Field Maps/ArcGIS Online Configuration for Transect Counts

Introduction

ArcGIS Field Maps is a configurable app that is well suited for recording transect count data in the field. If fact, we used the immediate predecessor of this app (ArcGIS Collector) in the DC Cat Count project for our transect counts. Field Maps is part of a much larger suite of Geographic Information System (GIS) software – called ArcGIS – produced by ESRI. If your surveyors end up using Field Maps to collect transect count data, you'll also be using a piece of ArcGIS software called ArcGIS Online (AGOL) to manage, map and analyze all the data that comes in from the field.

As we mentioned in the Transect Counts toolkit chapter, Field Maps is one of several options for recording transect count data, but it's the approach we most often recommend for several reasons:

1) Field Maps helps you navigate along transects AND record cat sightings, all in the same app. Some other options require you to go back and forth between different apps to navigate and record data.
2) Field Maps works on all kinds of smart mobile devices - phones or tablets and iOS or Android operating systems.
3) It works either online (with an internet connection) or offline.
4) If you collect data in Field Maps, you'll be able to work with your data in a flexible and powerful online GIS system (AGOL) and can also utilize many other fully integrated ESRI programs and apps.
5) Through AGOL, you'll be able to access a huge number of external datasets to enrich and inform your own data and analysis (we suggest you browse the ESRI Living Atlas to get a sense of these data sets).

Just about the only reasons **not** to use Field Maps and AGOL are because the software isn't free, and because there is a learning curve. Admittedly those factors can seem compelling at first, but there are important caveats. First, the expense is quite low if you qualify as a non-profit organization under ESRI's guidelines ($100 per user account per year as of October 2021). Second, the learning curve only applies to the person who configures the app and manages data for your organization – in other words, your "tech" person. In contrast, surveyors that use Field Maps to record data will find it no harder to learn than any other electronic data collection option. Anyone reasonably comfortable with using a smart phone and its apps should find it easy to learn Field Maps.

Most of this chapter is intended to provide your tech person with a detailed set of instructions for configurating Field Maps for your organization's transect counts. At the end of the chapter, we also provide an Appendix with user instructions for the surveyors.

User Accounts

To configure and use Field Maps, you'll need one or more AGOL user accounts, which you will purchase from ESRI. We recommend strongly that all projects using Field Maps have at least two user accounts; one for the administrator (i.e., tech person) who is responsible for app configuration and data management in AGOL, and at least one additional account for surveyors conducting transect counts using the Field Maps app. This arrangement allows you to limit the extent to which surveyors - who may be volunteers or temporary employees - can access and potentially alter your master data set, either accidentally or on purpose. You have the option of getting a separate user account for every individual surveyor, which makes it easy to track each surveyor's activities and data collection, but this can get expensive ($100 each per year, see above) if you have a large survey crew. In these cases, it will be more economical if your surveyors share one or a few user accounts. If you're unsure how many accounts you should have for your project, contact us and we'll help you decide.

Summary of the Configuration Process

Before getting into the nitty-gritty of Field Maps configuration, here is a brief overview of the process. It all centers around making a map in AGOL. This map will have three **layers** depicted; a base map layer that shows all the local roads, a layer that shows your designated transects, and a data layer that will show all the data your surveyors collect during transect counts. This data layer is divided into two distinct but related parts. One part holds information about each transect counting session, which we call **survey-level data.** Some examples might be the date, who completed the transect, the time when the survey started and the time when it ended, and the name of the transect that was surveyed. The other part holds information about each cat that you see while conducting transect counts, which we call **cat-level data**. Some examples might be the location of each cat, its estimated age, and whether it is ear-tipped. Survey-level data and cat-level data are linked together through a **relationship** within the data system so that the survey session during which a given cat was recorded is clear. As you make this map, you can define exactly what kinds of survey-level and cat-level data you want your surveyors to record - this flexibility is one of the reasons why the Field Maps app is called "configurable". Once this map and its underlying data layers are set up in AGOL, the Field Maps app provides your surveyors with a way to view the map and add new survey-level and cat-level data to it as transect counts are conducted. Each time your crew goes out to complete transect the data will be compiled, centralized and continually updated.

Two Configuration Options

You have two options for setting up Field Maps for transect counts. The first option is to configure everything from scratch. This approach gives you full flexibility to decide exactly what kinds of data you want your surveyors to record. If you choose this option, you'll need to read through all the instructions below for Configuration Step 1 and Configuration Step 2. The second option is to

use the preformatted version of the survey-level and cat-level data layers that we've provided for you the in the additional resources section of the Transect Counts chapter of the toolkit. This option will get you up and running faster, but you'll be starting with the default data structure that we built into the pre-formatted layers. If you choose the preformatted option, you can skip the material under Configuration Step 1 and go straight to instructions for Configuration Step 2.

