

Standard Operating Procedure (SOP) 7: Data Downloading and Backup, Version 1.0

Protocol for Monitoring Brown Bears

Arctic (ARCN) Inventory and Monitoring Network

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The main Narrative for the Protocol for Monitoring Brown Bears in Arctic (ARCN) Inventory and Monitoring Networks is available from the NPS Inventory and Monitoring Arctic Network website (<http://science.nature.nps.gov/im/units/arcn/>) and the Natural Resource Publications Management website (<http://www.nature.nps.gov/publications/nrpm/>)

SOP 7 – Data Downloading and Backup

Standard Operating Procedure #7
Version 1.0 (09/01/2017)

Revision History Log:

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

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SOP 7.0 – Introduction

SOP 7 gives the procedures for observers at the end of each survey day to download and backup data and prepare (e.g., recharge) survey equipment for the following survey day. It also includes instructions for some minor editing of the data that may be required due to field iPad error or other complications in flight that may have affected the data collected. When there are problems recording data on the field iPad, the observer should note this on the paper data sheet while still in-flight so that if issues arise during data downloading and/or edits are necessary these issues are not a mystery. These instructions are largely based on data downloading and backup procedures from the ARCN/CAKN sheep surveys (SOP 9) and the newly developed iPad and Park Observer data download and backup protocols. **These instructions can be found at the AKRO GIS website (<http://akrgis.nps.gov/observer/no-wifi.htm>).**

All data are downloaded to a laptop from the iPad, GPS units, and cameras that has the full ArcMap project (e.g., [UpperNOAT2017_BearSurvey.mxd](#)), associated geodatabase (e.g., [ARCN_Bears_2017.gdb](#)). Backup copies of the data are saved to USB external hard drives or thumb drives, downloaded to iTunes, saved with screen shots on the iPads at the end of the survey day, and emailed to the NPS PI's email addresses. Below is a summary of the data downloading, backup and equipment care steps that are detailed in the following SOP sections with the corresponding number.

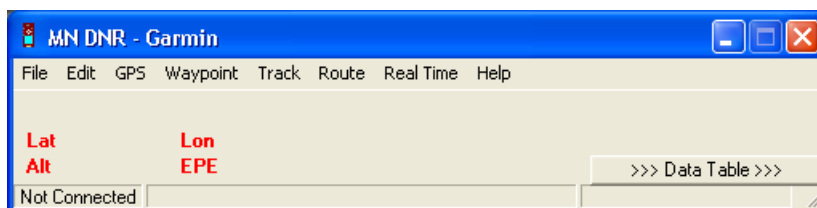
1. Download pilot's Garmin 296/495/496 tracklog and waypoints.
2. Download today's data survey data (by aircraft tail number and date) from Park Observer on the iPads to the base camp laptop. Ready a blank survey template on the iPad for tomorrow with tomorrow's date.
3. Download today's survey data.
4. Import today's data file into the ArcMap project (e.g., [UpperNOAT2017_BearSurvey.mxd](#)). Make sure your data from today displays.
5. Download your photographs.
6. Check any notes on your paper data sheets and make those edits in Park Observer on the iPad or in ArcMap if you have time in the evening or on a weather day and clarify your notes for the Project Manager.
7. Back up all data on a thumb (USB) drive or external hard drive.
8. Charge all electronics – iPad, camera, satellite phone. Give the pilot back his/her Garmin GPS unit.
9. Eat, drink water, go to sleep ☺.

SOP 7.1 – Downloading the Garmin GPS Units

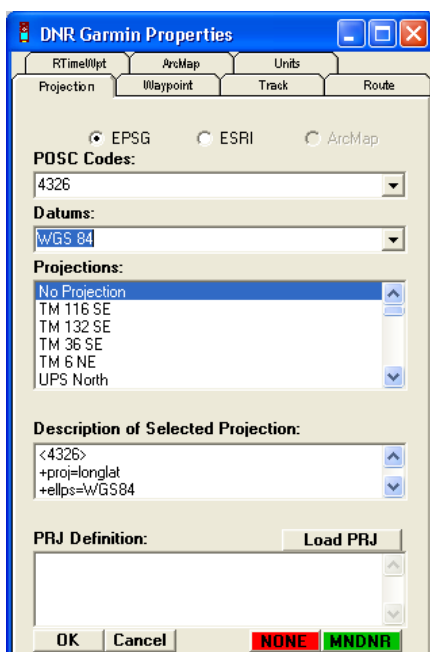
Download the pilot's (Garmin 296/396/496) tracklog and waypoints using DNR Garmin. If there is not a copy on your machine or it's not working, you can go online to find the most up-to-date DNR Garmin version. Minnesota Department of Natural Resources (DNR) produces this free software. *Important* – these screenshots are helpful, but please use the following file naming convention: AircraftTailNumber_DayMonthYear_Waypoints.shp (e.g., for Aircraft N792: N279_28May2017_Waypoints.shp); and AircraftTailNumber_DayMonthYear_Tracklog_Points.shp, (e.g., N279_28May2017_Tracklog_Points.shp). See also Appendix SOP 7-1 regarding the file naming and pathway convention.

SOP 7.1.1 – DNR Garmin Setup

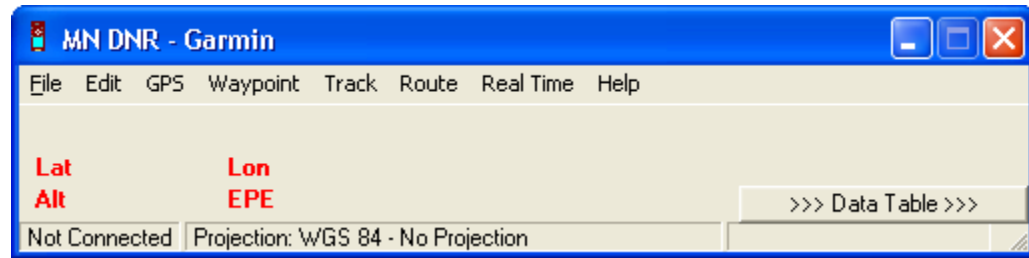
- 1) Turn on the laptop and open DNR Garmin.
- 2) Before downloading tracklogs and waypoints, you must set the projection in DNR Garmin. Select **File** dropdown menu → **Set Projection**. This will open the DNR Garmin Properties window, 'Projection' tab. See screenshots below.



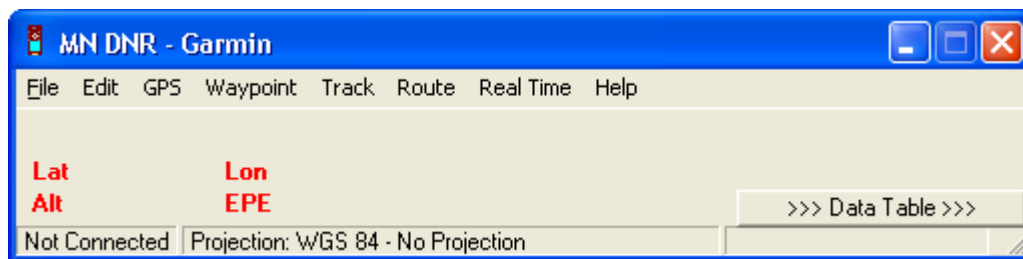
- 3) Select WGS84 from the pull-down list for Datum, and No Projection for Projections.



