

Quality Control using DIMA

Quality control (QC) is the process of checking or inspecting a data set to make sure that it is complete and meeting a pre-defined data quality standard. Good habits in quality assurance efforts will minimize the effort needed during the QC process. For more information on how the QA and QC are part of the monitoring process, see the *Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems*, 2nd ed. In this tutorial, we will describe the QC process using DIMA.



Step 1. Enter data, if needed. See the Quality Control section of the Monitoring Manual for data entry instructions.

Step 2. Check the data set for completeness.

Each plot should have:

- ☐ Plot Description Information
- ☐ Core Methods
- ☐ Supplemental Methods (optional)
- ☐ Species growth habit assignments

Many of these completeness checks can be accomplished using the reporting function in DIMA. From the main screen select **Reports**

Report Manager

Report Manager

Report Level:
Selected Site(s)

Select Date Range

Start Date: Jan 1 2003

End Date: Dec 13 2013

Select Method

- Method Tracking
- Plant Density
- Plant Production
- Plot Definition
- Rangeland Health Qual Asses.
- Soil Compaction
- Soil Stability**
- Species Reports
- Species Richness

Select Sites/Plots/Lines **Qualifying Data** **Select Report**

Select Site(s)

- Alkaline
- Aspen Woodland
- Brushy Loam
- Clayey Slopes & Foot
- Dry Exposure
- Loamy Slopes
- Mountain Loam
- Other
- Pinyon-Juniper
- Reclamation
- Riparian & Swale
- Rolling Loam

Select Plot(s)

Alkaline	AL-1
Alkaline	AL-10
Alkaline	AL-13
Alkaline	AL-14
Alkaline	AL-3
Alkaline	AL-5
Alkaline	AL-7
Alkaline	AL-9

Data for this method is by Plot, not Line

Top Level...
☒ By Site
☐ By Plot Tags

shift-click to select continuous range; ctrl-click to select individual items

In this screen you may select the sites, plots, and data ranges of field data collection you would like to QC. In most situations, selecting “All Sites” and “All Plots” will be appropriate.

Step 2.1 Check for complete Plot description information:

- ☐ GPS coordinates, recorded in Decimal Degrees

Select the **Plot Definition** report, highlight the **Soil Verification** report and select **Go**.

Report Manager

Report Manager

Report Level:
Selected Site(s)

Select Date Range

Start Date: Jan 1 2003

End Date: Dec 13 2013

Select Method

- Method Tracking
- Plant Density
- Plant Production
- Plot Definition**
- Rangeland Health Qual Asses.
- Soil Compaction
- Soil Stability
- Species Reports
- Species Richness

Select Sites/Plots/Lines **Select Report**

Report	Output Format
Soil Verification	Excel

Click **OK** when the “Report will now be displayed” window pops up. An Excel spreadsheet will open.

Book5 - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J	K	L
	Site	Plot	Ecol Site	Latitude	Longitude	Slope	Aspect	SlopeShape	Landform	Hillslope Profile	Pit Label	Total Soil Pedon
1	Alkaline	AL-1	UNKNOWN	40.20989	-108.95297	3	2	LL			Centerpoint	20
2	Alkaline	AL-10	UNKNOWN	40.18693	-108.9375	8	86	LC			Centerpoint	20
3	Alkaline	AL-13	UNKNOWN	40.13741	-108.96296	7	32	LL			Centerpoint	20
4	Alkaline	AL-14	UNKNOWN	40.1362	-108.91354	11	38	CV			centerpoint	20
5	Alkaline	AL-3	UNKNOWN	40.15349	-108.91446	8	138	LV			Centerpoint	20
6	Alkaline	AL-5	UNKNOWN	39.80547		13	155	LL			Centerpoint	20
7	Alkaline	AL-7	UNKNOWN	40.16694	-108.91641	7	151	LL			Centerpoint	20
8	Alkaline	AL-9	UNKNOWN	40.20902	-108.8988	2	214	LL			centerpoint	20

Ready | Metadata | Soil Pits | Horizons | 100%

- Select the **Soil Pits** tab. Note that the Latitude and Longitude of each plot is displayed. Plot AL-5 is missing longitude information, so I highlighted the empty cell to indicate a problem that needs to be corrected. I will check with the field crew and the GPS waypoint file to obtain the correct coordinate.

