Standard Operating Procedure (SOP) 2: Field Notebook and iPad Setup for Field Data Collection

Protocol for Monitoring Small Mammals

Central Alaska (CAKN) Inventory and Monitoring Network

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SOP 2 – Field Notebook and iPad Setup for Field Data Collection

Standard Operating Procedure #2
Version 1.0 (September 2018)

Revision History Log:

Previous Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #
Add rows as needed for each change or set of changes associated with each version.					

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SOP 2.0 – Introduction

This SOP describes how to prepare and use the field data notebooks and iPads with Park Observer app to collect field data for the small mammals live-trapping and mark-recapture surveys on the Rock Creek legacy plots in Denali National Park and Preserve.

Some specific tasks for the field data notebooks are covered by other SOPs (see SOP 7 Data Collection). Notebook preparation and data collection fields include: 1) Notebook requirements and 2) Setting up the data collection fields into Rite-in-rain pocket-sized field notebooks

Some specific tasks for the iPads and Park Observer are covered by SOP 7. Park Observer and iPad preparation and training tasks include: 1) installing Park Observer on the iPad; 2) making background maps (aka Tile Packages or .tbk); and 3) setting up the iPad and Park Observer app for small mammal surveys.

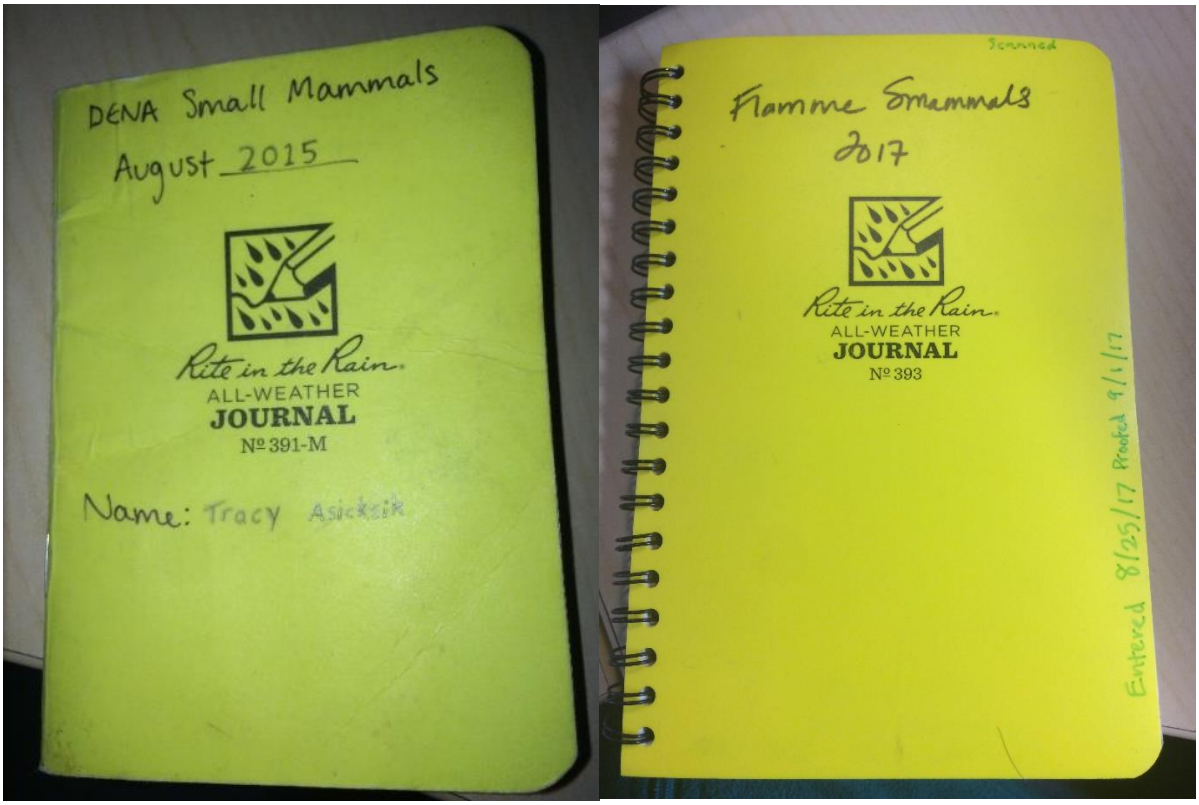
SOP 2.1 – Setting up Rite-in-the-Rain Field Notebooks for Data Collection

SOP 2.1.1 – Data Notebook Requirements

For small mammals live-trapping and mark recapture surveys, pocket-sized Rite-in-Rain notebooks are required for collecting data. These slip easily into pockets on field vests or fanny packs and are somewhat resistant to wet weather. CAKN uses yellow Rite-in- the-Rain field journals (No. 391-M), with a stapled binding and with horizontal lines (3”x4.5” size). Yellow is visible in the field and easily spotted if the notebook is dropped. There is enough room for all required data fields and up to 16-18 records per page. Each field crew member will carry a field notebook for data collection. These notebooks can be purchased in bulk locally from Surveyor’s Exchange.

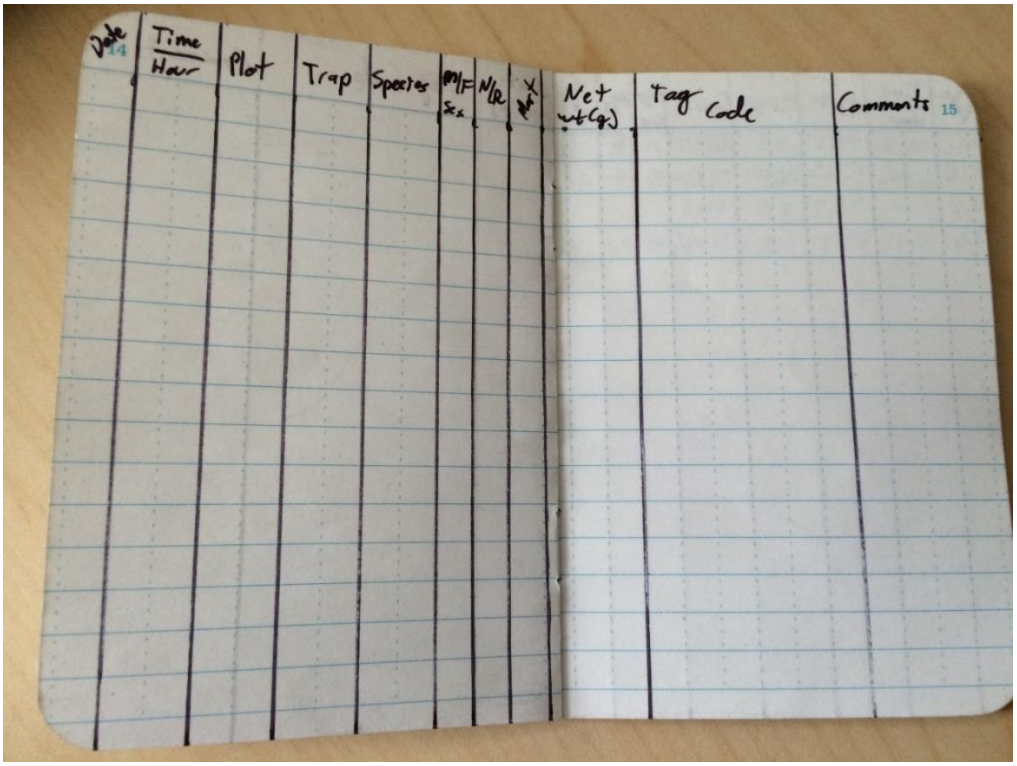
SOP 2.1.2 – Field Notebook (Metadata) Requirements

