

## ***User Manual for GrassSnap (Apple Version)***

GrassSnap is a useful tool when monitoring your pastures and grasslands. GrassSnap will take you through the monitoring process step-by-step.

GrassSnap meets the requirements for the NRCS Nebraska CSP monitoring activity (PLT-02), but is flexible and can be adapted for most monitoring systems.

The Photo Point, Photo Plots, and Nebraska Grazing Indexes for the Sandhills and western native range can be recorded for each transect. The app stamps the pasture/transect name, GPS location, date, and direction looking on each photo point, plot, and data.

Image Name: r29a-2013-Aug-13 point  
GPS co-ordinates: 41.922250,-100.684983  
Date: Aug 13, 2013, 2:24:04 PM CDT  
Direction: 0 N



Photo Point- landscape view

Image Name: r29a-2013-Aug-13 plot 1  
GPS co-ordinates: 41.922250,-100.684983  
Date: Aug 13, 2013, 2:24:14 PM CDT  
Direction: 0 N



Photo Plot- detail view

### **What is Photo-Monitoring?**

Photo-monitoring is the simplest way to monitor short- or long-term changes in pasture and rangeland. This orderly collection, analysis, and interpretation of resource data can evaluate progress towards meeting management objectives quickly and easily. Photographs alone provide a wealth of information, but must be accompanied with other information such as plant and weather data to realize the full potential.

Photographs of the same site over time allow you to see differences at a glance. A photograph is truly “worth a thousand words”. Photo-monitoring is repeatable and makes it easy to compare year to year changes in vegetation cover, growth, and density.

Photographs can show:

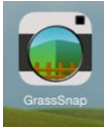
- the condition of the pasture
- type and relative abundance of species
- ground cover and standing forage
- evidence of erosion (wind or water)
- effects of fire, late freeze, drought, hail, grasshoppers
- healing of problem areas (washouts, control of cedar trees).

At a minimum, photographs should include a Photo Point and Photo Plot. For more intense monitoring, a Photo Point can be accompanied with several Photo Plots of that area. A picture is qualitative, so other methods are needed for quantitative data.

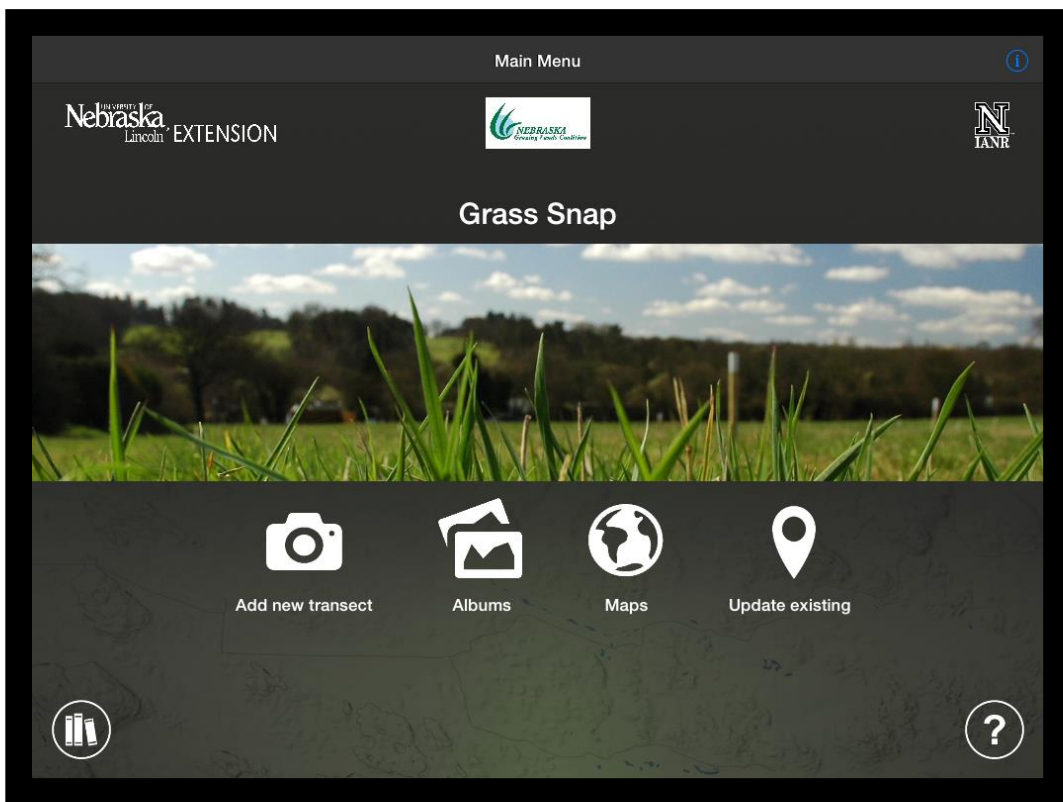
## Downloading GrassSnap to your Apple Device



To download the GrassSnap app on your Apple smart device, open the “App Store” icon on your smart device. Search for “GrassSnap”. Touch the GrassSnap icon. Click on “FREE” and then “INSTALL”. You may have to sign in to the iTunes store to download the app. Click on “OPEN” or exit out to your main screen. The GrassSnap icon should be on your main screen.