Configuration Step 1: Create Geodatabase Layers

A. OVERVIEW

To make the map we referred to above, you'll start by creating a geodatabase, which is the "home" of your survey-level and cat-level data layers. This is most effectively done using ESRI's desktop GIS software called ArcGIS Pro. A license for ArcGIS Pro should be included in your AGOL licensing, and you can find plenty of tutorials here to help you with any problems or questions you may run into. Alternatively, if you are already familiar with QGIS software (an open-source alternative to ArcGIS), you can create your geodatabase there and import it into AGOL.

Before we jump in, we want to prepare you for the fact that you are going to be exposed to quite a bit of new GIS jargon in this section, and throughout the chapter. This may seem esoteric at first, but once you work through the instructions these terms should start to make sense. The illustration in Appendix I will help you to understand some key terms a little better. We also want to let you know that in GIS, there are almost always multiple ways to accomplish any task. We've presented the steps that we use, but over time you may discover other ways to do the same things.

B. CREATE A NEW PROJECT AND GEODATABASE

Start by opening ArcGIS Pro and logging in with your user credentials. Then, you should create a **new project**, and select whether to base that project on a "map template" or a "catalog template". We prefer starting with the catalog template since you won't be finalizing your map in ArcGIS Pro, but rather in AGOL. Give the project a descriptive name, like "Transect_Count_Data" or something similar. Creating this project also creates a geodatabase with the same name which ends with a "gdb" suffix (i.e., Transect_Count_Data.gdb).

C. DEFINE GEODATABASE DOMAINS

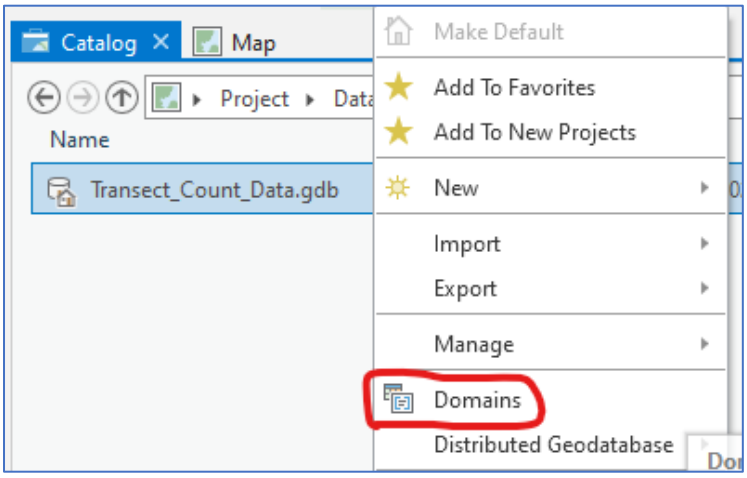
Once you've created a new project and geodatabase, you can remain in ArcGIS Pro to define domains for your geodatabase. Domains are the rules that define acceptable values for your data fields (also interchangeably called attributes; see Appendix I). For example, if your cat-level data has a field describing the age of the cat, the domain associated with this field may specify that acceptable values are "< 6 mo. (kitten)", "> 6 mo. (adult)", and "unknown". With the domain configured in this way, your surveyor will see only these three options when entering data in Field Maps. This is advantageous because it limits user error and keeps your dataset clean. Without a domain definition, you might have some surveyors answering "kitten", others answering "under six months", and others answering "< 6 m". Even though you know these are

all really the same answer in your human brain, your software's electronic brain does not realize this, and therefore you'll have to spend lots of time cleaning up your data to make it usable.

To define your domains, you'll need to know what your data fields are going to be for both your survey-level data and your cat-level data. For this reason, you should read all the material in the Configuration Step 1 section, and then make a list of all your data fields and all the domains you will need to define their acceptable values. Only then should you follow the numbered instructions just below. In making your list of data fields, it may also help to review discussion of relevant metrics in the Transect Counts toolkit chapter. As you are making your list of data fields, be aware that some of them may not require creating a domain. For instance, you may want to create a "Comment" attribute where surveyors can type any text they want, without constraints. Similarly, you may want to include a "Surveyor" attribute in your survey-level data where a surveyor can write their name. If you don't know the names of all your potential surveyors in advance, you won't be able to create a domain that lists all their names. In short, whenever you can reasonably create a domain to help standardize data entry for a given attribute, do so, but it won't make sense for every attribute.

Once you've made a list of all the data fields you want your surveyors to record during transect counts and know which ones will need domains, follow these steps:

1. From the Catalog pane, inside the "Databases" folder is a .gdb file. This is the geodatabase you already created, which is currently empty. Right-click on the .gdb file and select "Domains". This opens the domain view, where you can add new domains to your geodatabase.