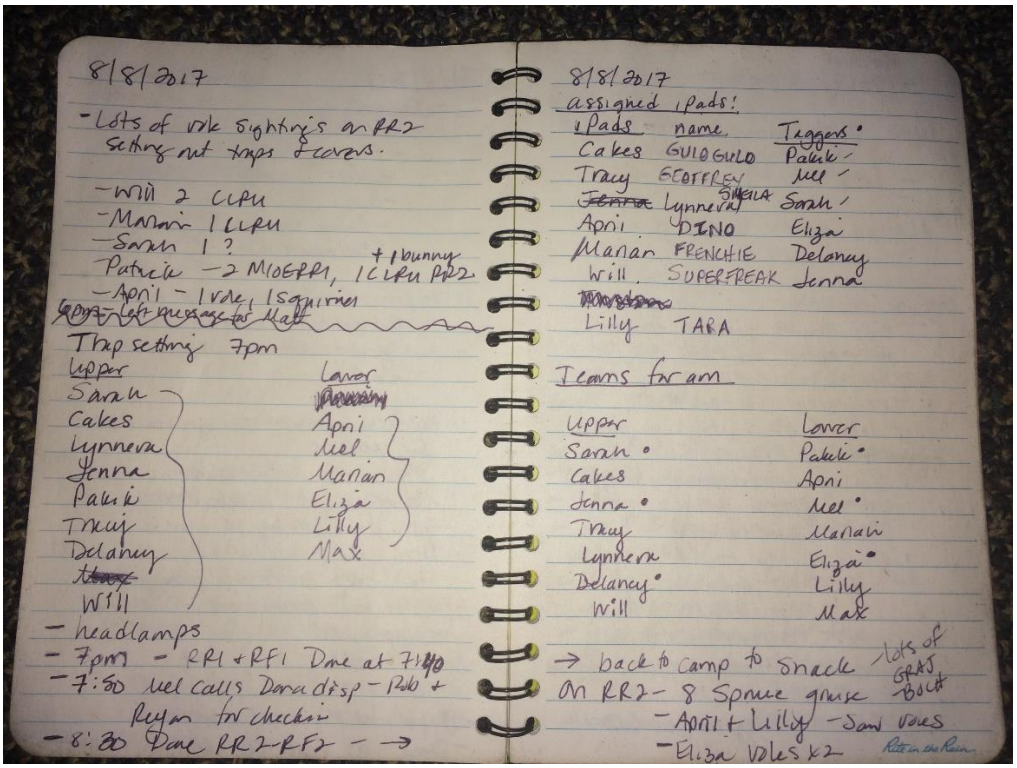
Larger, Rite-in-the-Rain field notebooks are also used to record the schedule and provide a journal or trip report about the daily events during the survey (e.g. logistics metadata such as members of each crew, who is assigned which equipment, weather on each trap check, etc.). These are assigned to crew leaders. CAKN uses the yellow Rite-in- the-Rain spinal-bound, plastic-covered field journals (No. 393) with horizontal lines (4.5”x7” size).



SOP 2.1.3 – Setting up the Data Collection Fields in the Notebooks:

For the data notebooks, pencil and ruler are used to draw straight, vertical lines for 11 data field columns that span the width of two pages in the notebook. Data field columns include: date, time/hour, plot, trap, sex, N/R, mort, net weight, tag code, and comments. The picture below shows roughly the amount of space needed for each field. Ten page pairs in each of the notebooks should be delineated. The remainder of the notebook can be used for incidental field notes. A ruler and a black permanent marker should be used to go over the pencil lines. Each notebook is set up like this prior to conducting field work. Details on each data field is provided in section 2.1.3. Each field notebook is labeled with the year and field crew member's name on the front and the year of the survey. The only requirement for setup for the field notebooks (for metadata and trip reporting) is to include dates at the top of each page and times on the left margin for daily events or comments.


Date
Time
Hour
Plot
Trap
Species
M/F
Sex
N/R
Net wt(g)
Tag Code
Comments


8/8/2017
- Lots of Vole sightings on RR2 setting out traps & covers.
- Will 2 CLRU
- Marian 1 CLRU
- Sarah 1?
- Patricia - 2 MIOERRI, 1 CLRU RR2 + 1 bunny
- April - 1 vole, 1 squirrel
Trap setting 7pm
Upper
Sarah
Cakes
Lynnera
Jenna
Patrick
Tracy
Delaney
Will
Lower
April
Mel
Marian
Eliza
Lilly
Max
- headlamps
- 7pm - RR1 + RF1 Done at 7:40
- 7:30 Mel calls Dana disp - Rob + Ryan for checkin
- 8:30 Done RR2-RF2 - →
8/8/2017
assigned iPads!
iPads
name
Taggers
Cakes GUIDGUID Patrick
Tracy GEOFFREY Mel
Lynnera SHEILA Sarah
April DINO Eliza
Marian FRENCHIE Delaney
Will SUPERFREAK Jenna
Lilly TARA
Teams for am
Upper
Sarah
Cakes
Jenna
Tracy
Lynnera
Delaney
Will
Lower
Patrick
April
Mel
Marian
Eliza
Lilly
Max
→ back to camp to snack
On RR2 - 8 Spruce grouse
- April + Lilly - Saw voles
- Eliza Voles x2
lots of GRAY - BOO!