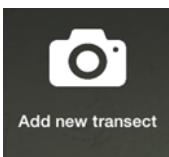


Click on the GrassSnap icon to open. The main menu of GrassSnap should appear. The Main Menu has four buttons (Add new transect, Albums, Maps, and Update Existing), a link to open the NebGuide on monitoring grasslands (book icon), videos on how to use the four buttons (question mark icon), and the *i* button has information about the app and feedback/suggestions.



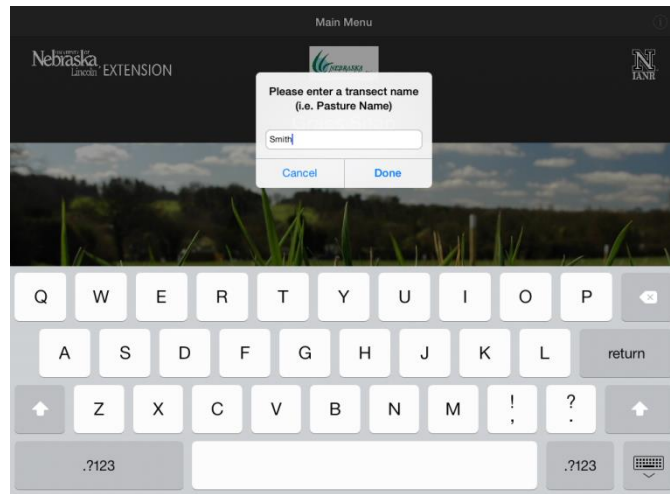
Let’s cover the four buttons on the main menu. The “Add new transect” will be the first button you choose when you begin monitoring. The “Albums” button stores all your photographs and data in pasture/transect folders by date. The “Maps” button shows your monitoring sites on google maps or lists the GPS coordinates for each transect.

## Add New Transect



Once you press the “Add new transect” button, GrassSnap will ask you to enter your transect name (or pasture name). You will type in the name of the pasture or monitoring site.

Enter the pasture name correctly, as this name will be used to name the photographs, data, and folders. The pasture name will be also be available for future monitoring of the site.



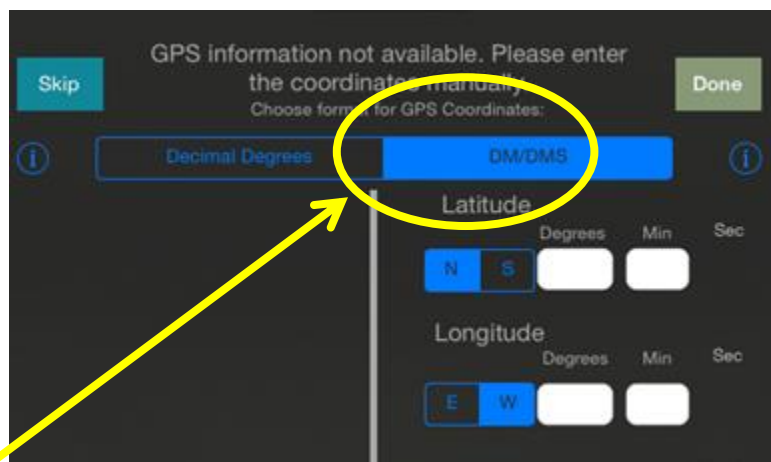
Press “CANCEL” to go back to the Main Menu. Press “DONE” when you are finished entering the pasture name. A warning will pop up to make sure your name is correct. If the name is not typed correctly, press “NO” to go back. Press “YES” to continue.

If you have cell service, GrassSnap will automatically enter the GPS coordinates of the monitoring site.

If you do not have cell service, GrassSnap will ask you to enter your GSP coordinates.

Symbols of GPS coordinates: ° is degrees, ‘ is minutes, and “ is seconds.

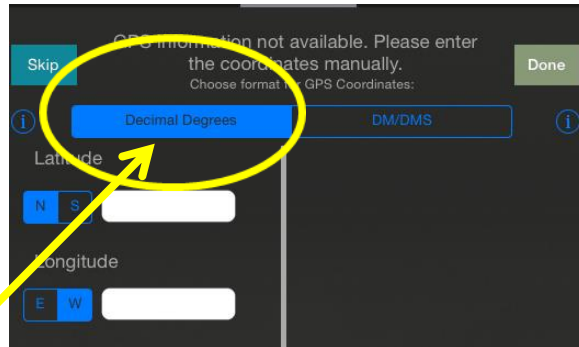
There are two types of GPS coordinates, depending on your GPS settings. You will choose one:



1) “DM/DMS” stands for “Degree-Minutes/Degree-Minute-Second”. Your coordinates will look similar to this:

Degree Minutes:                    N 41° 58.663’    W 100° 34.435’  
 Degree Minute Seconds:        N 41° 58’ 39”    W 100° 34’ 25”

Touch the white box to type in your numbers. Press the lower keyboard icon (bottom right hand side) to remove the keyboard.  
 Touch “Sec” to open up the seconds box.



