WARNELL PUBLICATION

Timber Harvesting

The University of Georgia WARNELL SCHOOL OF FORESTRY & NATURAL RESOURCES

WSFNR-15-10 **August 2015**

Web Soil Survey: A Timber Harvest Planning Tool

Ben Jackson, Professor

Introduction

Web Soil Survey (WSS) is an online interactive site created by the USDA Natural Resources Conservation Service that provides soils data and information produced by the National Cooperative Soil Survey. It has many potential applications for natural resource managers and forest landowners. The WSS web address is http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

Beginning users may find this simple introduction to WSS useful in property location and delineation, mapping and description of soil types, and land management attributes. The following example demonstrates the value of the WSS as a planning tool to aid in the selection of the best location for roads, skid trails and log landings for a timber harvest.

Getting Started

To begin, open the website and click on the big green **Start WSS** button (Fig 1). This will open the program and you should see the US map image next (Fig 2). **Area of Interest** is always the menu tab highlighted as you start (Fig 3).

Remember, if you work through the site and have to leave at some point for a brief time, you should be returned to your previous spot when you reactivate WSS. If you want to start over with Figure 2, you must clear your browser history before starting.

Figure 1: WSS Front Page

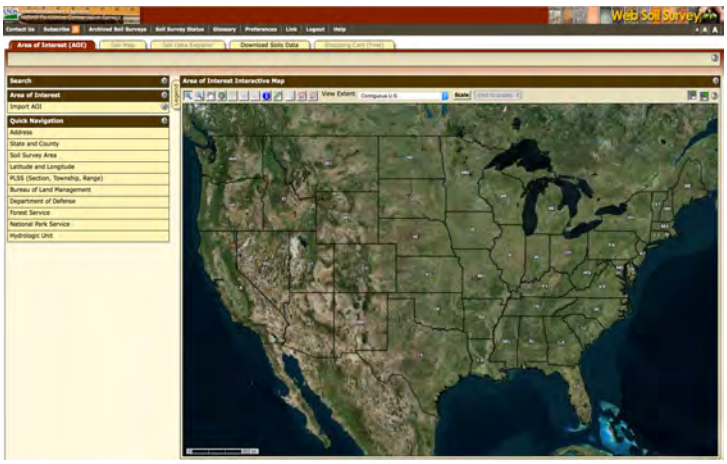

Figure 2: Beginning page for AOI selection

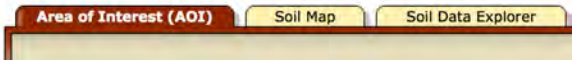

Figure 3: AOI Tab

Locating Your Property

There are several ways to find the property of interest (AOI). You can select the button (Zoom Tool) as seen in Figure 4 and place it over the US map and click it to zoom to your AOI. Use the feature (Move and Center Tool) in Figure 4 to move and center the AOI on the map. For example you can zoom in to Georgia, then the county of interest and then the property of interest. All other navigation options are listed on the **Quick Navigation** panel as seen in Figure 5. If you know the AOI address, the easiest way to locate property would be to open the **Address** tab, enter the information, and click **View** as shown in Figure 6.

Figure 4: Highlighted zoom tool

Figure 5: Quick Navigation Panel

Figure 6: Address panel opened with address entered

After clicking **View** as seen in Figure 6 above, the next image in the Area of Interest panel will be an aerial image of the AOI and surrounding area (Fig 7). The scale of the image could be 1:12,800 or one inch on the image equals 12,800 inches on the ground. If you want to change the scale of the image, you can do so by clicking the **Scale** button and selecting the scale you want (Fig 8). Good choices are 1:24,000 or 1:20,000 since these conform to the scale on traditional topography maps and soil survey maps respectively. Figure 9 shows the scale options available.