SOP 2.1.4 – Data Fields in Notebooks Required for Data Collection:

At each plot, observers record the following data fields (from left to right) when an animal is captured an animal (see SOP 7 for more details about each data field):

1. Date
2. Time (military) and Hour (trapping session 0600, 1300 or 2000)
3. Plot (RR1, RR2, RF1, RF2)
4. Trap location (e.g. 4C),
5. Species (MIOE, CLRU, MIMI or non-target such as GRAJ, SOSP or REDS, etc.)
6. Sex (M/F and details on reproductive status in the comments)
7. Capture type: N/R; New (untagged) or Recapture (already tagged)
8. Mortality (check the box if yes; leave blank if no)
9. Net weight and Age class in grams (see SOP 7 for more details on obtaining and recording weight)
10. Tag code (may be either 10 alphanumeric or 15 numeric characters, depending on tag type and batch).
11. Comments (see SOP 7 for more details on the types of information that may be included in the comments)

SOP 2.2 – Installing Park Observer on the iPad

SOP 2.2.1 – iPad specifications required to run Park Observer

For small mammal surveys, we use Apple iPad Air 2 Wi-Fi with the following specifications required to run Park Observer:

Product Description Apple iPad Air 2 Wi-Fi + Cellular - tablet - 128 GB - 9.7 - 3G, 4G
Product Type Tablet
Display 9.7 IPS TFT - LED backlight - 2048 x 1536 (264 ppi) - Multi-Touch
Processor Apple A8x - 64-bit
Storage 128 GB
Cellular Technology 3G, 4G
Cellular Protocols GSM, UMTS, EDGE, CDMA 2000 1X EV-DO Rev. A, HSPA, HSPA+, LTE, DC-HSDPA, CDMA 2000 1X EV-DO Rev. B
Wireless Connectivity Bluetooth 4.0, 802.11a/b/g/n/ac
Camera 8 Megapixel rear + (1.2Mpix front camera)
HD Video Recording 1080p
Location A-GPS/GLONASS
Security Devices Fingerprint reader
Battery Run Time Up to 10 hours
Dimensions (WxDxH) 6.7 in x 0.2 in x 9.4 in
Weight 15.66 oz

You will need 6-8 iPads, with power supply systems and USB lightening cables for each.

SOP 2.2.2 – Updating the iPad to the most current version of IOS and Park Observer

Each year, the most current version of Park Observer and IOS required to run it must be updated. The National Park Service has permission from Apple to place the NPS enterprise application, Park Observer, on iTunes for downloading onto iPads. All versions of Park Observer are signed with an expiring certificate, and will no longer run when the certificate expires. This is a licensing limitation imposed by Apple annually. After the annual Apple license expires, we will need to update the iPads with the appropriate version of IOS required to run the most recently updated version of Park Observer under the renewed Apple certificate. Regan Sarwas, with the Alaska Regional Office GIS Team, handles the annual renewal of the Apple licenses and the updates to Park Observer. He will send out an email (usually in early April) detailing the current version of IOS and Park Observer to use. Follow the instructions at this link to download and install the latest version of NPS Observer: https://akrgis.nps.gov/Observer. To update the iPad to the newest version of IOS, check the Park Observer website to make sure you have the most current instructions.

SOP 2.2.3 – Installing Park Observer without wireless

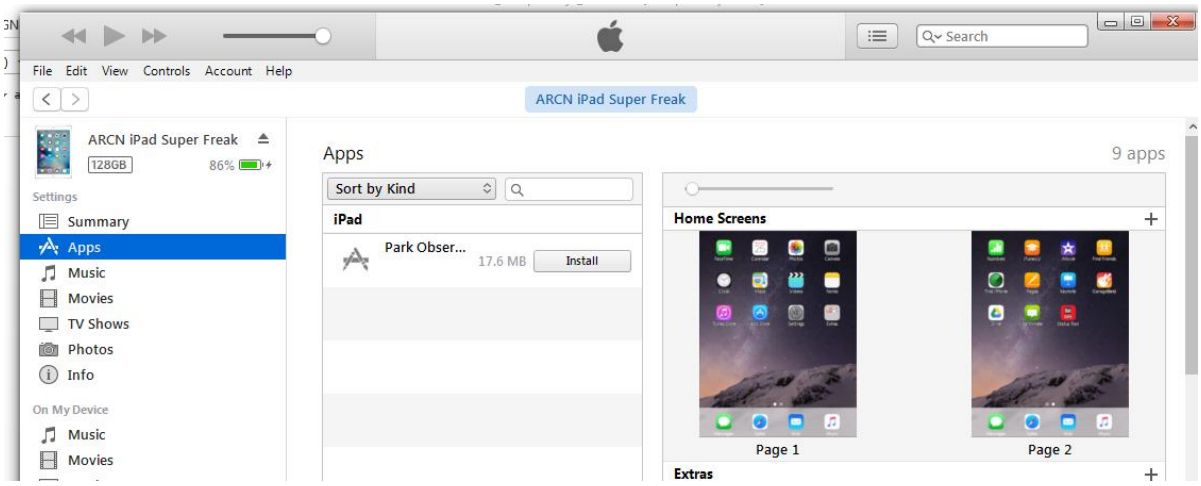
The iPads used in the aerial surveys should be set up in the following manner:

1. Go to this site: http://akrgis.nps.gov/observer/no-wifi.htm (contents shown below).
2. Download the application package (Park_Observer_1.2.0.ipa and the Park Observer Toolbox [ParkObserver.pyt]) to a PC or Mac with iTunes. The latest is 1.2.0 (as of June 2017).
3. Connect your iPad to the computer with a USB cable. The iPad can only be synced with one computer at a time, so always try to use the same computer.
4. Open iTunes on the computer.

Note: Network connection is not required to connect to the iTunes store. iTunes nor iCloud account are not required to authorize the device on the PC. Ensure no other account is logged into in iTunes – to check, select the "Account" menu from the main screen and look for "Sign in" as an option. If not, select "Sign out". If further problems arise, try logging out of the iTunes account on the iPad by opening the Music app, clicking on the small red user logo (person's head in a circle) and selecting "Sign out".

1. Click "Allow" in iTunes when prompted to allow access to the connected iPad.
2. Click the "Trust" alert on your iPad.
3. Select the iPad icon at the top left of the iTunes window to see the details of your iPad.
4. Click on Apps in the list on the left of the iTunes window.
5. Click the small icon "File" at the very top left and select Add File to Library... (or press Control-O).
6. Browse to and open the file downloaded in the first step. Or drag the download from step 1 onto the app page in iTunes.

7. Click the Install button next to Park Observer in the list of Apps.

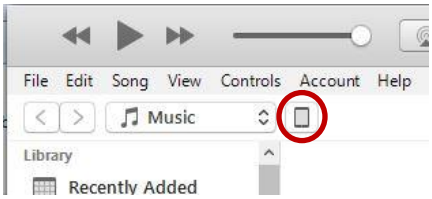


1. Click on the Apply button at the bottom of the iTunes window.
2. Installation progress will be reported in the banner at the top of the iTunes window (e.g, "Syncing Apps. . . ')
3. When done, click the eject button next to the name of your iPad, but leave the iPad attached to the computer.
4. Tap the Park Observer App icon on the iPad.
5. An "Untrusted Enterprise Developer" alert will appear, tap Cancel.
6. Tap on the Settings App icon and navigate (scroll down) to General -> Device Management -> National Park Service and tap on Trust National Park Service.
7. Press the Home button (round actual button at base of iPad).
8. Tap the Park Observer App icon on the iPad.
9. Tap Allow when asked if Park Observer can access your location.

