

Monarch Model Validator

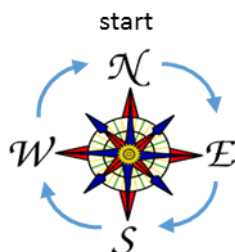
This instruction manual is designed to be a step-by-step guide for users of the ArcGIS Collector app as a tool for validating habitat suitability. The Collector app may be used on any Apple or Android smartphone, or on any device running Windows 10. This manual requires that you abide by the agreed upon disclosure available at <https://umaine.edu/mainecoopunit/monarch-model-validator/>. There are two key parts to validating a site with this application: photographs and a survey. Upon arriving at a validation site, please take eight directional photographs and then open the application, complete a survey, and attach the photographs. More details on how to complete these steps are included below.

Site Photographs:

This application requires you to take photos that are geotagged (i.e., have location coordinates embedded in the file) as well as the “appropriate” orientation. These photos must be taken outside of the application using the camera on your phone. The survey you will be completing within the Collector app will ask whether you uploaded all directional photos. This means you should take four directional photos: **North, East, South, and West**. This should be done with the camera capturing the area at both the **Local** level (within 5 yards/meters of your feet) and **Landscape** level (approximately 50 yards/meters, horizon photos). While there may be other ways to accomplish these tasks, this manual will instruct you on two equivalent methods. 1) Manually orienting geotagged photos, OR 2) Using Solocator app.

Method 1: Manually orienting geotagged photos

1. Turn on location services for your photos (**iPhone**)
 - a. Open Settings on your phone
 - b. Privacy
 - c. Location Services
 - d. Camera
 - e. Select **While Using the App**
2. Turn on location services for your photos (**Android**)
 - a. Open the camera app on your phone
 - b. Select Settings
 - c. Location Tag
 - d. Select the **On** button
3. Once you have made your way to the validation site (to be discussed later), take directional **Local** photos (photograph the area within 5 yards/meters of your feet)
 - a. **Open your Compass app and orient yourself so you are facing North**
 - b. **Take your first Local photo (North).**



- c. Turn 90 degrees clockwise and take your second **Local** photo (East).
 - d. Turn 90 degrees clockwise and take your third **Local** photo (South).
 - e. Turn 90 degrees clockwise and take your fourth **Local** photo (West).
4. Take directional **Landscape** photos (photograph the area between your location and 50 yards/meters away)
 - a. Open your Compass app and orient yourself so you are facing North
 - b. Take your first **Landscape** photo (North).
 - c. Turn 90 degrees clockwise and take your second **Landscape** photo (East).
 - d. Turn 90 degrees clockwise and take your third **Landscape** photo (South).
 - e. Turn 90 degrees clockwise and take your fourth **Landscape** photo (West).
 5. The ordering is important for these photos, so you can label them appropriately within the survey. The first photo taken is the **Local** North photo while the eighth photo taken is the **Landscape** West photo. See “Example Survey Photographs” near the end of this manual for an example of how these photographs should appear.

Method 2: Using Solocator to geotag your photos



1. Open the App store and buy (\$0.99)
 - a. This app takes a picture that includes: compass reading, elevation, bearing, latitude and longitude, and date and time.
2. Open the Solocator app
 - a. Once you have made your way to the validation site (to be discussed later), take directional **Local** photos (photograph the area within 5 yards/meters of your feet)
 - i. Open your Compass app and orient yourself so your facing North
 - ii. Take your first **Local** photo (North).
 - iii. Turn 90 degrees clockwise and take your second **Local** photo (East).
 - iv. Turn 90 degrees clockwise and take your third **Local** photo (South).
 - v. Turn 90 degrees clockwise and take your fourth **Local** photo (West).
 - b. Take directional **Landscape** photos (photograph the area between your location 50 yards/meters away)
 - i. Open your Compass app and orient yourself so you are facing North
 - ii. Take your first **Landscape** photo (North).
 - iii. Turn 90 degrees clockwise and take your second **Landscape** photo (East).
 - iv. Turn 90 degrees clockwise and take your third **Landscape** photo (South).
 - v. Turn 90 degrees clockwise and take your fourth **Landscape** photo (West).
3. The ordering is important for these photos, so you can label them appropriately within the survey. The first photo taken is the **Local** North photo while the eighth photo taken is the **Landscape** West photo. See “Example Survey Photographs” near the end of this manual for an example of how these photographs should appear.

