APPENDIX C

SOILS

Information Sources

The information contained within in the geology report was compiled from various published and unpublished geologic maps and reports as cited, and the personal knowledge of the preparer.

The source of bedrock geology information is the West Virginia Geological and Economic Survey Pocahontas County Geologic Map and Report which has been converted to digital format and is stored in the Monongahela National Forest GIS library as mnf_geology_0204 (J:\fsfiles\ref\gis\library\mon\shapefiles).

The MNF geologic shapefile, mnf_geology_0204 (i.e., layer) map has limitations for use in site-specific project analyses primarily due to differences in mapping scales. The mnf_geology_0204 layer is based on a compilation (i.e., scanning and mosaicing) of paper or hardcopy West Virginia Geological and Economic Survey County Maps produced in the early 1900's at a scale of 1:62,500. When overlaid on more detailed maps, such as 1:24,000 topographic maps, their inaccuracy is apparent. A second source of inaccuracy is that because the county geologic maps were generated by separate mapping projects, geologic information may not match across county lines.

As the maps show the general location of rock units exposed within a watershed area, the maps serve as a first screen for potential geologic concerns. Depending on concerns related to geology that are identified in the analysis, more detailed geologic or soils information may be needed. In many cases, detailed soils maps provide sufficient information to complete an analysis. In the case where more detailed geologic information is needed for the analysis, consulting the original county geologic map and/or field exam of a particular site may be required.

Information for the soil resource is located in the County Soil Survey Reports for Pocahontas (1998), Pendleton (1992) and Randolph, Main Part, (1984) Counties. The USDA Natural Resource Conservation Service, Soil Survey, is the author of these documents in cooperation with the USDA Forest Service, West Virginia University Agricultural Experiment Station, and local county authorities. The county soil survey report provides a map of the soil types (map units) at a scale of 1:24,000, soil map unit descriptions, typical soil series descriptions for the county, and soil map unit interpretations for various land management activities and soil properties. Soil characterization data for series used in this watershed is limited. However, because of the nature of soil survey and the principles on which soil is defined to form under, it is accepted that for large scale planning, soil characterization data for typical soil pedons from surrounding areas may be used to develop general analyses of soil chemistry and soil physical properties. Soil chemistry data for these typical pedons is stored in a National Soil Survey Center laboratory database.

Known discrepancies in the data are as follows:

- There are more acres of colluvial soils existing on the landscape than originally mapped. Many of these colluvial soils are mapped as residual soils.
- The concept of frigid soils was not used in the Randolph County, Main Part, Soil Survey; however, frigid soil concepts were used in the Pocahontas County Soil Survey. Therefore there are discrepancies in the soils data at the Pocahontas-Randolph County line. This may have relevance to habitat for vegetative communities like red spruce, nutrient cycling processes, and soil moisture. However, Randolph County inclusions were minimal.
- The counties do not have correlated soil surveys.

Soil Map Units In The Upper Greenbrier Watershed

The soil survey of the Upper Greenbrier Watershed spans three counties; primarily Pocahontas (>99%), with minor inclusions (<1%) of Randolph and Pendleton. Table C-1 lists those map units. The map unit symbol included alpha characters that identify the map unit and a number place that identifies the county. The follow legend can be used.