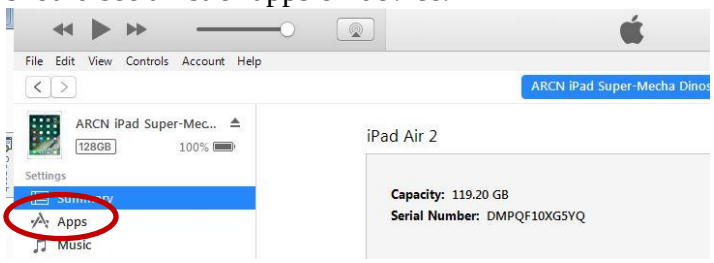
SOP 2.2.4 – Loading maps (.tpk) and data forms (.obsprot)

1. Download survey maps (Smammals_2017.tpk) and training maps (Fairbanks2.tpk) from J:\Monitoring\Small_Mammals\ParkObserver\tpk
2. Download protocols (Smammals_2017.obsprot) from http://akrgis.nps.gov/observer/protocols/ – or get these from the survey PI. Save these to a file on computer and the J drive: (from J:\Monitoring\Small_Mammals\ParkObserver\obsprot) *Note – you may not have background maps (tile packages) made yet for your survey. To make tile packages, see the next section, then return to this section to finish loading files for the iPad(s). Reattach iPad to the computer. It should appear as a device in iTunes.

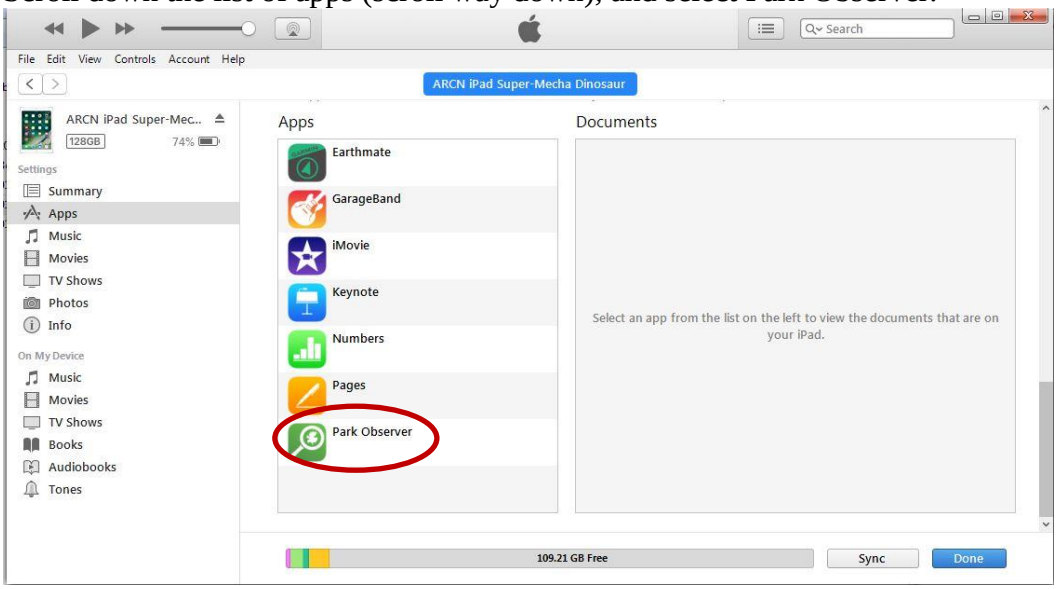
3. Launch iTunes, click on the iPad icon.



4. Click on Apps, in the list of options along the left side of the iTunes window, and you should see a list of apps on device.

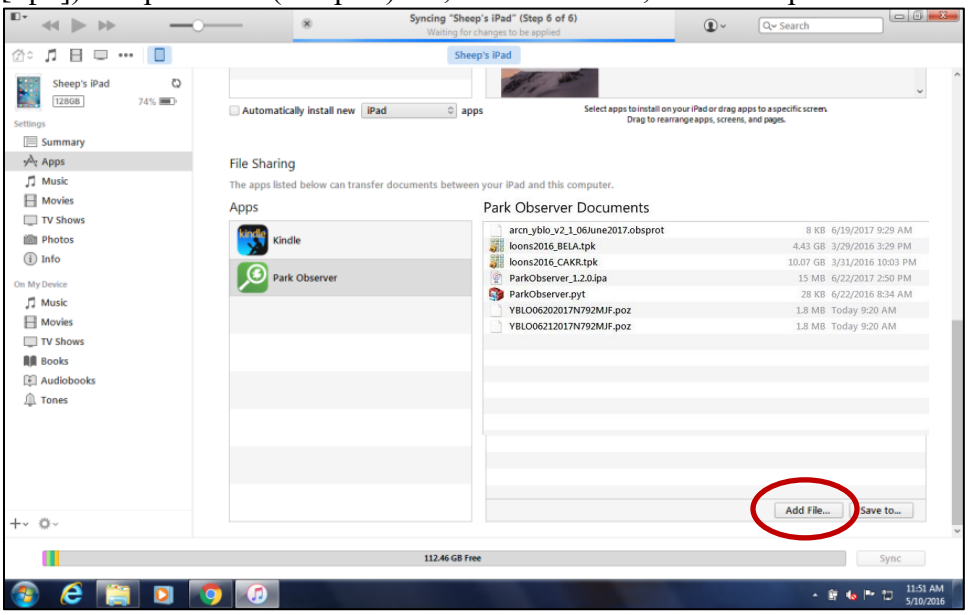


5. Scroll down the list of apps (scroll way down), and select Park Observer.



6. Scroll down further. At the bottom right is a button to add files to park observer. Click the Park Observer button on the left.

7. Click the ‘Add File’ button on the bottom right. Navigate to where maps (tile caches [.tpk]) and protocols (.obsprot) are, select the files, and hit ‘Open’.



8. When done syncing, eject the iPad from the laptop.

** See also Appendix which includes all instructions from the regional office.

SOP 2.2.5 – Making Background Maps (aka Tile Packages or .tpk)

[These instructions are borrowed from the AKRO GIS website (http://akrgis.nps.gov/observer/no-wifi.htm).](http://akrgis.nps.gov/observer/no-wifi.htm)

Basemaps can be created in ArcMap 10.1 or greater. The map is converted into a collection of small images at various scales for rapid rendering on the iPad device. Use any image or vector datasets prefered in themap, however proprietary online basemaps (like Google, Bing, or ArcGIS) cannot be used.

To create a basemap (aka tilecache or .tpk) in ArcMap:

1. Turn on the tool by selecting “ArcMap Options” in the Customize menu item. Then select the Sharing tab, and check the *Enable ArcGIS Runtime Tools*
2. Assemble map – display background imagery and any unit boundaries or transect lines, set symbology, labeling, scale dependencies, etc. to your liking and based on background image (e.g., bright royal blue lines show up on topos but may not show well on aerial photos). Note: The font sizing is often difficult; use larger font size than expected to better visual text. To enable background map to change at different zoom levels, set the ‘Visible Scale’ minimum and maximum for each layer.
3. Zoom to the full extents of the area preferred in the tile cache. To minimize file size, make the area as small as necessary.