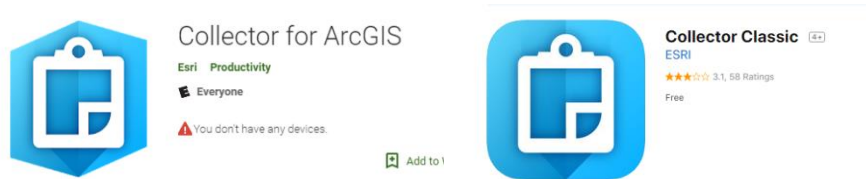
Site Surveys:

1. Download ArcGIS Collector from the following links:

Apple*: <https://itunes.apple.com/us/app/collector-classic/id589674237?mt=8>

Android: <https://play.google.com/store/apps/details?id=com.esri.arcgis.collector>

Windows: <https://www.microsoft.com/en-us/p/collector-for-arcgis/9wzdncrdg7lk?activetab=pivot%3Aoverviewtab>



* The correct version of the Apple App is titled Collector Classic

2. Open the application
 - a. Sign into **ArcGIS Online** using the provided credentials. These are available on the app web page (<https://new.umaine.edu/mainecoopunit/>). Using this login and password indicate that you agree to the [Terms of Use](#).

The image is a screenshot of a mobile device screen showing the sign-in process for ArcGIS Collector. At the top, the status bar shows 'VZW Wi-Fi', '12:57 PM', and '56%' battery. Below the status bar is a blue bar with 'Cancel' and 'Sign In' buttons. The main content area has a white background with the text 'Collector for ArcGIS wants to access your ArcGIS Online account information'. Below this is a 'Sign In' form with the Esri logo. The form includes fields for 'Username' and 'Password', a blue 'SIGN IN' button, and links for 'Forgot password?' and 'Forgot username?'. Below the form is an 'OR' separator, followed by 'Sign in with' buttons for 'ENTERPRISE LOGIN', Facebook, and Google. At the bottom, it says 'Collector for ArcGIS developed by:' followed by a small globe icon.

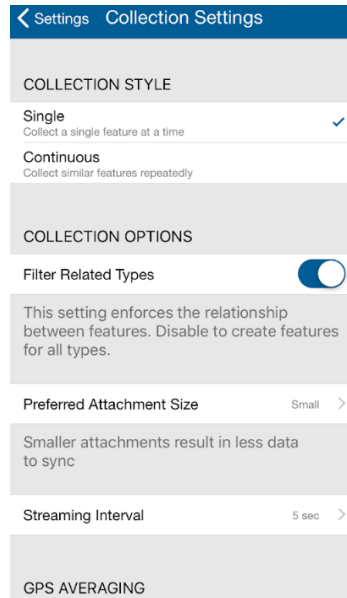
3. The following screen is a Launch screen. Before you begin collecting, you need to adjust your settings.