05 = Pendleton County
06 = Pocahontas County
08 = Randolph County

Table C-1. Acres per Map Unit of Soil Series in the Upper Greenbrier Watershed

Soil Map Units	Soil Map Unit Descriptions	Acres
AlB06	Allegheny Loam, 3 To 8 Percent Slopes	144
AlC06	Allegheny Loam, 8 To 15 Percent Slopes	40
At06	Atkins Silt Loam	71
BaB06	Belmont Silt Loam, 3 To 8 Percent Slopes	33
BaB08	Belmont Silt Loam, 3 To 8 Percent Slopes	0
BaC06	Belmont Silt Loam, 8 To 15 Percent Slopes	72
BaC08	Belmont Silt Loam, 8 To 15 Percent Slopes	2
BaD06	Belmont Silt Loam, 15 To 25 Percent Slopes	19
BbC06	Belmont Silt Loam, 3 To 15 Percent Slopes, Very Rocky	56
BbD08	Belmont Stony Silt Loam-Rock Outcrop Complex, 15 To 25 Percent Slopes	2
BbE06	Belmont Silt Loam, 15 To 35 Percent Slopes, Very Rocky	632
BbE08	Belmont Stony Silt Loam-Rock Outcrop Complex, 25 To 35 Percent Slopes	2
BbF06	Belmont Silt Loam, 35 To 55 Percent Slopes, Very Rocky	661
BbF08	Belmont Stony Silt Loam-Rock Outcrop Complex, 35 To 70 Percent Slopes	1
BeB06	Berks Channery Silt Loam, 3 To 8 Percent Slopes	19
BeC06	Berks Channery Silt Loam, 8 To 15 Percent Slopes	68
BeD06	Berks Channery Silt Loam, 15 To 25 Percent Slopes	23
BfC06	Berks Channery Silt Loam, 3 To 15 Percent Slopes, Very Stony	124
BfE06	Berks Channery Silt Loam, 15 To 35 Percent Slopes, Very Stony	1451
BfF06	Berks Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	5011
BgC06	Berks-Dekalb Complex, 3 To 15 Percent Slopes, Very Stony	28
BgC08	Berks Channery Silt Loam, Moist, 3 To 15 Percent Slopes	1
BgD08	Berks Channery Silt Loam, Moist, 15 To 25 Percent Slopes	0

Soil Map Units	Soil Map Unit Descriptions	Acres
BgE06	Berks-Dekalb Complex, 15 To 35 Percent Slopes, Very Stony	284
BgF06	Berks-Dekalb Complex, 35 To 55 Percent Slopes, Very Stony	827
BgF08	Berks Channery Silt Loam. Moist, 35 To 70 Percent Slopes	0
BhG06	Berks, Weikert And Calvin Soils, 55 To 80 Percent Slopes, Very Stony	82
BoB06	Blairton Silt Loam, 3 To 8 Percent Slopes	33
BsC08	Brinkerton Variant Very Stony Silt Loam, 3 To 15 Percent Slopes	1
BtC08	Buchanan And Ernest Stony Soils, 3 To 15 Percent Slopes	3
BtE08	Buchanan And Ernest Stony Soils, 15 To 35 Percent Slopes	0
BuC05	Buchanan Channery Loam, 8 To 15 Percent Slopes	1
CaC06	Calvin Channery Silt Loam, 8 To 15 Percent Slopes	7
CaC08	Calvin Channery Silt Loam, 3 To 15 Percent Slopes	2
CaD08	Calvin Channery Silt Loam, 15 To 25 Percent Slopes	0
CaE08	Calvin Channery Silt Loam, 25 To 35 Percent Slopes	5
CbC06	Calvin Channery Silt Loam, 3 To 15 Percent Slopes, Very Stony	42
CbC08	Calvin Silt Loam, High Base Substratum, 8 To 15 Percent Slopes	0
CbE06	Calvin Channery Silt Loam, 15 To 35 Percent Slopes, Very Stony	347
CbF06	Calvin Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	236
CcE08	Calvin Stony Silt Loam, High Base Substratum, 25 To 35 Percent Slopes	2
CcF08	Calvin Stony Silt Loam, High Base Substratum, 35 To 70 Percent Slopes	0
CdF05	Calvin-Dekalb-Hazleton Complex, 35 To 55 Percent Slopes, Stony	0
CeC06	Cateache Channery Silt Loam, 8 To 15 Percent Slopes	1
CfC06	Cateache Channery Silt Loam, 15 To 35 Percent Slopes	109
CfE06	Cateache Channery Silt Loam, 15 To 35 Percent Slopes, Very Stony	197
CfF06	Cateache Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	1714
Ch06	Chavies Fine Sandy Loam	33
CsC08	Cookport Varient Very Stony Silt Loam, 3 To 15 Percent Slopes	17
DbB08	Dekalb Channery Loam, Moist, 3 To 8 Percent Slopes	8
DbC08	Dekalb Channery Loam, Moist, 8 To 15 Percent Slopes	14
DbD08	Dekalb Channery Loam, Moist, 15 To 25 Percent Slopes	3
DbE08	Dekalb Channery Loam, Moist, 25 To 35 Percent Slopes	0
DhE06	Dekalb-Hazleton Complex, 15 To 35 Percent Slopes, Very Stony	1
DmC08	Dekalb Extremely Stony Loam, 3 To 15 Percent Slopes	0
DrC08	Dekalb Extremely Stony Loam, Moist, 3 To 15 Percent Slopes	4
DrE08	Dekalb Extremely Stony Loam, Moist, 15 To 35 Percent Slopes	6
DsF08	Dekalb Rubbly Loam, 25 To 80 Percent Slopes	24
EnC08	Ernest Silt Loam, 8 To 15 Percent Slopes	0
EnD08	Ernest Silt Loam, 15 To 25 Percent Slopes	0
GaC06	Gauley Channery Sandy Loam, 3 To 15 Percent Slopes, Extremely Stony	150
GaE06	Gauley Channery Sandy Loam, 15 To 35 Percent Slopes, Extremely Stony	60
HdC05	Hazleton-Dekalb Complex, 3 To 15 Percent Slopes, Stony	5
HdE05	Hazleton-Dekalb Complex, 15 To 35 Percent Slopes, Stony	0
HdF05	Hazleton-Dekalb Complex, 35 To 55 Percent Slopes, Stony	1
Ho06	Holly Silt Loam	82
LeC06	Leatherbark Silt Loam, 0 To 15 Percent Slopes, Very Stony	25
LeD08	Leetonia Rubbly Loamy Sand, 3 To 25 Percent Slopes	20
LhD05	Lehew And Dekalb Soils, 15 To 25 Percent Slopes	0
LlB06	Lily Loam, 3 To 8 Percent Slopes	11

