DIMA Quick Start

Using the Database for Inventory, Monitoring and Assessment for the BLM AIM Strategy

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Table of Contents

Quick Reference of Common DIMA Tasks

| Task	Best done…	Frequency	Dependencies	Page Number
Basic DIMA Concepts				4
Initial Setup				
Import state species list	In the office	Once	Download state list from USDA Plants website	10
Import ecological site names	In the office	Once	Download ecological site names from NRCS	15
Add names/roles of people	In the office	Once initially, then as necessary	None	18
Import county names	In the office	Once	County name files included with DIMA download	13
Hide unused method forms	In the office	Once	None	9
Create community species lists	In the office	For new database, then as necessary	None, but can help to have existing plant inventory or other info for sites	20
Setting up a GPS unit	In the office	Once	GPS unit, GPS Tools .dll file	23
Data Collection				
Create Site	In the office	When first going to new site	None	26
Create Plot	In the office, or field	When establishing a new plot	Must have a site for plot to belong to	27
Plot-level species list	In the office, or field	Whenever new plot is created (copy existing or create new)	Plot must be created first	20
Add data (either at plot or transect level)	In the field	Whenever measurements are taken at an established plot	Plot must be created first	30
AIM Strategy Methods				
Line-point Intercept with Height	In the field	Multiple times per plot	Plot and transects must be created first	31
Species Richness	In the field	Once per plot	Plot and transects must be created first	34
Canopy Gap Intercept	In the field	Multiple times per plot	Plot and transects must be created first	36
Soil Stability	In the field	Once per plot	Plot must be created first	38
Rangeland Health Indicators	In the field	One per plot	Plot must be created first	40

Basic DIMA Concepts

The Database for Inventory, Monitoring and Assessment (DIMA) is a highly-customized Microsoft Access database for collecting data electronically in the field and for organizing, storing, and reporting those data for monitoring and assessment. While DIMA can be used for any number of different monitoring data collection needs, it is particularly well suited to collecting data for the BLM's Assessment, Inventory and Monitoring (AIM) Strategy following the BLM Core Indicators and Methods. It is much easier to use DIMA if you have a basic understanding of what data are being stored in it and how they are organized.

Sites, Plots, and Lines

There are three basic objects within DIMA: sites, plots, and lines (i.e., transects).
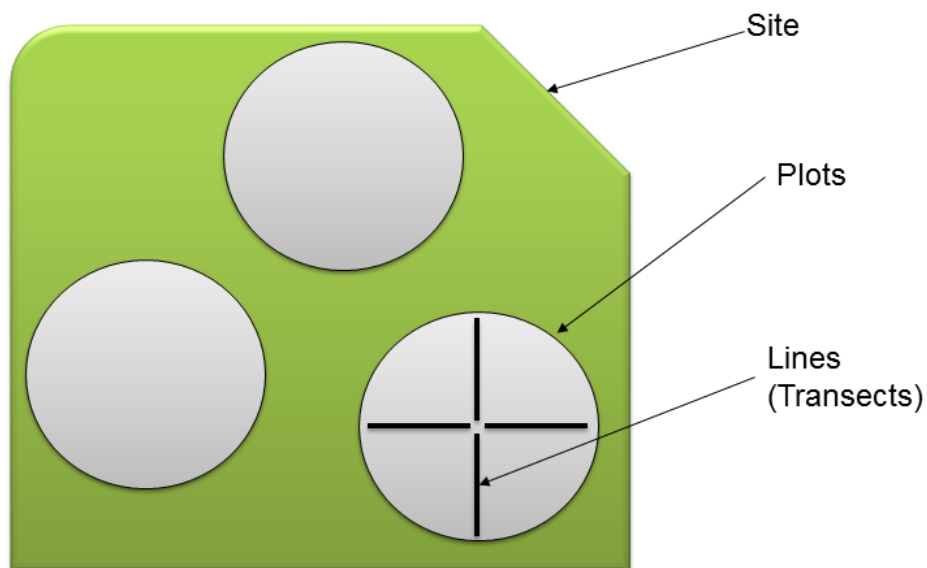
A **Site** is a large geographic unit that defines a management area of interest, and you must create at least one site before you can enter data. Sites can be whatever makes sense for management or monitoring. For example, if monitoring for grazing permits, an allotment might be a logical choice for a site. If the interest is in evaluating effectiveness of a restoration project, then the project area might be a site. In DIMA, sites have only a minimal set of information associated with them and do not have any explicit geographic information – they are just used as a way to organize the data. If you have data that could belong to more than one site (e.g., a restoration area within an allotment), you can use tags to track them (see Tags below).

A **Plot** is an area within a site where measurements are made. There are usually several or many plots per site. Plots contain specific information such as directions for how to get there, ecological site, a species list, and precise geographic coordinates. Certain methods such as species richness and soil sampling pertain to the plot itself.

A **Line or Transect** is a sub-measurement of a plot, and there can be multiple transects per plot. For many indicators (e.g., vegetation cover or composition), it is not possible to reliably measure or estimate the indicator for the entire plot at once. In this case it is common to sample smaller areas within a plot and use those measurements to estimate the indicator's value for the entire plot. One way of sub-sampling the plot is with measurements along transects or sub-plots along transects.

Methods

A method is a specific technique used to estimate the value of an indicator. For the AIM strategy, the methods are: Line-point intercept with vegetation height, plot-level species inventory, canopy gap intercept, soil stability, and soil sampling for toxins. Of these methods, line-point intercept with height and canopy-gap intercept are performed along transects. The other methods are performed at the plot level.

Geographic Information

In DIMA, precise geographic coordinates can be recorded for plot centers and for the start and stop locations of transects. When collecting data following the AIM protocol, it is sufficient to record only the plot center location.

DIMA can be set up to interface directly with a GPS unit for automated capture of coordinate values. Alternatively, the coordinate values can be typed in. While DIMA will allow you to record locations using any coordinate system, it is highly recommended that you 1) use the same coordinate system for all your locations, and 2) use the geographic (decimal degrees) coordinate system with the WGS84 datum. This will ensure that locations are consistently recorded and make it easier to merge datasets from different areas.

Species Lists

Part of what makes DIMA fast and easy to use in the field for collecting data is the use of lists of expected species for plots and transects. You can use DIMA without setting up a species list for a plot or transect, but it can be cumbersome and slow. As part of your initial DIMA setup, you should take some time and create some species lists for different plant communities in which you'll be working. Plant inventories or existing field data are a good place to look for species to include in the lists. When you create a plot, you can then copy one of your community species lists or copy the species list from another plot. Don't worry about having an exhaustive species list for your plot before you start – you can always add plants while you're recording data without too much of an interruption. The more plots you visit, the better your species lists will get and the faster DIMA will be to use in the field.

Tags

A **Tag** is a label assigned to a plot for your own sorting or querying purposes. Sometimes you need to organize your plots by more than just the one site that they belong to. For example, you have plots within an allotment that are inside a burn and plots outside the burn. This allotment is part of a field office and the data could be useful for field-office level planning too. DIMA only lets you define one site per plot. To associate your plots with all the different levels or uses you want, you would assign tags to the plots. Any plot can have an unlimited number of tags.

Tips for Successfully using DIMA

Close vs. Cancel buttons

On many of the DIMA forms, you will notice buttons that say "Close" or "Cancel" but rarely buttons that say "OK" or "Apply." This can be confusing to some users.

Close will save the data on the current form and close it, returning you to the previous form.