a. Select



b. Select Settings

c. Collection Settings



d. Preferred Attachment (Photo) Size

i. Select Small

e. Under GPS Averaging

i. **Turn On** Average Locations

ii. Set Number of Locations to **5**

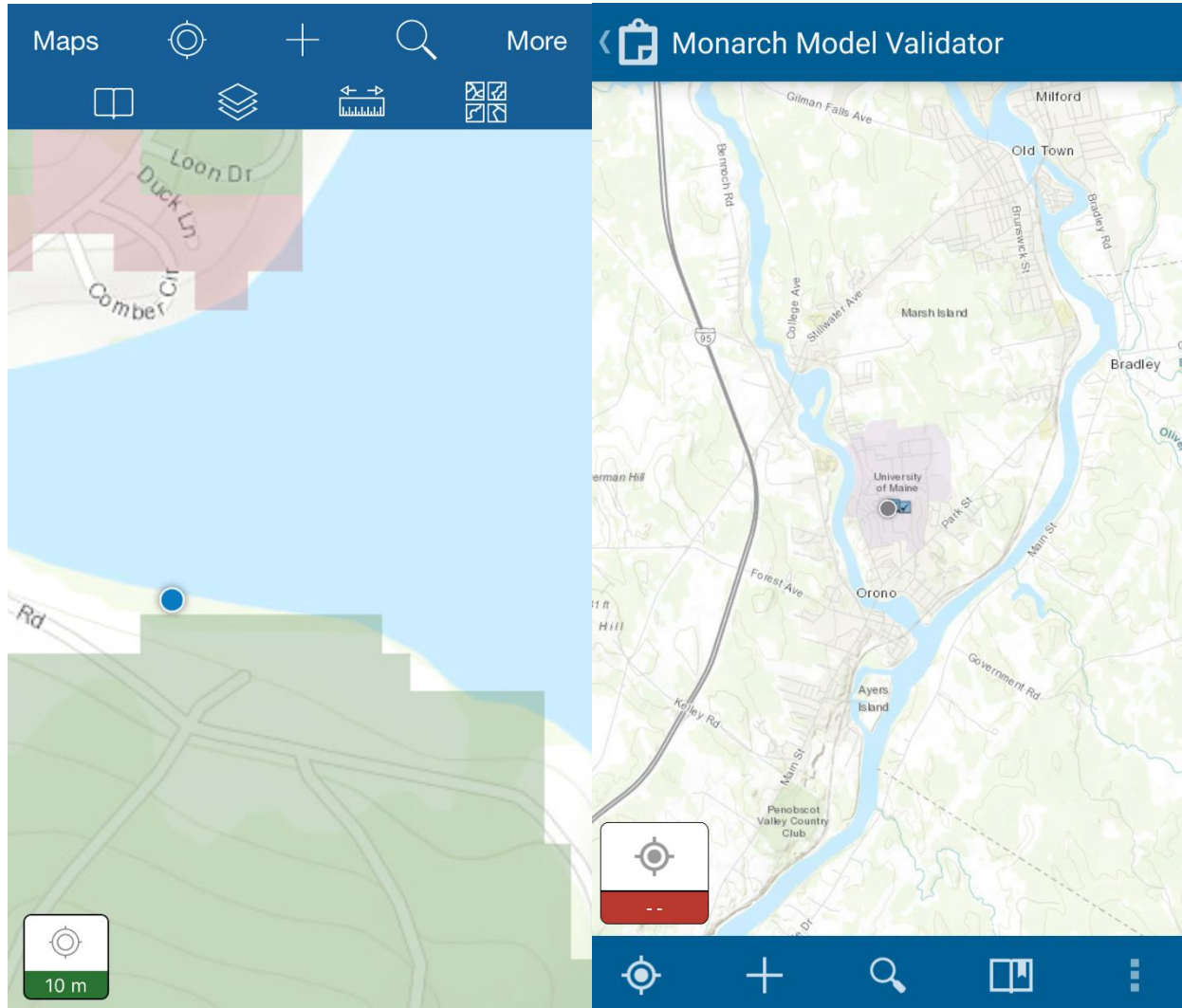
f. Return to the Launch screen by selecting



g. Selecting Done will return you to the Launch screen

4. Select the Map labeled “Monarch Model Validator”






- This will be the main screen that you will be using during this application. The app will zoom you in to the default extent of the first layer in the list of available layers, which is the model layer to be validated.



Apple

Android

Buttons

- Maps** - press to return to the Launch screen
-  - press to zoom to your location (toggle to turn the current location on and off)
-  - press to Start Collecting (you will select a layer here)
-  - press to search locations (by entering a location or name/number)
-  - press to open bookmarks, i.e., saved locations or default map extent
-  - press to adjust the layers displayed on the map (toggle on and off); the layers available to you are:



1. **Habitat Description:** a point layer identified by the UMaine icon. This layer should be used as a land cover category reference. The icons are spread across the western United States and each serve to describe one habitat type, with a representative photograph included in the attachment. The icon in Eastern Montana provides an overview of the model output for predicted habitat. This information is also available at the end of this instruction manual.
2. **Sites to Visit:** a point layer identified by the pin icon. These points identify the sites that most need to be visited and then validated. Note, however, that you are still welcome and encouraged to validate any site, even if it is not marked by a point.
3. **Site Evaluation Survey:** a point layer with a transparent icon. This layer is the primary survey layer.
4. **Evaluated Sites:** a point layer identified by the checkmark icon. This layer is a post-survey layer used to identify validation sites that already have been visited.