Soil Map Units	Soil Map Unit Descriptions	Acres
LlC06	Lily Loam, 8 To 15 Percent Slopes	38
Lo06	Lobdell Silt Loam	154
MaB06	Macove Channery Silt Loam, 3 To 8 Percent Slopes	17
MaC05	Mandy Channery Silt Loam, 8 To 15 Percent Slopes	9
MaC06	Macove Channery Silt Loam, 8 To 15 Percent Slopes	31
MaD05	Mandy Channery Silt Loam, 15 To 25 Percent Slopes	3
McC06	Macove Channery Silt Loam, 3 To 15 Percent Slopes, Very Stony	183
McE06	Macove Channery Silt Loam, 15 To 35 Percent Slopes, Very Stony	69
MdC06	Mandy Channery Silt Loam, 8 To 15 Percent Slopes	474
MdD06	Mandy Channery Silt Loam, 15 To 25 Percent Slopes	274
MdE05	Mandy Channery Silt Loam, 15 To 35 Percent Slopes, Stony	1
MdF05	Mandy Channery Silt Loam, 35 To 55 Percent Slopes, Stony	4
MfC06	Mandy Channery Silt Loam, 3 To 15 Percent Slopes, Very Stony	6169
MfE06	Mandy Channery Silt Loam, 15 To 35 Percent Slopes, Very Stony	16838
MfF06	Mandy Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	34804
MfG06	Mandy Channery Silt Loam, 55 To 80 Percent Slopes, Very Stony	1560
Mh06	Medihemists, Very Deep	40
MkC08	Meckesville Stony Silt Loam, 3 To 15 Percent Slopes	2
MkE08	Meckesville Stony Silt Loam, 15 To 35 Percent Slopes	1
Or06	Orrville Silt Loam	149
Ph06	Philo Silt Loam	10
Po06	Potomac Loam	366
Pt06	Potomac Very Gravelly Loam	217
Pu06	Purdy Silt Loam	17
ShB06	Shouns Silt Loam, 3 To 8 Percent Slopes	44
ShC06	Shouns Silt Loam, 8 To 15 Percent Slopes	95
ShC08	Shouns Silt Loam, 3 To 15 Percent Slopes	0
ShD08	Shouns Silt Loam, 15 To 25 Percent Slopes	0
SsC06	Shouns Silt Loam, 3 To 15 Percent Slopes, Extremely Stony	1681
SsE06	Shouns Silt Loam, 15 To 35 Percent Slopes, Extremely Stony	1276
SsF06	Shouns Silt Loam, 35 To 55 Percent Slopes, Extremely Stony	95
SwE06	Snowdog Silt Loam, 15 To 35 Percent Slopes, Extremely Stony	691
Tg06	Tioga Fine Sandy Loam	169
TrC06	Trussel Silt Loam, 3 To 15 Percent Slopes, Very Stony	2498
Uf06	Udifluvents-Fluvaquents Complex	3218
Us06	Udorthents, Smoothed	1
W06	Water	105
WeC06	Weikert Channery Silt Loam, 8 To 15 Percent Slopes	205
WeD06	Weikert Channery Silt Loam, 15 To 25 Percent Slopes	287
WeF06	Weikert Channery Silt Loam, 25 To 55 Percent Slopes	459
	Total Acres	**85072**

A map of these soil map units can be found on page 3-6 of this assessment.