2) “Decimal Degrees” is a pair of numbers. GrassSnap will convert and record all data in Decimal Degrees. I would suggest changing the settings on your GPS unit to “Decimal Degrees” before you begin monitoring.

Your coordinates will look similar to this:

Decimal Degrees:                    41.977745     -100.573833

Press “DONE” when you are finished entering your GPS coordinates for your field marker.

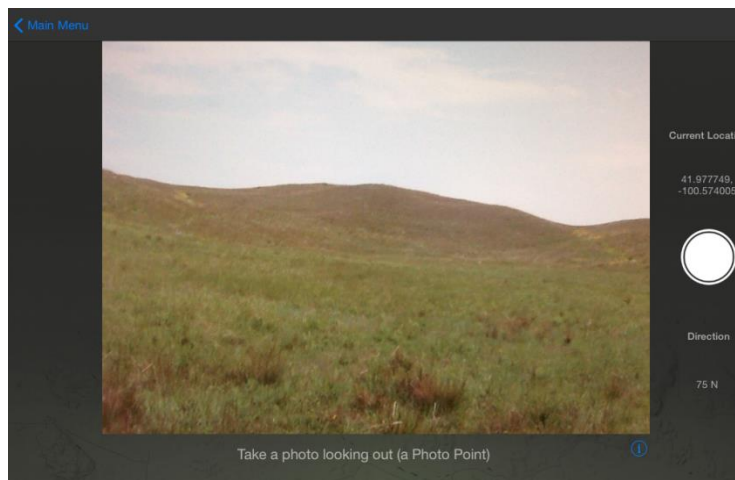
You may also “SKIP” entering your GPS location. However, all future photos taken for this pasture will have the GPS coordinates 0,0. *It is very important you enter your GPS coordinates for your field marker correctly the first time.*

Now GrassSnap will take you through the five steps to monitor your pasture.

#### PHOTO POINT- step 1

Take a photo looking out, known as a Photo Point. The Photo Point is a landscape view of the pasture. Standing at your field marker, look out to the horizon. Pick a point on the horizon and center your photo at this point. The land should account for ¾ of the picture, and the sky ¼ of the pictures.

Press the WHITE CIRCLE on the right hand side to take a picture.





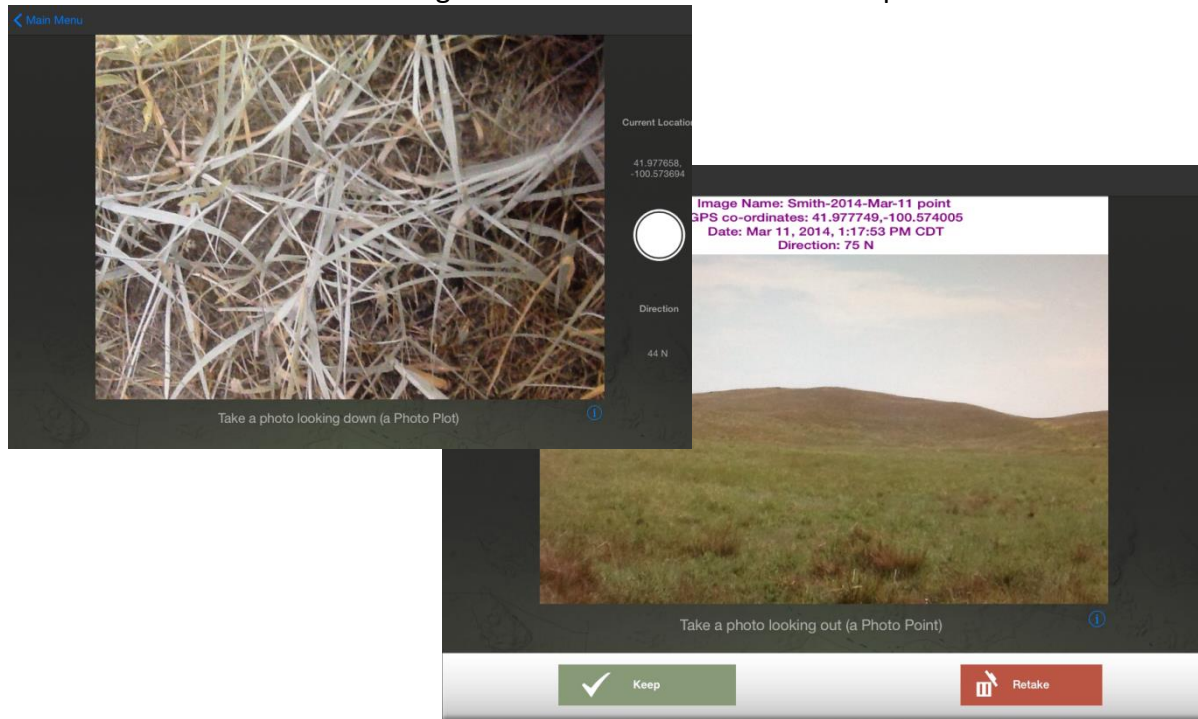
Press "KEEP" to save this picture. Press "RETAKE" if you do not like your picture and wish to take a new photo point picture. You will only take one (1) Photo Point picture per transect.