2. Select the blank row to begin entering the information for your first domain. As an example, we'll create the domain for entering the age of observed cats (a cat-level attribute) and fill out the fields as illustrated below.
    a. Domain Name: Age
    b. Description: The age of the observed cat.
    c. Field Type: Text *(this means that the data will be in text form rather than numbers)*
    d. Domain type: Coded Value Domain *(this means you will create a "pick list" of acceptable values for this domain)*
    e. Split Policy: Default

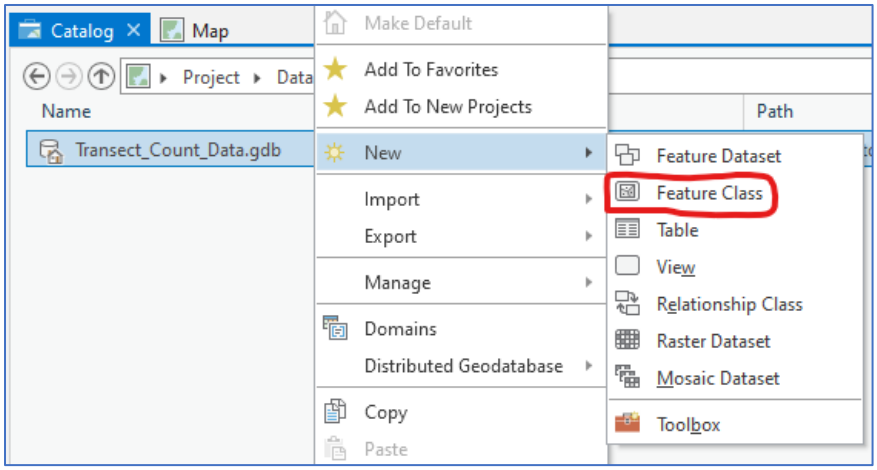
    f. Merge Policy: Default
3. You can now enter the values that you want available to surveyors for recording the age of a cat. This is done by defining the code and description for each value. The description field is what will be visible to surveyors using Field Maps.
    a. Code: Adult | Description: Adult (> 6 mo.)
    b. Code: Kitten | Description: Kitten (< 6 mo.)
    c. Code: Unknown | Description: Unknown
4. Repeat steps 2 and 3 above for each of the domains that you need for your survey-level and cat-level data fields. Including a "Test" code for some attributes is useful for differentiating observations made while testing your data collection procedure from real observations that you will want to use for later analysis. In Appendix II, you can find a list of possible domains and domain values that can be useful for typical survey-level and cat-level attributes in transect counts.

D. CREATE GEODATABASE FEATURE CLASSES (LAYERS)

After defining your domains, the next step (still working in ArcGIS Pro) is to create feature classes for your geodatabase. A feature class is a collection of data records that have physical locations. These locations can be described as points (like cat locations), lines (like roads), or polygons (like counties) in GIS, but a given feature class can only have one of these "geometry" types; for example, a feature layer that contains point records cannot contain records that describe lines or polygons. Within a given feature class, all the records will not only share the same geometry, but they will also share a set of attributes that describe each record. A geodatabase can contain one or many of these feature classes, which can be added to a map either individually or all at once, at which point they are called feature layers.

For transect counts, you will need two feature classes in your geodatabase - one for survey-level records and one for cat-level records. The feature class for cat-level records **must** have a point geometry, and the points will describe to spot where each cat was first seen. The geometry and location of your survey-level records isn't really important, but you'll have to pick something so for simplicity we suggest using points that describe the location at which you begin a given survey session. Although the survey-level and cat-level feature classes in your geodatabase will have the same geometry, they will have different sets of attributes, as we've described previously.

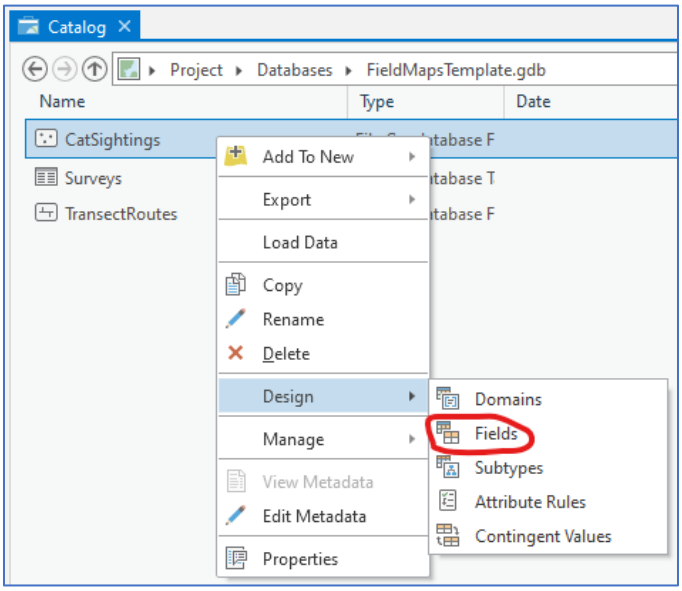
To make a new feature class, right-click on your geodatabase (the .gdb file in ArcGIS Pro) and select "new" and then "feature class" (see illustration). Then follow the steps below for the survey-level feature class. When done, repeat the process of creating another new feature class, this time using the cat-level steps below. Please note in both cases that we have provided you with a suggested list of fields, but that you are free to add additional fields or delete any of the fields we have suggested to best meet your needs. If you are prompted to enter any settings not specifically listed below, just accept their default values.