Cancel will close the current form *without* saving any data on the form

Running DIMA with different versions of Access

DIMA was developed for Access 2003. It will run without problem on Access 2007, but there are some compatibility issues with Access 2010. We are currently working through these problems and releasing incremental updates to DIMA as problems are fixed. For all of the Access 2010 problems, however, Access may crash if certain buttons are clicked, but this DOES NOT CAUSE DATA LOSS OR CORRUPTION.

Using a GPS with DIMA and Windows 7

The GPSTools.dll file that creates a connection between DIMA and an attached GPS unit was written for Windows XP. In order to use the GPS tools with DIMA on a computer with a Windows 7 operating system, you will need to run Access in "XP Compatibility mode." For more information, see http://windows.microsoft.com/en-US/windows-vista/Make-older-programs-run-in-this-version-of-Windows

The DIMA Home Page

Functions and options for DIMA Initial Setup.

Functions for creating and editing sites and plots.

Functions for entering and editing data for plots and transects (lines)

Tree-view of Sites, Plots and transects (lines) in the DIMA database

Toggle touch-screen functions on or off.

Initial DIMA Setup

The steps below should be followed to set up a new DIMA database for use. An internet connection is needed for some of these steps, so they are best done while in the office before going out to the field.

Hide methods not used in AIM strategy

DIMA contains data forms for 18 different monitoring and assessment methods. In most cases, though, you will only be using a small number of these methods. Hiding the unneeded data forms can not only simplify the DIMA interface, but can reduce confusion for field crews. To hide unneeded DIMA forms:

1. Click on the **Adminstrative Functions** button from the DIMA Home Page.
2. Choose **"Database Content"** from the System Setup drop-down list, and click the **Modify the Forms/Functions available in this copy** button.
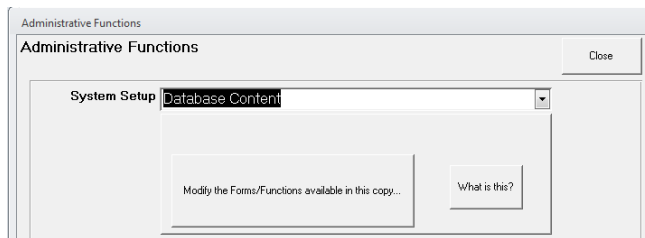
3. Enter the database administrator password (usually 9999 unless another password was set) and login.
4. Uncheck methods that will not be used, and then click **Close**. Click **Close** on the Administrative Functions page to return to the DIMA Home Page.
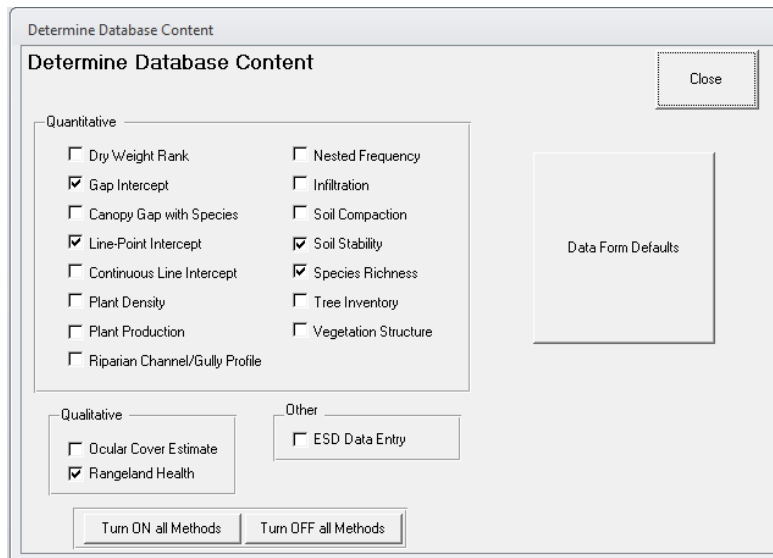
Import state plant species list from USDA PLANTS database

In order to quickly create species lists and to maintain consistency and accuracy of plant codes, DIMA uses the list of plants and codes for each state maintained by the USDA PLANTS database (http://plants.usda.gov). Because these lists are large (thousands of plant species for each state) and updated regularly, DIMA does not come pre-loaded with a master plant species list. You will need to download the species list for your state and load it into DIMA.

1. Click the **Support Tables** button from the DIMA Home Page
2. Click on the **State Species List** button in the center column of the Support Tables page.
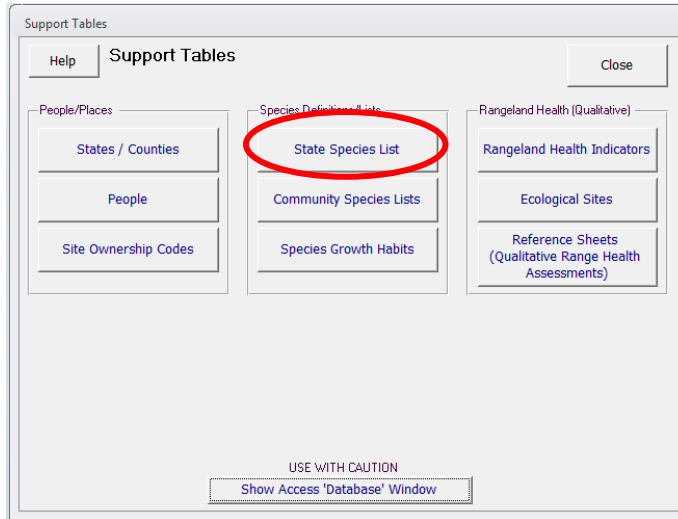
3. Click on **the Mass Import of Species Data…** button at the bottom of the State Species List page.
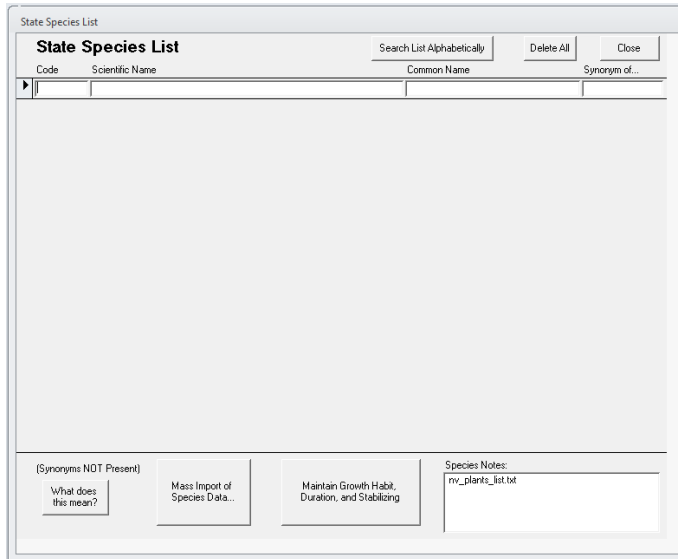
4. Open a web browser and go to the USDA PLANTS database state plant list page. Either click on the **"this site" link** or enter in the URL shown in the Mass Import of Species Data page.

