LandPKS TRAINING GUIDE

USAID FROM THE AMERICAN PEOPLE

USDA

App version 3.1

PLEASE SEE LANDPOTENTIAL.ORG FOR MORE INFORMATION

Equipment needed to record, store, and share soil and vegetation data using LANDPKS apps

- Android or iPhone smartphone with GPS function.
- LandPKS mobile app downloaded from Google Playstore or iTunes App Store.
- Shovel for LandInfo.
- 1 meter/yard stick for LandCover

GET IT ON Google Play

Download on the App Store

Download the free app to get started!

Step 1: Starting The App (first time)

1. Open the app.
2. Select **'Add New Account'**
3. Select '**Sign-In With Google Account**' and enter password, or create an account.
4. Once you have signed in, you will be returned to the LandPKS homepage. The homepage is now a list of your locations, titled the **"My Locations"** page.
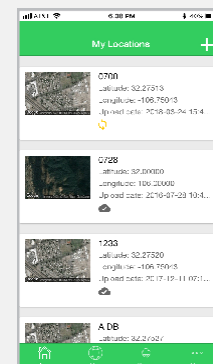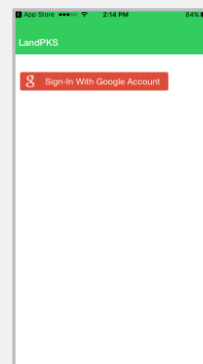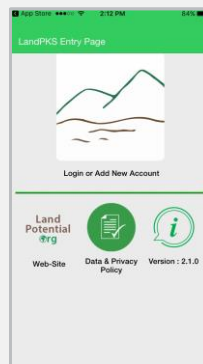
Step 2: Creating a New Site (every time)

1. Find the quick climate buttons in the top right corner.
2. Press the **'+'** in the upper right hand corner.
3. Enter your Site Name. Enter your location. If you do not know your location, select **"Obtain GPS"**. You will need to allow the app to access your location by selecting **'Use'** when prompted.
4. Once your site info has been entered, click **'Save"** in the upper right-hand corner.
5. Start entering data by clicking the Data Input Tab. This reveals data input categories for both LandInfo (top), and LandCover (bottom).
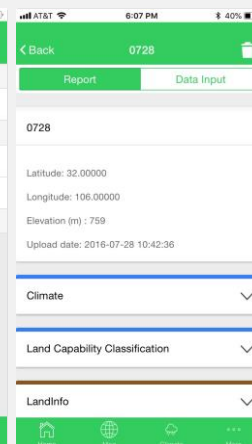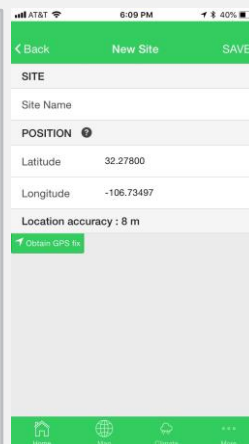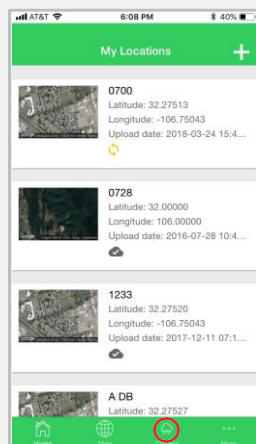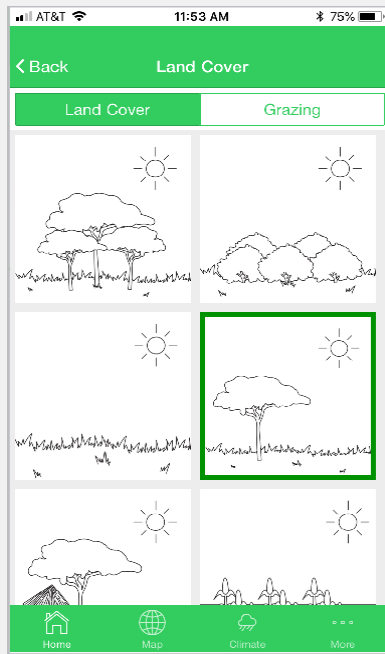
Click here for climate info

1. LAND COVER

Land Cover refers to the physical covering of the land you are analyzing and can help you understand how to better manage your landtype.