1. Survey-Level Feature Class
    a. Name: Surveys
    b. Alias: Surveys
    c. Feature Class Type: Point
    d. Fields: *(the first part is the field name to enter, the second part is the field type)*
        i. GlobalID | GlobalID *(the relevance of this field is explained below)*
        ii. TransectName | Text
        iii. OtherName | Text
        iv. StartTime | Date
        v. EndTime | Date
        vi. Notes | Text
    e. Select “Finish”
    f. Right-click the feature in the catalog pane, select “Manage”, select “Enable Editor Tracking” (this helps keep track of any edits made to the data over time).
2. Cat-Level Feature Class
    a. Name: CatSightings
    b. Alias: Cat Sightings
    c. Feature Class Type: Point
    d. Fields: *(the first part is the field name to enter, the second part is the field type)*
        i. GlobalID | GlobalID *(the relevance of this field is explained below)*
        ii. SurveyID | GUID *(the relevance of this field is explained below)*
        iii. Age | Text
        iv. EarTip | Text
        v. BodyCondition | Text
        vi. Injury | Text
        vii. Collar | Text
        viii. CoatLength | Text
        ix. PrimaryColor | Text
        x. SecondaryColor | Text
        xi. CoatPattern | Text
        xii. Notes | Text

e. Select “Finish”
f. Right-click the feature in the catalog pane, select “Manage”, select “Enable Editor Tracking”.
g. Enable attachments (for photographs of cats) by right clicking the feature in the catalog pane, select “Manage”, select “Enable Attachments”, select “Run” in the geoprocessing pane. This setting will enable the surveyors to take pictures of the cat with their device that will be permanently “attached” to the data record.

E. ASSIGN DOMAINS TO FIELDS



Now that the necessary feature classes have been created, you’ll assign the domains you made earlier to the relevant fields, still working in ArcGIS Pro. You’ll go through this process twice, once for the survey-level feature class (assuming it contains fields for which domain definitions are relevant) and again for the cat-level feature class. To access the field editing view, right-click on a feature class or table, select “Design”, and select “Fields”.

In the table that comes up (see illustration below for the cat-level feature class) assign domains to appropriate fields by selecting the blank “Domain” cell and choosing the appropriate domain name from the drop-down menu. Make sure to save your work!

Field Name	Alias	Data Type	Allow NULL	Domain	Default	Length
OBJECTID	OBJECTID	Object ID	☐			
Shape	SHAPE	Geometry	☑			
GlobalID	GlobalID	Global ID	☐			
SurveyID	SurveyID	Guid	☑			
Age	Age	Text	☑	Age		255
EarTip	EarTip	Text	☑	Ear		255
BodyCondition	BodyCondition	Text	☑	Body Condition		255
Notes	Notes	Text	☑			255

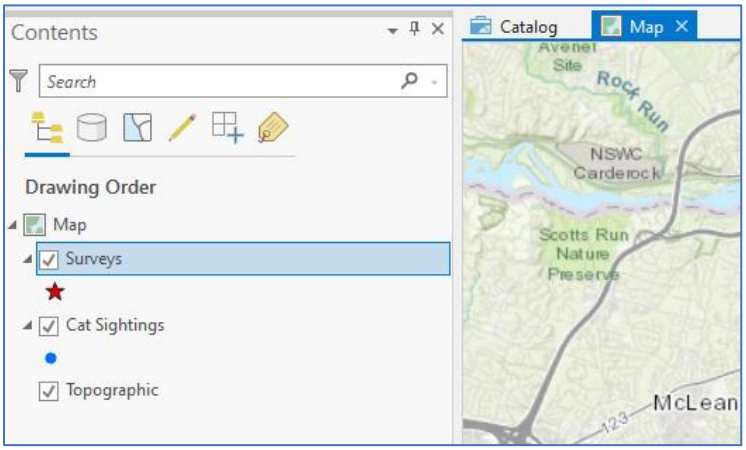
F. CREATE A RELATIONSHIP CLASS

For all the analysis, mapping, and reporting you’ll want to do with your data, it’s critical that you can easily tell which cats were seen during which survey sessions (and on which transects!). This is done by creating a relationship class in ArcGIS Pro that links the survey-level feature class records (one for each survey session) to the cat-level feature class records that were created during that survey session. To do this, follow the steps below, noting how the “mystery” fields (i.e. GlobalID, SurveyID) that we specified above under the instructions for creating feature classes are utilized!

1. Right click on the .gdb file in the catalog pane, select “New”, select “Relationship Class”.
2. Fill in the parameters as shown here:
    a. Origin Table: Surveys
    b. Destination Table: CatSightings
    c. Output Relationship Class: Surveys_CatSightings (Use the default value, which may be different if you used different names for your feature classes than described above)
    d. Relationship Type: Simple
    e. Forward Path Label: CatSightings
    f. Backward Path Label: Surveys
    g. Message Direction: None
    h. Cardinality: One to many (1:M)
    i. Origin Primary Key: GlobalID
    j. Origin Foreign Key: SurveyID
3. Select “Run”. The new relationship class should appear in your .gdb file.