☐ Soil pit description

Use the same Plot Definition report to examine the soil pit data. Select the **Horizons** tab. Examine the soil horizon descriptions. Is it complete? Does it look correct?

Book5 - Microsoft Excel

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	Plot	Pit Label	Upper Depth	Lower Depth	Horizon	Horizon mod	Hue	Value	Chroma	Color	Texture	Effervescence	Grade	Structure	Size	% Clay
1	AL-1	Centerpoint	0	10	A		10YR	4		4 Moist	L	VS	1	SBK	F	
2	AL-1	Centerpoint	10	20	B	k	7.5YR	4		4 Moist	SL	ST	1	SBK	F	
3	AL-10	Centerpoint	0	1	A		7.5YR	5		4 Moist	S	NE	1	SG	VF	
4	AL-10	Centerpoint	1	20	B		7.5YR	5		4 Moist	S	NE	1	SBK	VF	
5	AL-13	Centerpoint	0	20	A/B		7.5YR	4		4 Moist	SIL	ST	2	SBK	F	
6	AL-14	centerpoint	0	9	A		10YR	4		3 Moist	SICL	ST	1	SBK	F	
7	AL-14	centerpoint	9	20	B	k	10YR	4		3 Moist	SICL	ST	1	SBK	F	
8	AL-3	Centerpoint	0	3	A		10YR	5		3 Moist	SICL	SL	1	SBK	M	
9	AL-3	Centerpoint	3	20	B	k	10YR	5		3 Moist	SICL	ST	2	SBK	M	
10	AL-5	Centerpoint	0	20	A/B		10YR	4		3 Moist	SIL	ST	2	SBK	F	
11	AL-7	Centerpoint	0	20	A/B	k	10YR	4		3 Moist	SIL	SL	1	SBK	F	
12	AL-9	centerpoint	0	2	A		10YR	5		4 Moist	LS	NE	0	SG	F	
13	AL-9	centerpoint	2	20	B	w	10YR	5		4 Moist	LS	NE	2	SBK	F	

Ready | Metadata | Soil Pits | Horizons | Average: 3 Count: 16 Sum: 3 | 100%

☐ Plot layout description (number, length, azimuth of the transects)

Back in Access, return to the DIMA Home screen by selecting **Close**. The next task is to visually inspect each Plot Description page to ensure that the plot layout description is complete. Select a plot and then **Edit Plot** on the right.

Main Menu

Database for Inventory, Monitoring and Assessment [Exit Access](#)

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System Set-Up

[Support Tables](#)

[Site/Plot Description](#)

Data

[Reports](#)

[Enter/View Photos](#)

[View Documents](#)

Administrator

[Administrative Functions](#)

Data-Entry Method

☒ Keyboard/Mouse

☐ Touch-Screen

Data Quick View

Alkaline	Alkaline
Aspen Woodland	Aspen Woodland
Brushy Loam	Brushy Loam
Clayey Slopes & Foothills	Clayey Slopes & Foothills
Dry Exposure	Dry Exposure
Loamy Slopes	Loamy Slopes
Mountain Loam	Mountain Loam
Other	Other
Pinyon-Juniper	Pinyon-Juniper
Reclamation	Reclamation
Riparian & Swale	Riparian & Swale
Rolling Loam	Rolling Loam
Salt Desert	Salt Desert
Stony Foothills	Stony Foothills

011

097

10*

100

101

102

103

12

13

14

44

Select a site or plot and choose an operation from the buttons at the right

New Site

New Plot

Edit Plot

Enter/Edit Data




Data Status

Show hierarchy...

☒ By Site

☐ By Plot Tags

Manage Tags

Switch between the tabs to ensure that the plot layout information is entered. In the plot below, driving directions and azimuth information were not recorded. I will check with the field crew to see if this information was recorded on paper or exists elsewhere. If so, I will enter it.