5. Right-click in your web browser on the state you want a species list for and choose "Save target as…" (Internet Explorer) or "Save link as…" (Firefox, Chrome) to save the state species list to your computer. *Note the directory where the file was saved.*
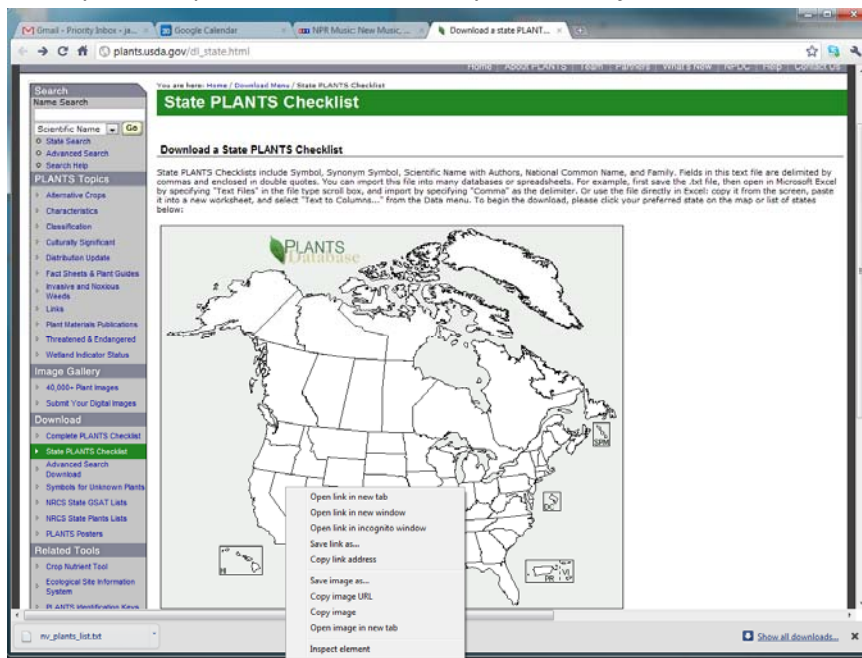
6. Back in DIMA, click the **Browse…** button in the Mass Import of Species Data page and select the state species list file you just downloaded. Click **Open**.
7. Click the **Validate Plant list and import into this database…** button.
8. Click **Close** on all the pages to return to the DIMA Home Page.

State Species List

State Species List

		Search List Alphabetically	Delete All	Close

| Code	Scientific Name	Common Name	Synonym of...
ABCO	Abies concolor (Gord. & Glend.) Lindl. ex Hildebr.	white fir	
ABCOC	Abies concolor (Gord. & Glend.) Lindl. ex Hildebr. var. concolor	white fir	
ABCOL	Abies concolor (Gord. & Glend.) Lindl. ex Hildebr. var. lowiana (Gord. & Glen	white fir	
ABEL	Abronia elliptica A. Nelson	fragrant white sand verbena	
ABIES	Abies Mill.	fir	
ABLA	Abies lasiocarpa (Hook.) Nutt.	subalpine fir	
ABLAL	Abies lasiocarpa (Hook.) Nutt. var. lasiocarpa	subalpine fir	
ABMA	Abies magnifica A. Murray	California red fir	
ABNA	Abronia nana S. Watson	dwarf sand verbena	
ABNAC	Abronia nana S. Watson var. covillei (Heimerl) Munz	Coville's dwarf sand verbena	
ABNAN	Abronia nana S. Watson var. nana	dwarf sand verbena	
ABPA3	Abutilon parvulum A. Gray	dwarf Indian mallow	
ABPO	Abronia pogonantha Heimerl	Mojave sand verbena	
ABRON	Abronia Juss.	sand verbena	
ABTH	Abutilon theophrasti Medik.	velvetleaf	
ABTU	Abronia turbinata Torr. ex S. Watson	transmontane sand verbena	
ABUTI	Abutilon Mill.	Indian mallow	
ABVI	Abronia villosa S. Watson	desert sand verbena	

(Synonyms NOT Present)

What does this mean?	Mass Import of Species Data...	Maintain Growth Habit, Duration, and Stabilizing

Species Notes:

nv_plants_list.txt nv_plants_list.txt

Import county names

DIMA comes with a set of Excel files that contain the county names for each state, but these must be loaded into DIMA before going out into the field.

1. Click on the **Support Tables** button on the DIMA Home Page
2. Click on the **States/Counties** button on the Support Tables page
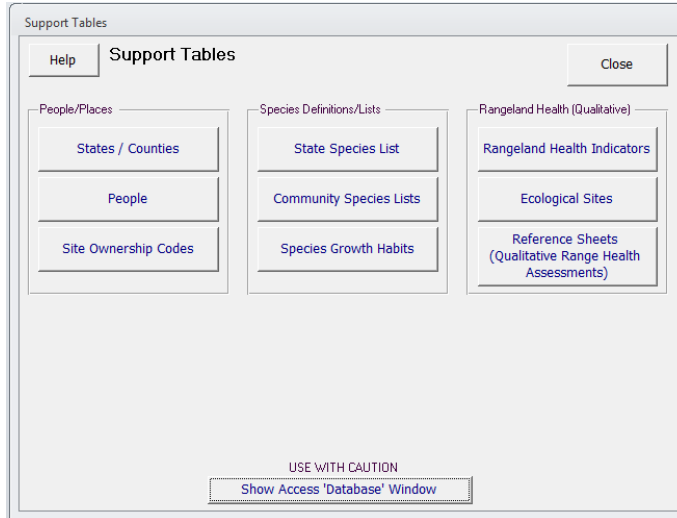
3. Click on the Import Counties button on the States/Counties page
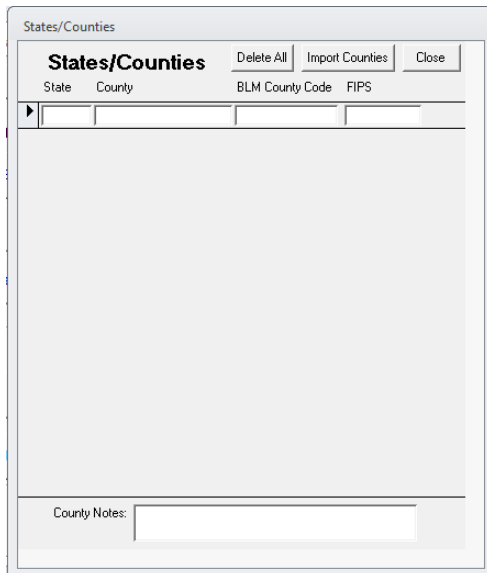
4. Click the Browse button. Navigate to the directory where DIMA is located and open the Counties folder. Select the Excel file for the state you want and click Open.
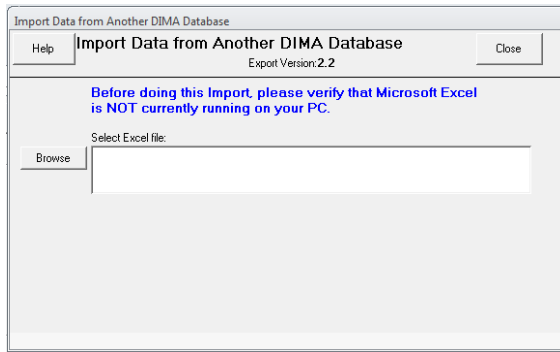
5. Click the **Do Import…** button to import the counties
6. Click **Close** on all the pages to return to the DIMA Home Page.
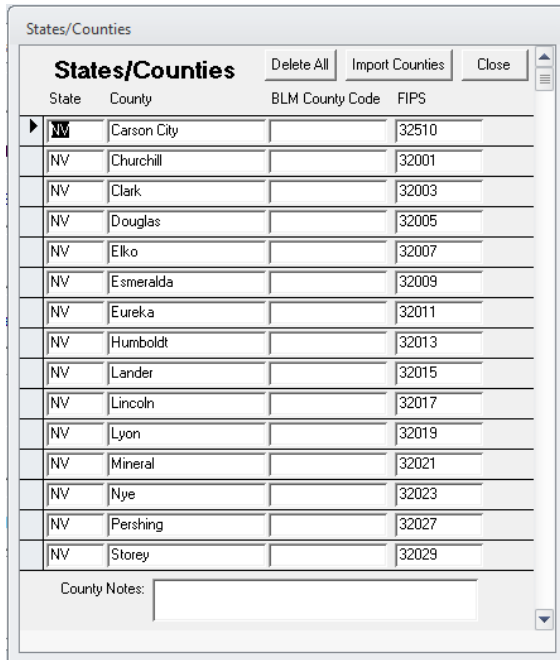
Import ecological site names

Similar to plant species names, there are just too many ecological sites to include them all in DIMA. You will need to identify which Major Land Resource Areas (MLRAs) you will be working in and download and load the appropriate ecological site names. This is important because interpretation of much of the monitoring and assessment data collected in DIMA is dependent on knowing what the ecological site is for each plot visited.