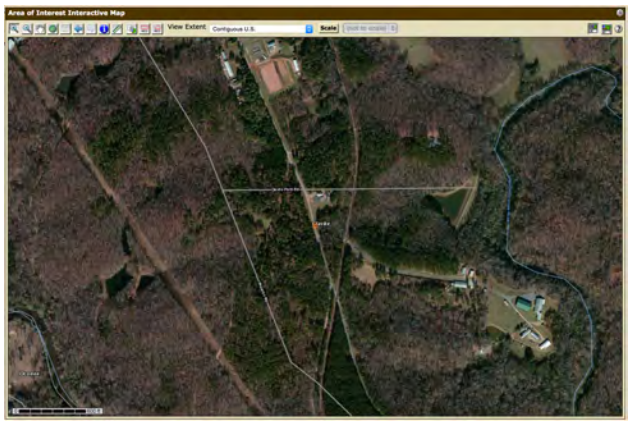

Figure 7: Initial map view of AOI address

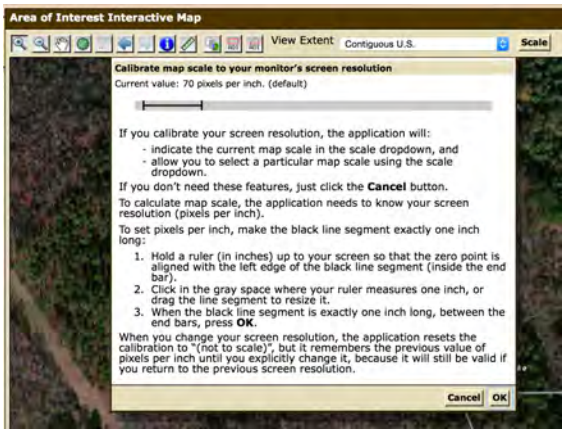

Figure 8: Screen calibration tool

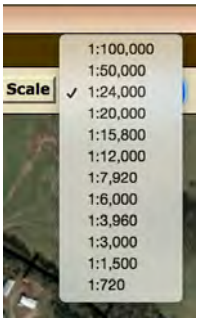

Figure 9: Image scale options

Figure 10 shows the general area of the AOI at a scale of 1:24,000. The  symbol represents the address point on Phoenix Road. The red arrow in Figure 10 points to the AOI tab used to delineate the boundary of the area you want mapped. Once it is activated, you place the cursor at a point along the AOI boundary and click the mouse. Continue around the perimeter of the AOI with the cursor, clicking at turning points along the way. When you return to the beginning point, double click to finish outlining the AOI. For convenience, say point "**A**" is the starting point in Figure 11. The next point is "**B**" along the road and then point "**C**" on the road. From there move to point "**D**" and click then on to points "**E**", "**F**", "G" and then back to "**A**". The end result in this example is shown in Figure 11. The WSS system has crosshatched the AOI and changed the scale to maximize the AOI size in the mapping panel. The letters A through G do not show up on the WSS screen.