Sensitive Soils

Current analyses of the soil resource are conducted using the Forest GIS database system and field visits to the watershed. A digital layer of the soils exists for 9 of 10 counties within the Forest proclamation boundary. A digital layer depicting the sensitive soils is also available in the GIS database. Soils rated as sensitive may require mitigation measures beyond those in the Forest Plan that are routinely applied during project implementation. Sensitive soils are grouped in the following categories: soils that are prone to mass wasting and/or slippage, slopes > 30-70%, prime farmland, hydric soils, flood plain soils, soils that form on limestone and karst topography, and soils that are moderately well-drained or wetter.

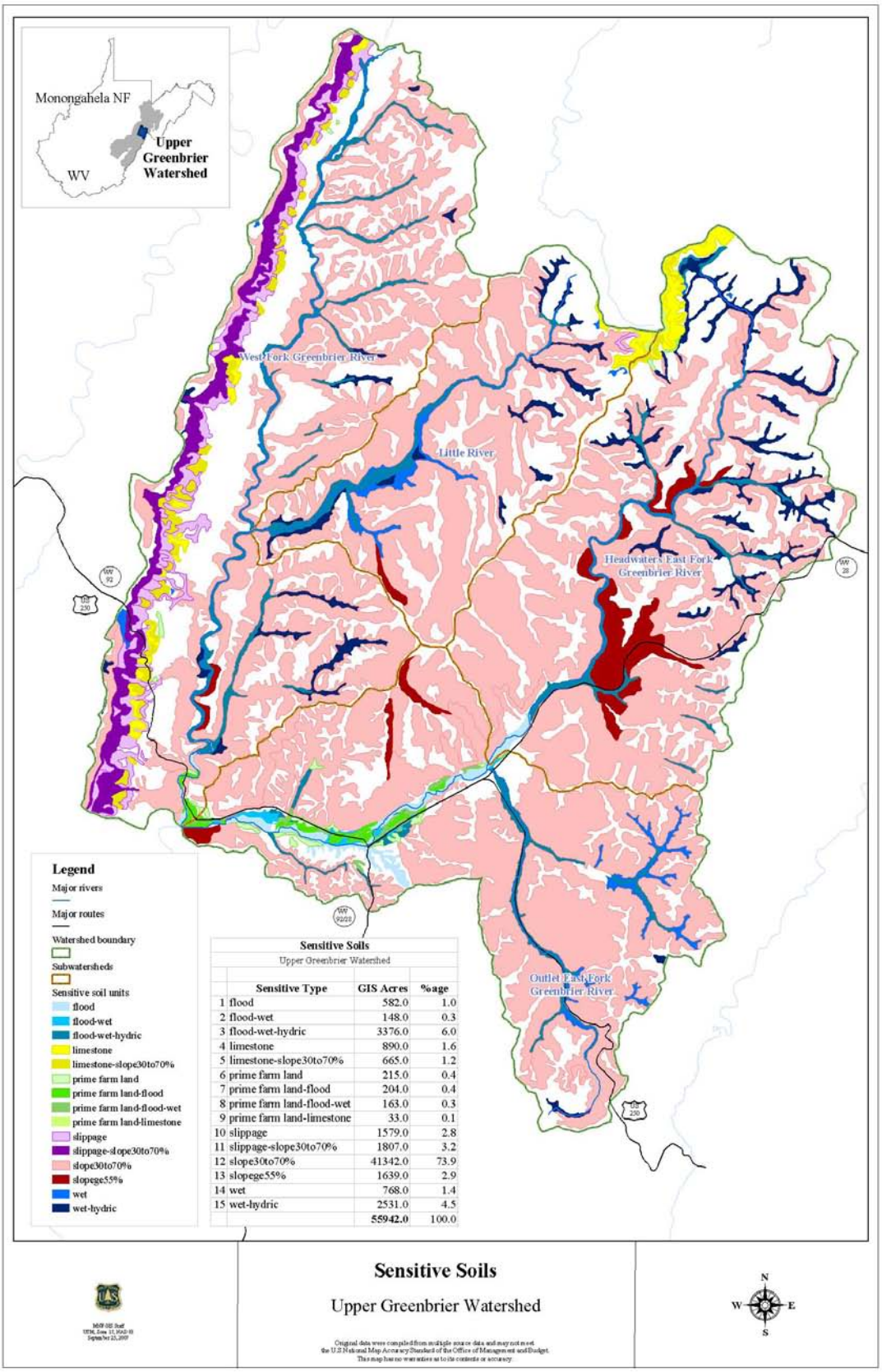
Soils in the Upper Greenbrier River Watershed are sensitive for flooding, hydric soil designation often used in wetland delineations, slippage, steep slopes (30 to 70 percent), and wetness (moderately well-drained or wetter). Table C-2 displays the soil map units and their respective sensitivity. Map C-2 visually displays the patterns of sensitive soils within the watershed. This information will be utilized when planning site-specific projects within the watershed for activities such as road building, timber harvesting, range management, or restoration activities.