1. Click on **Support Tables** from the DIMA Home Page
2. Click on **Ecological Sites** from the Support Tables page
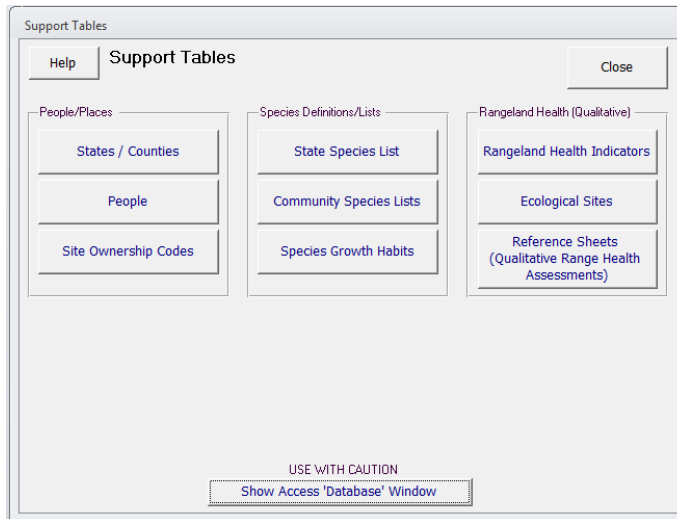
3. Click on the **Import Site Numbers/Names from NRCS** button at the bottom of the Ecological Sites page
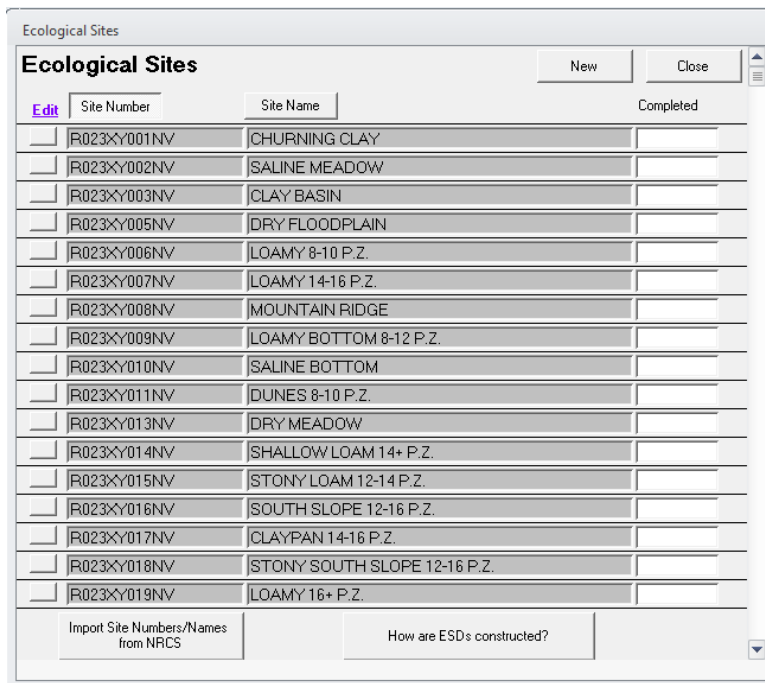
4. Open a web browser and navigate to the NRCS ESIS website for downloading the ecological site names. Either click on the **"this site" link** or enter in the URL shown in the Mass Import

15

of Species Data page.

5. On the ESIS webpage, check **Rangeland**, select the MLRAs you need ecological sites for. Check **Ecological Site Number and Name** as the download type, and then click **Submit**

6. Scroll to the bottom of the ecological sites list page and click **Select All**. Then click **Download File**.

7. Right-click on the **GSAT Download link** on the next page and save the file to your computer. *Note where the file is saved.*

8. Back in DIMA, click the **Browse** button and navigate to where the ecological site name file was saved. Select the file and click **Open**.
9. Click the **Validate Site list and import into this database…** button.
10. Click **Close** on all the forms to return to the DIMA Home Page.

Add names to the people list

DIMA records the names of people who have participated in data collection, review, and editing. When using DIMA in the field, the data entry forms will be locked until the people who are observing and recording the data are specified. The names and contact information of people using DIMA should be entered before going out in the field.

1. Click **Support Tables** from the DIMA Home Page
2. Click the **People** button from the Support Tables page
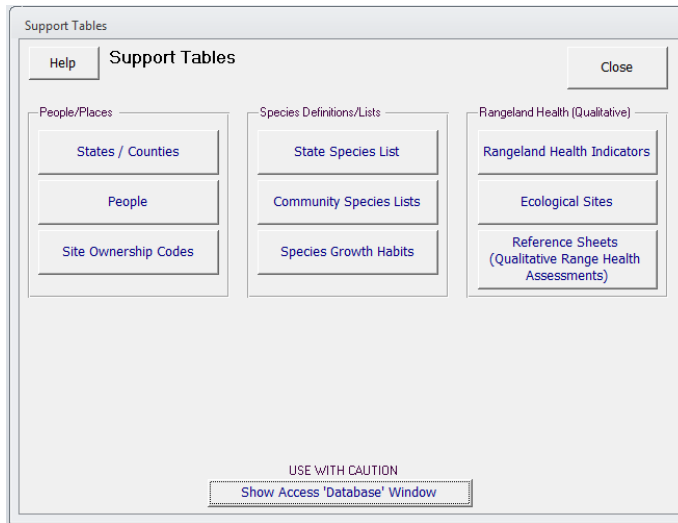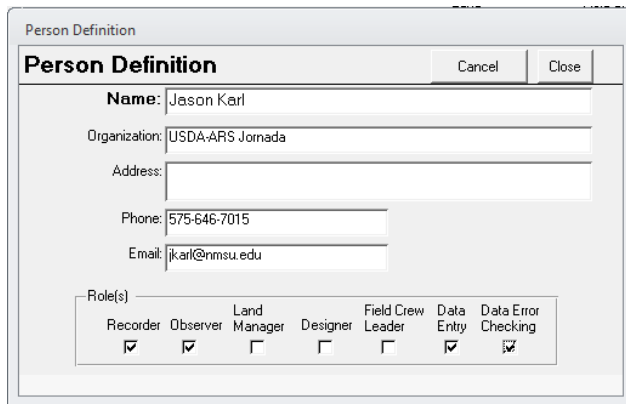
3. Click **New** to add a person to the database.
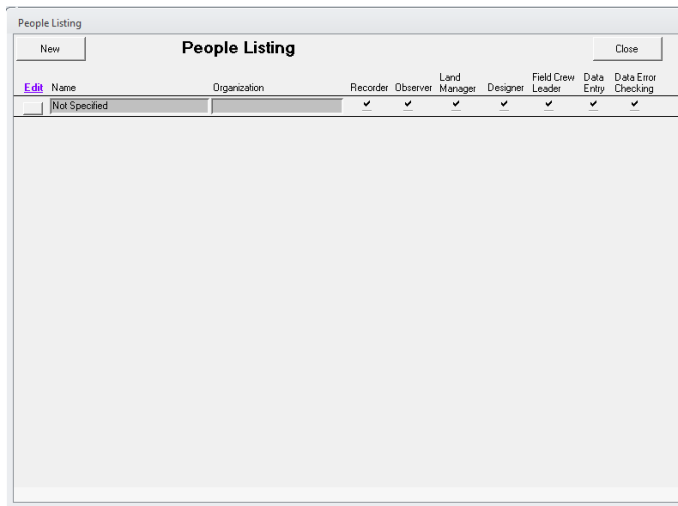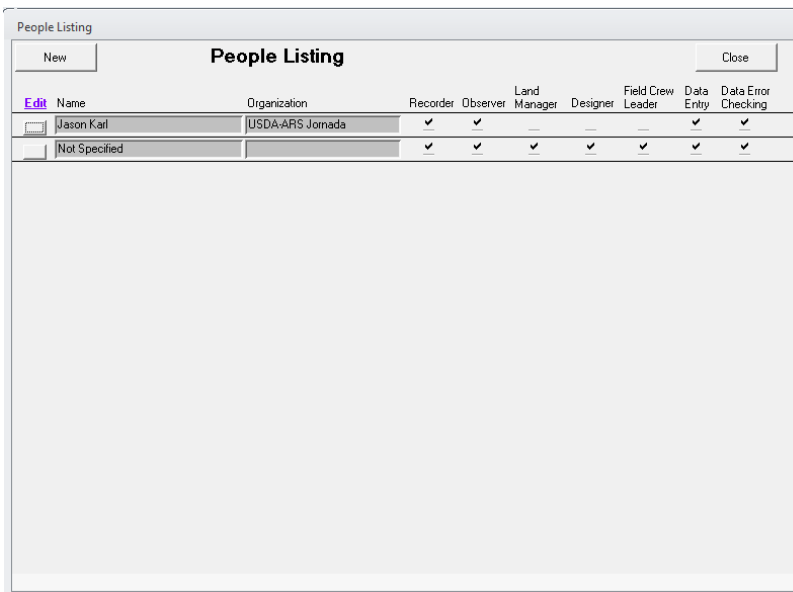
4. Fill in information about the person who will be using DIMA and their roles. *At a minimum, a name must be provided.* Click **Close** when finished to save the information and return to the