- 4) Hit OK. The main DNR Garmin page will now show your Projection as 'WGS 84 – No Projection'.

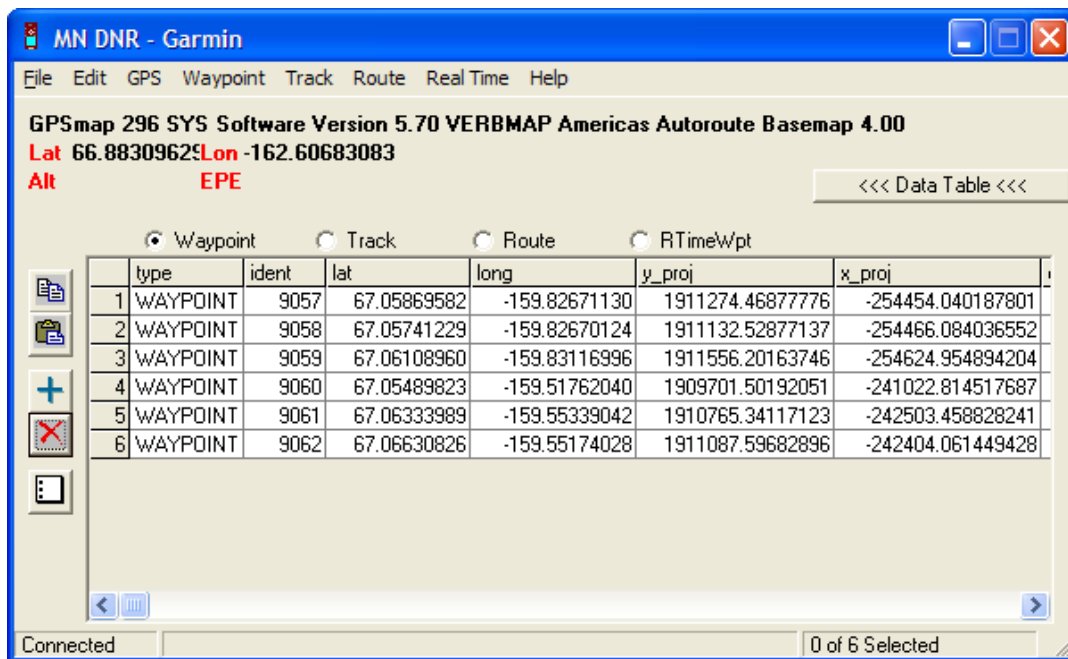


- 5) Using the USB cord (you can use the white USB cord from the Canon camera case if you don't have a Garmin-specific, black USB cord), connect the pilot's GPS unit the laptop computer and turn the GPS on.
- 6) DNR Garmin should recognize your GPS unit. If not, go to the **GPS** pull-down menu, and make sure **Set Port** is set to **USB**. Once connected, information about your GPS unit will show below the menu, above Lat Lon.

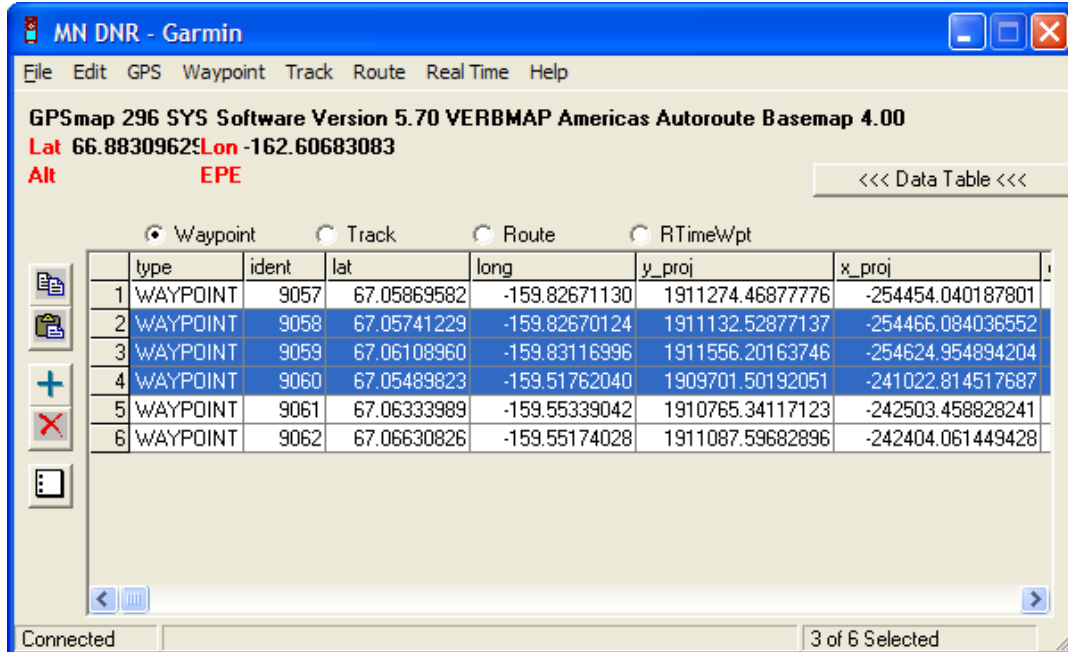


SOP 7.1.2 – Downloading Waypoints

- 1) Go to the Waypoint pull-down menu, select Download, and DNR-Garmin will download your waypoints (see screenshot below). This may take some time.