Table C-2. Soil Sensitivity by Map Unit in the Upper Greenbrier Watershed

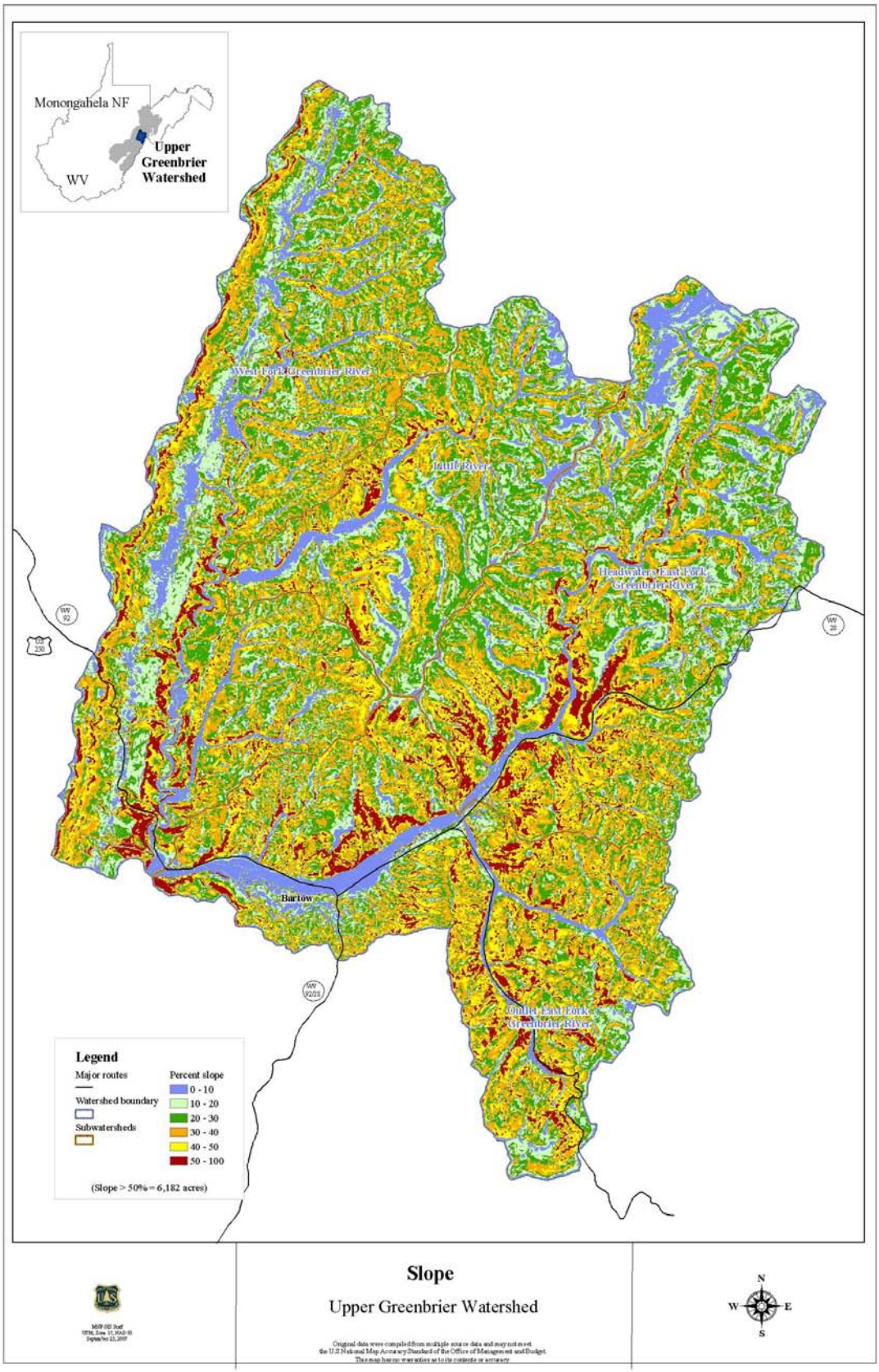
Soil Map Units	Sensitivity	Soil Map Unit Descriptions	Acres
AlB06	Prime Farm Land	Allegheny Loam, 3 To 8 Percent Slopes	143
At06	Flood-Wet-Hydric	Atkins Silt Loam	71
BaB06	Prime Farm Land-Limestone	Belmont Silt Loam, 3 To 8 Percent Slopes	33
BaB08	Prime Farm Land-Limestone	Belmont Silt Loam, 3 To 8 Percent Slopes	0
BaC06	Limestone	Belmont Silt Loam, 8 To 15 Percent Slopes	138
BaC08	Limestone	Belmont Silt Loam, 8 To 15 Percent Slopes	1
BaD06	Limestone	Belmont Silt Loam, 15 To 25 Percent Slopes	38
BbC06	Limestone	Belmont Silt Loam, 3 To 15 Percent Slopes, Very Rocky	55
BbD08	Limestone	Belmont Stony Silt Loam-Rock Outcrop Complex, 15 To 25 Percent Slopes	3
BbE06	Limestone	Belmont Silt Loam, 15 To 35 Percent Slopes, Very Rocky	650
BbE08	Limestone	Belmont Stony Silt Loam-Rock Outcrop Complex, 25 To 35 Percent Slopes	2
BbF06	Limestone-Slope 30-70%	Belmont Silt Loam, 35 To 55 Percent Slopes, Very Rocky	664