People Listing page.

5. To edit or delete an existing person listing, click on the **square button** to the left of the person's name.

6. Click **Close** on this page and the Support Tables page to return to the DIMA Home Page.

Creating Species Lists

List of species found at particular sites or for plant communities are a central part of the DIMA database. As you collect more and more data for plots in a site, the species lists for that site will become more complete and you can just copy lists between similar plots (this saves a lot of time). Initially, though, it pays to spend some time setting up a good species list to use for a plot. This section covers creating a community species list, but the technique is the same if you are creating a plot species list from scratch within the Plot Description page.

1. Click on **Support Tables** from the DIMA Home Page
2. Click on the **Community Species Lists** button.
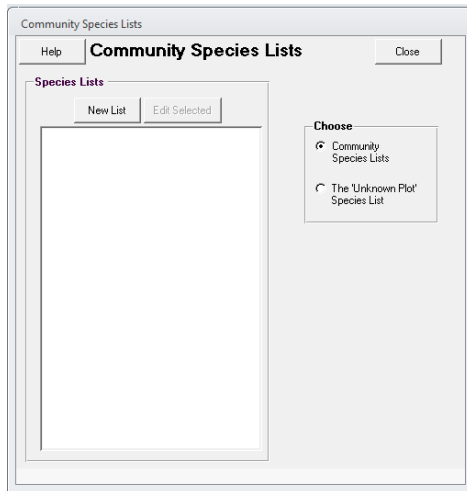
3. Click on the **New List** button to create a new species list. In the Plant Community Species List page, give the list a name. You are now ready to start adding species to the list.
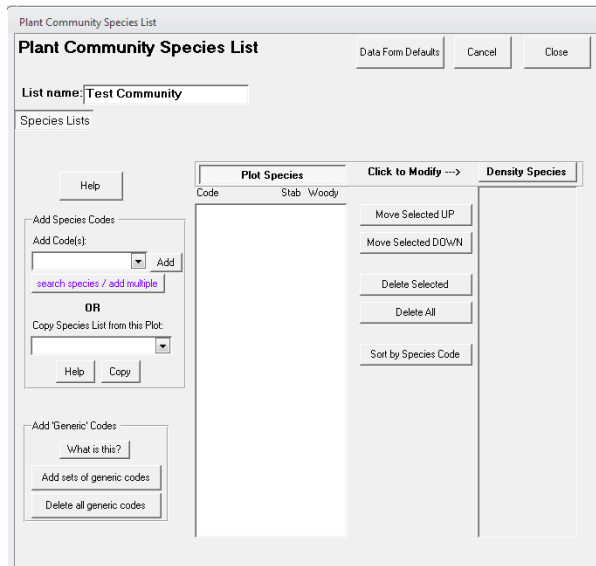
4. Enter the plant species code in the Add Code(s) text box. You can enter multiple plant codes at once by separating them with semicolons (DO NOT INCLUDE SPACES BETWEEN THE CODES). Click Add to add the plant species to the species list. *Note that you must use the*

official plant codes recognized in the USDA PLANTS Database.

5. If you do not know the plant species codes or need to search for plant species, click the **search species/add multiple** button. This will open a window where you can search by plant code, scientific name, or common name.

6. Type the first letters of a name or plant code in the **Beginning with:** text box and click **Go**. This will return a list of matching plants.

7. Find the species you're looking for and click the **square button** to the left of its name to add it to the **Selected codes:** list at the top.

8. Search for additional plants and click on their **square buttons** to add them to the selected codes list.

9. When you are finished adding codes, click **OK** to add these species to your species list.

10. From the Plant Community Species List, you can do additional operations like copying a list from an existing plot, sorting the species in the list to put common species at the top, or delete species from the list.
11. Click **Close** when you are finished to save the list and return to the Support Tables page.

Setting up a GPS Unit

One powerful feature of DIMA is that it can interface directly with a GPS unit that is either built-into a computer (i.e, tablet PC) or linked to the computer via a cable or wireless (e.g., Bluetooth) connection. The link between DIMA and a GPS unit is done by way of a third-party piece of software. This software does not require Windows installation, but it does need to be registered to work with Access. The following steps will register the interface software and set up the GPS unit in DIMA.