Plot Description

Site: **Stony Foothills**

Plot ID: **011** Plot Established on: 7/19/2012 Today

General Tags GPS/Lines Soil Verification Disturbances/Mgt History

Species Lists Additional Plot Info Notes

State: County: **CO** **Rio Blanco**

Directions to Plot:

Avg. Precip: 13.8 in Ecological Site: UNKNOWN

Map Unit Symbol: 91rbc Soil Series: Torriorthents-RockOu Parent Material:

Slope %: 20.0 Aspect: 180 Slope Shape: CC

Landscape Unit: Terrace** **Terrace Component:

Management Unit:

Plot Description

Site: **Stony Foothills**

Plot ID: **011** Plot Established on: 7/19/2012 Today

General Tags **GPS/Lines** Soil Verification Disturbances/Mgt History

Species Lists Additional Plot Info Notes

GPS Coord. System: **Decimal Degrees** Datum: **WGS84**
(WGS84 Decimal Degrees recommended)

Latitude Longitude Elevation:
Plot: 39.9636 -108.1980 1991.0 m

Description Distance

Supplemental Coordinate Pairs (optional)

Line ID	Azimuth	Latitude	Longitude	Elevation
1	0 True	Start 0.0000 End 0.0000	0.0000 0.0000	0.0 0.0 m
2	0 True	Start 0.0000 End 0.0000	0.0000 0.0000	0.0 0.0 m
3	0 True	Start 0.0000 End 0.0000	0.0000 0.0000	0.0 0.0 m

Add Lines...

☐ **Plot observation notes**

Examine the Disturbances/Management History tab. No weather information is recorded. If it is not present elsewhere, I will look up this information using NOAA or PRISM.

Plot Description

Site: **Stony Foothills**

Plot ID: **011** Plot Established on: 7/19/2012 Today

General Tags GPS/Lines Soil Verification **Disturbances/Mgt History**

Species Lists Additional Plot Info Notes

Recent Weather

(past 12 months)

(previous 12 months)

Recent Disturbances (check all that apply):

☒ Wildfire ☐ Soil Deposition from Water

☒ Small Rodents ☐ Soil Deposition from Wind

☒ Large Mammals (not rodents) ☐ Underground Utilities

☒ Water ☐ Overhead Transmission Lines

☐ Wind ☐ Other

Wildlife/Livestock Use: Signs of wildlife, no signs of cattle usage.

Management History (i.e., grazing plan, prescribed fire, shrub control, seeding, plowing, water units):

Offsite Influences: Old burn scar ~150 m south of plot.

Other Comments:

Step 2.2 Check for complete core methods

- ☐ Line-point intercept for each transect
- ☐ Canopy gap intercept for each transect
- ☐ 1 species richness form
- ☐ 1 soil stability form

In the **Reports Manager** window, select the **Method Tracking Report** and select **Go**.

When the Excel spreadsheet opens, select the **Field Sampling** tab.

	A	B	C	D	E	F	G	H	I	J	K	L
	Site	Plot	Ecol Site	Establish Date	Transects	Gap Intercept	Line-Point Intercept	Plant Density	Soil Stability	Species Richness		
1	Alkaline	AL-1	UNKNOWN	07/23/13	3	3	3	3	1	1		
2	Alkaline	AL-10	UNKNOWN	07/17/13	3	3	3	3	1	1		
3	Alkaline	AL-13	UNKNOWN	07/16/13	3	3	2	3	1	1		
4	Alkaline	AL-14	UNKNOWN	07/16/13	3	3	3	3	1	1		
5	Alkaline	AL-3	UNKNOWN	07/17/13	3	3	3	3	1	1		
6	Alkaline	AL-5	UNKNOWN	07/10/13	3	3	3	3	1	1		
7	Alkaline	AL-7	UNKNOWN	07/17/13	3	3	3	3	1	1		
8	Alkaline	AL-9	UNKNOWN	07/18/13	3	3	3	3	1	1		

For each plot, the total number of transects as well as the number of forms for each method is present. Note that AL-13 only has 2 Line-point intercept forms. I will add this to the list of missing data to pursue.

Step 2.3. Check that supplemental methods (where collected) are present.

Common supplemental methods include:

- ☐ Plant density
- ☐ Interpreting Indicators of Rangeland Health

Use the **Method Tracking** report described above.

Step 2.4. Check that all species recorded are present in the State Species List

Run the Method Species Recorded Report to make sure that all your codes are in the state species list. Codes like BRASSAF01 may need to be added manually. Maintain a list of codes that need to be added so that I can add them to the master list that will be used for future DIMA updates.