The basic structure for your geodatabase is now complete!

G. EDIT LAYER SYMBOLOGY



Now you can view and format your feature classes on a map, which is when you’ll start to call them feature layers. You can create a map in ArcGIS Pro by either right clicking on one of your layers and selecting “Add to New” and then “Map”, or by using the “Insert” tab at the top of the screen to add a new blank map. Once a map is open, add the CatSightings, Surveys, and TransectRoutes layers by dragging them from the Catalog pane to the Contents pane of your map.

Having your layers in a map lets you edit their symbology – in other words, how the points will look to users. Choosing a good symbology can really help users to easily identify and differentiate the various features shown on the map. Access the symbology pane by right clicking a layer and select “Symbology”. You can customize your layers however you like, but here we provide the symbology used by the DC Cat Count.

1. Surveys
    a. Single symbol
    b. Symbol: Red Star symbol from gallery *(This star will be located wherever the Field Maps user was standing when they created the data record for a new survey session; this will typically be at the beginning of a transect)*

2. Cat Sightings
    a. Single symbol
    b. Symbol: circle of any color that contrasts well with your chosen base map. This symbol will be placed at the location for each cat sighting.

H. EXPORT TO ARCGIS ONLINE

The final step within ArcGIS Pro is to share your feature layers to AGOL so that they can be used in Field Maps. Because you have a relationship class established between your survey-level and cat-level layers, sharing one of them will effective share both of them, and it will also create the underlying geodatabase structure within the online universe of AGOL. This is where the data collected with Field Maps will actually "live". To accomplish this sharing, right click the survey-level feature layer on your map in ArcGIS Pro and select "Sharing" → "Share as Web Layer". Fill in the appropriate information on the Share as Web Layer Pane and publish the layer to AGOL. Because you already signed-in to your AGOL account when you started ArcGIS Pro, the system will know exactly where to send this information!

Configuration Step 2. ArcGIS Online Setup

A. IMPORT DATA LAYERS

If you chose the preconfigured data layers option, you'll need to upload the layers we provide as a zip (compressed) file into AGOL. To do that, sign in to your AGOL account and then follow these instructions. When prompted, be sure to select "Enable Editing" and "Keep Track of Created and Updated Features", and "Keep Track of Who Created and Last Updated Features".

If you chose instead to configure everything from scratch, then you've worked through all the instructions described above in Configuration Step 1, and your survey-level and cat-level layers are already in AGOL.

B. CREATE GROUPS

Groups in AGOL help to organize members of your organization based on their roles. More specifically, groups can help define the extent to which different users can access and edit data. We recommend creating an Admin Group and a Field group. Members of the Admin group should be able to view and edit all items and data records shared with the group, while members of the Field group should only be able to view and edit items they create. Basically, your tech person and anyone involved in data analysis will need to be in the Admin group, whereas your field surveyors that conduct transect counts will generally be in the Field group.

1. In the AGOL "Groups" tab, select "Create Group"
    a. Provide distinct names for the two groups you create, such as "Transect – Field" and "Transect – Admin".
    b. In the Group designations options, only the Admin group should have shared update enabled; the Field group should not. Other options can usually be left in their default values.
2. Add members to the appropriate groups based on their role in the project.

C. CONFIGURE VIEW LAYERS

Creating hosted feature layer views is a convenient way to display or share a single set of data in different ways. You can create multiple views for a single underlying feature layer, each with its own unique symbology or unique combination of settings. This is very useful for Field Maps, because a view of your data can be created for the Field group members that only shows the most recent data collected by a particular user. This keeps their map from getting cluttered up with data points as they accumulate over long periods of time. The steps below will create a view of your survey-level and cat-level layers to share with the Field group.

1. Find the feature layer that contains your survey-level and cat-level data in the Contents section of AGOL, and then click the "Overview" tab.
2. Click on "Create View Layer", and then give the view layer a name that incorporates both the original feature layer name and a brief indication of the purpose of the view layer. For instance, if your feature layer is called "Transect_Count_Data", then a view created for the

Field group might be named “Transect_Count_Data_FieldGroup”. Fill out the rest of the required information and click “OK”.

3. In the settings in your newly created view layer choose all the following options:
    a. Enable delete protection.
    b. Enable editing.
    c. Editors can only see their own features.
    d. Editors can only edit their own features.
4. Add a content filter in the Visualization tab as follows:
    a. Choose the survey-level layer.
    b. Create a filter by clicking the icon that looks like a little flashlight. Create a filter using the “created_date” field that will only show records created in the last two days (or whatever period makes sense for your project).
    c. Repeat a. and b. for the cat-level layer.