1. Click **Administrative Functions** from the DIMA Home Page.
2. Select **GPS Device Management** from the System Setup dropdown box and click the **Manage your GPS device** button.
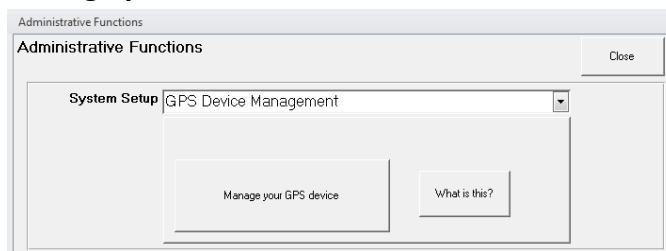
3. Select **GPS is attached to this computer** from the Mode dropdown box and then click the **Setup GPS** tab.
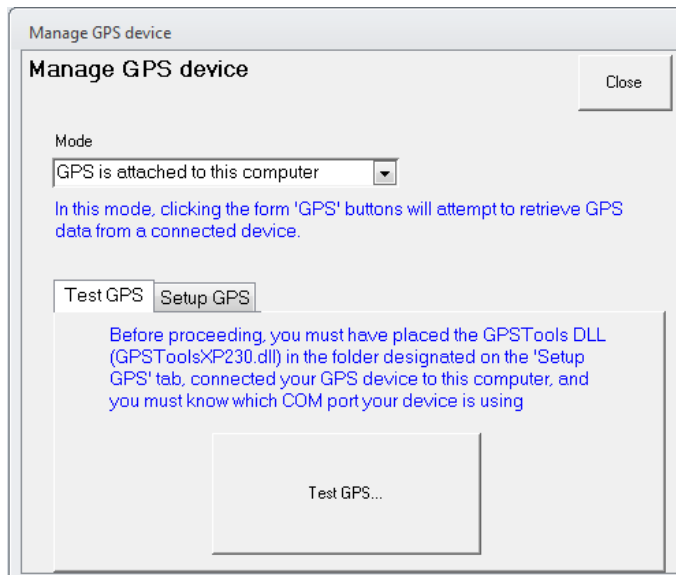
4. Click the **Browse** button on this page and navigate to the Directory where DIMA is stored. In that location you should find a directory called GPS Tools. Select this
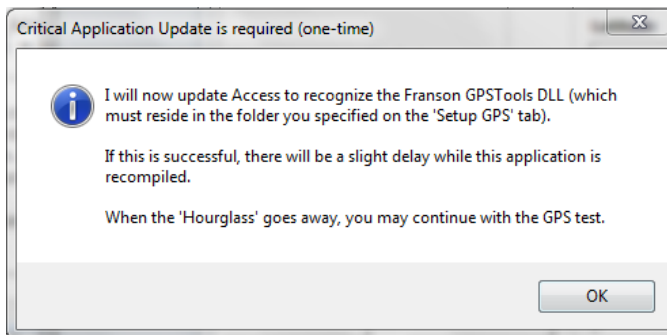
directory and click **Open.**
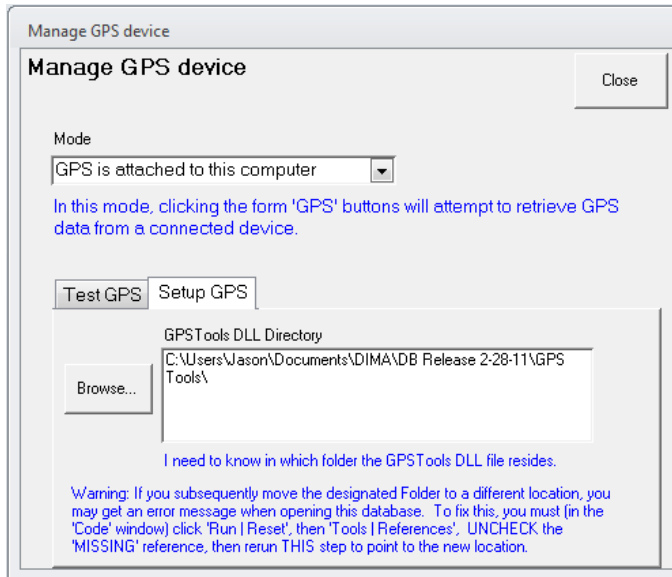
5. Click back on the **Test GPS** tab.
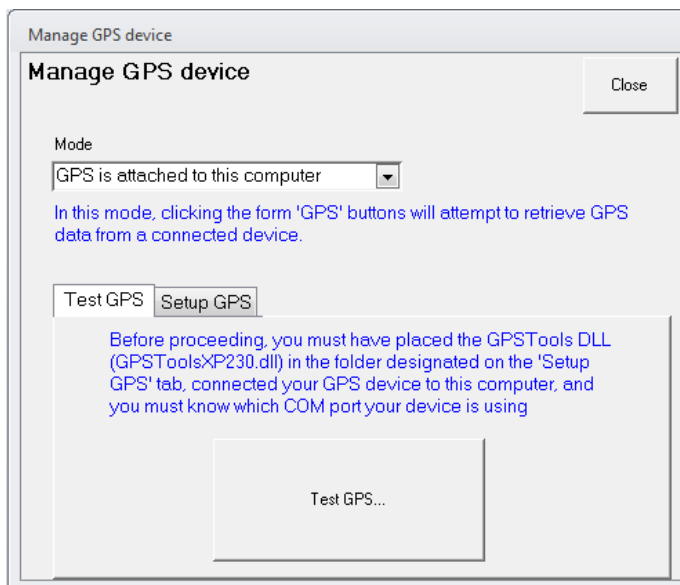
6. Click the **Test GPS** button. This will register the GPS Tools software component with Access and display the following message. Click **OK**.

7. Click the **Read GPS** button to link to the GPS and acquire a coordinate reading. When you are finished, click **Accept.**
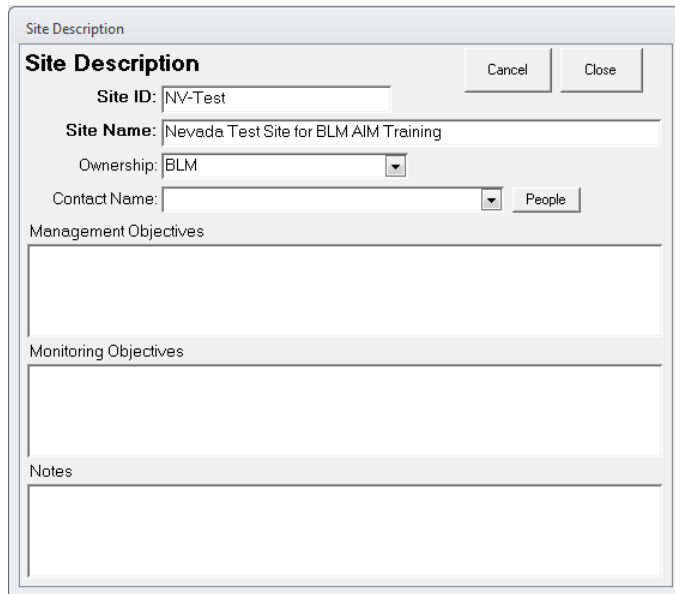

With the GPS unit activated in DIMA, data forms that have fields for geographic information (i.e., plots and lines/transects) will now display a GPS button that allows you to acquire coordinate values directly from the GPS unit.

Clicking on the **GPS** button will open the Get GPS Info page. Click on **Read GPS…** to get the current coordinate information, and click **Accept** to transfer the coordinate values back to the data form.