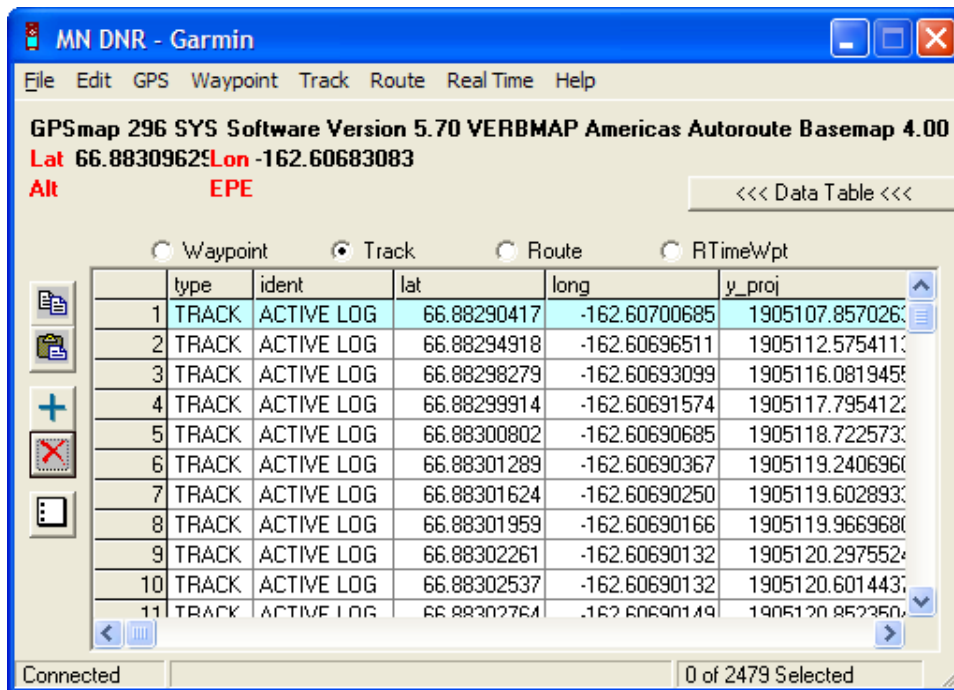
- Highlight all waypoints that you want to save. This step is necessary because the pilot's GPS will likely have lots of unrelated waypoints and the more waypoints you select for downloading, the longer the process takes. You can scroll to the right to see the date and just download waypoints with today's date.



- 3) Go to the File pull-down menu → Save to → File. Pick the file location (e.g. **C:\ARCN\Bears\UpperNOAT2017\PilotsGarmins\N792_28May2017\Waypoints**).
- 4) A Save As window will open. For 'Save as type:' choose 'ArcView Shapefile (Unprojected) (*.shp)'.
- 5) Name the waypoint file using the tail number, date and the word Waypoints (e.g., N792_28May2017_Waypoints.shp).

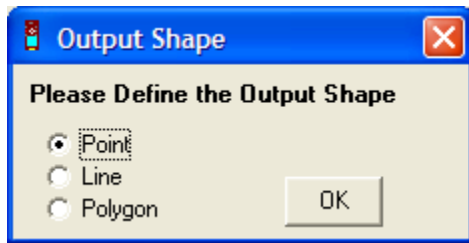
SOP 7.1.3 – Downloading Tracklogs

- 1) Select the Track pull-down menu → Download. This download will take considerably longer than the waypoints download because you should have a few thousand points.



- 2) Highlight all TRACK points that you want to save. They should all say 'ACTIVE LOG' in the 'ident' column. Again, you can scroll to the right to see the date and just download points with today's date.
- 3) Go to the File pull-down menu → Save to → File. Pick the file location (e.g. **C:\ARCN\Bears\UpperNOAT2017\PilotsGarmins\N792_28May2017\Tracklogs** (see also Appendix SOP 7-1)).
- 4) A Save As window will open. For 'Save as type:' choose 'ArcView Shapefile (Unprojected) (*.shp)'.
- 5) Name the tracklog file using pilot's initials, date and the words 'Tracklog_Points' (e.g., N792_28May2017_Tracklog_Points.shp). Do not enter the projection into the name yet.

- 6) **IMPORTANT:** The exception for tracklogs (compared with waypoints) is that you will be asked for the output shape after navigating to the directory and typing a filename. **Please select 'Point'** – see below. Be careful, the default is 'Line'.



- 7) If you want to, you can repeat steps 5 and 6 and save another shapefile as a line shapefile.

SOP 7.1.4 – Checking the Waypoints and Tracklog Shapefiles

- 1) Make sure that you have waypoints and tracklog shapefiles where you saved them. There will be 4-7 files for each waypoint or tracklog shapefile. They should all have the same name (e.g., N792_28May2017_Waypoints – with different extensions for each: *.shp, *.prj, etc.).
- 2) Check your waypoints and tracklogs by adding them to your ArcMap project's map view. If asked to choose a Geographic Transformation to bring these WGS84 shapefiles into your ArcMap project, select Nad_1983_To_WGS_1984_2 (ArcMap 10.0, not available in 10.1 or 10.2 but it will suggest another option – go with it). If they don't project, or display in the map in the wrong area, go to SOP 7.1.5.

SOP 7.1.5 – Projecting the Waypoints and Tracklog Shapefiles

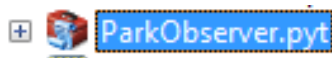
- 1) If your tracklogs and waypoints don't project or display, select the Search function and search for Define Projection. Select your waypoint or tracklog shapefile as the Input Dataset or Feature Class. Set the Coordinate System by clicking the browse button, then select Geographic Coordinate Systems → World → WGS 1984.prj. Click OK, and OK again.
- 2) If step 1 doesn't work, open Excel and open the .dbf file of your shapefile there. Save this as a .csv. Open ArcCatalog and navigate to your .csv file. Right click on this file, select 'Create Feature Class' and then select 'From XY Table'. Set the X Field as the 'Long' field from the *.csv (not the projected long field, just the Long field). Set the Y Field as the 'Lat' field from the *.csv. Click on the 'Coordinate System of Input Coordinates' button and navigate to the WGS84 coordinate system (Select→Geographic Coordinate Systems→World→WGS 1984.prj). Specify where you want to save the shapefile. Now you should have a shapefile in WGS84 coordinate system.

SOP 7.2 – Downloading Data from Park Observer in the Evening

To bring data into ArcMap:

This feature is for those who cannot access the Park Observer server on the NPS wireless network, and those that want to view/edit the data collected in ArcMap while still in the field.

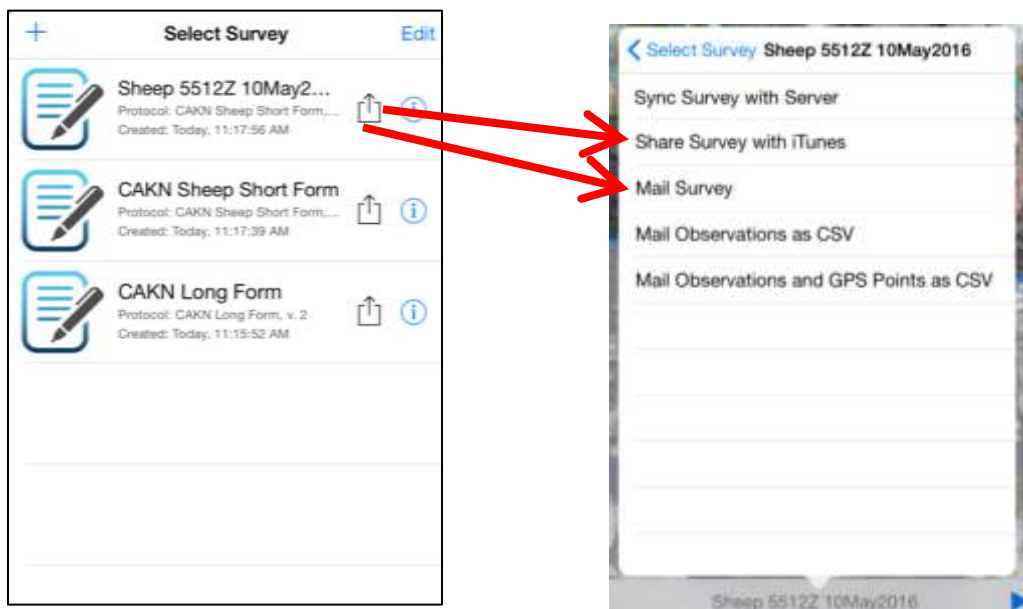
1. Make sure you have the latest version of the Park Observer app (1.2.0; confirm you have the newest version with AKRO GIS website prior to heading into the field) and save the Park Observer Toolbox (ParkObserver.pyt) on your PC. You should also have ArcMap and ArcCatalog on this computer.