D. DRAW TRANSECT ROUTES

If you recall, we mentioned that your map for Field Maps needed not on survey-level and cat-level layers, but also a layer that shows the transects along which you will be surveying. Here we’ll describe how to create that layer directly in AGOL but if you prefer you can instead create it in ArcGIS Pro desktop software and then share it to your AGOL account. Before you start creating this layer, please review the Transect Count toolkit chapter to remind yourself of some of the things you should consider when designing your transects. Once that’s done, the you can follow the steps below or view them in the AGOL documentation:

1. Sign in to your AGOL account.
2. From the home page, click on the “Content” heading along the top row.
3. Click on the “New Item” button.
4. In the dialogue box, click on the “Feature Layer” option.
5. Select the “From Template” option, and then scroll through the various templates until you find the one called “Lines”. Click on it and then choose “Create”.
6. Click “Next”
7. In the map, zoom in to your approximate project area, but make sure not to clip part of it out. It’s not important to be exact. Then click “Next”.
8. Fill out the dialogue box with a name (title) for your layer (probably this will be “Transects”) and some tags, or descriptive words and phrases that are used for search indexing. You can also specify where the layer will be stored. Usually accepting the default option will be fine. Then click “Done”.
9. Next, you’ll need to create a data field for the new transect layer where you’ll put the name of each transect. To do this, on the page that comes up after the preceding step, click on “Data” and then on “Fields”. You’ll see a list of automatic fields, but you’ll want to then click on the “Add” button. Fill out the dialogue box with a name for the new field (this must be only eight characters or less, so choose “TranName”), a display name which can be longer (“Transect Name”). Choose “String” for the type (this is another word that refer

to a text field rather than a number field), choose a maximum length (default is fine), and uncheck “Allow Null Values”, which will force you name every transect that you create.

10. Now click on the “Overview” button. Then click the button to “Open in Map Viewer”. The map viewer will open, and you’ll see your work area. You’ll also see the “Transects” layer listed to the left in the map Table of Contents column, but you won’t see any transects yet because you haven’t made any.
11. Click the “Basemap” button and change the base map to one of the maps that shows roads. There are usually two to choose from, so you can try them both and pick the one you like best.
12. Now, save the map by clicking “Save” and giving it a name, like “Transects”.
13. Now you are ready to actually draw some transects. The first step is to zoom in to the area where your first transect will be. Then, click the “Edit” button, and then click “New Feature”. Once you do this you are in drawing mode, and anything you click on the map will be interpreted as making your transect. You’ll click on a start point, and then at each of the turns along your transect. When you double click, the transect will be done, and a dialogue box will come up where you will give the transect a name that will distinguish it from all your other transects.
14. Don’t worry about getting your transect line drawn exactly right when you first make it. The fine tuning is easiest to do after the rough transect is drawn and finalized. Basically, you double click on the transect, and you’ll see a bunch of dots along it. By dragging these around, you can adjust the location of your transect so that it corresponds nicely to the underlying roads. Just give it a try, you’ll get the hang of it!
15. If you don’t like the transect you just drew and can’t edit it to your liking, you can always just double click it and then choose “Delete” as long as you remain in edit mode.
16. For each new transect, just repeat the steps above.
17. Once you are done drawing a transect, click “Details” to leave editing mode, and then save the map.

E. UPDATE DOMAIN VALUES

We described how to set domain values in Configuration Step 1 part C, but you may want to update them once your layers are in AGOL. As mentioned previously, domains are the rules that define acceptable values for your data fields (also interchangeably called attributes; see Appendix I). They can be edited in AGOL by following these instructions. This is most useful for updating the list of transect names to choose from in your survey-level layer as you draw additional transect routes over the course of your project.

F. CREATE MAPS FOR FIELD GROUP AND ADMIN GROUP

Finally, it’s time to make the map that we described earlier, the one that the Field Maps app will use as the basis for transect count data collection. While you’re at it, we’ll also have you create a map for the admin group to use in AGOL. With all the various layers now available, making these maps is fairly easy. Go to the “Maps” tab to open the Map Viewer, and then start adding the layers you need to your map. The map for the Field group (the one that they’ll work with in the Field

Maps app) should have the “view” layer we mentioned above, the transect layer, and the base map. Once the transect layer has been added, look for the three dots just below it in the Contents panel, and select the “disable editing” option. This will prevent your surveyors from inadvertently trying to create new transects while they are collecting data. There are many ways to fine tune the “look” and behavior of your map, so we encourage you to explore these options, and to look here if you need more help. When you like the map, save it under a name like “Transect_Count_Field”. Then, finally, you’ll need to share this map with the Field group. You do this in the Map Viewer by clicking on “Share”, then click “Members of these Groups”, and then click the Field group. There are also options for sharing this map in the Contents panels and the Overview panel for the map. Make the map for the Admin group the same way, but instead of using the view layer, use the main feature layer that contains the survey-level and cat-level data. You’ll share this map only with the Admin group, naturally. In this map, your tech person and anyone else in the Admin group can review all the data sent in by surveyors and make any corrections if they think they are necessary.