4. Export the map by selecting File->Share As->Tile Package from the ArcMap menu Tile Package Tab
5. Save the package to a file. Save as "SmallM". When done, this file can be loaded into the app via iTunes.
    a. Tile Format Tab
    Leave the Tile scheme as *ArcGIS Online / Bing Maps / Google Maps* and Tile Format as *PNG*. Leave this at 17 or lower, (unless survey area is very small and/or very high resolution of imagery is required). 5m resolution imagery will generally not look any better at more detail than level 17. The higher the number, the longer the tile cache will take to generate, and the larger the tile package will be. Base maps tile packages for Small Mammals surveys generated at level 17 have been found to provide the appropriate resolution required for conducting the surveys and properly placing points around a lake. Be aware each increase in zoom level will quadruple the size and time it take to generate the tile cache. Allow the computer to process for several days to export the level 17 tile package,
    b. Item Description Tab
    As a minimum, provide a Summary and Tags.
6. Load the tile cache (.tpk) just created on to iPads with iTunes.
7. For tile cache to appear in the list of basemaps available to all users, contact Regan Sarwas (Regan_Sarwas@nps.gov) to make this .tpk will be available for future surveys.

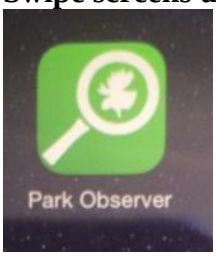
SOP 2.3 – Setting up the iPad and Park Observer app for Small Mammals Surveys

SOP 2.3.1 – Getting started on the iPad

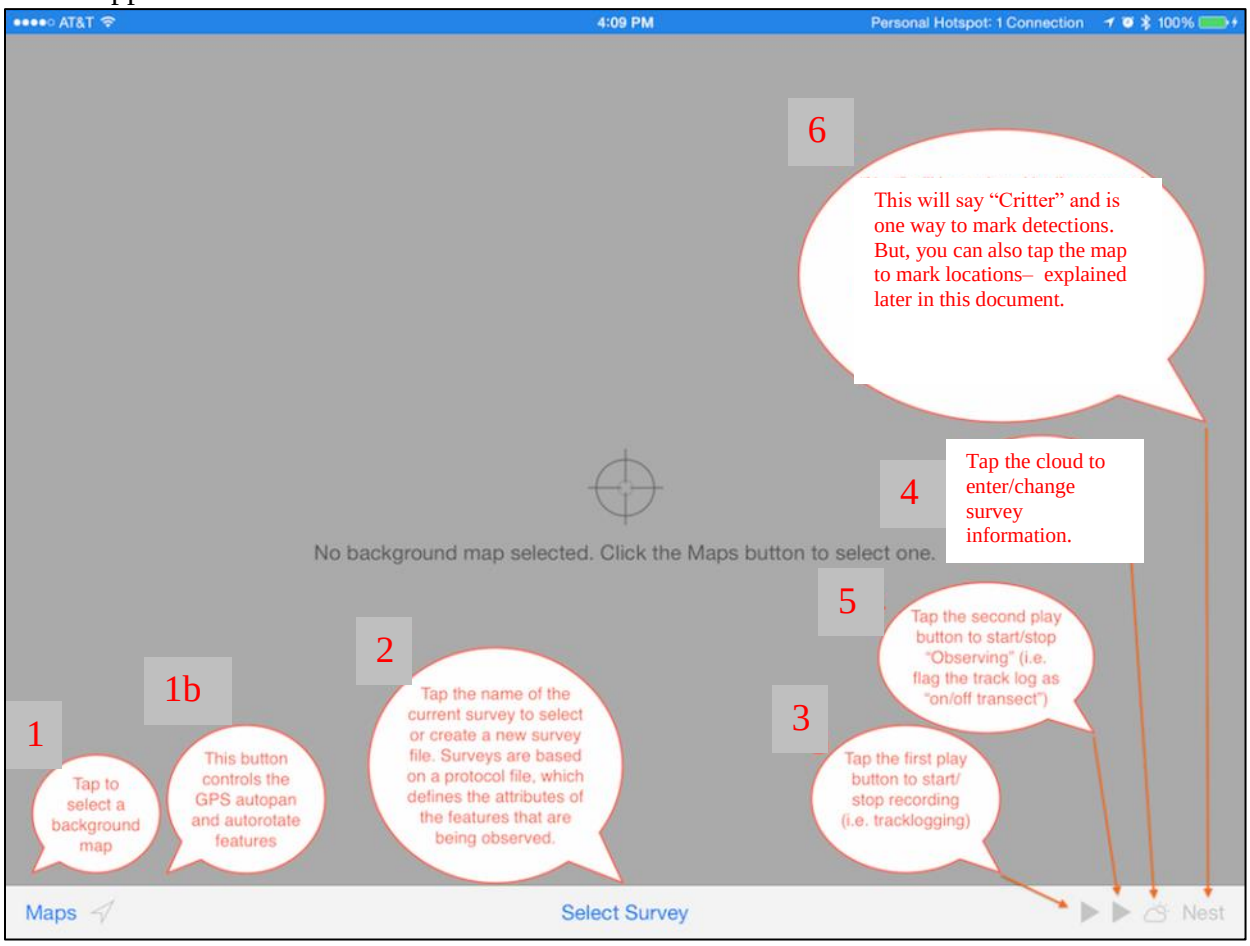
1. **Power and back-up power** - Make sure iPad is at 100% at the start of the day. Alternatively, use two external battery packs (e.g., Kanex GoPower portable battery 11,000 mAh), per day day per iPad (one as a backup). Plug the iPad into the battery pack at the start of the day in the plane (use the 2.1A port). The battery pack helps to slow the battery drain during the day. You may be at 50% or so at the end of the day, but it would be 0% without the battery pack.
2. **Turn iPad on.**
3. **Use the internal iPad GPS or set up the optional Dual Bluetooth GPS (e.g. Dual Bluetooth GPS)**. To set up the Dual Bluetooth with your iPad:
    a. Hold down the power button on the "Dual GPS receiver" until the blue light blinks, which indicates it's looking for a Bluetooth connection.
    b. Go to settings in iPad. Select and turn on Bluetooth.
    c. Wait for the device name starting with "XGPS150" and ending with the numbers labeled on the GPS receiver to appear under "devices" (e.g., XGPS150-40C881). Select this device.
    d. When prompted to download the app to use device, "ignore" this request.

e. Once the Bluetooth connection is established with your iPad the blue light on the Dual receiver will stay lit. The GPS button will flash green until it's picked up enough satellites, then it will stay lit.
f. Alternatively, turn on location services in the iPad settings to activate internal GPS.

4. **Swipe screens until you see the Park Observer app** and select it.



