Standard Operating Procedure (SOP) #6

Using ArcGIS Field Maps Application

Version 1.0 (December 10, 2024)

Change History

New Version #	Revision Date	Author	Changes Made	Reasons for Change	Previous Version #
1.0	12/10/2024	Brayden Pollvogt, Mark Wasser	SOP created based on FTPC SOP #8 and adopted for Stream workflow. This will replace existing Streams SOP #6 Collecting Stream Transect Photographs.	No longer using Ricoh Cameras for photo collection. Implementing Field Map for data collection of GPS points and photos for Stream Protocol.	n/a

Only changes in this specific SOP will be logged here. Version numbers increase incrementally by hundredths (e.g., version 1.01, version 1.02) for minor changes. Major revisions should be designated with the next whole number (e.g., version 2.0, 3.0, 4.0). Record the previous version number, date of revision, author of the revision, changes made, and reason for the change along with the new version number.

Purpose

This SOP explains how to use the ArcGIS® Field Maps Application (‘Field Maps’ hereafter) to collect points and photos for the Pacific Island Network (PACN) Water Quality (Freshwater, Marine, Anchialine Pools, Brackish, and Groundwater sites), and Freshwater Animals (Stream and Anchialine Pool sites) Protocols. This application can be used on any currently supported mobile device and works with both Android and iOS devices. PACN currently owns Android devices. The screenshots and examples provided are generated from a mix of Android and iOS environments. Some screenshots may look slightly different on the opposite OS, but functionality is similar. Both government issued and personal mobile devices are currently compatible with ArcGIS Field Maps and the PACN data collection environment (ArcGIS Online through National Park Service organizational accounts).

Pre-Field Preparation

Equipment

At this time, a mobile device (phone or tablet) is the only equipment needed for the use of Field Maps as a field data collector. Content is associated with individual user accounts and is delivered/available to the device after sign-in. However, several accounts and apps must be installed and active to be able to login and utilize Field Maps for data collection (see below).

Device Preparation

It is recommended these steps be completed several days in advance of field work in case device or sign-in troubleshooting is required.

1. Ensure the following apps and accounts are installed/created and active. Contact the PACN GIS Specialist or PWR GIS Specialist if any issues are encountered with any of the following applications and/or accounts.

    a. ArcGIS Field Maps is installed on the mobile device intended for data collection use. If it is not on your device, download the app (free + IT approved) and install from either the Google Play or Apple Store.

    b. ArcGIS Online (AGOL) Accounts through the National Park Service organization are created and active for all users. The Field Maps sign-in utilizes the user's AGOL account credentials. Contact the PACN GIS Specialist and/or Regional GIS Specialist to check on the status of individual user accounts and for account creation and/or activation instructions, if necessary.

    c. Microsoft Authenticator app is installed and Authenticator accounts setup (individually) for all users. This app is required to authenticate Field Maps sign-in. Authenticator accounts are specific to each user, not device, and may be installed on either a user's personal or government device (but can then be used to authenticate that user's login on any device). Current Authenticator setup instructions are available on the NPS IT SharePoint here[1].

2. Open Field Maps and sign in (Figure SOP 6.1).

    a. Select the option to Sign in with ArcGIS Online.

    b. On the login screen select "Your ArcGIS organization's URL", and then enter "nps" in the blank space next to ".maps.arcgis.com."

    c. On the next screen tap the blue National Park Service button under ArcGIS login.

    d. You will be taken to a DOI sign-in page. Enter your active directory email/username and tap Sign in.

    e. After entering your NPS/DOI credentials, you will receive a notification from Microsoft Authenticator asking to Approve Sign-in. There will be instructions to open your Authenticator app (or click on the notification from the App) and enter the number shown to sign-in. Once you click the Authenticator notification, there will be a place to type in the number and click Yes to sign in.

[1] Enabling Sign-in on Phone Setting on the MS Authenticator App, https://doimspp.sharepoint.com/sites/nps-irm/SitePages/Enabling-Phone-Sign-In-Option-within-MS-Authenticator-on-Mobile-Devices.aspx (last accessed 10 December 2024).

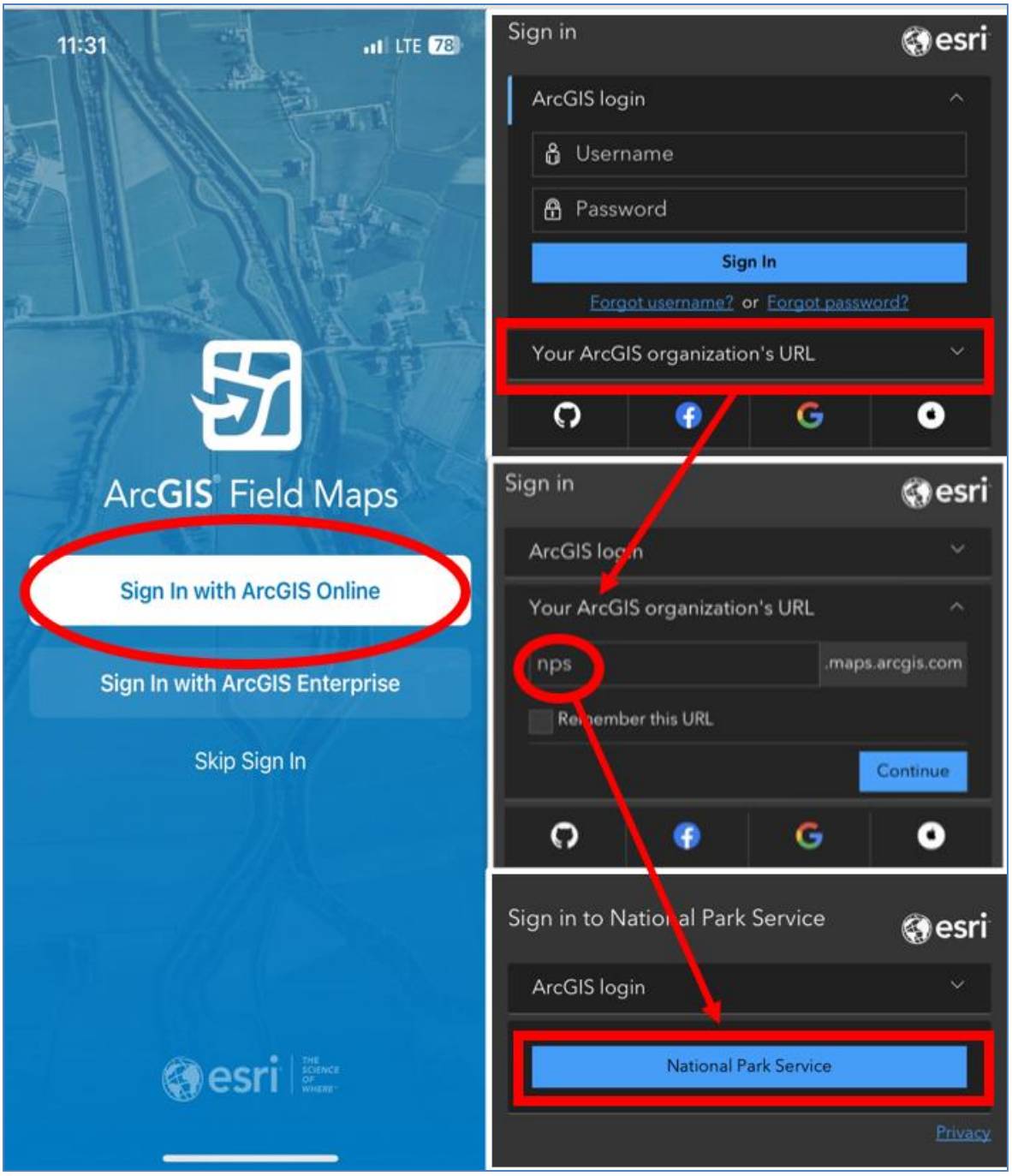
***Note**: You will need Microsoft® Authenticator setup and linked to your NPS DOI account to complete this step. Please contact the PACN GIS Specialist and/or IT to complete setup of Microsoft Authenticator.*

f. Then you will get a page that asks if you want to stay signed in, click yes or no (no is recommended), and you should be signed in.