### PHOTO PLOTS- step 2

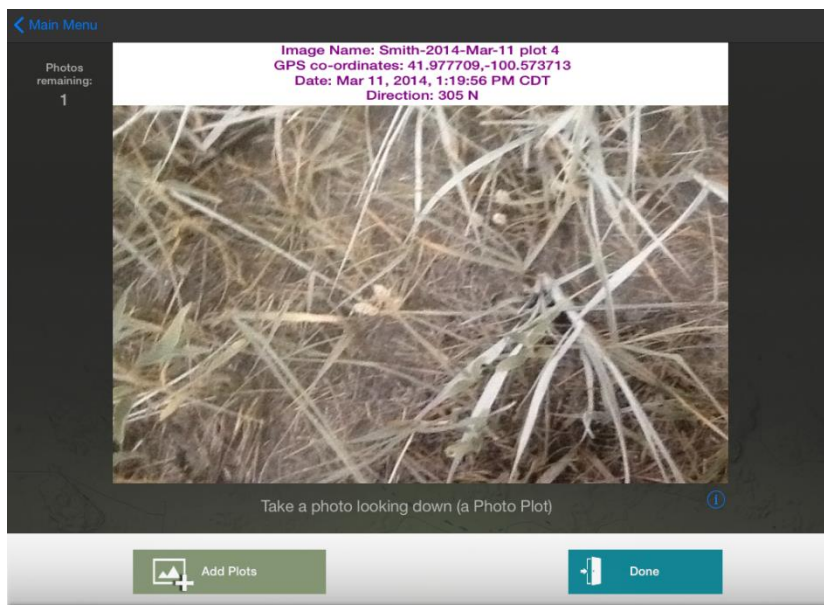
Next, GrassSnap asks you to take Photo Plot pictures. A Photo Plot is a detailed picture of the ground to record plant density, plant residue/litter, ground cover, or plant composition.

Looking straight down at the grass and soil. (A plot frame in the picture will give you reference to plant size and is recommended for all photo plot pictures.)

Press the WHITE CIRCLE on the right hand side to take a Photo Plot picture.



Press "KEEP" to save this picture. Press "RETAKE" if you do not like your picture and wish to retake the photo plot picture.



GrassSnap allows up to five (5) Photo Plots per transect. Press “ADD PLOTS” to take another photo plot picture. Press “DONE” when you are finished taking your Photo Plot pictures. In the upper left hand corner, the number of plot pictures remaining will help you keep track of how many plot pictures you have taken.

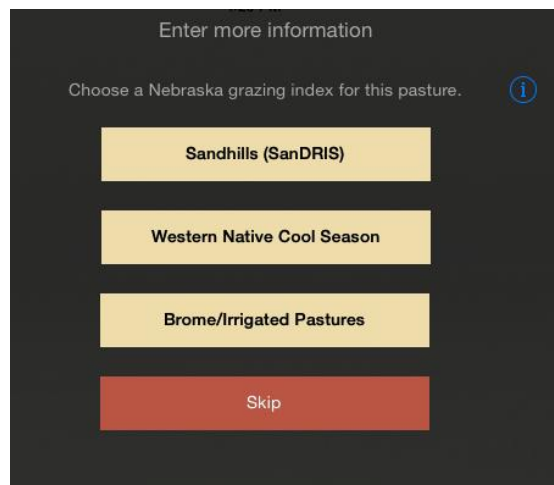
A total of six pictures can be saved in GrassSnap. However, if your monitoring system uses a different system than one photo point and several photo plots, you can use GrassSnap to capture your pictures. Just remember the pictures will be named Point, Plot 1, Plot 2, Plot 3, Plot 4, and Plot 5.

A warning will pop up if you have not taken all five Photo Plot pictures. Press “YES” if you are finished. Press “NO” if you did not mean to leave this screen.

### NEBRASKA GRAZING INDEX- step 3

Nebraska grazing indexes for the Sandhills and Western Native Cool Season pastures are available on GrassSnap. A grazing index helps producers set up grazing rotations based on when they grazed the previous year, precipitation, and residual.

Choose from the following four options:



1) SanDRIS (Sandhills Defoliation Response Index System) is for warm-season dominated Sandhill pastures. More information can be found at <http://drought.unl.edu/ranchplan/BeforeDrought/GrazingStrategy/DecisionSupportToolsforGrazing/SandhillsDefoliationResponseIndex.aspx>.

Touch the “Sandhills (SanDRIS)” button. Touch the box to highlight your selection for Season of Defoliation, Precipitation Regime (October to September), and End-of-Season Residual. Touch the *i* button at the end of the row for more detailed information about that category.

Write observations in the “Comment” box. Touch the gray box to bring up the keyboard. Type in your comments. Press the lower keyboard icon in the lower right-hand corner to lower the keyboard. Press “DONE” to continue.

A warning will come up to make sure you didn’t exit too soon. You can go back and make corrections or changes by selecting “Hold On!”. Select “DONE” if you are finished.

Your data will be saved with your photographs in the “Albums”.

2) For Western Nebraska Native Cool-season dominated pastures, there is the “Western Native Cool Season” button.

Touch the box to highlight your selection for Grazing Date, Precipitation (April to June), and Stubble Height of key species. Touch the *i* button at the end of the row for more detailed information about that category.