2. Tap on your Survey file at bottom center (e.g., BearN792_28May2017). See the example from the sheep surveys below. The “Select Survey” dialog box will open and the list of options will show.
3. Tap on the share icon (square with up arrow) next to the survey to share



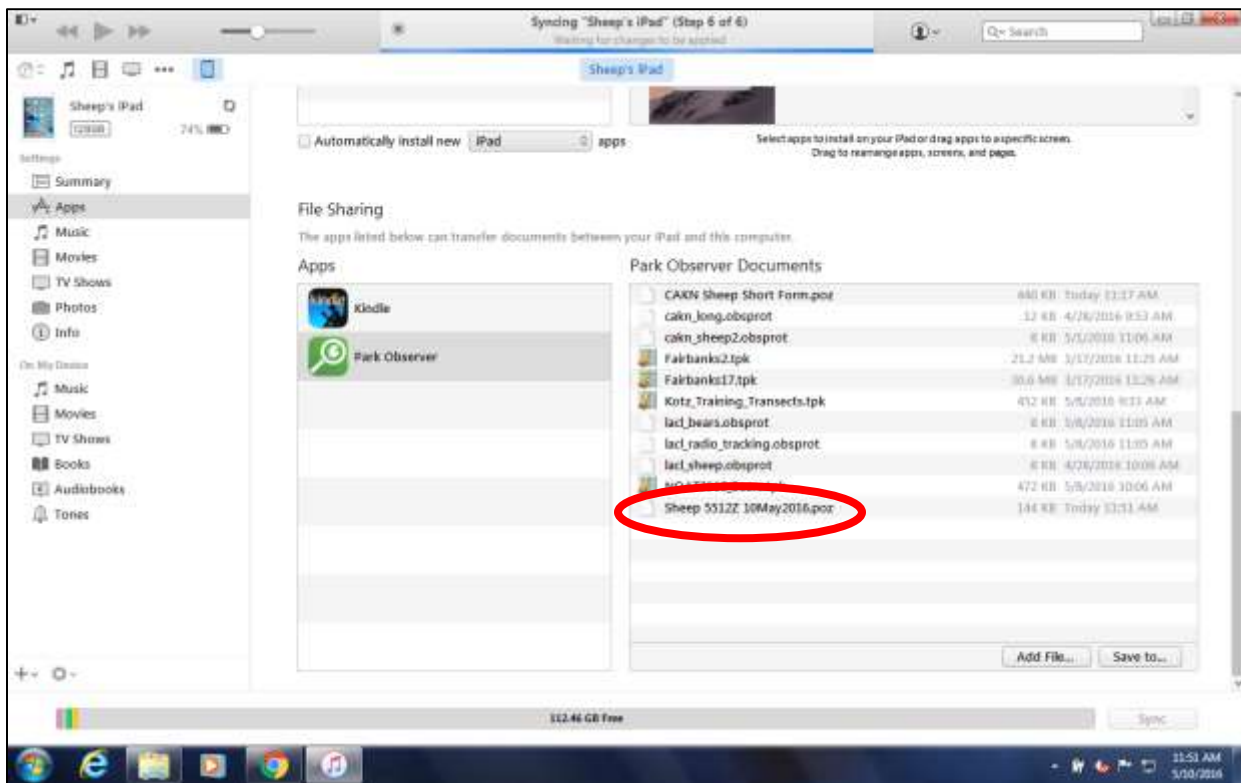
4. Tap on *Share Survey with iTunes*. If you are somewhere with wifi, you can also *Mail Survey* and the .poz file will be sent from the iPad’s email account.



5. Connect your iPad to an ArcGIS PC and start iTunes.

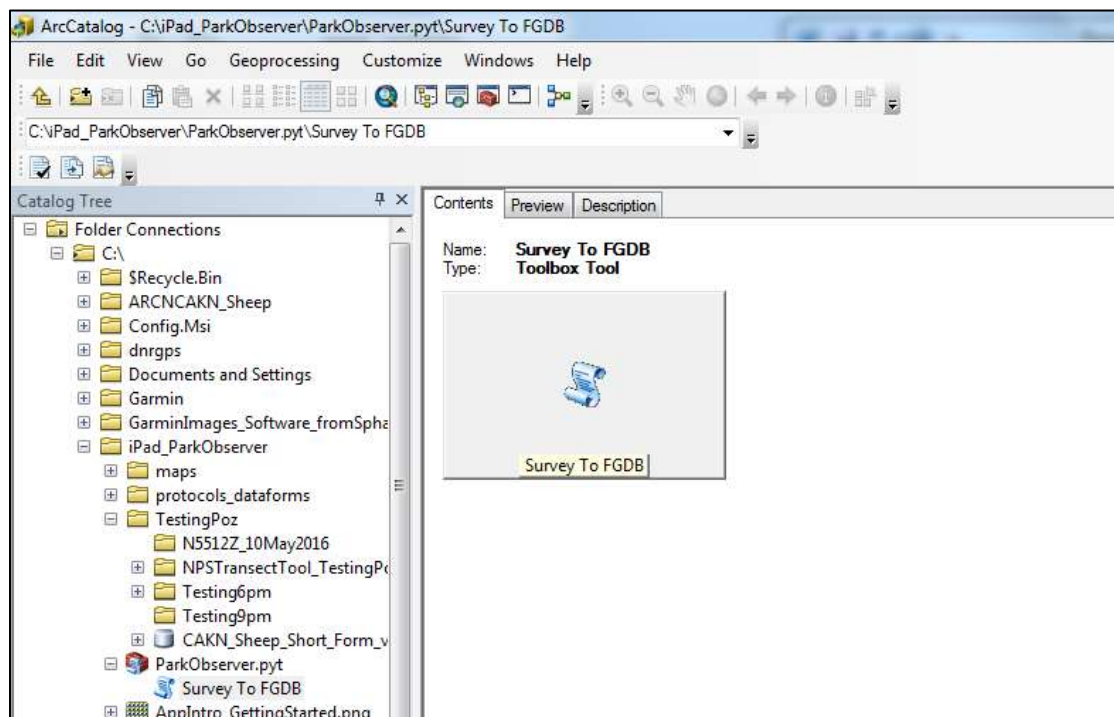
*NOTE: Ensure that iTunes on the computer is not logged on to an account. From the iTunes home screen, click “Account” on the top menu and select “Sign out”. If further difficulties arise, try signing the iTunes on the iPad out as well. Access by going to the “Music” icon at the bottom of the home screen, click on the icon with a small red head in a circle, and select “Sign out”.