g. If there are problems with the sign-in process, clear the browser cache on the device and try again (especially on shared devices). If sign-in problems persist, please contact the PACN GIS Specialist and/or IT for assistance.

h. Further instructions on the sign-in process are available on the NPS IT SharePoint site here[2].

[2] Login to ArcGIS Online, Portal, or Other Esri Products, https://doimspp.sharepoint.com/sites/nps-irm/SitePages/Login-to-AGOL-Portal.aspx (last accessed 10 December 2024).


11:31
LTE 78
ArcGIS Field Maps
Sign In with ArcGIS Online
Sign In with ArcGIS Enterprise
Skip Sign In
esri
Sign in
esri
ArcGIS login
Username
Password
Sign In
Forgot username? or Forgot password?
Your ArcGIS organization's URL
Sign in
esri
ArcGIS login
Your ArcGIS organization's URL
nps
.maps.arcgis.com
Remember this URL
Continue
Sign in to National Park Service
esri
ArcGIS login
National Park Service
Privacy

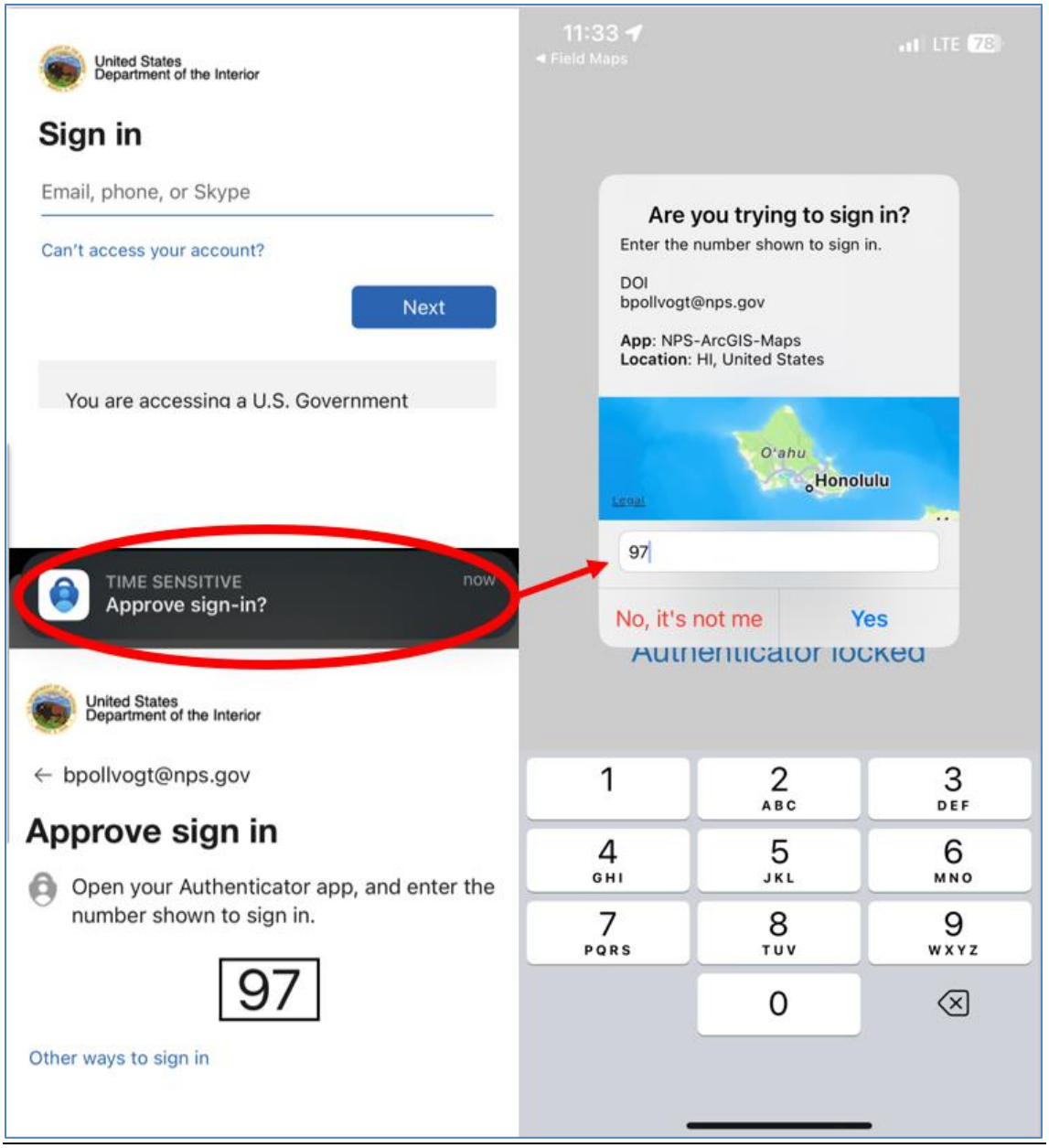


Figure SOP 6.1. Sign in procedures for ArcGIS Field Maps.

3. Once successfully logged in, the main landing page (sometimes called the Maps List) of Field Maps will automatically display all Maps and Groups associated with your profile(this may take 20-30 seconds to load). The PACN GIS Specialist will ensure all content is deployed to the appropriate users. Find the desired map and tap to open and explore content (see Appendix SOP 6.a. for basic Field Maps functionality information). If not opening a new session in the app, the most recently opened map will display as *Current* on the top of the map list. If there are any maps with areas downloaded onto the device for offline use, those maps will display near the top under a section named *On Device*.