BbF08	Limestone-Slope 30-70%	Belmont Stony Silt Loam-Rock Outcrop Complex, 35 To 70 Percent Slopes	1
BfF06	Slope 30-70%	Berks Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	5010
BgF06	Slope 30-70%	Berks-Dekalb Complex, 35 To 55 Percent Slopes, Very Stony	828
BgF08	Slope 30-70%	Berks Channery Silt Loam, Moist, 35 To 70 Percent Slopes	0
BhG06	Slopege55%	Berks, Weikert And Calvin Soils, 55 To 80 Percent Slopes, Very Stony	82
BoB06	Wet	Blairton Silt Loam, 3 To 8 Percent Slopes	33
BrF06	Slope 30-70%	Briery-Rock Outcrop Complex, Very Steep	3
BsC08	Wet	Brinkerton Variant Very Stony Silt Loam, 3 To 15 Percent Slopes	1
BtE08	Wet	Buchanan And Ernest Stony Soils, 15 To 35 Percent Slopes	0
BuC05	Wet	Buchanan Channery Loam, 8 To 15 Percent Slopes	1
CbE08	Slippage	Calvin Silt Loam, High Base Substratum, 25 To 35 Percent Slopes	0
CbF06	Slope 30-70%	Calvin Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	197
CcE08	Slippage	Calvin Stony Silt Loam, High Base Substratum, 25 To 35 Percent Slopes	3