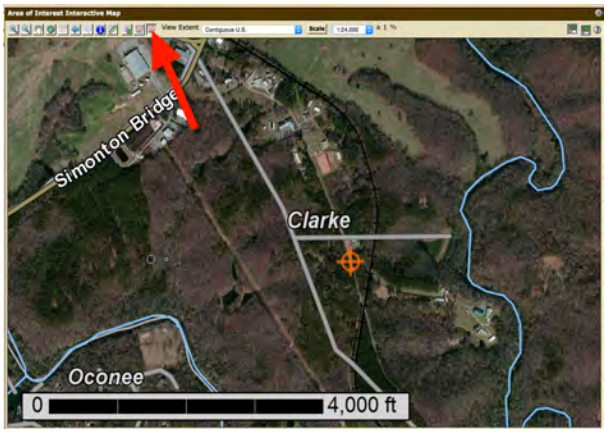

Figure 10: AOI Delineator button

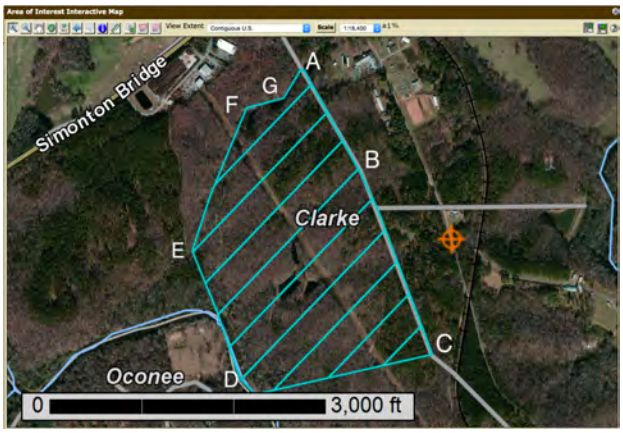

Figure 11: AOI after delineation on map

In the **AOI Properties** panel of the WSS image (Fig 12) it shows that the AOI is 120.7 acres – see right hand corner of the figure. One common rule of thumb is to have one log landing per 40 acres. Fore this AOI it is likely there will need to be three landings. This area calculator is a handy tool for this application since it shows the size of the proposed timber harvesting area. Certainly there are many other ways to use this information capability for whatever purposes are needed.

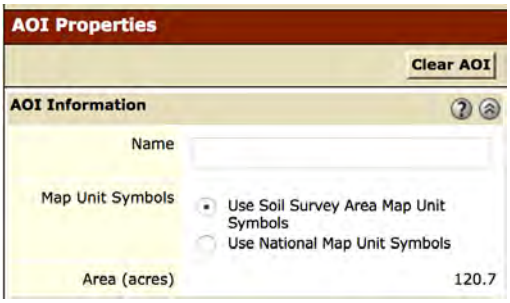

Figure 12: AOI acreage

Soil Mapping

Since we are interested in the soil characteristics for the AOI we need to switch from the **Area of Interest** tab to the **Soil Map** tab as seen in Figure 13. When you do that the soils information for the AOI shows up in the Mapping panel (Fig 14). Accompanying the soils map is a **Map Unit Legend** panel (Fig 15) that briefly describes the soils present in the AOI and the acreage ascribed to each one. The soils descriptions are interesting but not very informative concerning capacity or suitability for log landings and roads. We must look further.

Fig 13: Soil Map tab highlighted.