Choose the best match for land cover at the location.

2. GRAZING

Grazing characterizes whether the site being tested is grazed or not grazed.

Selecting the icon with the large, red **'X'** identifies your site as **"not grazed."**

If your site is grazed at any time during the year, select which type of grazing occurs at the site (cattle, goat, sheep, mixed species). You can select more than one.
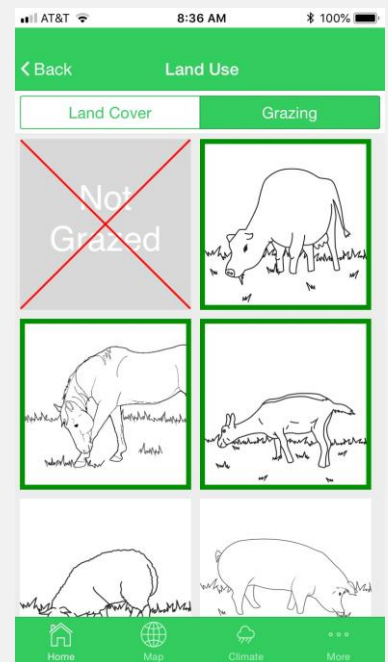
3. SLOPE

Understanding the Slope of your land is important to assess how rainfall will affect your land.

Choose a slope class OR use slope meter: look ACROSS the slope and align the long edge of the phone with the slope.
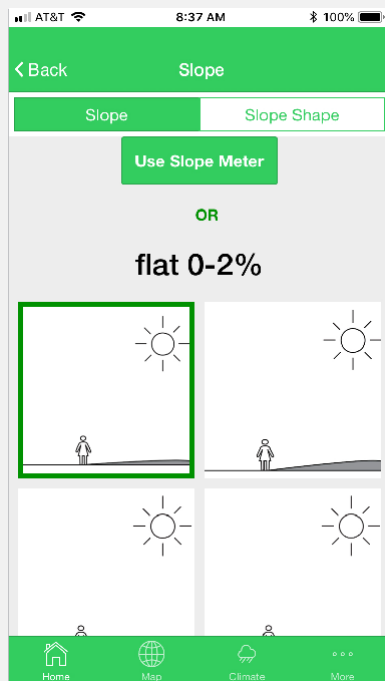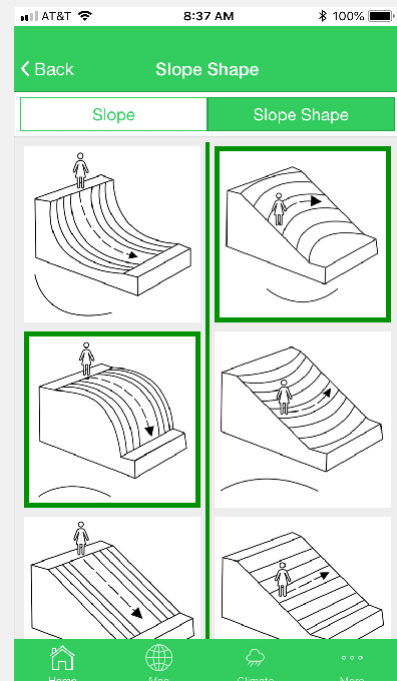

4. SLOPE SHAPE

Slope shape determines whether water will move faster (convex) or slower (concave) as it moves across the site.

It is used together with slope and soil texture to help predict how much water will soak into the soil.

Look DOWN the slope (left) and ACROSS the slope (right) for a 20-50m diameter area around the site.

LANDINFO MODULE (cont.)