Creating a Site

In order to collect data on a plot or transect in DIMA, a site must first be created. This is a simple process that can either be done in the office or in the field. A plot can only be associated with a single site. Tags can be used in addition to the site if you need to categorize a plot multiple ways. *All the existing sites in a DIMA database are listed in the Quick Data View window of the DIMA Home Page.*

1. Click the New Site button from the DIMA Home Page.
2. Provide at least a Site ID and a Site Name.

3. Click Close when you are finished to save and close the form and return to the DIMA Home Page.

Creating Plots within a Site

Once sites have been created, you can then create plots and begin recording data in the field. The New Plot button on the DIMA Home Page will only become active when you have selected a site in the Data Quick View window.
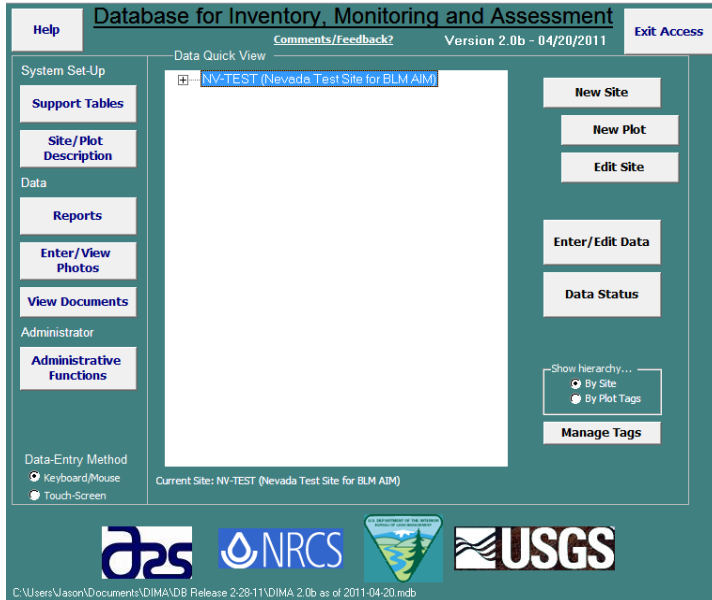
1. Click the **New Plot** button in the DIMA Home Page
2. Specify the number of transects that will be associated with this plot (typically 3 or 4) and click **OK**. This will automatically create transects and associate them with the plot you are creating.
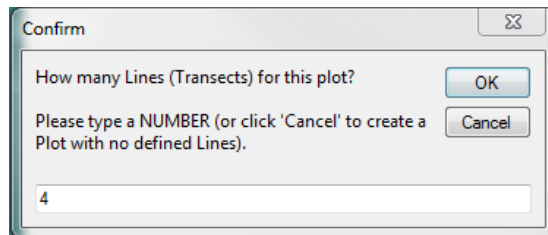
3. Give the plot an ID number in the Plot Description Page and fill in any other attributes in the General fields (e.g., county, state, ecological site). It is important to verify in the field and

27

select the Ecological Site for the plot. Provide text directions to the plot also.

4. Click on the **GPS/Lines** button and record the GPS coordinates for the center of the plot.

   a. Click on the **Species Lists** button to create a species list to use for data collection at this site. You can either create a new list by selecting species from the state species list or copy an existing list from another plot or one of the DIMA community species lists you created previously. See the section above on creating species lists for more

information.

b. Click **Close** to save the plot information and return to the DIMA Home Page.

Entering Field Data

The process for entering data for any of the methods starts the same way, by selecting a plot and specifying the method for entering the data.

1. Click the **Enter/Edit Data** button to open the Enter/Edit Data page

2. Select the **site** and **plot** you want to enter data for and select the **method** being used to collect the data. The list at the bottom of the page will be blank if there are no data already collected for the method you selected. Once data have been collected at a plot, summaries of the data will be displayed.

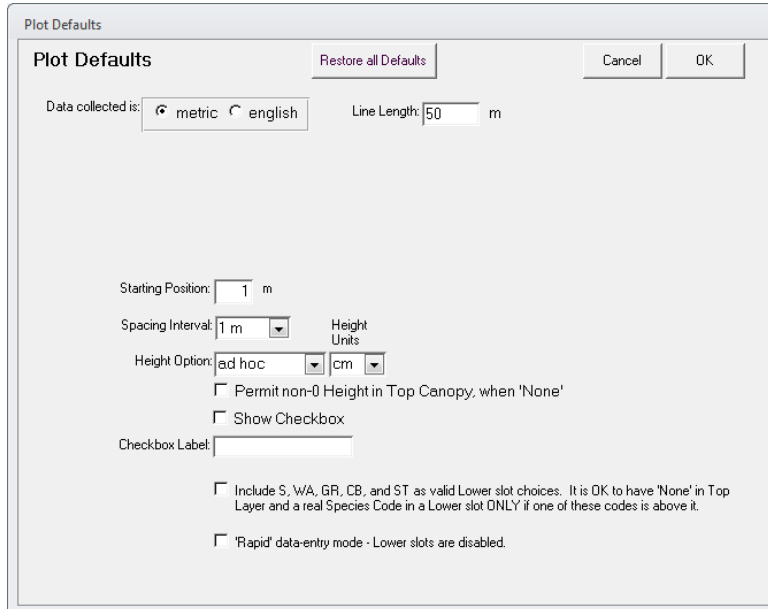

3. Click the **New** button to start collecting data for the selected method.

   The following sections describe data entry for each method separately.
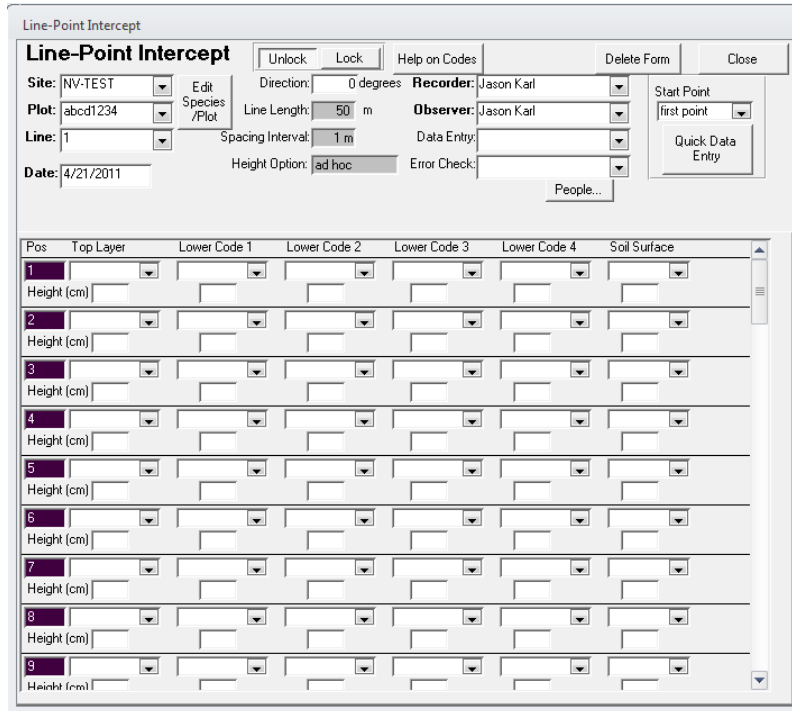
Line-point Intercept with Height

After clicking New on the Enter/Edit Data page, you must first specify the plot-default values for line-point intercept and then start entering the data.

1. Verify the correct values for the line-point intercept attributes (e.g., metric or English units, line length, point spacing interval).

2. Set the **Height Option** to "ad hoc". This will allow you to enter height information at whatever interval is appropriate for your sampling.
3. Click **OK** to proceed to the data entry screen.

4. Specify the **transect number, recorder, and observer**. The data entry controls on this form will be locked until these three attributes are filled in.

5. You can enter LPI data directly in this screen by using the drop-down boxes that correspond to the point along the transect (Pos) and the canopy layer (e.g., Top, Lower Code 1, Soil Surface). Refer to the Monitoring Manual (Herrick et al. 2009) for details on how data should be collected and recorded. Heights for each canopy layer may be recorded as well. While this default form is convenient for viewing and quickly verifying LPI data, it is cumbersome for actually entering the data. The **Quick Data Entry** form works much better for entering LPI data in the field.