The screenshot shows a mobile application interface for entering information about a pasture. The title is "Enter more information" and the subtitle is "Western Nebraska Native Cool Season Dominated by western wheatgrass/needlegrass".

On the left, there is a "Comments:" section with a text input field containing "Late frost." and "89 pairs in April." Below the input field is a "Back" button.

On the right, there are three sections, each with an information icon (i) in a circle:

- Grazing Date:** A horizontal bar chart with seven segments for months: April (0), May (-1), June (-3), July (0), Aug (1), Sep-Oct (-1), and Nov-Mar (+3).
- Precipitation (April through June):** A horizontal bar chart with three segments: Well above average (+2), Near average (0), and Drought (-2).
- Stubble height of key forage species:** A horizontal bar chart with three segments: Excellent (+2), Adequate (0), and Poor (-2).

At the bottom, there is a "Total" field showing "-2" and a "Done" button.

Write observations in the “Comment” box. Touch the gray box to bring up the keyboard. Type in your comments. Press the lower keyboard icon in the lower right-hand corner to lower the keyboard. Press “DONE” to continue.

A warning will come up to make sure you didn’t exit too soon. You can go back and make corrections or changes by selecting “Hold On!”. Select “DONE” if you are finished.

Your data will be saved with your photographs in the “Albums”.

3) Grazing management information for smooth “Brome and Irrigated pastures” is also available.

The screenshot shows a mobile application interface titled "Brome - Irrigated Best Management Practices".

The subtitle is "Best Management Practices: Smooth bromegrass and irrigated cool-season grasses".

Below the subtitle is a list of best management practices:

- Rotational grazing with multiple grazing periods during the growing season will improve harvest efficiency and slow onset of plant maturity.
- Smooth bromegrass pasture stocked at proper stocking rates can tolerate multiple grazing periods during the growing season.
- Recovery (rest) periods should be greater than 28 days during the growing season.
- Graze no closer than a stubble height of about 4 to 6 inches.
- Initial grazing date in the spring can be as early as April 20-25 when tillers are in the third or fourth leaf stage.
- Avoid heavy fall grazing to minimize damage to newly emerged tillers.
- Spring fertilization (60 – 80 lb N/acre) (dryland) or spring to early summer on irrigated pasture (100 – 150 lb N/acre) will significantly improve production. <http://www.ianrpubs.unl.edu/epublic/live/g1977/build/g1977.pdf>
- Additional information on irrigated pasture can be found at: <http://www.ianrpubs.unl.edu/epublic/live/g1502/build/g1502.pdf>

At the bottom, there is a "Back" button on the left and a "Done" button on the right.

4) If none of your pastures fall into these ecosystems, press “SKIP” to proceed to the next step.

### NEBRASKA APPARENT TREND SCORE- step 4

The Apparent TREND is for estimating what you have now based on the potential of a standard ecological site. Comparing and looking back (usually 5-10 years) will show trend, if your management decisions are improving or harming your pasture health compared to the standard ecological site description.

This TREND score is specific for Nebraska, and may be required for the CSP monitoring activity (PLT-02). You may skip this section if you are not in Nebraska.

The screenshot shows the 'Nebraska Apparent TREND Scores' app interface. It features several input fields and sliders for data entry. On the left, there are sections for 'Ecological site' (set to SANDS), 'Reference plant community' (switchgrass), 'Current year precipitation' (set to Below normal), and a 'Comments' box containing text about calving pasture and sand bluestem. On the right, there are five sliders for 'Composition changes', 'Abundance of seedlings and young plants', 'Plant residue and litter', 'Plant vigor', and 'Condition of soil surface'. A 'Total' score of 1 is displayed at the bottom, along with a legend for the score ranges: >3: trending towards reference, 0-3: not apparent, and <0: trending away from reference. Buttons for 'Back' and 'Done' are also visible.

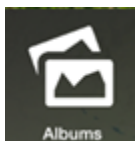
Choose an ecological site (range site). Pick from one of the Nebraska sites. Touch “Reference Plant Community” to type in the indicator species. Record your current calendar year’s precipitation.

Add comments by touching the gray box and bringing up the keyboard. Type in your comments. Press the lower keyboard icon in the lower right-hand corner to lower the keyboard. Press “DONE” to continue. Your data will be saved with your photographs in the “Albums”.

Choose the number in each category that best suits your observation. Touch the *i* button at the end of the row for more detailed information about that category. The app will total your score.

Choose “SKIP” if you want to go back to the grazing indexes. Pick “DONE” if you are finished. A warning will pop up- choose “Done” if you are finished. Choose “Hold On!” if you need to enter more information.

Success! You have completed monitoring your transect. Go back to the main menu to view your photographs and data in the “Albums”.