5. SOIL TEXTURE

Determining your soil texture by depth helps indicate how efficiently water is infiltrating your soil, the water holding capacity of your soil, and how susceptible your land is to erosion.

The below steps should be repeated at each depth:

Rock fragment volume. Pick the best match.

Soil texture.
Option 1: pick from drop-down list.
Option 2: answer questions in **'Guide Me.'**
Option 3: Click on '?' in **'Guide Me'** to view short (<10 second) video tutorials.

If you hit bedrock, choose the bedrock depth in the drop down menu.

Go to **Settings >> Utilities>>Soil Texture** to use Soil Texture Guide Me function without creating a site.

6. SOIL LIMITATIONS

The Soil Limitations screen is used to indicate vertical cracks in soil, salt on soil surface, lime requirements, surface stoniness, water table depth, soil depth, and flooding.

These characteristics indicate limited plant growth and help determine Land Capability Classification.
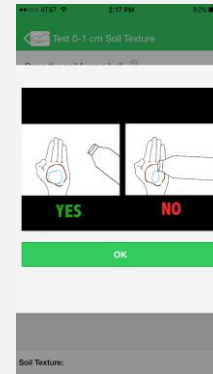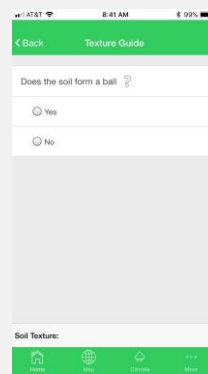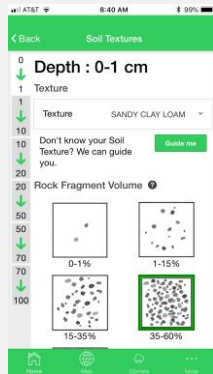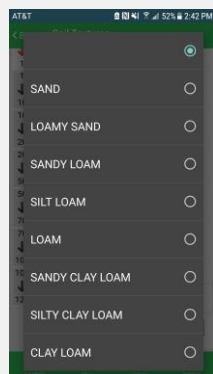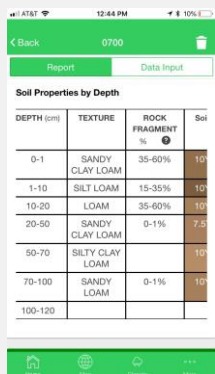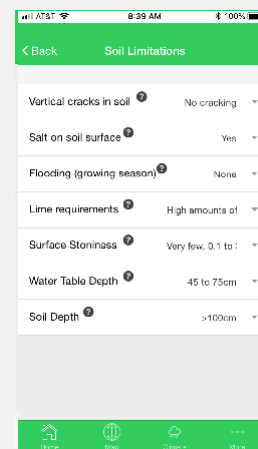
7. SOIL COLOR

Use the Soil Color tab to determine the color of your soil by depth. Soil color is useful for soil identification and determining other important soil qualities.

Step 1: Prepare soil sample by running dry soil through a sieve. Flatten the pile of soil.
Step 2: Place a color reference card next to the soil pile.
Step 3: In uniform lighting conditions (not direct sunlight), take a photo of the color card and soil about 10 to 20 cm above. Select Ok.
Step 4: Touch the reference card and then touch the soil sample. Ensure the correct reference card type, soil moisture, and lighting conditions are selected below.
Step 5: Select Save and the soil color results will appear.

Go to Settings to change reference card type and input source (Camera vs. Manual).

Go to **Settings >> Utilities>>Soil Color** to use Soil Color without creating a plot.

LAND CAPABILITY CLASSIFICATION

The Land Capability Classification System (LCC) has been used globally for land evaluation, as it determines land capability and risk of degradation by classifying the land into 8 classes.

To generate Land Capability Classification results on the Report page, complete the existing data collection steps including Soil Texture, Slope, and Soil Limitations

The first value is the LandPKS-determined LCC class. The number is the overall class, and the letters refer to the sub-class or most limiting criteria; to interpret this, simply click on the question mark for guidance.