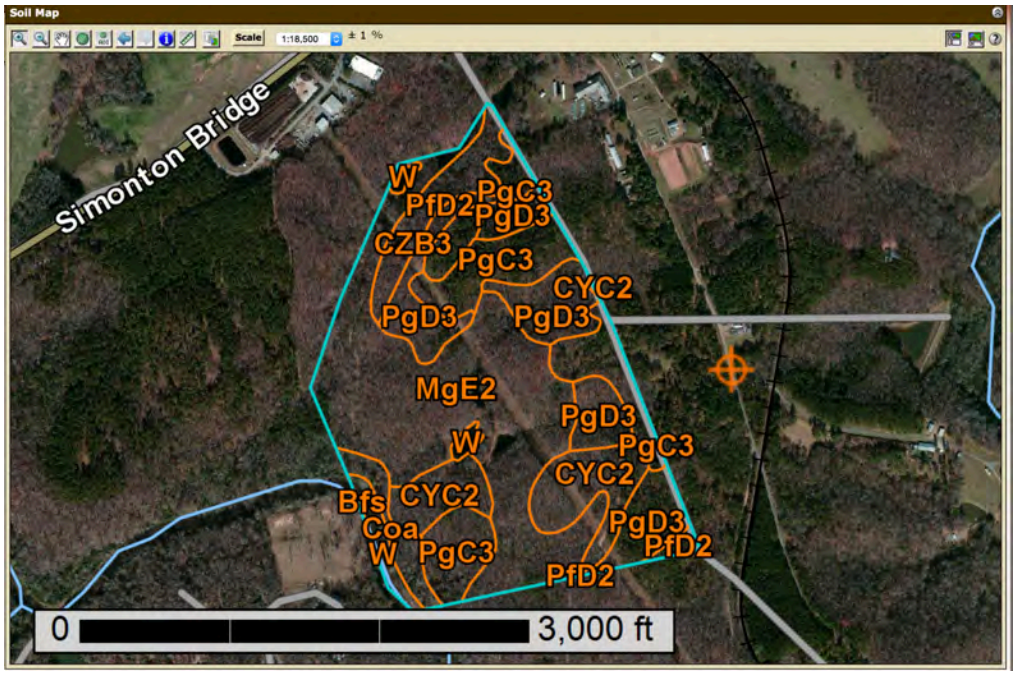

Fig 14: Soils map of the AOI

Map Unit Legend

Clarke and Oconee Counties, Georgia (GA623)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Bfs	Buncombe loamy sand	0.1	0.0%
Coa	Congaree soils and alluvial land	3.6	3.0%
CYC2	Cecil sandy loam, 6 to 10 percent slopes, eroded	18.5	15.4%
CZB3	Cecil sandy clay loam, 2 to 6 percent slopes, severely eroded	2.3	1.9%
MgE2	Madison sandy loam, 15 to 25 percent slopes, eroded	47.5	39.3%
PfD2	Pacolet sandy loam, 10 to 15 percent slopes, eroded	7.8	6.5%
PgC3	Pacolet sandy clay loam, 6 to 10 percent slopes, severely eroded	16.4	13.6%
PgD3	Pacolet sandy clay loam, 10 to 15 percent slopes, severely eroded	21.0	17.4%
W	Water	3.6	3.0%
Totals for Area of Interest		**120.7**	**100.0%**

Fig 15: AOI soils description and acreage

The way to obtain more relevant and useful information is to open the **Soil Data Explorer** tab (Fig 16). There you will find the **Suitabilities and Limitations Ratings** panel (Fig 17). If you click on the **Land Management** options it will change to show the many information options available (Fig 18). Chose the **Suitability for Roads (Natural Surface)** option at the bottom of Figure 18. That panel will open as in Figure 19 and then click **View Rating**.