4. Access your profile settings by clicking/tapping on the small icon of a person in the upper right-hand corner (Figure SOP 6.2.). You will be taken to a screen of your profile settings. Ensure profile settings are as follows:

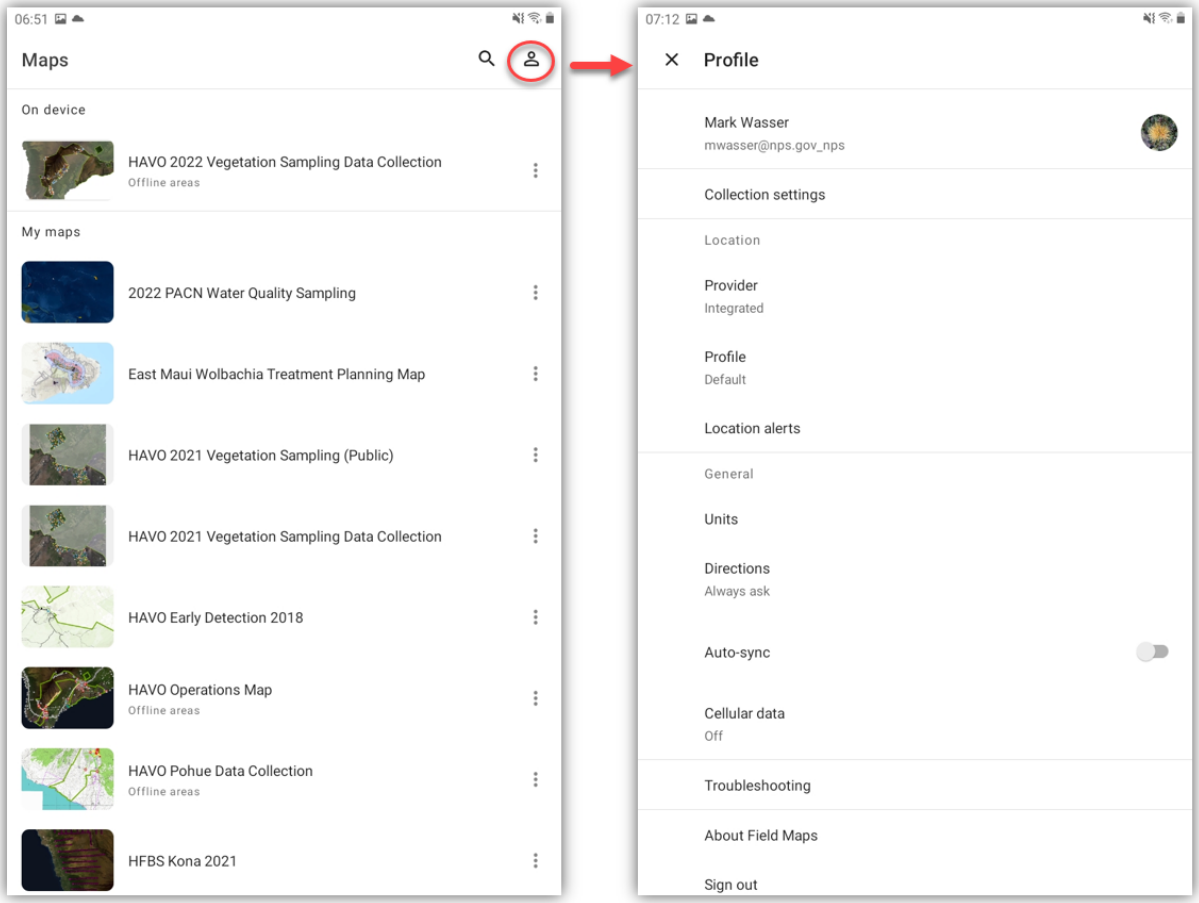


Figure SOP 6.2. Accessing the user profile in order to set up profile settings.

a. Within Units

   i. Measurement Units = Meters
   ii. Coordinates = Automatic
   iii. Distance = Meters
   iv. Area = Hectares

b. Within Collection Settings

   i. Accuracy = 10 m (this setting controls the minimum accuracy at which the app will allow features/data to be collected)
   ii. GPS averaging = off
   iii. Streaming = Distance 3 m
   iv. Photo upload size = Large

v. Show Related types = N/A
vi. Snapping = *as preferred by user*

c. Provider = integrated

d. Profile = default

e. Units = *as desired* (metric for data recording)

f. Auto-sync = off

g. Download & sync (aka Cellular Data) = Wi-Fi only

Map Preparation

1. Select the map used for the current field season. This will be named – "PACN [YYYY][3] Water Quality Sampling Data Collection" (data collected for the Freshwater Animals Protocols are also collected in the Water Quality map).

2. Most PACN field data collection takes place in a disconnected environment. To collect data in this environment, specific areas of the map must be taken 'offline'. Complete the following steps to take map areas offline. **This must be done in a connected environment <u>before</u> going into the field and can be done two ways – with or without predefined offline maps areas.**

   <u>If the GIS Specialist has setup predefined offline areas (preferred)</u>:

   a. Tap the title of the desired map name on the map list screen. This will take you to the main landing page for that map.

   b. Under will be a section named *Map Areas*, tap the download icon to the right of the map area you wish to download. That map area will move into the *On Device* section of the screen and download progress will be displayed. Once downloading is complete, the map area will display a checkmark below the area title, along with information about how much data the map area is using and the last time synced (immediately following the download of the map area this will display as "now") (Figure SOP 6.3).