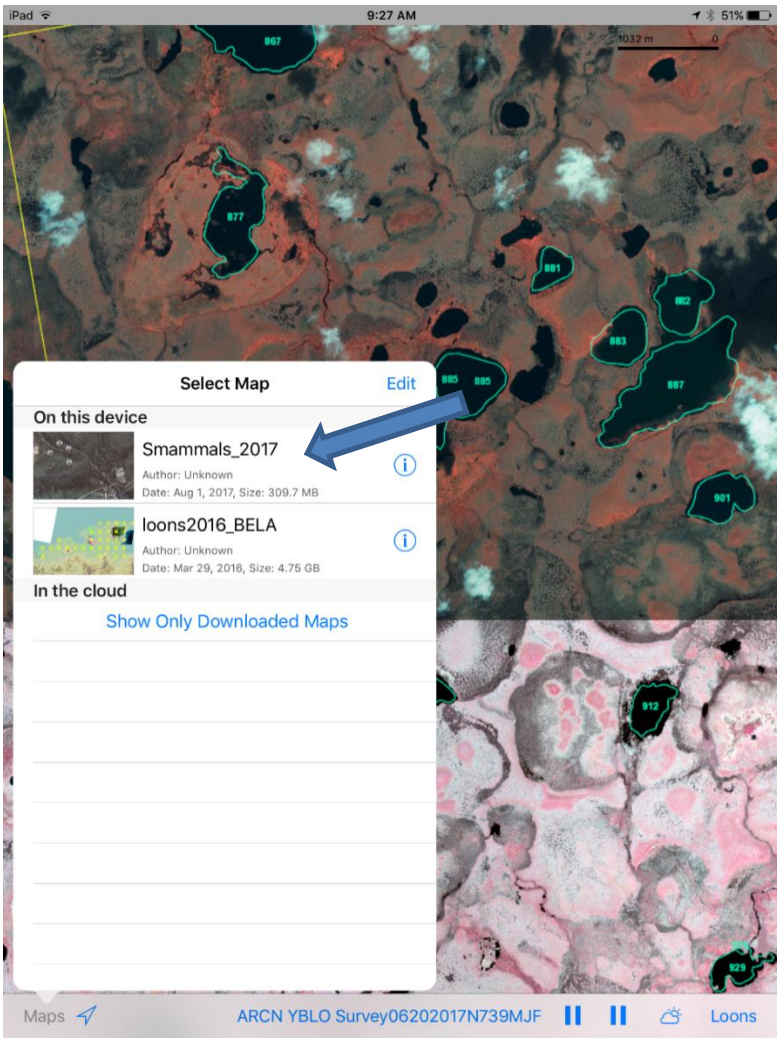
5. The screen will look like this more or less like the figure below. Instructions for using the app follow in the next sections and SOP 7.



SOP 2.4 – Setting Up Park Observer for Collecting Small Mammal Data

SOP 2.4.1 – Select a survey base map

1. Hit "Maps" (lower left) and select a base map from the list (drag down on the list to refresh if your map does not appear). Observer will remember the last map used Maps can be expanded and stretched with fingers or by double-tapping the map. Making features larger can help with more accurate placement (dragging) of waypoints (yellow dots) to specific locations on the map. To shrink again, just "squeeze" image with fingers.



2. **Keep the open arrow icon for map on "no auto pan".** Toggle through this to see options for panning or for setting the map so up is in the direction you are hiking. A red arrow in the upper right hand corner will reset so north is up.

3. **Upon opening, Park Observer will remember previously selected map**. Select the training map for training in Fairbanks or the Smammals_2017 map for conducting surveys in Denali.

SOP 2.4.2 – Select a survey base protocol (datasheet)

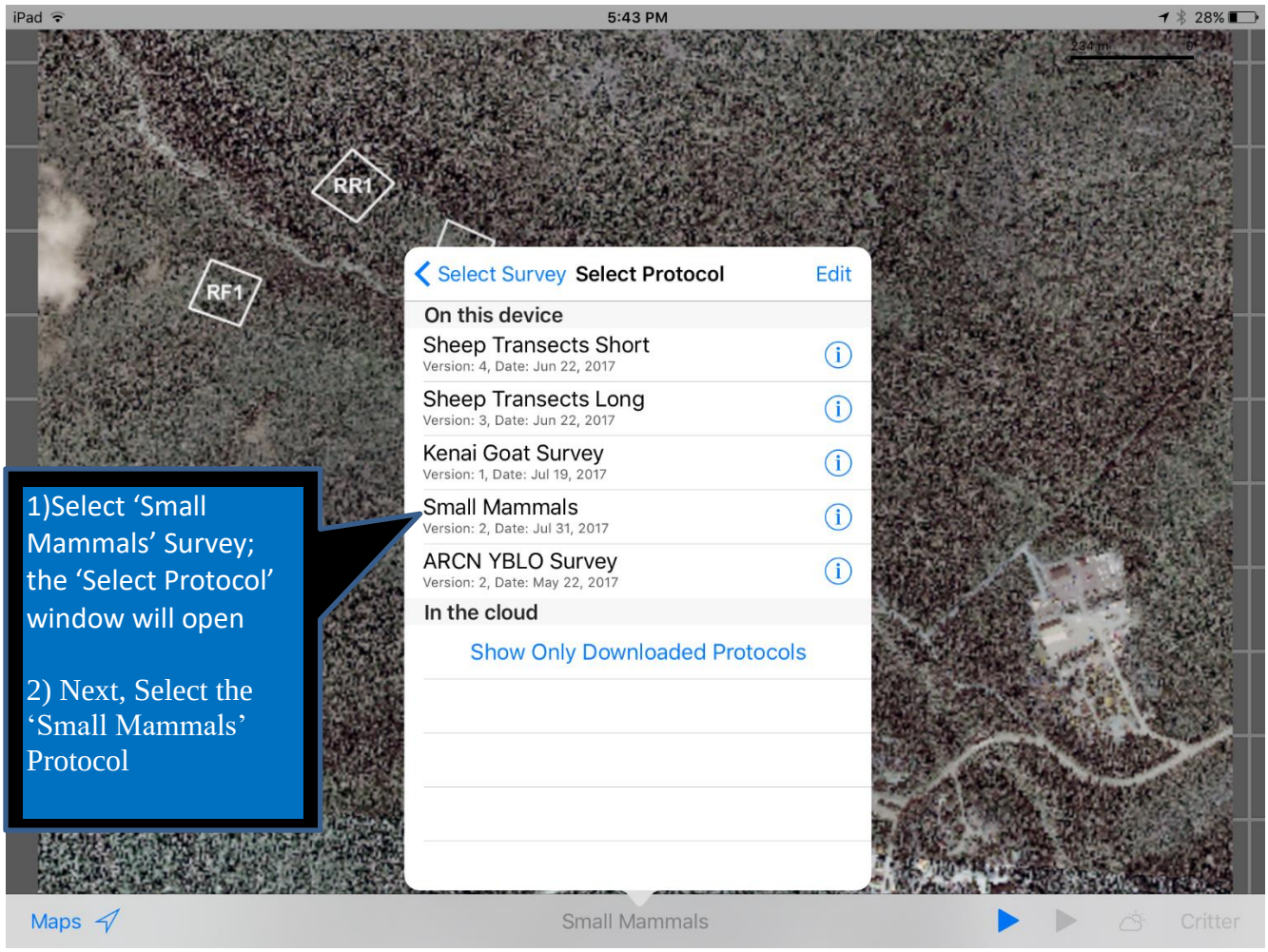
1. Click on middle Select Survey tab. A menu should pop up (Select Survey window) with a list of survey types including the 'Small Mammals' Survey. This may be empty. If so, proceed to step 1a below.