- 1) Select Report.
- 2) For selected method select "Species Reports"
- 3) Select **All Sites**
- 4) Under the select report Tab Select **Method Species Recorded**
- 5) Select Go
- 6) An Excel document will open in a new tab (may take several minutes to open).

Any entry that has '(I)' or a *Scientific Name* is currently listed in your State Species list (Table 1).

Table 1.

Any entry that has **no value** in column B (Table 2) is not on your current State Species List.

A	B	C
ALNAZ	()	Line Point Intercept
BOER4	Chondrosium eriopodum ()	Line Point Intercept
CRPO5	Croton pottsii (leatherweed)	Line Point Intercept
DEHO		Line Point Intercept
GUSA2	Xanthocephalum tenue ()	Line Point Intercept
MUPO2	Muhlenbergia porteri (bush muhly)	Line Point Intercept
PRGL2	Prosopis glandulosa (honey mesquite)	Line Point Intercept

Table 2.

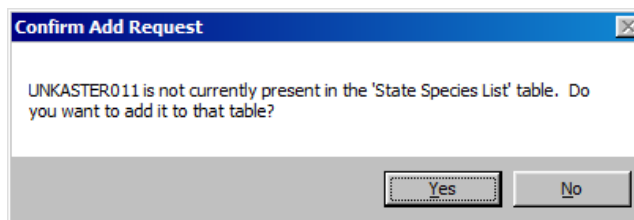
ARTR02		CanopyGap
UNKASTER01		Line Point Intercept; Species Richness

7) Check that all codes in your **Method Species Recorded Report** are in the state species list (have “()” or a scientific name in the excel output, see Table 1 and 2) and meet the standard unknown code format.

8) For codes that do not follow protocols, use the mass update of species code function to change it

9) All species codes that are in the list without a value in Column B need to be added to the States Species list.

- Do this by opening the species list from any random plot.
- Type the Code (eg BRASSAF01) into the Add Code(s)
- Select Add
- When prompted to add to table select ‘Yes’.



- Do this for all of the codes without a value in **column B** in Table 2 from the **Method Species Recorded**

Step 2.5 Check that all species have growth habit assignments:

- Open DIMA and Select ‘Reports’.
- Under “Select Method” choose the “**Species Richness**”
- Select **All Sites** and plots
- Under the **Select Report** Tab Select **Species List-Vertical**.
- Click ‘**Go...**’ (this may take several minutes).

Report Manager

Report Manager

Report Level:
Selected Site(s)

Select Date Range

Start Date:

End Date:

Select Method

- Method Tracking
- Plant Density
- Plant Production
- Plot Definition
- Rangeland Health Qual Asses.
- Soil Compaction
- Soil Stability
- Species Reports
- Species Richness

Select Sites/Plots/Lines | Qualifying Data | Select Report

Report	Output Format
Species List	Excel
Species List - Vertical	Excel

6) If any of your species don't have a growth habit, sub-code, and duration you will need to update this information into your DIMA database (eg. ARTR2) using the classes listed in bullets below. Use the growth habit categories listed below. With any questions you have about classifying these plant codes do not hesitate to contact the GBI state office. Also see the growth habit assignment protocol for assignment rules based on USDA plants categories.

7) Any sub-Code that does not have one of the following categories will also have to be changed:
The growth habit categories we are using for AIM are:

- Non-woody
- Woody

For when growth habit was not assigned:

- Unknown

The duration categories we are using for AIM are:

- Perennial
- Annual

Step 3. Documenting Missing Data

It is important to know where and why data may be missing. We'd rather know when something went wrong than ignore it or leave the data out.

Document missing data using this template: http://aim.landscapetoolbox.org/wp-content/uploads/2015/08/Missing_Data_Template.xlsx

Step 4. Check the data for correctness.

4.1 Run indicator reports. See the "AIM Data Reporting" tutorial for instructions. Do the indicators match expected variation for the stratum and ecosystem?

4.2 Map the plot locations using ArcGIS. See the "Creating a Shapefile from DIMA" tutorial for instructions. Are the plot locations correct relative to the original sample design?

Contacts

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