[3] YYYY = 4-digit sampling year

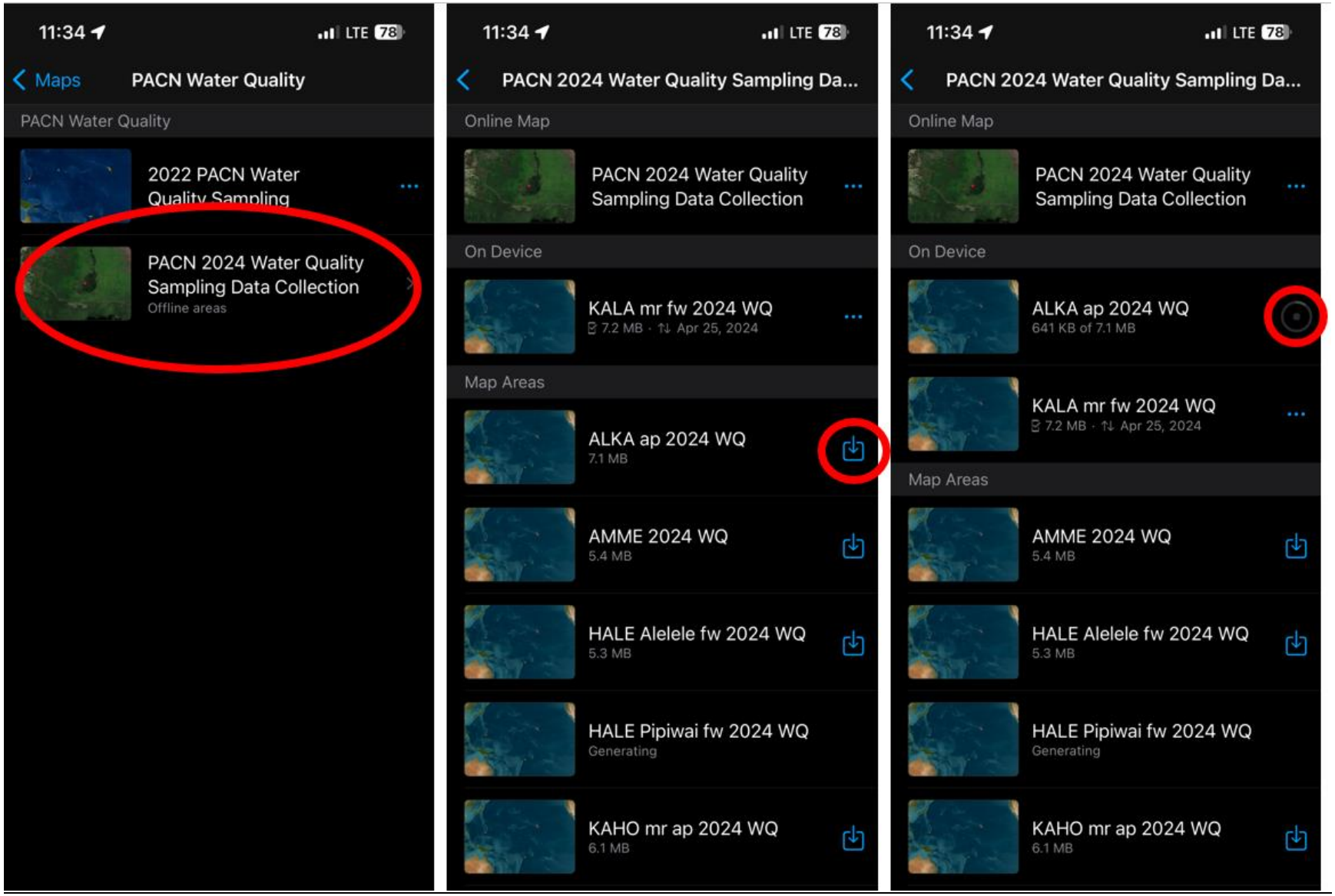


Figure SOP 6.3. Steps for downloading a map for offline use that has predefined offline areas.

If there are no offline map areas predefined (Figure SOP 6.4):

a. Tap the Kebab Menu (three vertical dots) to the right of the desired map name on the map list screen. From the expanded menu tap “Add offline area”.

b. Pan and zoom to the area on the map you would like to take offline. The extent of the offline area is indicated by a box overlayed on the map, and the maximum size of that area is determined by the level of detail selected. Below the name of the area that you will take offline (Area 1, etc.), select the level of detail (displayed as either a map scale or references – room, building, area, etc.). Bigger areas and a finer level of detail (small second number on map scale) will take longer to take offline since more information is being downloaded. The recommended level of detail is *Buildings*. When the area and the level of detail is set satisfactorily, tap the blue *Download Area* button at the bottom of the screen.

c. The map area will start to download, with progress indicated next to the map area (when the map starts to download you are taken back out of the map to a page that lists the offline areas for the map). *The download may take several minutes or more*.

d. Once the download is complete, the downloaded map area will appear in the list of map areas that fall under the header *On Device*. The Field Maps home page with the list of maps will also indicate which maps have offline areas stored on the device.

e. The device and map are now prepared for offline data collection in the field.

f. Once the map is offline (on device) and ready for use, is it recommended you set the device to airplane mode before leaving for the field.

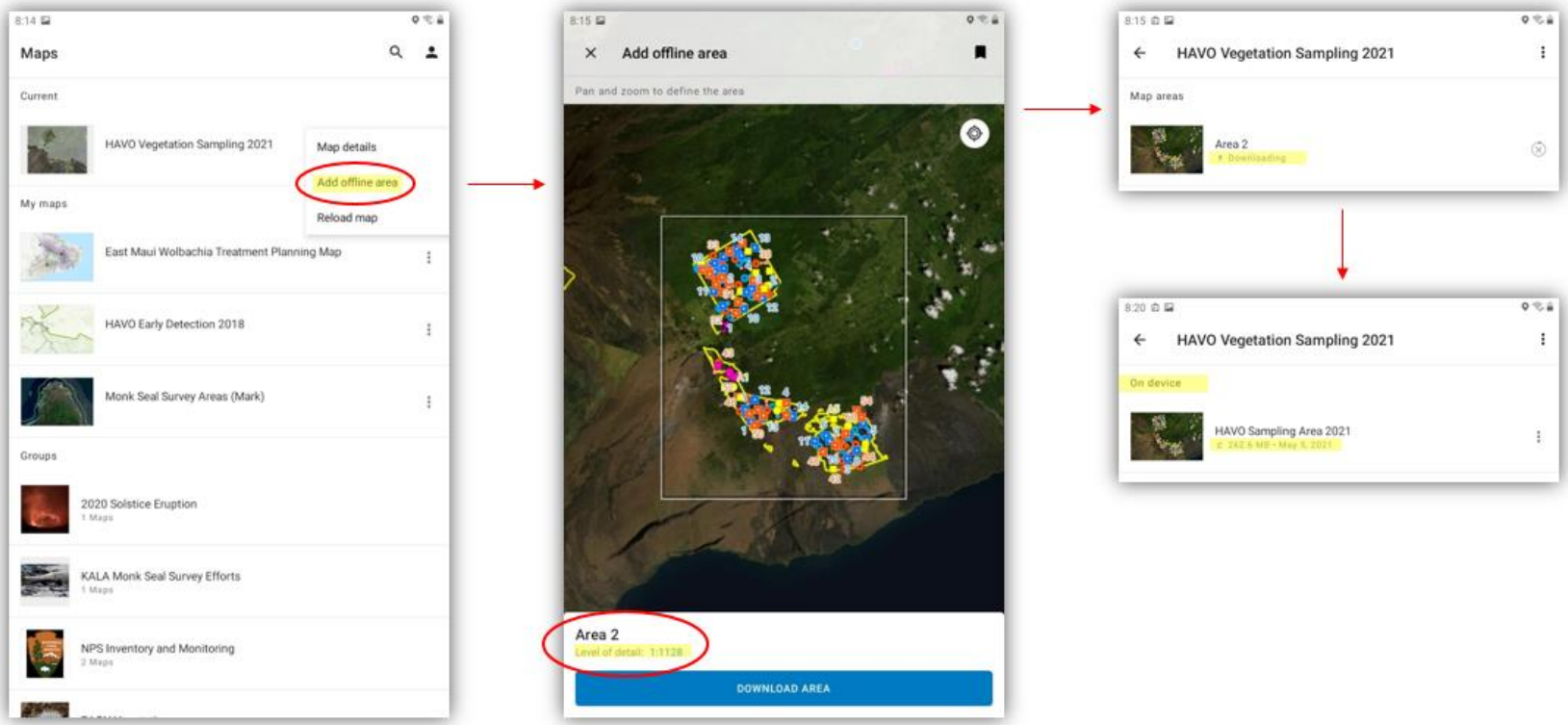


Figure SOP 6.4. Steps for downloading a map for offline use that has no predefined offline areas.

Field Maps Field Procedures

Data Collection

Within Field Maps, points and photos are collected for the Water Quality and Freshwater Animal (Anchialine Pools, Streams) Protocols across the PACN parks where sampling is conducted. See the next section Stream Specific Procedures, and Appendix SOP 6.b. for a list of points/photos that need to be collected for each protocol, and the attribute fields for each data layer.

1. To initiate collection of a point, tap the blue button with a plus sign in the lower right-hand corner of the map (Figure SOP 6.5, left).

   Note*: The Field Maps map is, by default, centered on the user's current location, indicated by this symbol* *. A user can pan to different areas of the map by swiping. If the map has been panned before data collection, Field Maps will place the point at the location panned to on the map and indicate by a circle with crosshairs. Before collecting data (assuming it is desired the point is collected at your current location), pan the map back to your current location by tapping the crosshairs symbol in the upper right corner of the map* .