Soil Map Units	Sensitivity	Soil Map Unit Descriptions	Acres
CfC06	Slippage	Cateache Channery Silt Loam, 3 To 15 Percent Slopes, Very Stony	109
CfE06	Slippage	Cateache Channery Silt Loam, 15 To 35 Percent Slopes, Very Stony	198
CfF06	Slippage-Slope 30-70%	Cateache Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	1712
Ch06	Prime Farm Land-Flood	Chavies Fine Sandy Loam	33
CsC08	Wet	Cookport Variant Very Stony Silt Loam, 3 To 15 Percent Slopes	17
DbF08	Slope 30-70%	Dekalb Channery Loam, Moist, 35 To 70 Percent Slopes	0
DsF08	Slope 30-70%	Dekalb Rubbly Loam, 25 To 80 Percent Slopes	24
EnC08	Wet	Ernest Silt Loam, 8 To 15 Percent Slopes	0
Fu08	Flood-Wet	Fluvaquents-Udifluvents Complex	0
Ho06	Flood-Wet-Hydric	Holly Silt Loam	83
LeC06	Wet	Leatherbark Silt Loam, 0 To 15 Percent Slopes, Very Stony	24
LlB06	Prime Farm Land	Lily Loam, 3 To 8 Percent Slopes	10
Lo06	Prime Farm Land-Flood-Wet	Lobdell Silt Loam	153
MaB06	Prime Farm Land	Macove Channery Silt Loam, 3 To 8 Percent Slopes	17
MdF05	Slope 30-70%	Mandy Channery Silt Loam, 35 To 55 Percent Slopes, Stony	4
MfF05	Slope 30-70%	Mandy Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	0
MfF06	Slope 30-70%	Mandy Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	34817
MfF08	Slope 30-70%	Mandy Channery Silt Loam, 35 To 55 Percent Slopes, Very Stony	0
MfG06	Slopege55%	Mandy Channery Silt Loam, 55 To 80 Percent Slopes, Very Stony	1557
Mh06	Wet-Hydric	Medihemists, Very Deep	40
MkE08	Limestone	Meckesville Stony Silt Loam, 15 To 35 Percent Slopes	3
Or06	Flood-Wet	Orrville Silt Loam	148
Ph06	Prime Farm Land-Flood-Wet	Philo Silt Loam	10
Po06	Flood	Potomac Loam	365
Pt06	Flood	Potomac Very Gravelly Loam	217
Pu06	Flood-Wet-Hydric	Purdy Silt Loam	16
ShB06	Prime Farm Land	Shouns Silt Loam, 3 To 8 Percent Slopes	45
ShC08	Slippage	Shouns Silt Loam, 3 To 15 Percent Slopes	0
ShD08	Slippage	Shouns Silt Loam, 15 To 25 Percent Slopes	0
SsE06	Slippage	Shouns Silt Loam, 15 To 35 Percent Slopes, Extremely Stony	1269
SsF06	Slippage-Slope 30-70%	Shouns Silt Loam, 35 To 55 Percent Slopes, Extremely Stony	95
SwE06	Wet	Snowdog Silt Loam, 15 To 35 Percent Slopes, Extremely Stony	692
Tg06	Prime Farm Land-Flood	Tioga Fine Sandy Loam	171
TrC06	Wet-Hydric	Trussel Silt Loam, 3 To 15 Percent Slopes, Very Stony	2491
Uf06	Flood-Wet-Hydric	Udifluvents-Fluvaquents Complex	3206
WeF06	Slope 30-70%	Weikert Channery Silt Loam, 25 To 55 Percent Slopes	459
		TOTAL ACRES	**55942**

Map C-1. Soil Nutrient Sensitivity in the Upper Greenbrier Watershed



Sensitive Soils
Upper Greenbrier Watershed

	Sensitive Type	GIS Acres	%age
1	flood	582.0	1.0
2	flood-wet	148.0	0.3
3	flood-wet-hydric	3376.0	6.0
4	limestone	890.0	1.6
5	limestone-slope30to70%	665.0	1.2
6	prime farm land	215.0	0.4
7	prime farm land-flood	204.0	0.4
8	prime farm land-flood-wet	163.0	0.3
9	prime farm land-limestone	33.0	0.1
10	slippage	1579.0	2.8
11	slippage-slope30to70%	1807.0	3.2
12	slope30to70%	41342.0	73.9
13	slopege55%	1639.0	2.9
14	wet	768.0	1.4
15	wet-hydric	2531.0	4.5
		55942.0	100.0

Map C-2. Slopes 50 Percent or Greater in the Upper Greenbrier Watershed