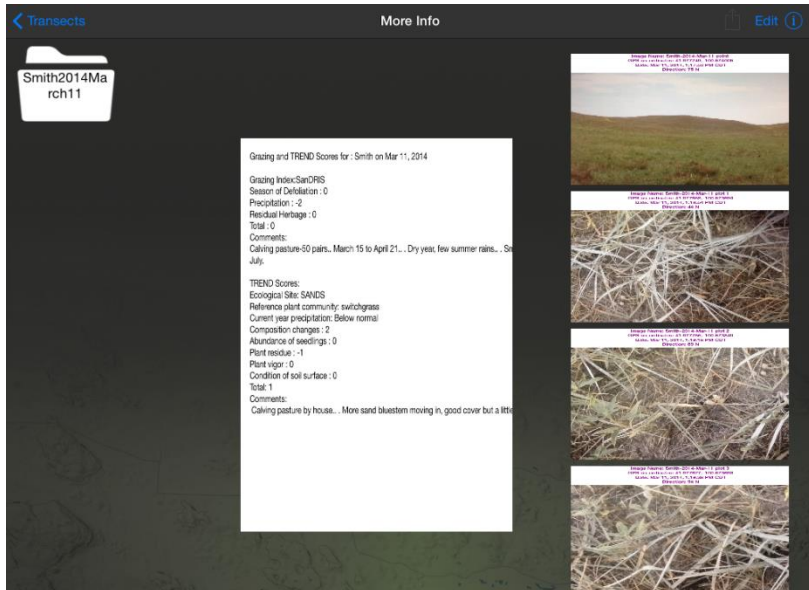


### Albums

When you add a new transect (i.e. pasture) or update existing pastures, the photographs and data are stored under the “Album” button.



Each transect name has its own folder. Click on a folder to open. If you have monitored at multiple dates, multiple sub-folders will be here. The photo point, photo plot(s), and grazing index and Apparent TREND data are stored here.



Touch the pictures to open a larger version. The grazing index and Apparent TREND data can be magnified by touching the data screen with two fingers, then moving your fingers apart.

### DOWNLOADING DATA

There are several ways to

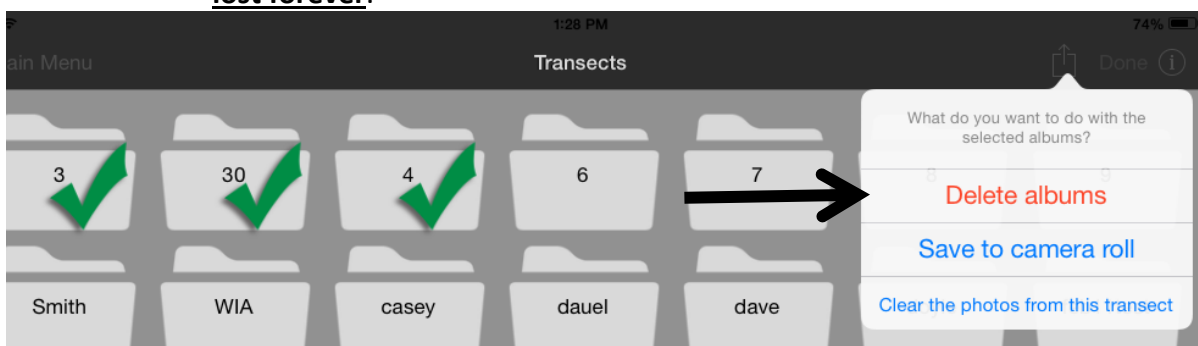
download your data. The easiest way to copy all the data and pictures for all the transects to your computer is using iTunes.

1. Hook up your Apple smart device to your computer.
2. Open iTunes on your computer and click on your device's name.
3. On the menu bar, navigate to the "Apps" section.
4. Scroll down to the "File Sharing" section.
5. Click on the GrassSnap app and then on the "Albums" folder.
6. Save to your computer.

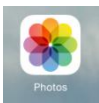
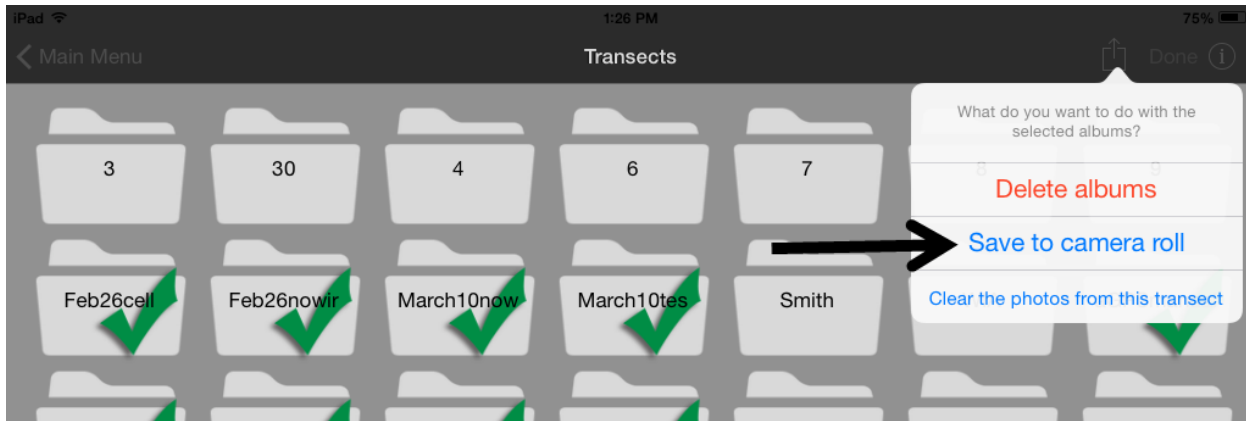
I would suggest copying or moving the pictures/data to My Documents on your computer. If you delete pictures on your iPad, iTunes may delete them on your computer the next time it updates.