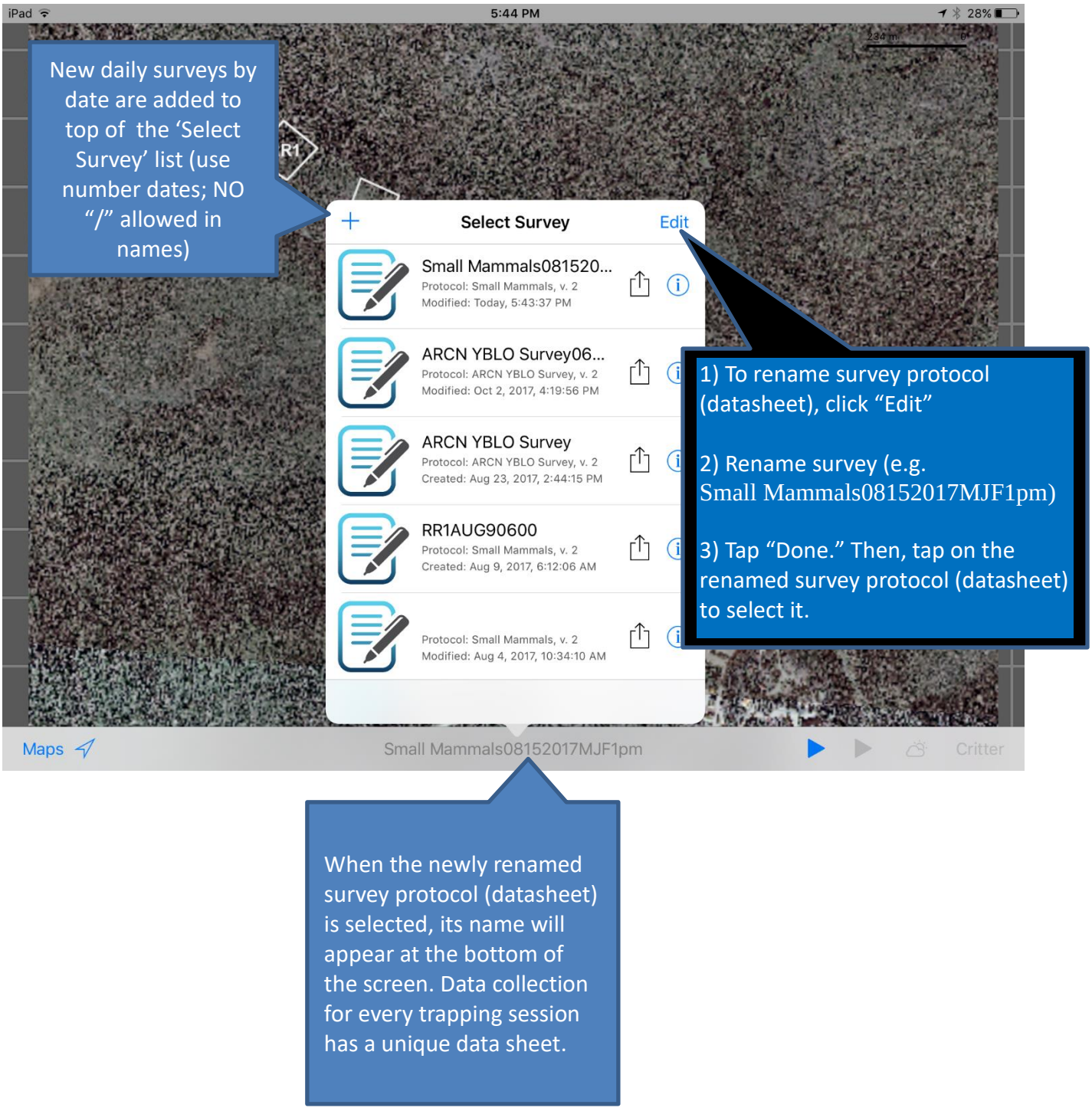
    a. Note: There are both "survey protocols" and "surveys" in Park Observer. A "survey protocol" (e.g. Small Mammals) is a template defining the parameters and attributes of the data to be collected (e.g. digital datasheet. A "survey" is actual collection of the data on a specified date (e.g. trapping small mammals on surveys on 08313017) using a datasheet (survey protocol). Each trapping session (0600, 1300 or 2000) of the survey, a new survey protocol (datasheet) will be selected to use (e.g. Small Mammals) and then named by date, observer's initials and trapping session (e.g. Small MammalsNumberDateYourInitialsTrappingSessionTime) when data collection begins (e.g. trap critters). For example: Small Mammals08152017MJF1pm.



b. Note: As surveys conducted each day, there are both the original survey protocols (datasheets on the "Select Protocol" window) and the daily surveys listed in "Select Surveys" window. **Do not delete** the original survey protocols (e.g. datasheets; they will remain listed at the bottom). Also, **do not delete** any previous trapping session surveys until data is downloaded after the surveys are completed.

2. **Press the edit button (top left) and change the name** of the current day's survey to: "SmammalsNumberDateTrappingSessionTimeYourInitials" (for example "Smammals081320171300MJF). Do NOT put any "/" in the file name or data will not download; use "-" or "_" instead for dates, etc. Use survey file (datasheet) to record each day's data.


iPad
5:43 PM
28%
RR1
RF1
Select Survey
Select Protocol
Edit
On this device
Sheep Transects Short
Version: 4, Date: Jun 22, 2017
Sheep Transects Long
Version: 3, Date: Jun 22, 2017
Kenai Goat Survey
Version: 1, Date: Jul 19, 2017
Small Mammals
Version: 2, Date: Jul 31, 2017
ARCN YBLO Survey
Version: 2, Date: May 22, 2017
In the cloud
Show Only Downloaded Protocols
1)Select 'Small Mammals' Survey; the 'Select Protocol' window will open
2) Next, Select the 'Small Mammals' Protocol
Maps
Small Mammals
Critter


New daily surveys by date are added to top of the 'Select Survey' list (use number dates; NO "/" allowed in names)
Select Survey
Edit
Small Mammals081520...
Protocol: Small Mammals, v. 2
Modified: Today, 5:43:37 PM
ARCN YBLO Survey06...
Protocol: ARCN YBLO Survey, v. 2
Modified: Oct 2, 2017, 4:19:56 PM
ARCN YBLO Survey
Protocol: ARCN YBLO Survey, v. 2
Created: Aug 23, 2017, 2:44:15 PM
RR1AUG90600
Protocol: Small Mammals, v. 2
Created: Aug 9, 2017, 6:12:06 AM
Protocol: Small Mammals, v. 2
Modified: Aug 4, 2017, 10:34:10 AM
1) To rename survey protocol (datasheet), click "Edit"
2) Rename survey (e.g. Small Mammals08152017MJF1pm)
3) Tap "Done." Then, tap on the renamed survey protocol (datasheet) to select it.
Maps
Small Mammals08152017MJF1pm
Critter
When the newly renamed survey protocol (datasheet) is selected, its name will appear at the bottom of the screen. Data collection for every trapping session has a unique data sheet.

