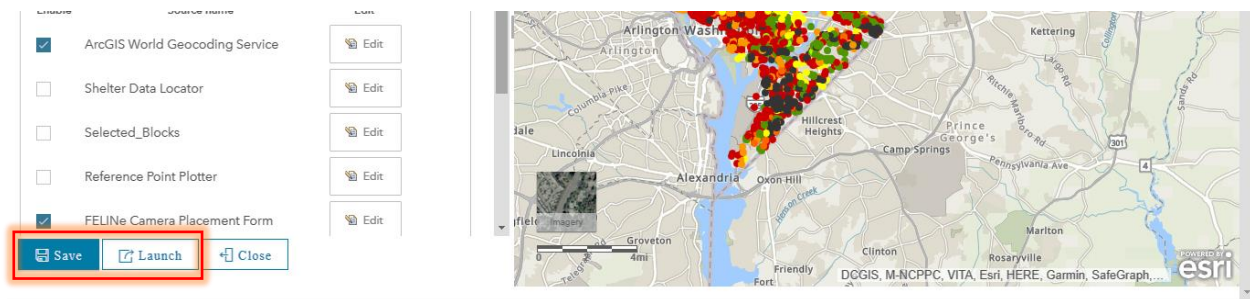
12. Under *Configure search tool*, locate and enable your camera host interest layer (C) by clicking the box to the left of the layer name. After enabling the layer, select *Edit*.
13. A new window will appear. Under *Placeholder* type *Potential Participant*.
14. Select *Enable Suggestions*. Use the dropdown menu below *Maximum Suggestions* to select 5.
15. Under *Display field* select *Name1*.
16. Under *Search Fields* hold down the control button on your keyboard [Ctrl] to select multiple fields. Select *Name*, *Organization*, *Name1*, and *Name2*. Select *SAVE*.



17. Under *Configure search tool*, locate and enable your Camera Layer (F) by clicking the box to the left of the layer name. After enabling the layer, select *Edit*.
18. A new window will appear. Under *Placeholder* type *Camera*.
19. Select *Enable Suggestions*. Use the dropdown menu below *Maximum Suggestions* to select 5.

20. Under *Display field* and *Search Fields* select *GPS point name*. Select *SAVE*.

21. Select *Save*, then *Launch*.



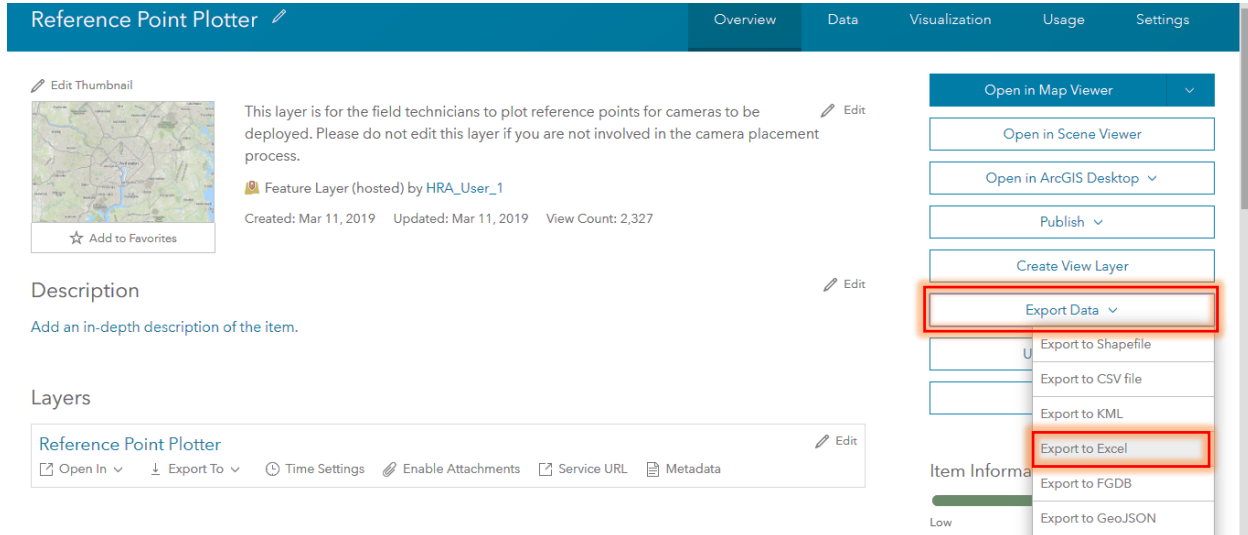
22. A new window will appear with your application. The link from this window can be used to access your application in the future. For ease of access, consider bookmarking this page and pinning it to your search bar. The application can also be accessed via your ArcGIS Online content folder.