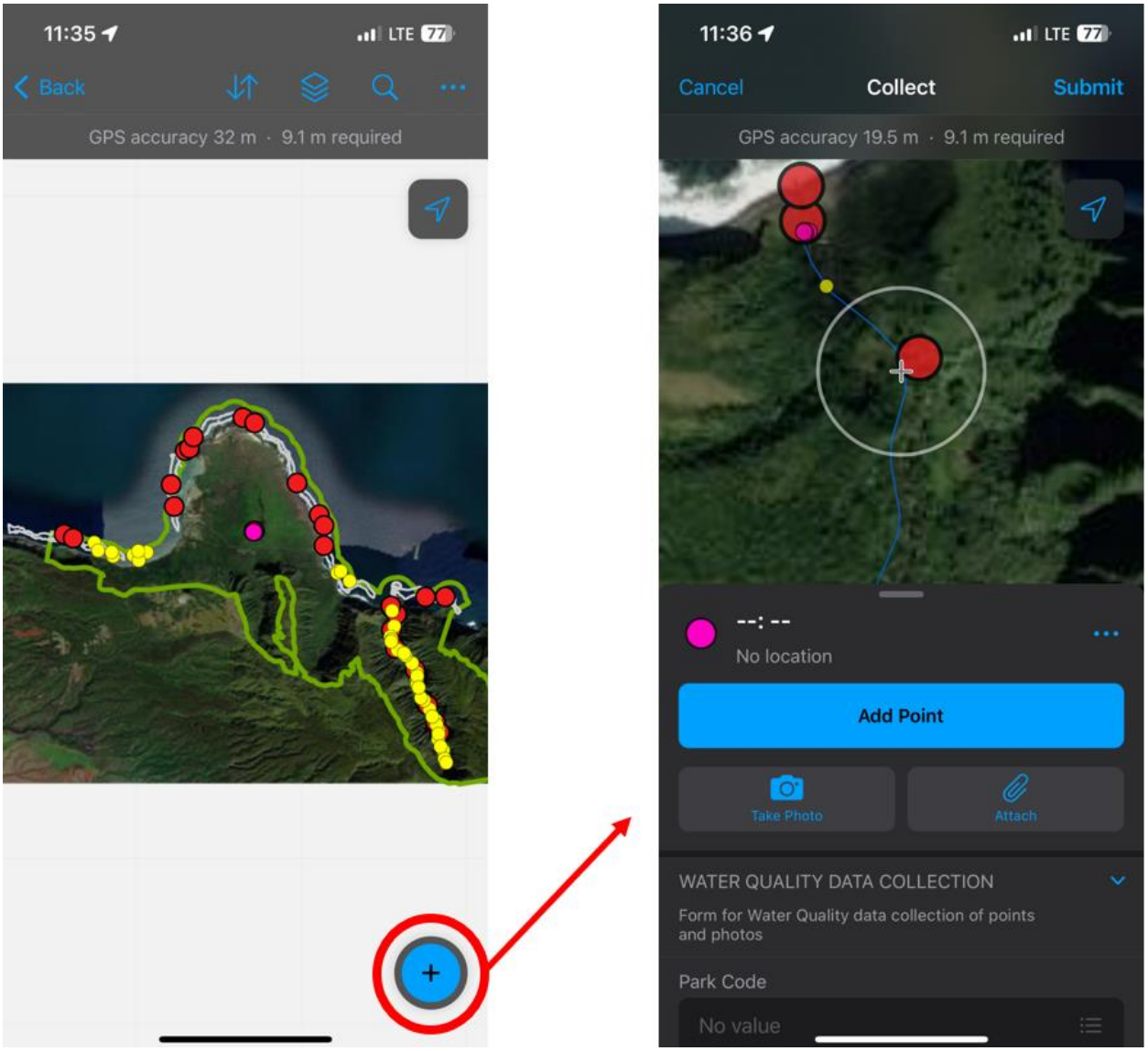


Figure SOP 6.5. Adding a point (left). Data collection interface window pop-up (right).

2. After tapping the collect data button (Step 1), the data collection interface is now active. The header of the app window will change to display **X Collect ü** (or **Cancel Collect Submit** for iOS devices) . A new point will appear on the map, and a window will pop-up at the bottom half of the Field Maps interface with attribute data for the point. That window will display the point name (auto-populated based on attribute field entries), point location, show three buttons, and then the data attribute fields below (Figure SOP 6.6).

    a. Tap the *Take Photo* button, this will activate the device camera. Take photo and tap OK if satisfactory.

    b. Populate the attribute fields for the data point. To populate a field, tap on it. If the field has a domain (predetermined list of acceptable values), a pick list will appear. Select from that list. For many of the fields, the available values are contingent (your

options for one field are constrained to specific options based on other fields i.e., if you pick HALE for Park Code, only Freshwater will show up as an option for Water Type since there is no sampling in Marine or Brackish water types in that park). If the field accepts typed text, a keyboard will pop up. Populate text as desired.

i. For attribute fields with long pick lists, the list may be search by typing in text in the space at the top of the list. Tap the open area at the top of the list to activate the keyboard and start typing. The list will be filtered to the values containing the text you have typed. Select a value as desired.

c. If desired (i.e., if GPS accuracy improves while populating data fields), you may update the spatial location of the point. To do this, from the data collection interface, pan the map frame until the white cross within the white circle outline in the center of the map frame is over the desired location. Then tap the *Update Point* button.

d. When all attributes fields for the point are populated as desired, photo(s) are taken, and point location is satisfactory, tap the check mark in the upper right corner to collect the point.

e. A window will pop-up with a spinning circle and the text *Submitting…*. This should take just a moment. Once the point has been collected, you will be taken back to the main map interface.