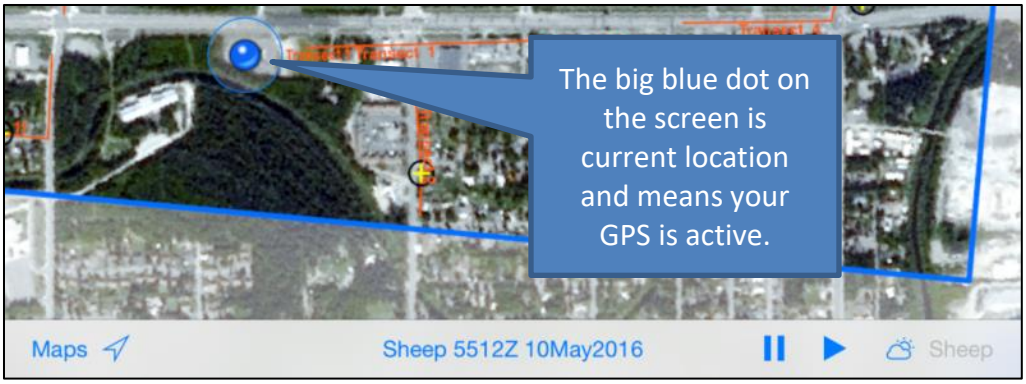
3. **Select "**Small MammalsNumberDateYourInitialsTrappingSessionTime" **survey protocol (datasheet; should be a top of list)**. The "Select Survey" window will close and the survey for the day will show at the bottom of the map screen and the first play arrow will turn blue. Format "number date"as: MMDDYYYY (e.g. 082132017 for August 13, 2017. Do NOT use '/' in the renaming format; it will interfere with the ability to export and import the output files from Park Observer).

SOP 2.4.3 – Start the GPS and an active tracklog

1. **Press the first blue play button to start an active tracklog,** recording one location point per second. The first play button will now look like a pause button, and the second play button and cloud button will turn blue.



2. A big blue dot will appear on the screen meaning your GPS is now active. The blue dot will move and represents your current location.

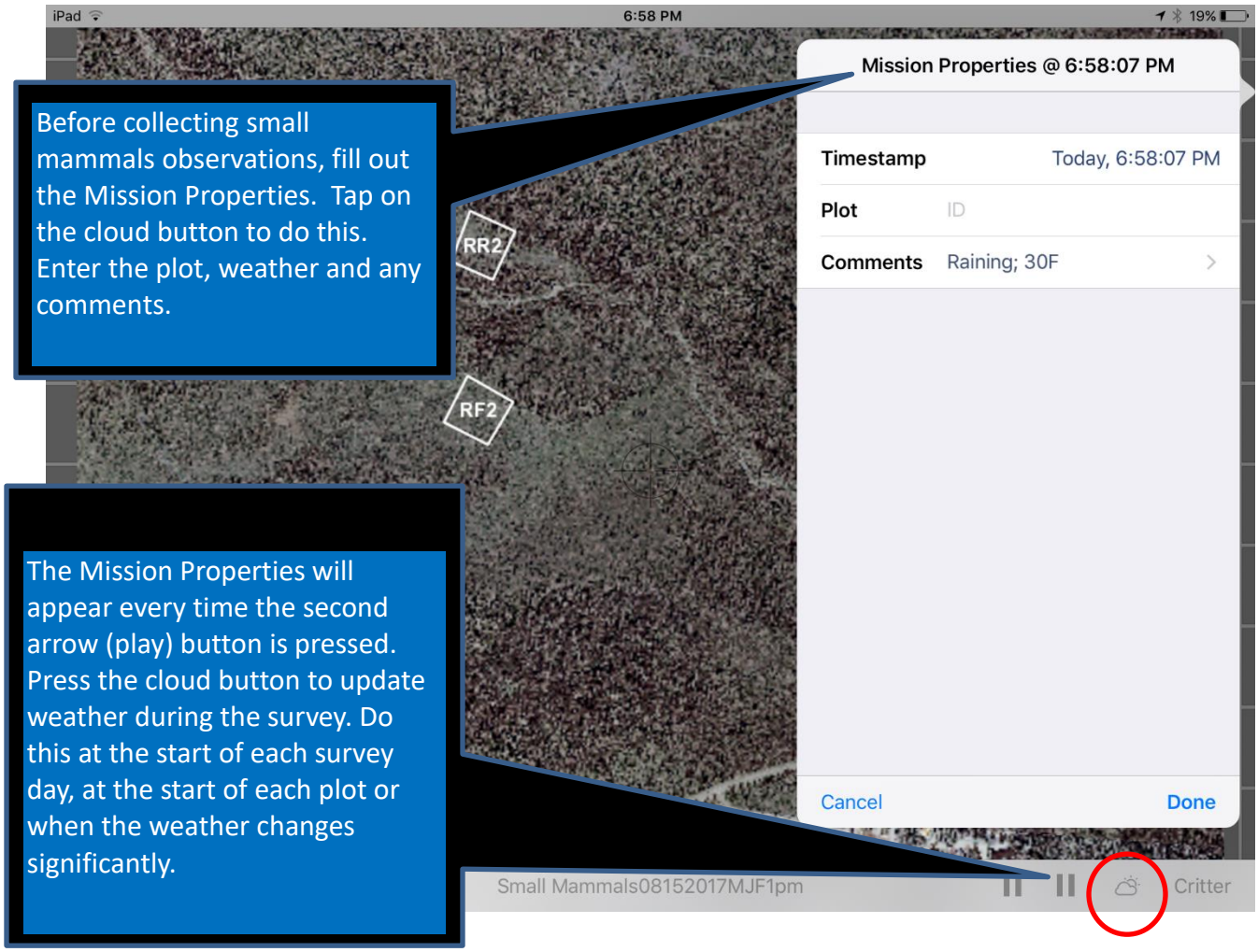


SOP 2.4.4 – Enter Mission Properties prior to survey

Enter plot, comments and weather information using the cloud button.



1. Before collecting small mammal observations, define the Mission Properties: the time stamp for starting the plot, the plot ID, comments and weather conditions prior to surveying each plot. Before arriving to the target plot, press the cloud button. The Mission Properties window will pop up and have entries from the previous plot or it will be blank at the start of the day.



2. Select the 'critter' button to collect small mammal observations. See SOP see SOP 6 (Conducting Survey) and SOP 7 (Data Collection) for next steps to use the data notebooks and the Park Observer app on the iPad to collect small mammal data.