6. Select your iPad in iTunes, then Apps from the left hand list for your iPad, then scroll way down to where your apps are listed and select Park Observer. On the right hand side you'll see a list of your maps (.tpk), your protocols (.obsprot), and your data files from today and any previous days (.poz). Highlight your .poz files and click "Save to..." to save your .poz onto your laptop. Save these in the same folder for your survey. The file name should reflect what you called the file for the day on your iPad (e.g., for bears BearN792_28May2017 or Sheep_N5512Z_10May2016 for sheep [below]).

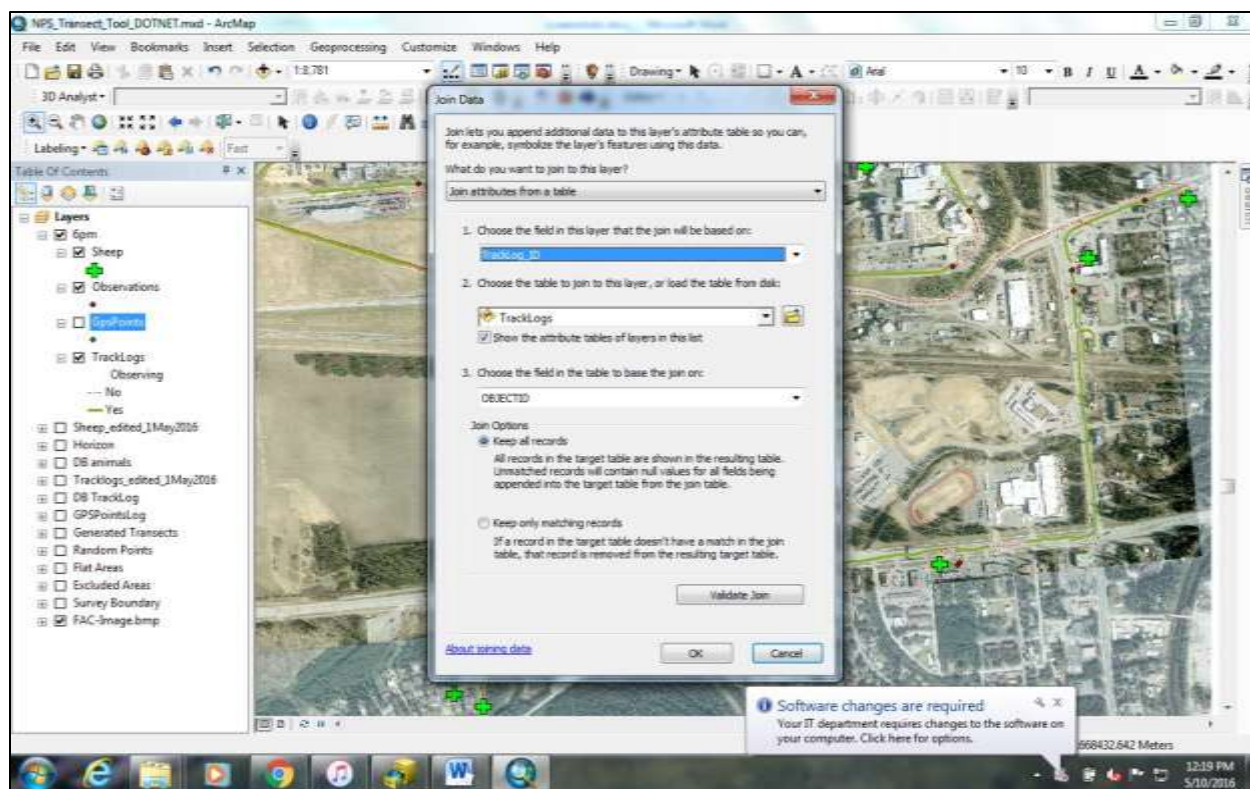


7. Open ArcCatalog.
8. In ArcCatalog, browse to the location where you saved the Park Observer Toolbox (ParkObserver.pyt) file downloaded in the first step. Click on the .pyt to open the toolbox, *Survey to FGDB* tool – it will show in the right hand window in ArcCatalog (see screenshot below).
9. Double click the *Survey to FGDB* tool.

**** NOTE **** If there is a red X over the .pyt or the tool, you can close and reopen ArcCatalog and try again, or just fully open the iPad folder where you have the .pyt so that the folder contents are shown in the Contents window on the right side of ArcCatalog (see below). Do that once or twice and it should reset without the red X and be ready to go.



10. There is only one input to this tool: the poz file from step 6. Select it and click OK.
11. When the tool is done, it will have created a FGDB (file geodatabase) in the same folder where you saved your (*.poz) file. The FGDB is named to match the survey protocol name and version (e.g., ARCN_Bears_2017.gdb). The FGDB will include feature classes for the tracklogs, gps points, various kinds of observations and relationships among these various feature classes. If you have data from previous days in here, today's data will be appended to those within the database. Pretty slick. Just be sure you're making backups of this file geodatabase if you're also editing those files in the field.
12. Open the ArcMap project in your survey file (e.g., UpperNOAT2017_BearSurvey.mxd). Move the GPSPoints, Tracklogs and Bear feature classes from today's gdb into ArcMap. You can change the color, icon shape, labeling, etc. for these on the display.
13. Join the GPSPoints feature class to Tracklogs using the Tracklog ID field in GPSPoints to match the OBJECTID field in Tracklogs (see below).
14. Next Join the Bear feature class to GPSPoints. The GPSPointID in the Bear feature class matches OBJECTID in GPSPoints. BUT – if you need to delete bear detections, you need to remove the joins on the Bear feature class first. You can edit them, but you can't delete if it's joined.



15. Steps 13 and 14 thus link the bear detections with their respective sampling units so you can look and the bear and sampling unit # will be in there. This might help for labeling or display as you start editing data.
16. If you need to fix today's data (i.e., bear, den, or track detections), follow ARCN/CAKN Sheep SOP 11 for editing/processing these data in ArcMap. The Tracklogs file is a line file that is a combo of the old DBTracklog and Generated Transects feature classes in the old ArcPad system and Sheep should correspond with DBAnimals from the old ArcPad system.
17. To save, insert the thumb drive into the laptop computer, and save the folder housing today's data to the following file path. For example,

C:\ARCN\Bears\UpperNOAT2017\iPad\PozFiles\AircraftTailNumber_DayMonthYear

For example, for aircraft N792 flying bear surveys on May 28, 2017:

C:\ARCN\Bears\UpperNOAT2017\iPad\PozFiles\N792_28May2017

To set up again for the next day:

- 1) Create a folder on the thumb or external hard drive with the following naming convention: AircraftTailNumber_DayMonthYear (e.g., F:\ARCN\Bears\UpperNOAT2017\iPad\PozFiles\N792_29May2017 where F:\ is the thumb or external hard drive).