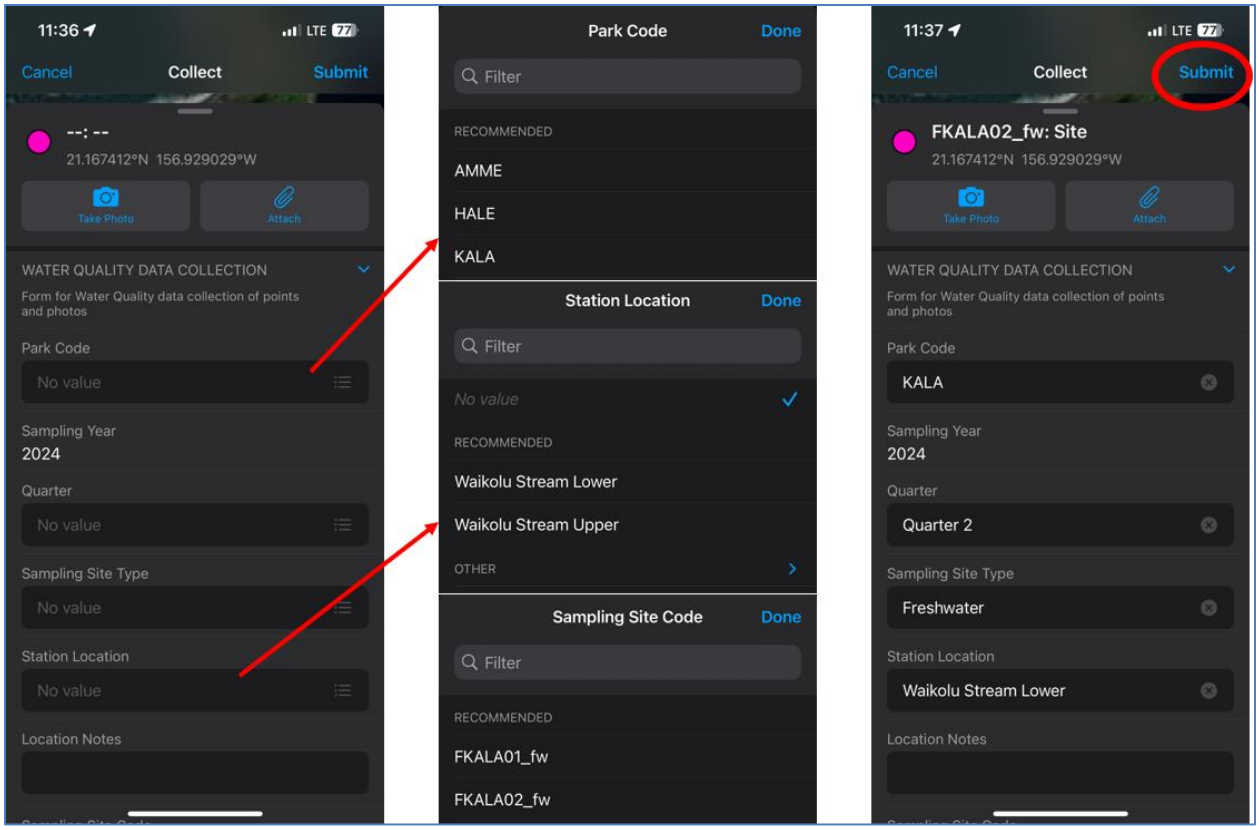


Figure SOP 6.6. Populating and submitting the attribute fields for the added data point. Once KALA is chosen the only options for Station Location are the ones in KALA. Only the KALA stations are coming up as options in the Sampling Site Code field because of the contingent values added to these fields.

3. To edit, duplicate, or delete a point, tap it on the map and select the point from the item pop-up list. In the bottom left corner, there is a pencil icon. This allows you to edit the fields and the attachments for a point. In the middle there is an icon with two off-set squares with a plus-sign in one , this creates an additional point that is a copy of the point you duplicated and fills in all the same fields. To delete a point, tap the kebab menu at the bottom right and select the Delete button.

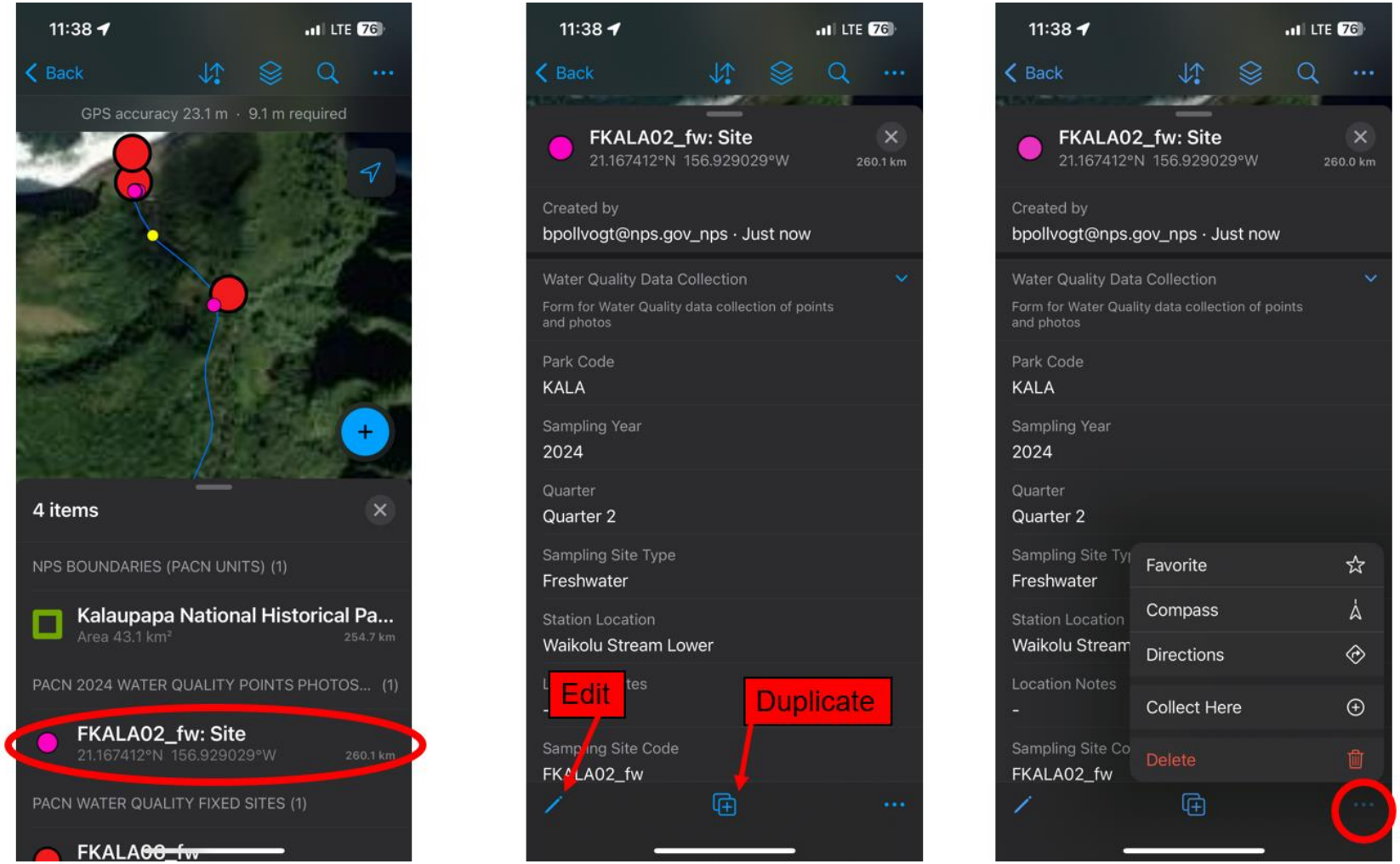


Figure SOP 6.7. Opening a collected point and showing how to edit, duplicate, and delete that point.

Stream Specific Procedures

While data collection is mostly consistent across the Water Quality and Freshwater Animals Protocols, there are a few stream-specific procedures.

1. Photos for Streams sampling should be taken from the center of each transect (0 m, 15 m, 30 m) facing upstream, downstream, and towards the right and left bank (12 photos total for the site). Photos of any other noteworthy scenes should be taken (i.e., any major change at the site such as a tree fall or major bank erosion).

Post-Field Office Tasks

Data Synchronization / Upload

Data collected in offline mode in a disconnected environment is stored locally on the mobile device and must be uploaded (synced) to ArcGIS Online once back in a connected environment.