If you do not have iTunes on your computer, you may save the pictures/data on your smart device, then download them to your computer.

1. On the Transect home screen, select "EDIT" in the top right hand corner.
2. Touch the folders you want to download. A green checkmark should appear.
3. Select the BOX ARROW icon.
4. You have three options:
  - a) Delete Albums- **DO NOT DO THIS** unless you **never plan to monitor** this site again, your folders, overlay, photographs and data will be **lost forever**.



b) Save to Camera Roll- this will copy the pictures/data to your smart devices photos. Click "SAVE TO CAMERA ROLL". It will take several minutes to download to the Photos.

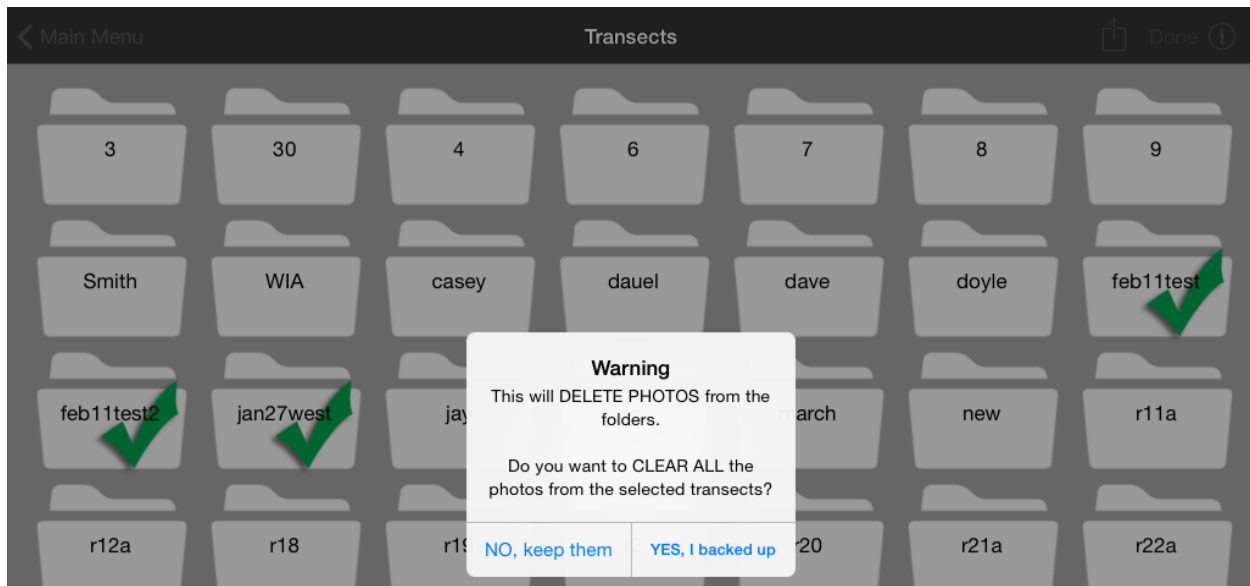


Exit out of GrassSnap. Click on the "PHOTOS" icon. Your pictures and data should appear here.

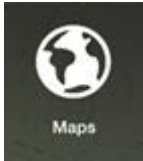
To download to your computer, plug in the smart device to your computer. Select your smart device folder. Select folders until you see the photos. Copy and paste into a folder on your computer.

c) Clear the Photos from this Transect- this clears the pictures/data from the folders, but leaves the folders in place for future monitoring.

*\*Use this button when you are ready to monitor again (**and have backed up your pictures/data on your computer**). This will free up memory on your smart device.\**



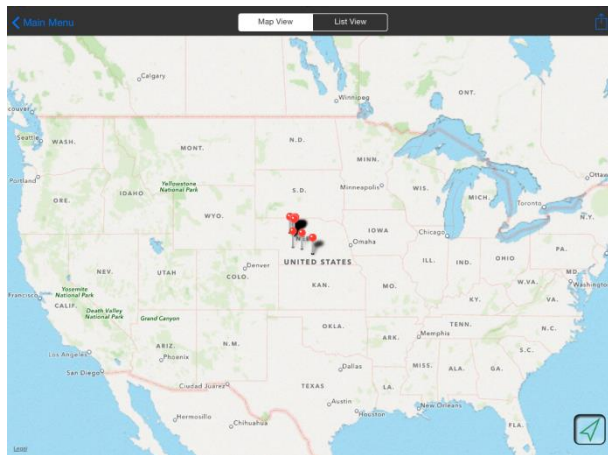
Select multiple folders (a green checkmark should appear). Select the BOX ARROW icon, then “CLEAR THE PHOTOS FROM THIS TRANSECT”. Your annual pictures/data will be deleted, but the folder and permanent data will remain for future monitoring.