G. FORMAT IN FIELD MAPS

You’ll then need to perform two final setup steps in the browser version of Field Maps (i.e., not on a mobile device). From AGOL, open the Field Maps application (find it by clicking the icon that is a grid of nine dots) and open the map shared with your Field group. Complete the following steps:

1. Go to the “Settings” page and toggle “Show Related Types” to “yes” or “on”. If you fail to do this, the app will not recognize the relationship class between the survey-level data and the cat-level data.
2. Format the survey-level and cat-level data layers in the form builder to make sure that the attributes you want your surveyors to see are enabled and – where appropriate – required. This will all probably look the way you want it to if you configured your geodatabase from scratch, but if you are using our preformatted geodatabase, you may want to “turn off” some of the attributes we included if they aren’t needed for your project.

Field Maps allows for conditional formatting of your fields, meaning that you can have different fields show up depending on the data entered in other fields. One useful application of this feature in your Survey-level layer is to have the “Other Name” field available only when the “Transect Name” field is set to “other”. To set this up, enter the following code into the conditional formatting box for the “Other Name” field: `$feature.RouteName == "Other"`.

H. INSTALL ON DEVICES

First, figure out which devices your surveyors will be using. We assume here that these will either be smart phones or tablets with an LTE data connection. If you will be using a tablet without an internet connection via cellular data, you will need to follow some additional instructions to set up Field Maps for “offline” data collection. We don’t detail those instructions in this chapter, but you can read about it here. Once you know what devices will be used, you’ll need to install the

Field Maps app on each of them. This is easy, just go to either the Apple Store (for iOS devices) or the Play Store (for Android devices), look for ArcGIS Field Maps, and install it. After you install the app, open it, and sign in with the appropriate AGOL credentials. Some devices with an outdated operating system may not be able to use Field Maps. In this scenario, you can download ArcGIS Collector to view and collect data (Collector has the same functionality as Field Maps and requires no additional setup).

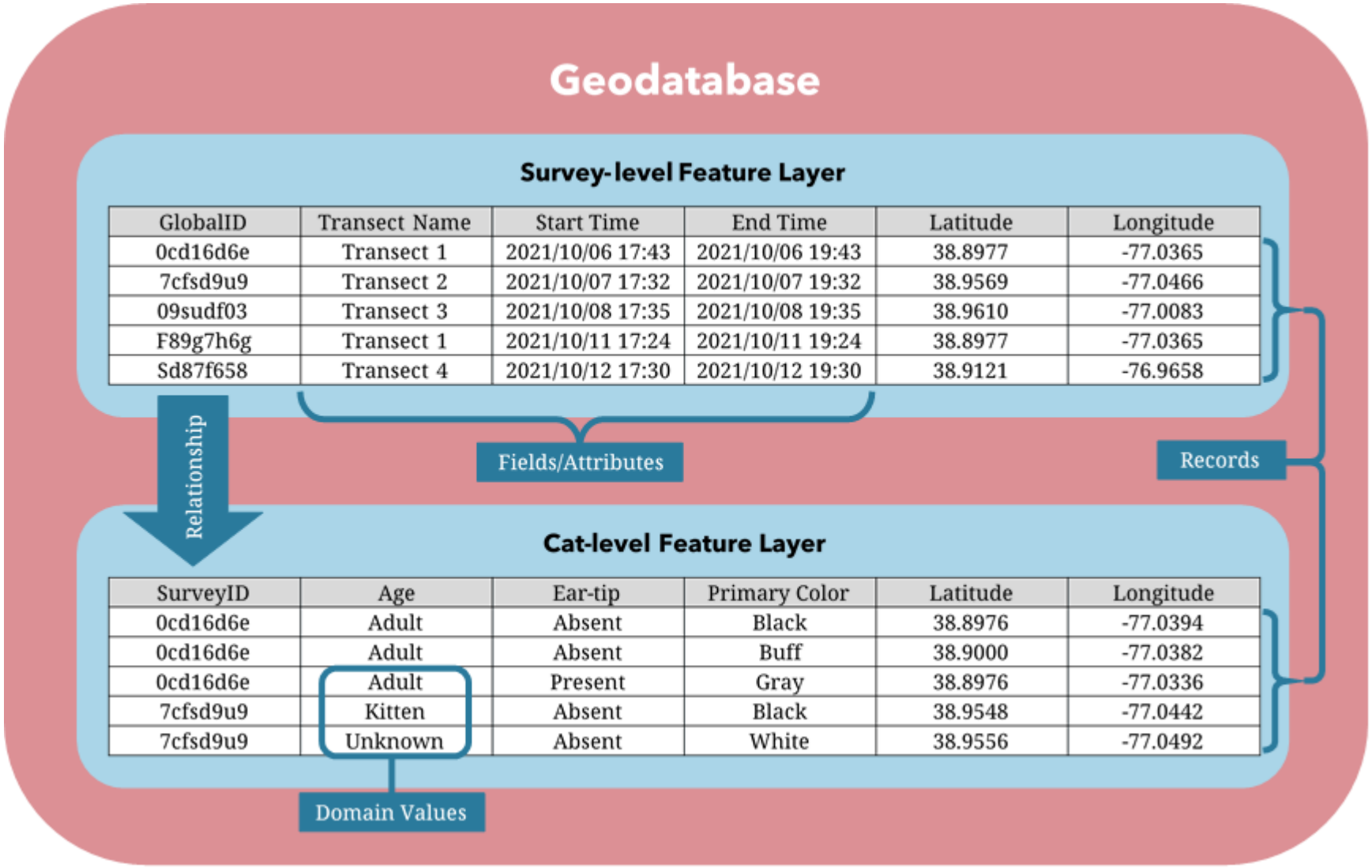
Now you are ready to start collecting transect count data! The map you made for the Field group should show up on the front screen of the app. A protocol for using Field Maps based on the configuration we've described previously is provided in Appendix III.