1. All offline maps which data has been collected in must be synced. This must be done in a connected environment, either via Wi-Fi or a direct USB/Ethernet connection to the NPS Network.
2. Any offline maps with data collected will display text in the map information area saying ***XX local edit(s)***.
3. To sync collected data, tap the kebab menu to the right of the map, and select *Sync* (Figure SOP 6.7).
    a. The area below the offline map name will show ***Syncing***, and a progress indicator will appear in place of the kebab menu. *Synching may take up to 15-20 minutes*.
    b. Once synching is complete, the kebab menu will reappear to the right-hand side, and text below the offline map area name will again indicate the size of the offline area and the date of the most recent sync (if less than one day has passed, the time since sync will be displayed – e.g., ***One hour ago***).

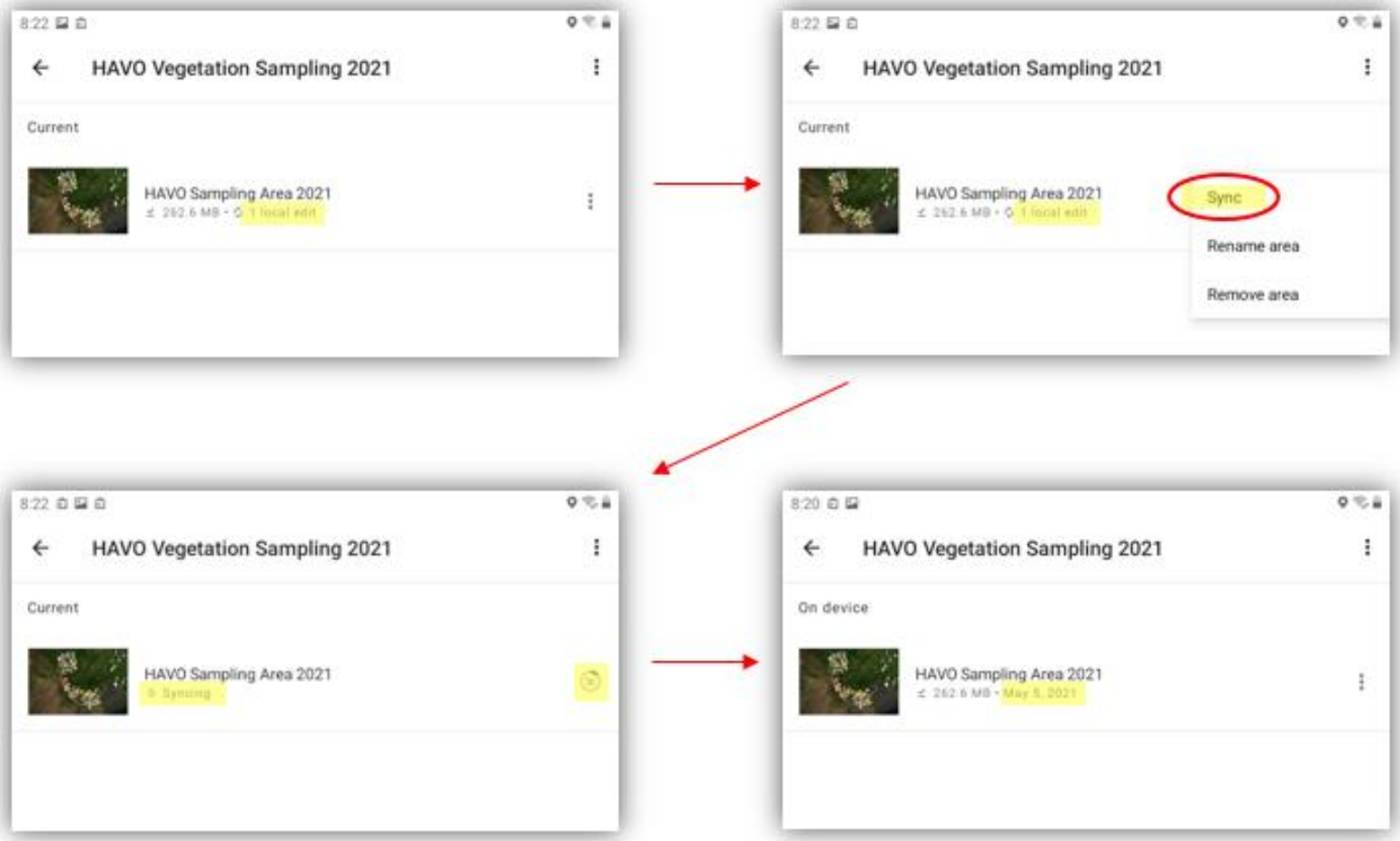


Figure SOP 6.7. Steps for syncing data that was collected while offline to ArcGIS online for preservation.

c. If sync fails, retry. If several sync attempts fail, please contact the PACN GIS Specialist for troubleshooting advice.

4. Ideally, data is synced at the end of each field day once back in the office. At minimum, all devices with data collected should be synced once weekly.

Other Data Collection Tips and Resources

Screen shots provided are from a tablet running Android OS (light mode screenshots)and iOS (dark mode screenshots), some small differences exist when using the App between phones and tablets, and Android and iOS devices. The instructions throughout are applicable for both Android and iOS with differences noted in parentheses. Many steps in this guide must be completed in a connected environment (wi-fi or cellular).

ESRI Produced Quick Reference Guides for Field Maps are available here:

Android Phone

Android Tablet

iPad

iPhone

Appendix SOP 6.a. Basic Field Maps Functions and Interface

Basic Map Functions

Note: *The screen shots displayed are from the now deprecated ArcGIS Collector® Application, but all applicable functions identified in this figure remain in the same location with the same functions for Field Maps. There has been a Sync button added to the left of the Layers Menu for Field Maps, but this functionality should not be utilized by PACN Staff from within the data collection frame.*