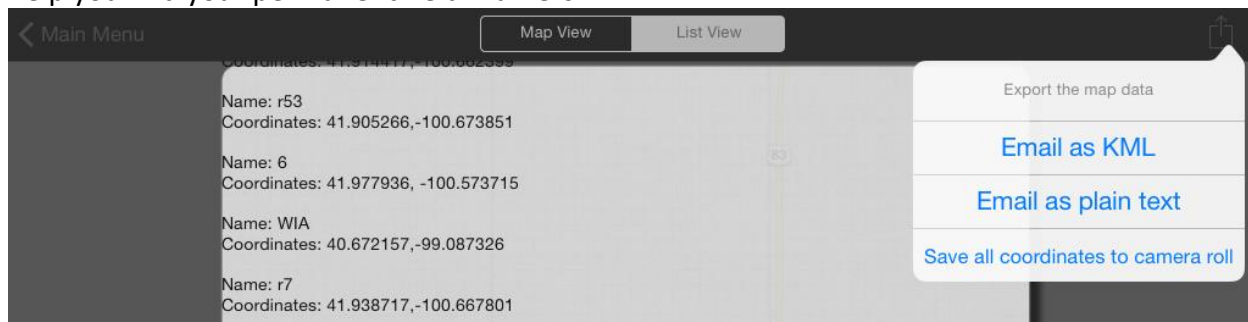
## Maps

When you add a new transect (i.e. pasture) or update existing pastures, the GPS coordinates are recorded.

The MAP VIEW is an easy way to visualize your monitoring sites on a google map. You may zoom in or out. Touch two fingers to the map and spreading them (zoom in) or bring your fingers together (zoom out).



The LIST VIEW has all the transects with their corresponding GPS coordinates (in decimal degrees). The LIST VIEW is helpful when you return to monitor your transects the next year. This will help you find your permanent field markers.



To export the GPS coordinates, select the BOX ARROW icon. If your email is set up on your smart device, you may email the coordinates as KML or plain text. Otherwise, you can save the coordinates to the “PHOTOS” on your smart device.



### Update Existing

After your initial monitoring of the transect, choose the “UPDATE EXISTING” button to monitor. You may scroll up or down to find your transect (i.e. pasture) name. Select the transect you wish to monitor from the list of names.

“UPDATE EXISTING” follows the same steps as “ADD NEW TRANSECT” with a few exceptions. Your original GPS coordinates will be saved (on the left hand side). If you have cell service, you will be able to view your current GPS location (on the right hand side). The original direction is also on the left hand side.

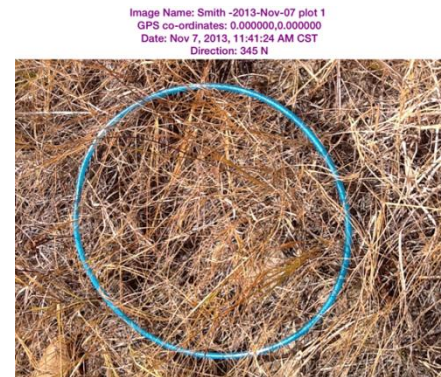
Touch the OVERLAY button to activate a transparency of the original photo point. If you are at the same permanent field marker, looking in the same direction, your OVERLAY transparency of the horizon should line up.

Continue to take a photo point, photo plot(s), and enter data in the grazing index and/or Apparent TREND. For more detailed steps, see Steps 1-4 under “Add New Transect”.

### Using your Collected Data

Monitoring grasslands provides valuable information, if we choose to use it. Data collected over multiple years helps managers decide if their grazing practices are headed in the right direction.

Photographs are good reminders of what the year looked like. The data also secures precipitation amounts, grazing dates, and how much grass was left after grazing. Looking over multiple years at the same location allows you to view changes. No two years of grass production is the same. Monitoring makes us focus on what we have, and helps us look ahead. Decisions we make this year will impact the health and production of the grass next year.



Below is advice from two rangeland specialists on what to do with your photo-point monitoring data:

*“I think a few things they should be looking for are trends (multiple years); either positive or negative. It is also important to remember that change in range can happen fairly slowly.”*



*If changes are happening, then it is important to look back at management and try to figure out why those changes happened. Put the pieces together.*

*Sometimes things like drought, hail, or other disturbance can result in visible changes fairly quickly, but stay the course through these... 2 steps forward, 1 back. That's OK.*

*Key multiple years changes to look for are desirable grass species, increased cover, plant density, litter/residue, productivity, etc. Local precipitation records are also important to complement the monitoring data."*



*"The photos will be good reminders of what the year looked like. The data should be able to give a ranch manager a range of production potential and what the plants are on their place compared to what it should be. With time they will be able to make their own stocking rate; which is what they are really after (proper stocking rate keeps the land productive). They already know that each year does not have the same grass production, but they'll never have a handle on what that amount is without the collected data. After a while they will really pay attention to healthy plants and fall precipitation. They will really learn best how to stock and when to set the "trigger points" of when to increase, or more likely to decrease, animals based on rainfall, hail, grasshoppers, early frosts."*

If GrassSnap has been helpful in your monitoring operation, we would appreciate your feedback and comments (send to [bjohnston3@unl.edu](mailto:bjohnston3@unl.edu) or fill out "Feedback" on the app).