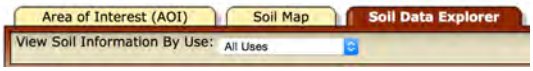

Figure 16: Soil Data Explorer panel

Figure 17: Suitability rating options

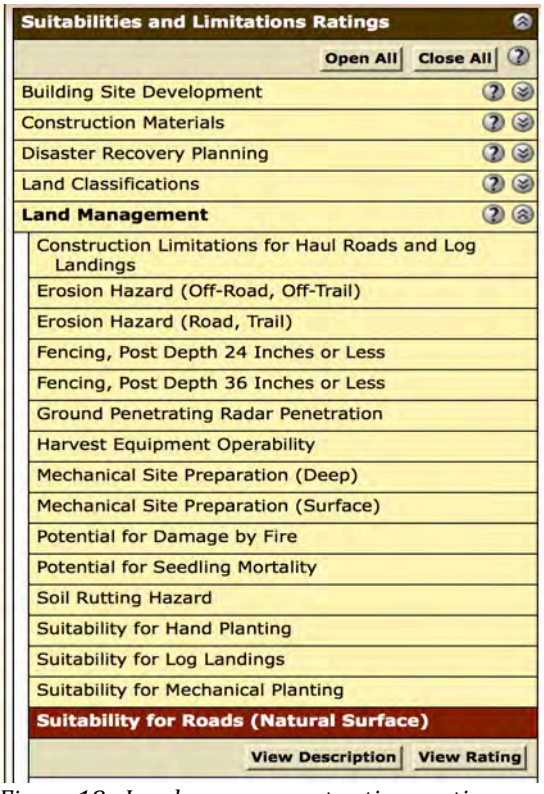

Figure 18: Land management ratings options

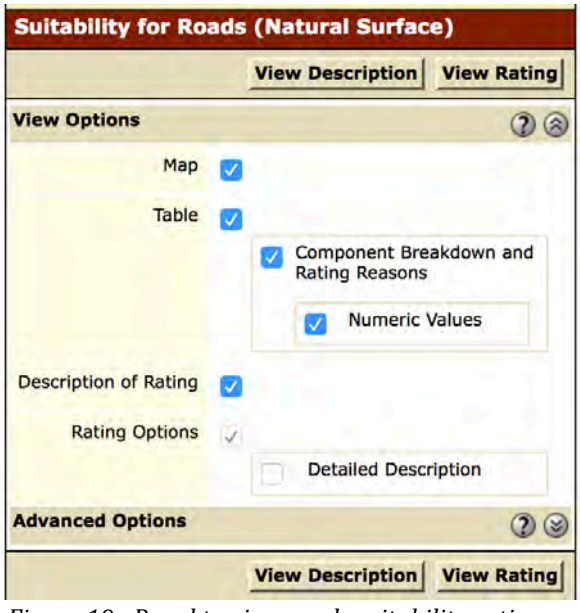

Figure 19: Panel to view roads suitability rating

Figure 20 shows the new Map panel for the AOI indicating the grouping of soils as to their suitability for roads. Figure 21 rates the soils and shows that the Cecil sandy soils (CYC2 and CZB3) and Pacolet sandy clay loam soils (PgC3) are moderately suited for roads using native materials for surfacing. The other soils are poorly suited for roads. Figure 22 indicates that 37.7 acres of the total 120.7 acres have soils moderately suited for roads and even skid trails. Not

shown is a map that could be created to examine soil suitability for log landings. In this example, the map would be exactly the same as for the roads suitability map.