- 2) Turn off and charge the iPads for tomorrow.

The filing system is delineated in Appendix SOP 7-1. You may need to create this filing system for your survey on day one of the survey.

SOP 7.3.3 – Editing the Survey Data

If you discover that the GPS lost signal during the survey and some, but not all of your data are missing, you can use the pilot's tracklog and waypoints and the data sheets to edit the points in Park Observer on the iPad prior to downloading, backing up or emailing data. This is a way to salvage the data if the GPS loses contact with your reality. You may have to edit or add the bear and den information as well by moving or creating waypoints on the iPad within Park Observer. It is best if this is done by the observer right after the day's survey is completed, however, all of this can be done later in the office by the Project Manager, but please clarify that this needs to be done with explicit notes on your data sheets.

SOP 7.3.4 – Updating the Sample Units Flown by Aircraft on the Overview Map and pilot-observer team maps

When surveys are completed each day, the large master overview map at the base(s) needs to be updated with all of the plots that have already been flown by different aircraft. This can be done by making a slash across the units flown using a sharpie. Observers should also update their team's paper 8.5"x11" (or 11"x17") map.

SOP 7.3.5 – Backup of Survey Data Edits

If you've made edits, save your edited files to the base's laptop using the file locations and naming conventions above. You can also e-mail the files (whether or not you have internet) or back them up on another thumb or external hard drive.

SOP 7.4 – Downloading and Filing Photographs

- 1) Create a folder filing system (see Appendix SOP7-1) for an example of the filing system) for the photographs you will be downloading from the camera.
- 2) Download the photos to from the camera and save them to the file pathway as shown in the following example with photos from aircraft N792 on May 28, 2017 while surveying Unit 12a: C:\ARCN\Bears\UpperNOAT2017\Photos\N792_28May2017(add initials of observer if more than one observer flies in the aircraft)\N792_28May2017_Unit12a_Bear1.jpg
- 3) Please delete all blurry photos.
- 4) Also if there's time, please weed through the remaining photos to select the best 1-3 photos for each bear group and re-label the photos with more details. If more than 1 photo is taken of the same bears or wildlife, label them consecutively as photo 1, 2, 3, etc. Please use the following examples as a guide when relabeling photos:

- N792_28May2017_Unit12a_Bear1.1.jpg

- N792_28May2017_Unit12a_Bear1.2.jpg

SOP 7.5 – Checking Paper Datasheets

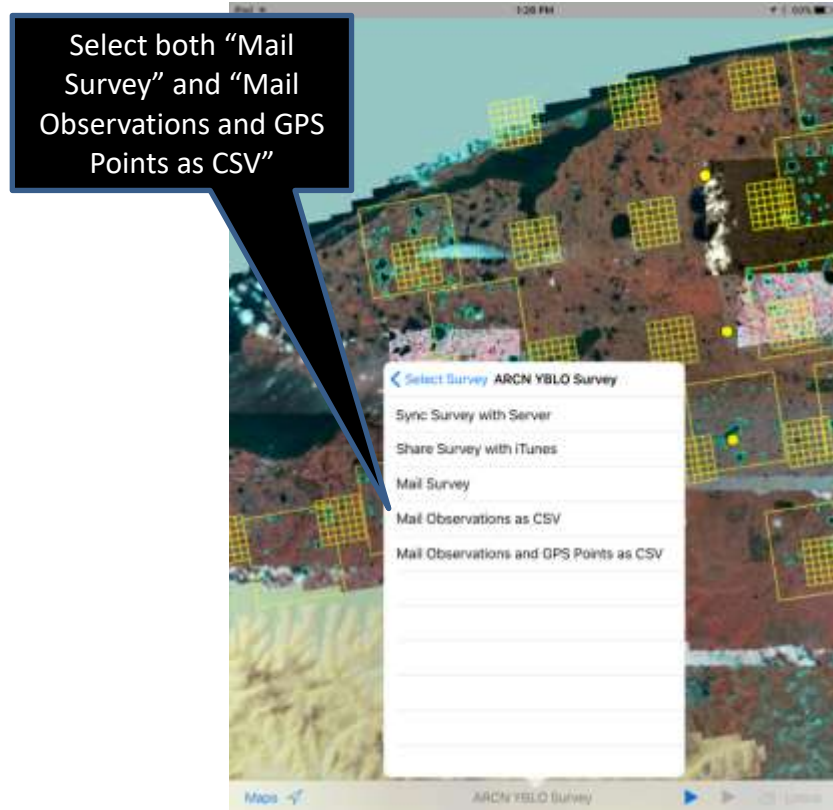
Check any notes on your paper datasheet and make those edits in ArcMap ([see SOP 7.3.3](#)) if you have time in the evening or on a weather day. If you don't have time the same day that you collected the data, clarify your notes for the Project Manager.

SOP 7.7 – Backing up Data by Emailing Survey Data from the iPad in Park Observer

At the end of each survey day, whether you have internet or not, email the day's survey data to back it up. Select the survey protocol with today's date and then tap the "open rectangle with an arrow at the top" icon:



This will open a dialog box with email and survey back up options (this example is from loons).



You will select "Mail Survey" and "Mail Observations and GPS Points as CSV." If you have internet, email the survey data at the end of each survey day. **Even if you don't have an internet connection** and the email is not sent, **it will be backed up in the sent folder**. Use the subject line in the email:

“BearObsData_DayMonthYear_AirplaneTailnumber_ObserverInitials.” Here’s an example email subject line:

“BearObsData_28May2017_N792_HLR”

Note: DO NOT USE BACKSLASHES in any survey protocol names or email subject lines. It will interfere with the ability of Park Observer to email the data.

Email the data to the PI’s -email address.

SOP 7.8 – Data Backup

All data will be backed up on a thumb drive each day that survey flights occur. Set up the same filing system on the thumb drive as you have on the base airstrip’s laptop computer (Appendix SOP 7-1). Each day, after you have downloaded and processed all data on the main laptop computer, copy each pilot-observer team’s data to the filing system on the thumb drive or external hard drive.

SOP 7.9 – Preparing Equipment for the Following Survey Day

Each evening after the data is downloaded, ask the pilot to clear the tracklog on his/her Garmin GPS unit. Erase all photographs on the camera. Plug in and charge the iPad, satellite phone, external battery packs, and camera battery. Update all sample units surveyed today on the master map on the wall and each pilot-observer team’s paper map. Pack everything else into your survey back pack for the day, including the pilot’s GPS unit.