The second value is the user-adjusted LCC. The user can change this value by turning on or off the different criteria. The user-adjusted LCC assists the user to conduct scenario assessment or tailor the LCC score to a specific context.

To understand each criteria, simply click on the corresponding question marks.
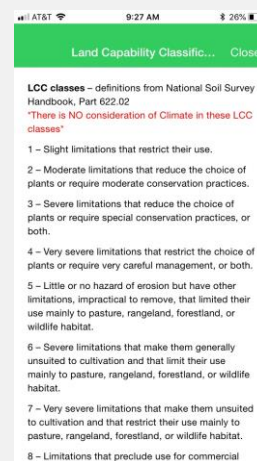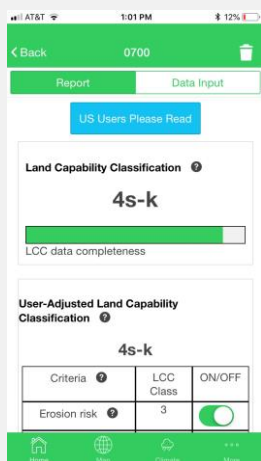
SUBMIT SITE

At any point in the data collection process, you can submit your data by clicking on "Synchronize Now" at the top of the Data Input page. Synchronization can be done at any point, and multiple times.

Once you submit your site, you are still able to modify or add data at any point. You can also now access your data on the Data Portal at *landpotential.org/data-portal/*
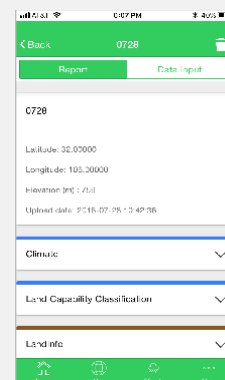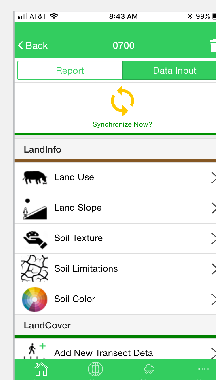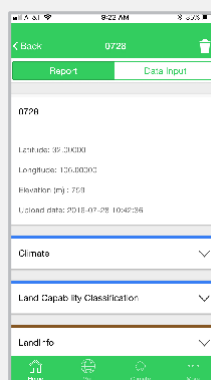
LandCover includes forms for entering vegetation and soil cover data for 20 1m sticks. There are 4 types of data (1-4 below). 20 minutes total/plot for all 4 methods for experienced users. Data can be collected with a meter or a yard stick as appropriate.

1 Meter
10 cm 20 cm 20 cm 20 cm 20 cm 10 cm

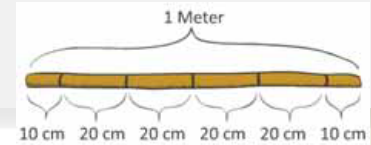## 1. Plant and Ground Cover

Plant and ground cover will tell you what percentage of the ground is covered by different types of plants, litter, rock, or not covered at all.

- Select your plot in the main menu. Click '**N'** to begin collecting data in the North direction.

- Start at your site's center point. Begin walking 5m North in a straight line. Drop the measuring stick randomly in front of you.

- Select '5m' in the app. Select the type of plant and/or ground cover that is present at each notch on the stick. Make sure to record only the plant and ground cover that are above or below each mark on the stick. Aim to be consistent.

- Continue collecting cover data every 5m until the end of the transect (laying down your stick when you stop at 5, 10, 15, 20, and 25 m from the center point).