Final Thoughts

If you read through this whole chapter, it's a lot to digest, but it's all easier-seeming (usually) when you are actually doing it than when you are just reading about it. Don't be afraid to give it a try. Once you start to get familiar with important terms and gain familiarity with how GIS works and how AGOL is organized, everything will get progressively easier. ESRI has created voluminous online help resources, and these are supplemented by various user group forums, so we also encourage you to search out information about things you don't understand or that you would like to understand better. Finally, remember that there are usually several ways to accomplish a given task in GIS. We encourage you to be open to learning new techniques and workflows that could work better for you than what we've described here.

Good luck!

Appendix I: Diagram of Transect Count Geodatabase and Feature Layers



Appendix II: Domains Values for Feature Classes

DOMAINS RELEVANT TO SURVEY-LEVEL ATTRIBUTES

1. Transect Name (Text)
    a. Transect 1
    b. Transect 2
    c. ...
    d. Other

DOMAINS RELEVANT TO CAT-LEVEL ATTRIBUTES

1. Age (text)
    a. Adult (> 6 mo.)
    b. Kitten (< 6 mo.)
    c. Unknown
2. Ear (text)
    a. Tip Present
    b. Tip Absent
    c. Unknown
3. Body Condition (text)
    a. Healthy Weight
    b. Underweight
    c. Overweight
    d. Unknown
4. Injury
    a. Yes
    b. No
    c. Unknown
5. Collar
    a. Yes
    b. No
    c. Unknown
6. Coat Length
    a. Short
    b. Long
    c. Unknown
7. Primary Color
    a. Black
    b. Gray
    c. White
    d. Buff
    e. Orange
    f. Brown
    g. Unknown
8. Secondary Color
    a. Black
    b. Gray
    c. White
    d. Buff
    e. Orange
    f. Brown
    g. Unknown
    h. N/A
9. Color Pattern
    a. Solid
    b. Tuxedo
    c. Mitted
    d. Locket
    e. Harlequin
    f. Marbled Tabby
    g. Mackerel Tabby
    h. Points
    i. Calico
    j. Tortoiseshell
    k. Mixed Pattern
    l. Unknown

View the Cat Classification Guide Here!

Appendix III: Field Maps for Transect Counts

The steps below assumes that Field Maps has been installed on the device, that the app has been started, and that the surveyor has signed in using their AGOL credentials.

A. CREATE A NEW SURVEY

1. At the beginning of a new transect count session, press the "+" button and select "Surveys" (or the equivalent name for your survey-level layer).
2. Fill out the survey-level data form and enter the date and enter the start time for your survey. Fill out any additional fields, including the transect name in this form, but leave the end time blank for now. You will edit that field once the transect count is complete.
3. Submit this record by clicking the check mark or "Submit" button in the upper right (location/label may vary depending on device). A symbol will appear on the map, and a little box will come up at the bottom of the screen. It is important to keep this box open for the entire transect count session! If you accidently close the box, tap the symbol you just created on the map to select this survey-level record again and bring the box back up.

B. RECORD CAT SIGHTINGS

1. While walking the transect, DO NOT press the "+" button if you see a cat and want to record it. The "+" button only makes new survey-level records, which you don't want to do right now. Instead, to record a cat, scroll down in the box to the "Related Layers" section and select the "CatSightings" link, or press the 🔗 (link) symbol.
2. Press "Add" to create a new cat-level record.
4. On the CatSightings form, adjust the map to place the crosshair where the cat was seen and update the point. This moves the location of the cat record from the default location (where you are standing) to the place where the cat actually was when you first saw it.
5. Take a photo of the cat with the 📷 (camera) button or upload a photo of the cat to the sighting record later.
6. Fill out all the fields in the CatSightings form and add any additional information that might be useful to the "Notes" field.
7. Check that all fields are filled out correctly, then submit the sighting by clicking the check mark or "Submit" button in the upper right (location/label may vary depending on device).
8. Repeat steps 1 – 7 of this section for each new cat sighting during this transect count.

C. FINISH THE SURVEY

1. When you reach the end of the transect, click on the survey-level point that you created when you started the survey. Update the end time field and then save the record.

D. AFTER THE SURVEY

1. If you took pictures of cats with a separate camera rather than with your device, you can "attach" them to the correct cat-level records by editing those records either in the Field Maps app or in AGOL. In AGOL, you find the cat-level data layer in the Contents pane, then click the Data tab, and then you should see the column for "Photos and Files", and the option to add photos to records that don't currently have one.