K. Reference Point Table

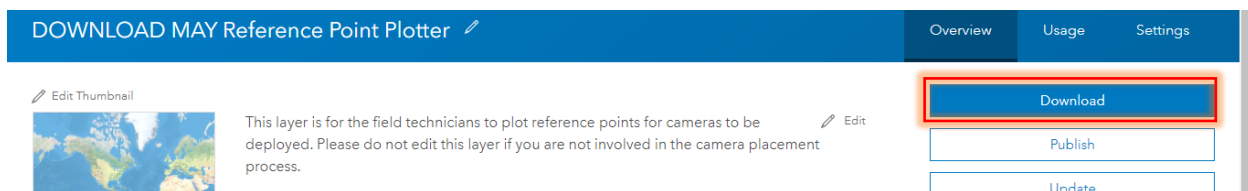
Reference points created in FELINE can be downloaded in both .xlsx or .csv formats. A reference point table is needed to upload reference points into your fieldwork-ready Handheld GPS Unit (L).

1. Create a folder on your desktop and name it something easy to remember (ie. Ref points).
2. Navigate to and select your Reference Point Layer (H) in your ArcGIS Online content folder.

3. A page will appear with details about the layer. On the menu on the right-hand side of the screen select *Export Data*.
4. A drop-down menu will appear. Select *Export to Excel*.



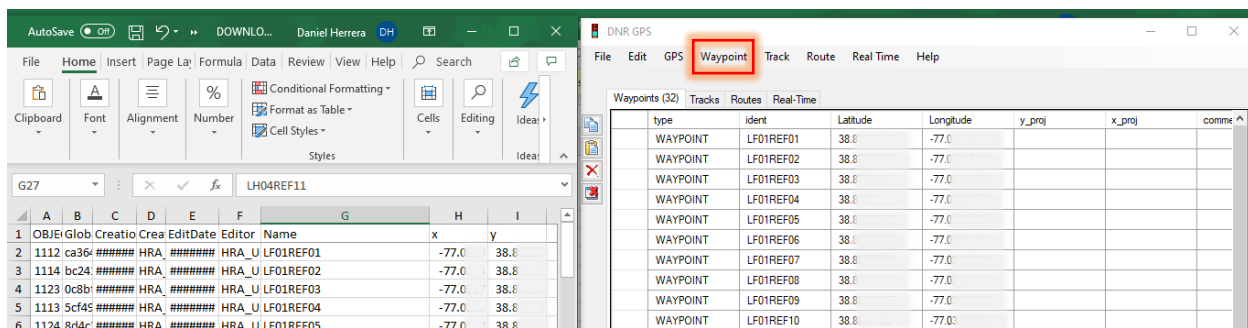
5. A window will appear asking for information about the layer. Type "DOWNLOAD [MONTH]" in front of its default title. Add tags, summary, and adjust the folder as necessary.
6. Click *Export*.
7. You will be brought to the page for the newly created layer on ArcGIS. On the right-hand side of the screen select *Download* and open the document after it downloads. Save this file to the folder you created in step 1.



L. Fieldwork-ready Handheld GPS Unit

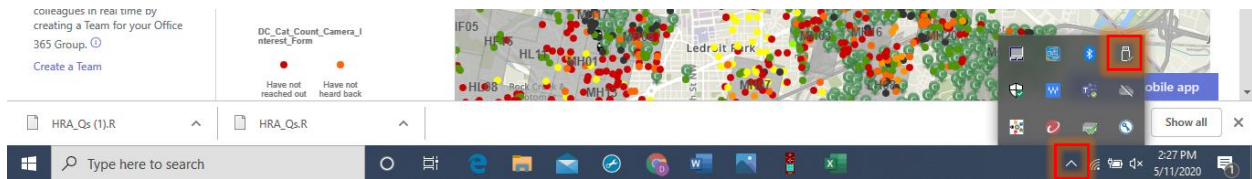
Once you have downloaded the Reference Point Table (K) you can upload the points into a handheld GPS unit without manually typing the information for each point. These instructions are written for the free software DNRGPS 6.1.0.6 and require the USB cable for your handheld GPS unit.

1. Open your Reference Point Table (K) and check for missing values, mislabeled values, etc. Remove any listed reference points that do not have names or are not relevant to your current sampling season.
2. Turn your hand-held GPS unit on and connect it to your computer using the USB cable.
3. Open the DNRGPS program and position the window such that DNRGPS and K are both visible.
4. In K, copy the values under the field titled *Name* and paste them into the DNRGPS field titled *ident*.
5. In the excel sheet, copy the values under the field titled *x* and paste them into the DNRGPS field titled *Longitude*. Unfortunately, if you are working in the Western Hemisphere you may have to manually alter each longitudinal value to make it negative.
6. In the excel sheet, copy the values under the field titled *y* and paste them into the DNRGPS field titled *Latitude*. Unfortunately, if you are working in the Southern Hemisphere you may have to manually alter each latitudinal value to make it negative.
7. In the DNRGPS window, select the *Waypoint* tab. A drop-down menu will appear. Select *upload*.



8. If you receive an “mscorlib - Input string was not in a correct format” error, select OK. This will not inhibit your upload.

9. When prompted, name the file using a standardized project nomenclature. Note that the file is a composite of all the reference points and will not be referenced by name in your handheld GPS unit.
10. Safely eject the GPS unit from the desktop.



11. Turn the GPS unit on and search for a newly added reference point to test if they loaded properly. Power the unit down when finished.

This concludes the FELINE setup process. With additional questions, please contact info@dccatcount.org