6. Click on the **Quick Data Entry** button to open the quick data editor. The quick data editor is organized very differently from the standard LPI form. The page displayed on the Quick Data Editor corresponds to a single point along the transect. The point (position) number is displayed at the top-left of the page.
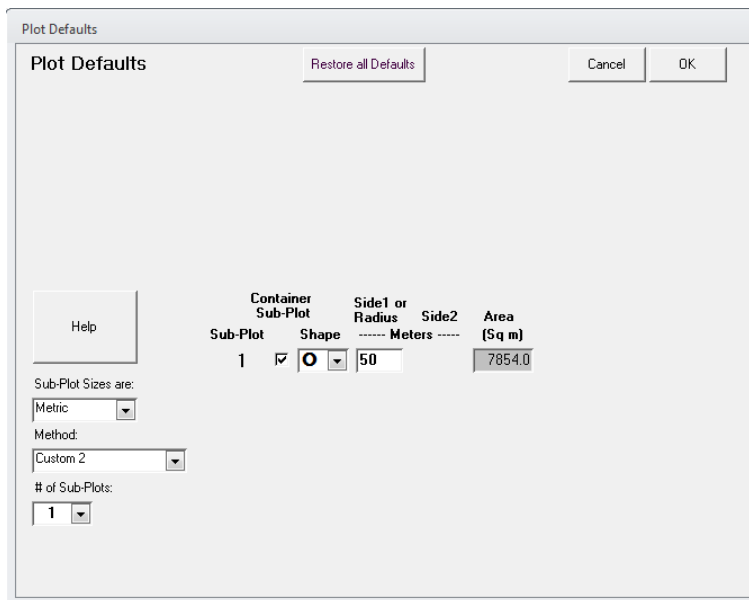

7. Click on plant species codes to add them to the current point's data record. At a minimum, a soil surface must be specified. If plant canopies are encountered, a top canopy must be specified and then additional canopy layers in order from one to four.

8. Clicking on a plant species code will add it to the Current Data box for that layer and promote it to the top of the species list. Over time, the most common species will tend to be toward the top of the lists.

9. Click **Next** to go to the next LPI point on the transect. You can use the **Next, Previous, and Go to position #** controls to navigate to different points along the transect.

10. Record the height of the different canopy layers as specified in the AIM protocol.

11. Click on the **Modify Plot's Species List** button if you encounter a species that is not in the plant list. You can modify the plot species list and add new species encountered.

12. Click on **Help on Codes** for explanations of what the standard LPI codes (e.g., L, BR, S, R) are.

13. Click on the **square button** below each canopy layer data box to clear the data entry for that canopy layer.
14. Click **Close** when you have recorded data for all points along the transect. This will return you to the standard LPI form.
15. Click **Close** when you are done entering the LPI data for that transect to return to the Enter/Edit Data page.
16. Repeat these steps for the additional transects.

Plot-level Species Richness

The total list of species occurring on a plot is one of the core indicators of the AIM strategy. This is accomplished by a plot-level inventory after the LPI data have been collected.

1. Select the Species Richness method and the appropriate site and plot in the Enter/Edit Data page.
2. Click **New** to create a species richness record for the plot. This will open the richness Plot Defaults page.
3. Choose "Custom 2" from the **Method** drop-down list and set the **# of Sub-Plots** to "1". Check the box under Container Sub-Plot, change the shape to circular, and set the radius of the plot according to your plot dimensions. These settings follow the AIM protocol recommendations.

4. Click **OK** to open the Richness data page.
5. Enter the **Recorder, Observer, and Transect**. The data entry fields on the form will be locked until these are filled in. In the case of the AIM protocol, richness is estimated at the plot level, and not for individual transects. In this case, just choose line (transect) 1 for recording

the richness data, but actually count species over the entire plot.

6. Click on species in the plot species list (center column) that you observe in the plot. The plant codes for these species will be recorded in the plot richness field at the left.
7. Click **Close** when you are done recording species that occur in the plot.

Canopy Gap Intercept

Canopy gap intercept is also a core method of the AIM strategy. This method is implemented on the same transects as LPI and can be done quickly following LPI by reading the transect backwards (i.e., LPI starts from 0 and reads along increasing distances, gap intercepts starts at the maximum distance away from the origin and reads back down the tape toward the plot center).

1. Select the Gap Intercept method and the appropriate site and plot in the Enter/Edit Data page.
2. Click **New** to create a gap intercept record for the plot. This will open the gap intercept Plot Defaults page.

3. Set the **Data to be Collected** drop-down box to "Canopy Gap only."

4. Click **OK** to go to the gap intercept data collection page.

5. Enter the **transect number, observer, and recorder** to unlock the gap intercept form.
6. Check the **Canopy Gap data direction** settings. If reading the transect backwards after reading LPI, set this to "High to Low."
7. Record the start and stop locations (i.e., distance from the origin of the transect) of canopy gaps in the form. Every time you enter values for a canopy gap a new row is added to the form.
8. NOTE THAT THE CANOPY GAP FORM RECORDS GAPS IN **CENTIMETERS OR INCHES**.
9. Click **Close** to save your data and return to the Enter/Edit Data page when you have finished recording canopy gaps for the transect.

Soil Stability

The soil stability test is a contingent method for the AIM strategy and is only measured when there is reason to believe that there are problems with soil stability at the plot. Refer to the Monitoring Manual (Herrick et al. 2009) for detailed instructions on implementing this method.

1. Select the Soil Stability method and the appropriate site and plot in the Enter/Edit Data page.
2. Click **New** to create a soil stability record for the plot. This will open the soil stability Plot Defaults page.

3. Verify that the settings are for "Surface Only" with an interval of 15 seconds.
4. Click **OK** to proceed to the data collection page.

5. Specify the **Recorder and Observer** to unlock the form.

6. Prepare soil samples and record the position of each sample in the test kit and the type of vegetation from each sample. The data form provides the times at which samples should be submersed in water and dipped.
7. Begin the soil sampling and record the stability values for each sample in the **#** column drop-down boxes.
8. Click **Close** when you are finished to return to the Enter/Edit Data page.

Rangeland Health Indicators

The 17 indicators described in Interpreting Indicators of Rangeland Health (Pellant et al. 2005) are a qualitative assessment technique. While they are not officially part of the AIM strategy core methods (but do consider some of the AIM strategy indicators in a qualitative sense), it is common for the Rangeland Health Indicators to be assessed at sites where the AIM Strategy quantitative monitoring is also taking place. The following steps illustrate how to record the rangeland health indicators in DIMA.

1. Select the Rangeland Health Indicators method and the appropriate site and plot in the Enter/Edit Data page.
2. Click **New** to create a Rangeland Health evaluation for the plot. This will open the Rangeland Health page.

3. Enter in pertinent information on the **Evaluation Area** tab. The Ecological Site for the plot should have already been defined when you created the plot. If it was not, close this form and go back to the plot form and define the ecological site for the plot.

4. Click on the **Evaluation Sheet** tab.

5. Fill in the ratings for the 17 indicators using the drop-down boxes. Provide adequate comments to document your rationale for the ratings you chose.
6. Click on the **Attribute Ratings** tab when you are finished to see the overall site ratings.
7. Click **Close** when finished to return to the Enter/Edit Data page.

References

Herrick, J. E., J. W. Van Zee, K. M. Havstad, L. M. Burkett, and W. G. Whitford. 2009. Monitoring manual for grassland, shrubland, and savanna ecosystems. USDA-ARS Jornada Experimental Range, Las Cruces, New Mexico.

Pellant, M., P. Shaver, D. A. Pyke, and J. E. Herrick. 2005. Interpreting indicators of rangeland health, version 4. BLM/WO/ST-00/001+1734/REV05, U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center, Denver, CO.