- press to open measurement tool (potentially used to measure distance from current location to a validation point)



- press to choose new basemap (e.g., imagery, street map, or topographic map displayed in the background/under the model to be validated)

6. Start Collecting. This process will require you to complete two surveys.
 - i. First complete the **Site Evaluation Survey**
 - ii. Then complete the **Evaluated Sites** survey
 - a. Make your way to a validation site of your choosing. These locations can be found on the **Sites to Visit** layer (select the “+” symbol to find the layer options), or you may choose your own site. Each designated validation site has a unique location ID, which you will need to reference during the **Site Evaluation Survey**. You can display the point layer by turning on the **Sites to Visit** layer by selecting “more” and then the “stack of maps” icon.
 - b. Once you are at or near the validation site, follow the steps below to complete the **Site Evaluation Survey**.
 - i. Press , this will zoom the map to your location.
 - ii. Press  to begin the survey.
 - iii. Choose the **Site Evaluation Survey**.
 - iv. Fill out the survey to the best of your ability by pressing on each question and choosing your response from the dropdown menu. Some of the questions require you to make approximations (e.g., percentage estimates of habitat types). Just do your best.
 - v. Uploading the photos. Please follow the above procedure while taking both the **Local** and **Landscape** directional photos. Choose the **camera button** in the **Site Evaluation Survey** part of the Collector app which will take you to a screen to select photos to upload.
 - Upload the photos in order, i.e., the first photo uploaded should be the **Local** North photo while the final directional photo should be the **Landscape** West photo. After each photo is uploaded please **click on** the photo and **Rename** with the appropriate name. Example: name the **Local** North photo “Local-N” or “Local North”.
 - If there are any notable features at this site, i.e., butterflies or other features, please photograph and then name the photo accordingly.

- vi. Submit the **Site Evaluation Survey**.
 - c. Follow the steps below to complete the **Evaluated Sites** survey.
 - i. Press , this will zoom the map to your location.
 - ii. Press  to begin the survey.
 - iii. Choose the **Evaluated Sites**.
 - iv. Confirm that you have visited the validation site.
 - v. Submit the **Evaluated Sites**.
 - vi. Once you have submitted this survey, you should see a large “Check Mark” icon appear at your location.
 - d. If you are willing to share your e-mail address, please send an e-mail to monarch-model-group@maine.edu. Tell us the points you visited and for which you completed a questionnaire, and your preferred contact information.
7. Thank you for Collecting! Please feel free to Collect at other validation sites.

Example Survey Photographs:

Local-North



Local-East



Local-South



Local-West



Landscape-North



Landscape-East



Landscape-South



Landscape-West



Habitat Descriptions:

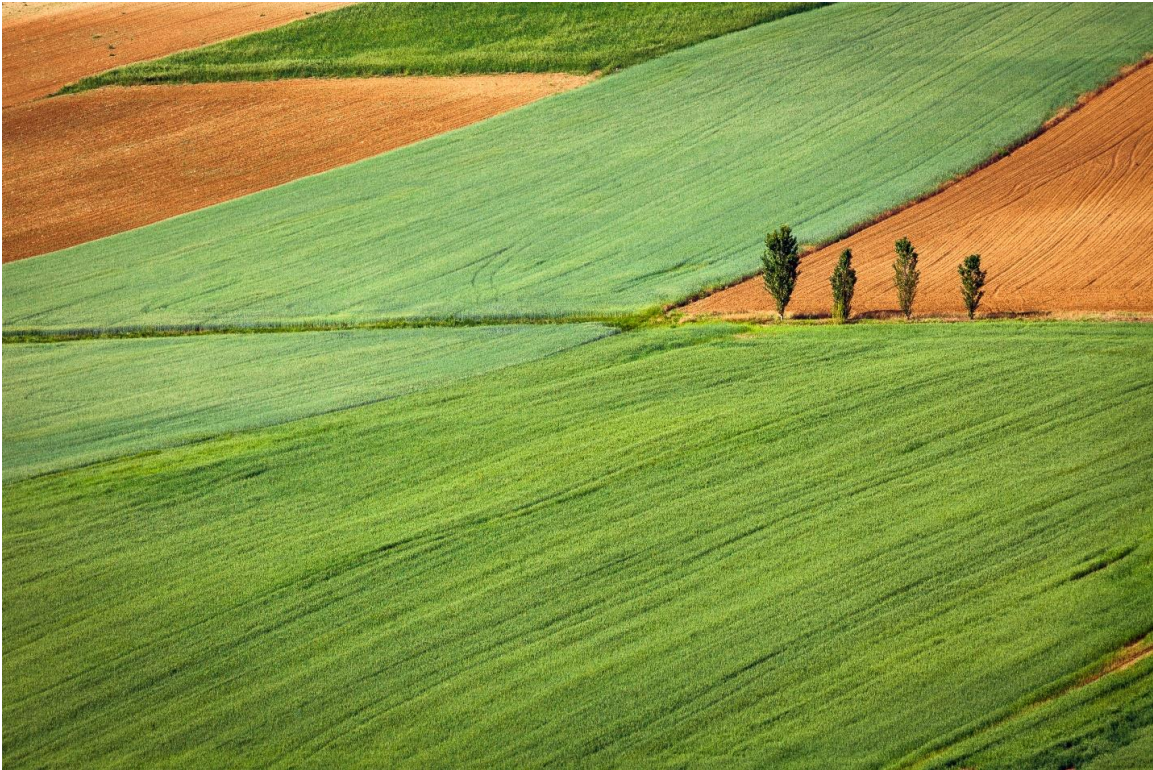
Category	Dropdown Options	Description
GRASSLAND/ AGRICULTURE	PASTURE/MEADOW	Areas of plant growth that are mostly or entirely devoid of trees. These areas may be managed to meet human needs; but they are not manicured or treated on a regular or heavy basis. Includes grassy areas, fields of wildflowers, and rangeland for large livestock such as cows and horses.
	CULTIVATED CROP	Agricultural fields subject to intense human manipulation. Generally represented by rows of crops and heavy chemical treatment. Includes fields of corn, soybeans, wheat, etc.
DEVELOPED	RESIDENCES AND LAWNS	Areas of human development characterized by buildings interspersed with green spaces such as grassy yards, parks, and gardens.
	HEAVY PAVEMENT	Areas of human development in which virtually all space is used by parking lots/roads/buildings. There may be occasional plant life present in the form of trees planted in the sidewalk or flower beds in windows, but no significant land space is set aside.
Forest, no mid- or understory	Evergreen	Forest with little to no plant growth occurring between the trees. Predominant trees possess needles, such as pines and firs.
	Deciduous	Forest with little to no plant growth occurring between the trees. Predominant trees have broad leaves, such as oak and elm.
Forest, with mid or understory	Evergreen	Forest with plant growth occurring between the trees. Predominant trees possess needles, such as pines and firs.
	Deciduous	Forest with plant growth occurring between the trees. Predominant trees have broad leaves, such as oak and elm.

SHRUB/SCRUB		Areas where the predominant plant growth consists of woody bushes that are shorter than trees.
WET	OPEN WATER	Exposed surface water including lakes, ponds, rivers, streams, and the ocean.
	EMERGENT WETLAND	Areas with consistently wet soil where non-woody plants such as cattails are growing.
	SHRUB/WOODY	Areas with consistently wet soils where woody plants such as shrubs and trees are growing.

Pasture/Meadow



Cultivated Crop



Residences and Lawns



Heavy Pavement



Forest, No Mid- or Understory, Deciduous



Forest, No Mid- or Understory, Evergreen



Forest, With Mid- or Understory, Deciduous



Forest, With Mid- or Understory, Evergreen



Shrub/Scrub



Open Water



Emergent Wetland



Forested Wetland