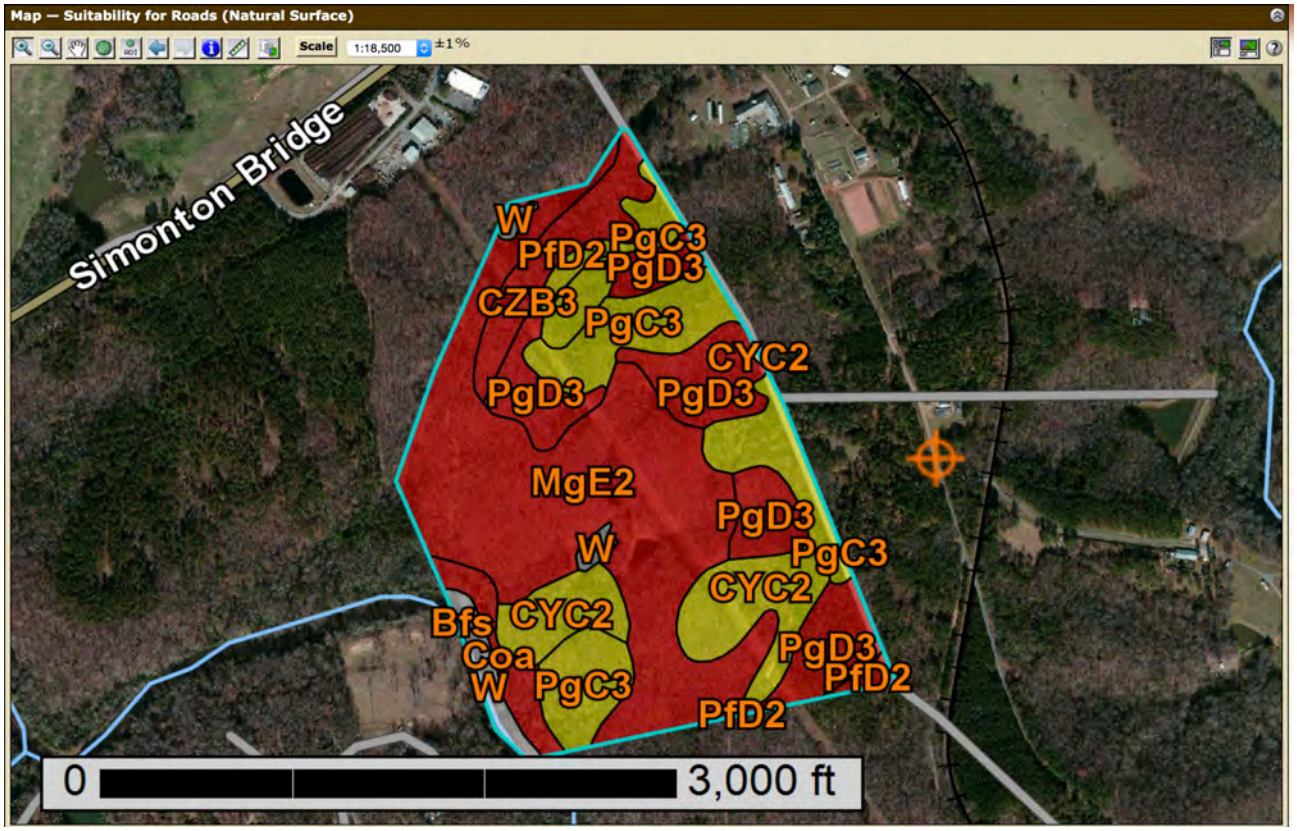

Figure 20: Map of AOI soils grouped as to their suitability for roads.

Tables — Suitability for Roads (Natural Surface) — Summary By Map Unit

Summary by Map Unit — Clarke and Oconee Counties, Georgia (GA623)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Bfs	Buncombe loamy sand	Poorly suited	Buncombe (100%)	Flooding (1.00)	0.1	0.0%
Coa	Congaree soils and alluvial land	Poorly suited	Congaree (65%)	Flooding (1.00)	3.6	3.0%
				Low strength (0.50)		
				Dusty (0.08)		
			Alluvial land (30%)	Flooding (1.00)		
				Low strength (0.50)		
				Dusty (0.06)		
			Wehadkee (5%)	Flooding (1.00)		
				Wetness (1.00)		
				Dusty (0.05)		
CYC2	Cecil sandy loam, 6 to 10 percent slopes, eroded	Moderately suited	Cecil (100%)	Slope (0.50)	18.5	15.4%
				Dusty (0.07)		
CZB3	Cecil sandy clay loam, 2 to 6 percent slopes, severely eroded	Moderately suited	Cecil (100%)	Low strength (0.50)	2.3	1.9%
				Dusty (0.08)		
MgE2	Madison sandy loam, 15 to 25 percent slopes, eroded	Poorly suited	Madison (100%)	Slope (1.00)	47.5	39.3%
				Dusty (0.07)		
PfD2	Pacolet sandy loam, 10 to 15 percent slopes, eroded	Poorly suited	Pacolet (100%)	Slope (1.00)	7.8	6.5%
				Dusty (0.10)		
PgC3	Pacolet sandy clay loam, 6 to 10 percent slopes, severely eroded	Moderately suited	Pacolet (100%)	Slope (0.50)	16.4	13.6%
				Dusty (0.11)		
PgD3	Pacolet sandy clay loam, 10 to 15 percent slopes, severely eroded	Poorly suited	Pacolet (100%)	Slope (1.00)	21.0	17.4%
				Dusty (0.11)		
W	Water	Not rated	Water (100%)		3.6	3.0%
Totals for Area of Interest					**120.7**	**100.0%**

Figure 21: Table of AOI soils rated as to their suitability for roads

Table — Suitability for Roads (Natural Surface) — Summary by Rating Value

Summary by Rating Value

Rating	Acres in AOI	Percent of AOI
Poorly suited	79.9	66.2%
Moderately suited	37.2	30.8%
Null or Not Rated	3.6	3.0%
Totals for Area of Interest	**120.7**	**100.0%**

Figure 21: Percentages of AOI soils rated as to their suitability for roads

Summary

The publication is intended to demonstrate and introduction in to the use of Web Soil Survey. There are many other applications that the forest landowner can use to aid in decision-making about their woodlands. It is a powerful and useful tool.

Athens, Georgia 30602-2152
Phone: 706.542.6819 • fax: 706.542.5073
An Equal Opportunity/Affirmative Action Institution