SOP 7.10 – Final Steps at End of Survey Day

Make sure you have closed out properly with Denali Dispatch (see SOP 1). Check in with your pilot and the Project Manager to make plans for the following day assuming the weather will cooperate again. Then, and most importantly, eat, drink water and go to sleep, early.

Appendix SOP 7-1 – Sample Data Filing System

The data storage and backup filing system for data or photos should be as follows, using data from May 28, 2017 and aircraft tail number, “N792” as the example.

For the iPad -

C:\ARCN\Bears\UpperNOAT2017\iPad\PozFiles\N792_28May2017(add initials of observer if more than one observer flies in the aircraft)

For the Camera/Photos -

C:\ARCN\Bears\UpperNOAT2017\Photos\N792_28May2017(add initials of observer if more than one observer flies in the aircraft)

\\N792_28May2017_Unit12a_Bear1.jpg OR

\\N792_28May2017_Unit12b_Bear2.jpg OR

\\N792_28May2017_Unit13c_Muskox1.jpg

For the pilot's GPSs –

C:\ARCN\Bears\UpperNOAT2017\PilotsGarmins\N792_28May2017(add initials of observer if more than one observer flies in the aircraft)

\\Waypoints

\\N792_28May2017_Waypoints.shp *[will be several files per shapefile]*

\\Tracklogs

\\N792_28May2017_Tracklog_Points.shp *[pilot's 296/496 tracklog]*

Appendix SOP 7-2 – Regional Office Information

Below are instructions for downloading and installing Park Observer, making maps, and viewing data in ArcMap. Please see the Alaska Regional Office GIS Team website for updated information (<http://akrgis.nps.gov/observer/no-wifi.htm>).

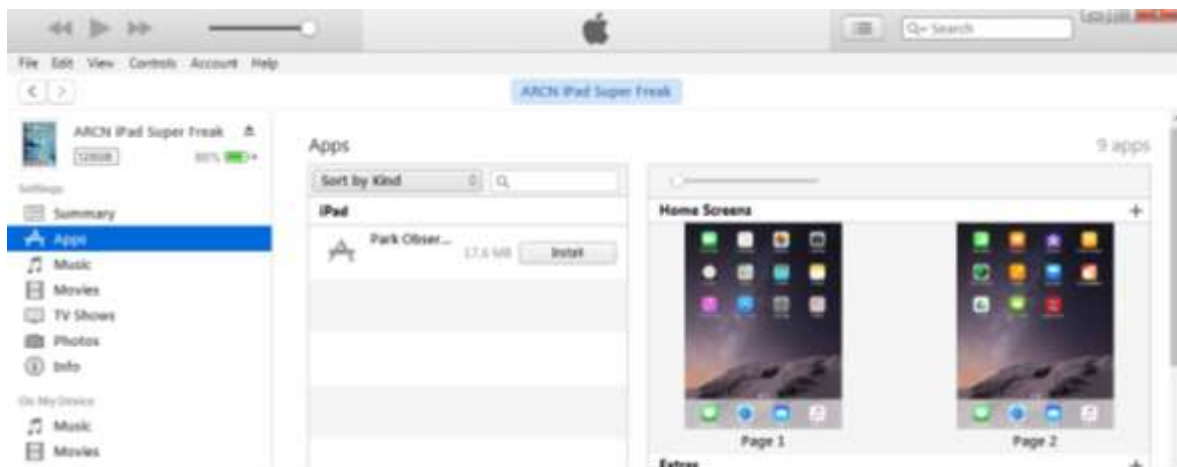
Installing without wireless (any office but AKRO):

1. Go to the Alaska Region NPS GIS shop website to look for the latest set of instructions and version of the iPad Park Observer app and the associated .obsprot for the bear survey.
2. Go here for Park Observer downloading <http://akrgis.nps.gov/observer/no-wifi.htm>. Download the application package (Park Observer v1.2.0 [or the most recent version]) and the Park Observer Toolbox (ParkObserver.pyt) to a PC or Mac with iTunes. As of this writing, the latest is v1.2.0.
3. Connect your iPad to your 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 - You do not need to be on the network or connect to the iTunes store. Nor do you need to have an iTunes or iCloud account, or authorize the device on the PC. Make sure no one is logged into iTunes – to check, select the “Account” menu from the main screen and make sure you see “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”.

5. Click "Allow" in iTunes when prompted to allow access to the connected iPad.
6. Click the "Trust" alert on your iPad.
7. Select the iPad icon at the top left of the iTunes window to see the details of your iPad.
8. Click on Apps in the list on the left of the iTunes window.
9. Click the small icon “File” at the very top left and select Add File to Library... (or press Control-O).
10. Browse to and open the file downloaded in the first step. Or drag the download from step 1 onto the app page in iTunes.
11. Click the Install button next to Park Observer in the list of Apps (see screenshot below).

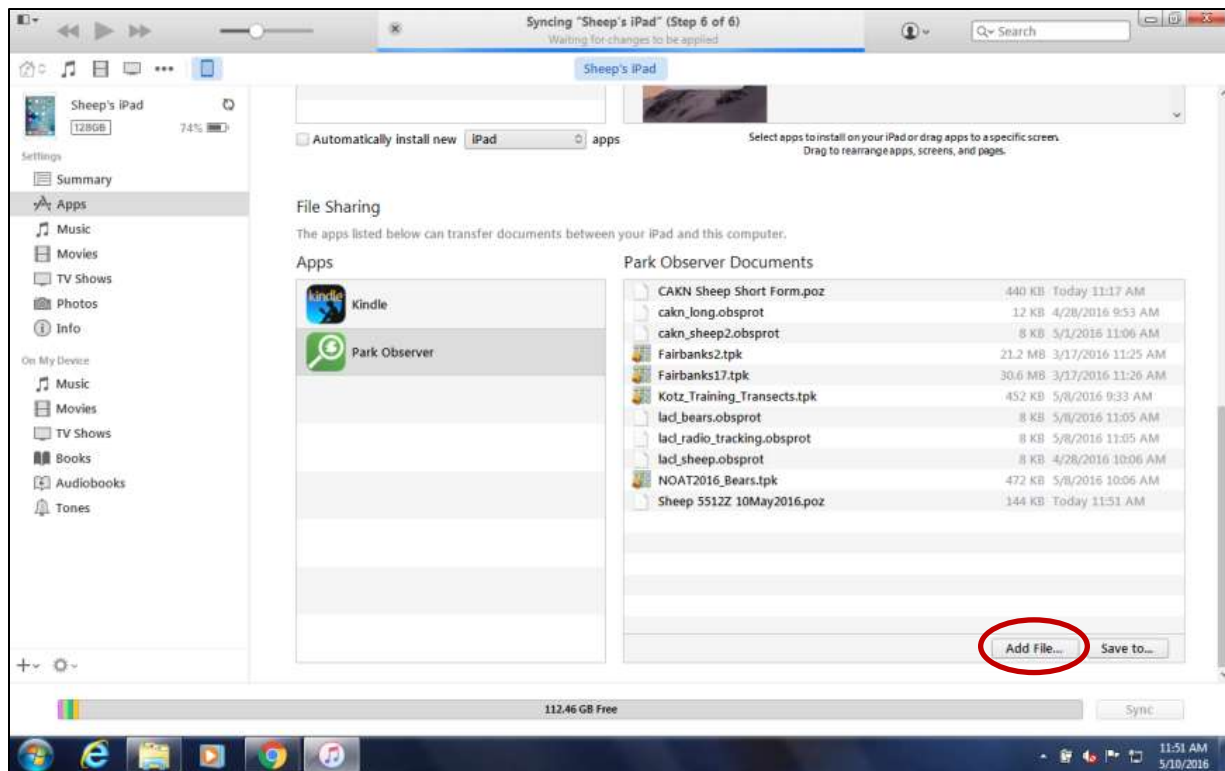
*NOTE - Permission for the Park Observer application to run on your iPad expires every year, and the application will refuse to launch. This is a licensing limitation imposed by Apple. You should always download the latest iteration – the version name may be the same, but the license will then be good until the following year. Be sure to download and install the latest version. You should also update your iOS on your iPads as versions < 10 will not be supported in the near future. For maximum security, keep your iPad OS updated. At the time of this writing, the current version is 10.3.1. You can check/upgrade in the general tab of the Settings App.