25 m   20 m   15 m   10 m   5 m   Start
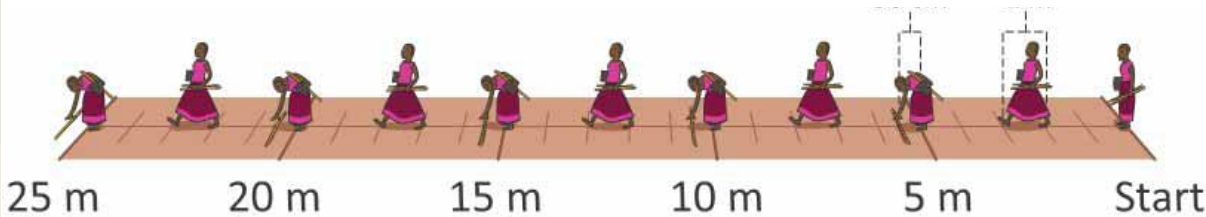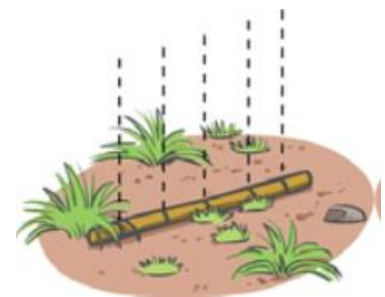
2. Basal/Canopy Gaps

This method will tell you what percent of the landscape falls in large gaps between bases and between plant canopies. This data would provide an important early warning indicator of future changes at this site.

- Gaps between plant bases: If the stick touches any kind of plant base in any place along the stick, select 'no basal gap.' If there is no plant base, select the **'basal gap'** icon.

- Gaps between plant canopies: If the canopy gap is greater than the length of the stick, select **'canopy gap.'** If there is a canopy gap smaller than the length of the stick, select 'no canopy gap.'

- Note: plant leaf or stem must be between 10cm and 2m in height. Canopies shorter than 10 cm or taller than 2m are not effective at slowing wind erosion.

3. Plant Height

Plant height data can be used to monitor changes in vegetation structure – or what percentage of the landscape is covered by tall versus medium versus short plants.

- Use a second stick to outline a box 1x1m in front of the stick.

- Identify the tallest plant part (branch, leaf, or stem) that is within this 1x1m box. Use the second stick to estimate the height of the plant part.

- Identify the height class of this plant part on the leftmost side of the screen.


4. Species Density

Plant density data is most useful for measuring changes in the abundance otf trees shrubs, and succulents when plant cover is low (less than 5%. This data would provide an important early warning indicator of future changes at this site.

- Use a second stick to outline a square box (1x1m) in front of the stick on the ground.

- Count the number of plants that are rooted inside the plot (the base of the stem is inside the plot).

- Record species counts in the rightmost panel of the 'Height/Gap' tab. You can enter counts for 2 species.

Repeat

Repeat these steps for each of the three other transects (East, South, West). Note: You can 'Submit' sites with partial transect data (incomplete transects). However, if you Submit your data, you will only be able to make edits on the Portal.
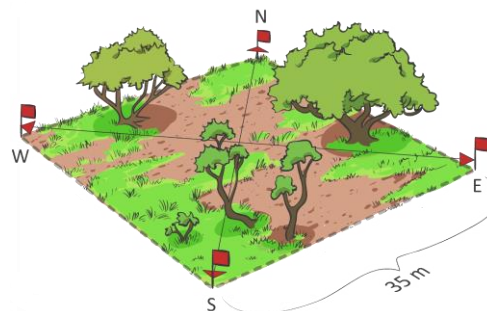
For more information, please visit www.landpotential.org

LandPKS is being developed to help users determine the sustainable potential of their land, including its restoration potential, based on its unique soil, topography and climate. The land potential assessments will be updated based on new evidence regarding the success or failure of new management and restoration systems on different soils. Our knowledge engine, together with mobile phone applications and cloud computing technologies, will facilitate more rapid and complete integration of local and scientific knowledge into land management. The current version (3.0, 2018) supports collection and automated storage and sharing of the basic information needed to determine land potential (LandInfo module). It also includes a LandCover module for vegetation inventory and monitoring.