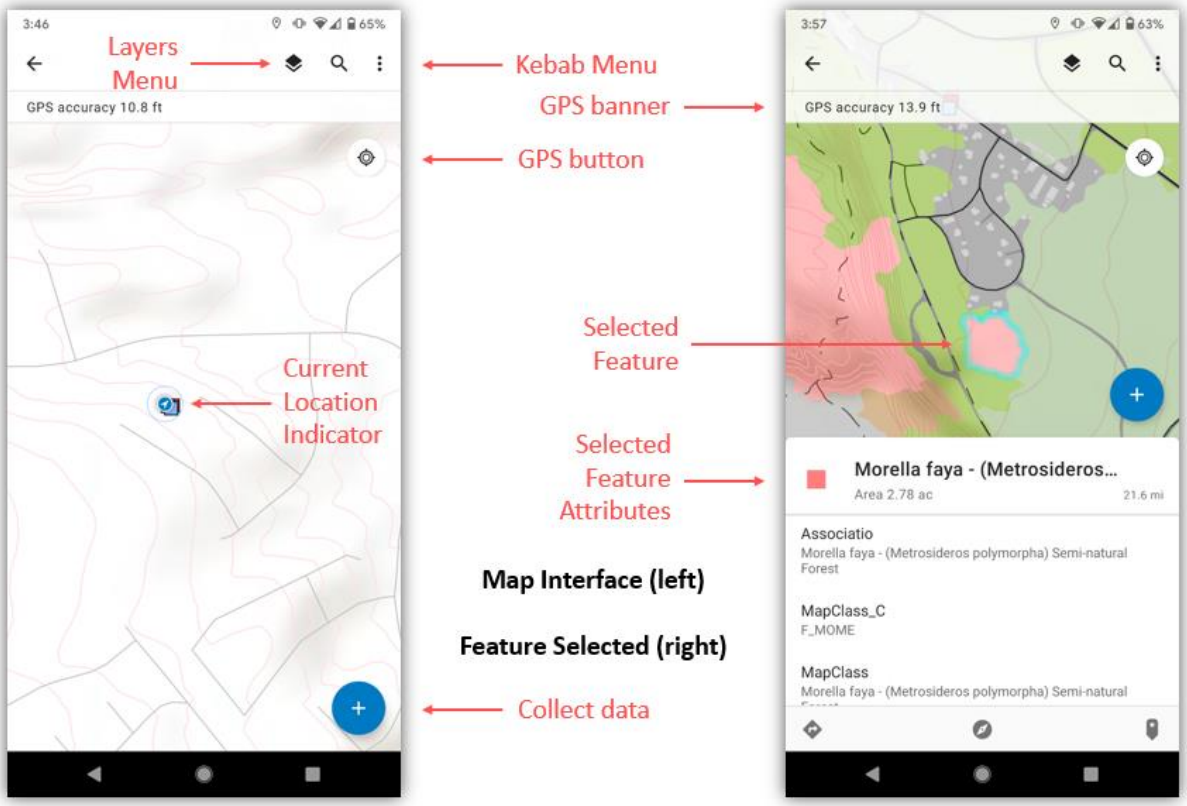


Figure SOP 6.a.1. Screen captures of the map interface (left) and feature selected interface (right) in Collector.

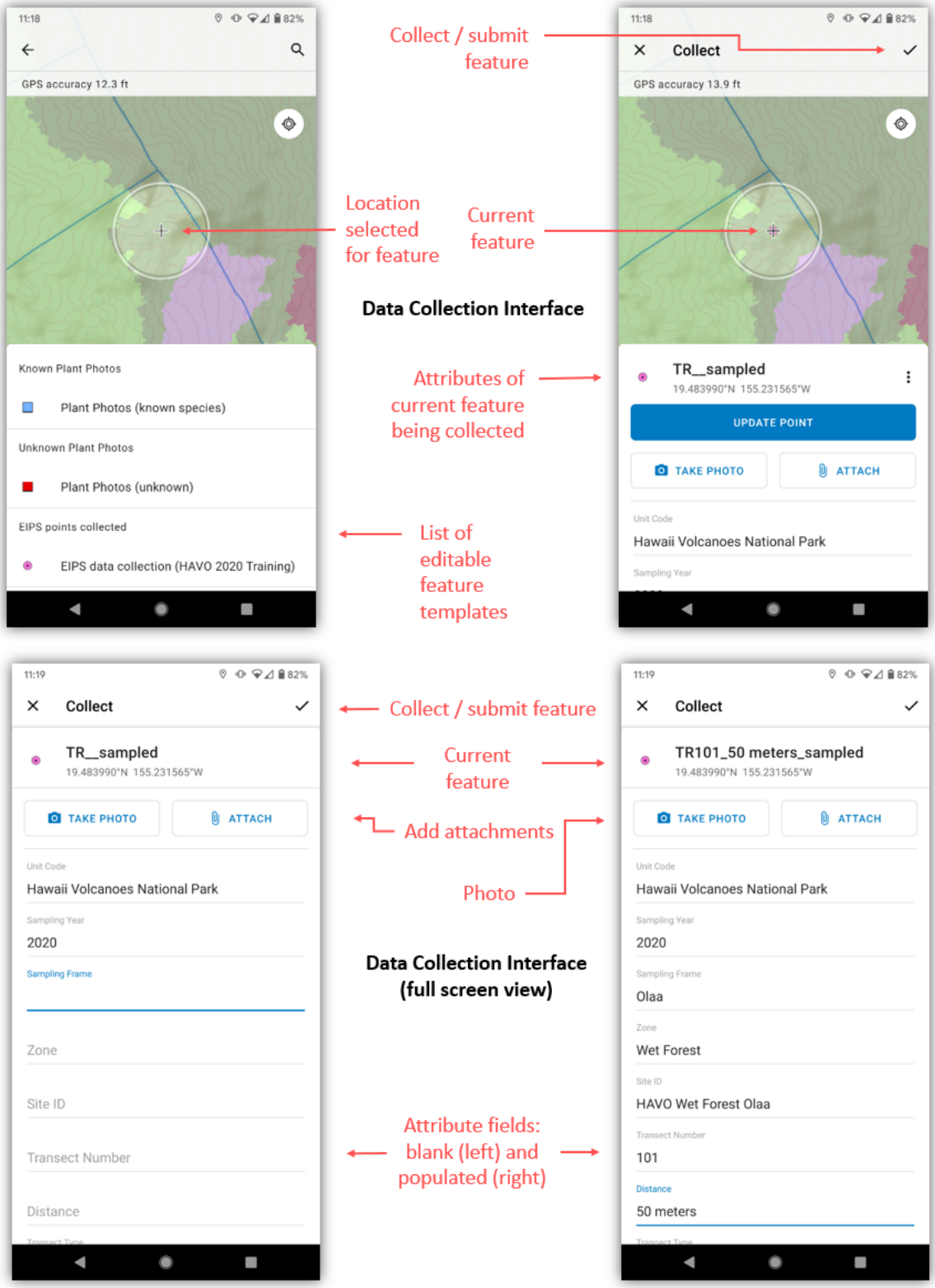


Figure SOP 6.a.2. Screen captures of data collection interface (top) and the full screen viewing mode (bottom) in Collector.

Appendix SOP 6.b. Required Photos and Attribute Fields for Field Maps Data Collection

Points & Photos: Water Quality and/or Freshwater Animals Protocols

Table SOP 6.b.1. Required photos (and points) to be collected in Field Maps for Water Quality and Freshwater Animal protocols.

Protocol	Site Type	Photos & Points Needed				
Water Quality	Freshwater	Site	Left Bank	Right Bank	Upstream	Downstream
Water Quality	Marine	Site	North	South	East	West
Water Quality	Anchialine Pools	Site	North	South	East	West
Water Quality	Brackish	Site	North	South	East	West
Water Quality	Groundwater	Site	North*	South*	East*	West*
Freshwater Animals	Streams**	Site	Left Bank**	Right Bank**	Upstream**	Downstream**
Freshwater Animals	Anchialine Pools	Site	Benchmark	Survey	-	-

**Optional photos. Not required but ideally included for consistency*

***For the Streams Protocol these photos should be collected at 0m, 15m, and 30 m along the transect (12 photos total + Site).*

Table SOP 6.b.2. Attributes in Field Maps data collection layer for Water Quality and Freshwater Animal Protocol points and photos.

Attribute Field	Data Type	Collection Method
Park Code	Text	Pick List (contingent)
Sampling Year	Short Integer	Auto-populated
Quarter	Text	Pick List
Water Type (or Location Type)	Text	Pick List (contingent)
Location (or Station Location)	Text	Pick List (contingent)
Station ID (or Sampling Site Code)	Text	Pick List (contingent)
Transect	Text	Pick List
Direction	Text	Pick List
Comments	Text	Type in
CreationDate	Date	Auto-populated
Creator	Text	Auto-populated
EditDate	Date	Auto-populated
Editor	Text	Auto-populated