12. Click on the Apply button at the bottom left of the iTunes window.
13. Installation progress will be reported in the banner at the top of the iTunes window (e.g., “Syncing Apps. . .”)
14. When done, click the eject button next to the name of your iPad, but leave the iPad attached to the computer.

15. Tap the Park Observer App icon on the iPad.
16. An "Untrusted Enterprise Developer" alert will appear, tap Cancel.
17. Tap on the Settings App icon and navigate (scroll down) to General -> Device Management -> National Park Service and tap on Trust National Park Service.
18. Press the Home button (round actual button at base of iPad).
19. Tap the Park Observer App icon on the iPad.
20. Tap Allow when asked if Park Observer can access your location.
21. Download maps (.tpk)* and protocols (.obsprot – the latest version as of this writing is **arcn_bears2.obsprot** [ARCN Bears v2.0]) from the server – or get these from the survey PI. Save these to a file on your computer.

*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 your iPad(s).



22. Reattach iPad to the computer. It should appear as a device in iTunes.
23. In iTunes, click on your iPad under Devices in the left sidebar in iTunes.
24. 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 your device.
25. Scroll down the list of apps (scroll way down), and select Park Observer.

26. Scroll down some more. At the bottom right is a button to add files to park observer. Click the Park Observer button on the left and navigate to where your maps (tile caches [.tpk]) and protocols (.obsprot) are and “Add File” the maps and protocols downloaded in the previous step. See screen shot below which is from the sheep survey but will look similar for bears or other .obsprot and survey types.
27. Hit Apply. When it’s done syncing, click Done and then eject the iPad from the laptop.

Background Maps (AKA Tile Packages or .tpk)

These instructions are borrowed from the AKRO GIS website (<http://akrgis.nps.gov/observer/no-wifi.htm>). Please see this website for the latest and greatest instructions, and also for existing tile package base maps for your area (maybe you don’t have to recreate one ☺)

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. You can use any image or vector datasets that you like in your map, however you can **NOT** use proprietary online basemaps (like Google, Bing, or ArcGIS).

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 your map – display background imagery and any unit boundaries or transect lines, set symbology, labeling, scale dependencies, etc. to your liking and based on your background image (e.g., bright royal blue lines show up on topos but may not show well on aerial photos).
3. Zoom to the full extents of the area you would like to have in the tile cache. To minimize file size you should make the area as small as necessary.
4. Export the map by selecting File->Share As->Tile Package from the ArcMap menu
 - a. Tile Package Tab
You will want to save the package to a file. Give it any name you want. When done, this file can be loaded into the app via iTunes.
 - b. Tile Format Tab
You will want to leave the Tile scheme as *ArcGIS Online / Bing Maps / Google Maps* and Tile Format as *PNG*. You will want to leave this at 17 or lower, unless you have a very small survey area, and need a very high resolution of data. 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. Generating an entire park at level 17 may take several hours or more. I would experiment with small areas and low zoom levels to get a feel for how long it takes, and what zoom level gives you adequate resolution. Be

aware each increase in zoom level will quadruple the size and time it take to generate the tile cache.

c. Item Description Tab

As a minimum, you are required to provide a Summary and Tags.

5. Load the tile cache you just created on to your device with iTunes.
6. If you want the tile cache to appear in the list of basemaps available to all users contact Regan Sarwas. If you do this the .tpk will be available for future surveys

Installing Basemaps

1. Download an existing basemap to your computer or build your own with ArcMap (see above).
2. Scroll down to the File Sharing section at the bottom of the page.
3. Click on Park Observer in the File Sharing list. The panel to the right shows the Park Observer files.
4. Drag and Drop the maps from step one to the list of Park Observer files, or use the Add button to browse to your maps.
5. Some maps are quite large and may take a few moments to copy onto the iPad, monitor the progress at the top of the iTunes window.
6. When done, click the eject button next to the name of your iPad.
7. Tap the Park Observer App icon on the iPad.
8. Tap the Maps button at the lower left of the Park Observer screen.
9. If your new map does not appear, refresh the map list by pulling down on the list (press on the list and drag your finger down before releasing.)
10. To use a basemap, tap on the map in the list.

Installing Protocols

1. Download an existing protocol (i.e., .obsprot – the latest version is arcn_bears2.obsprot [ARCN Bears v2.0]) to your computer.
2. Tap the Survey button at the bottom middle of the Park Observer screen. (The survey button may be labeled 'Select Survey' or with the name of the current survey.)
3. A protocol is used to create a new survey, so tap the '+' icon at the top left of the survey list to see the list of protocols.
4. If your new protocol does not appear, refresh the protocol list by pulling down on the list (press on the list and drag your finger down before releasing.)
5. To use a protocol, tap on the protocol in the list, and a new survey will be created from the selected protocol.

Using Park Observer

This figure is from **SOP 2** (Figure 3) and **SOP 6** (Figure 4) and shows a conceptual model of how to use Park Observer on the iPad. Detailed instructions of setting up Park Observer on the iPad and using Park Observer to collect data are in SOP 2 and SOP 6, respectively.



View data in ArcMap

This is for those who want to view/edit the data collected in ArcMap while still in the field.

1. In SOP 7.2 you used the *Survey to FGDB* tool to create a FGDB in the same folder as the survey's (*.poz) files. The FGDB is named to match the survey protocol name and version
2. The FGDB will include feature classes for the tracklogs, gps points, various kinds of observations and relationships among these various feature classes. Just drag and drop all the feature classes into ArcMap and symbolize/select to your heart's content.