WV State Envirothon 5th Topic Scenario

Agriculture and the Environment:
Knowledge and Technology to feed the world

Introduction:

It is estimated that the world population will reach 9 billion by 2050. The USDA estimates that 41 million people or 1 in 8 individuals in the United States were food insecure as of 2016. This means these individuals were living in households without consistent access to adequate food sources. Thirteen million of these individuals were children who require healthy food sources for proper development. According to Feeding America, West Virginia's food insecurity rate is at 14.6% of the state's population. West Virginia's food insecurity rate for children is even worse. 20.2% of children in West Virginia are food insecure. This lack of food can cause individuals to have numerous health issues. It can also weigh on a family's finances by forcing them to make the difficult decision between utilities and necessary living items in place of adequate food resources. It is for these reasons that in April of 2013 West Virginia passed Senate Bill No. 663, otherwise known as the West Virginia Feed to Achieve Act. This bill allows for the creation of partnerships to provide healthy food sources to children during and outside of the school day.

It is the development of agriculture that has allowed humans to increase in population. As the need for food resources increases, the amount of food production must also increase. This push for increased agriculture can be beneficial, but it can also be harmful to the environment and ecosystems if done incorrectly. Past Farming practices and onset of environmental factors caused the Dust Bowl in the 1930's. Various farming practices have turned out to be detrimental to the environment. Examples include over-plowing, eagle decline from the use of the pesticide DDT, and large areas of land being cleared causing major habitat loss.

We have since learned to use more environmentally friendly practices such as limiting the amount of tilling to prevent erosion from wind and water runoff. Currently 70% of the world's freshwater supply is being used for agriculture, so we have developed timed watering systems and runoff reservoirs for water reuse. We have even become better at planting polycultures rather than monocultures with seasonal crop rotations, cover crops, and better planting arrangement systems. Although controversial, we have even developed genetically modified organisms or GMOs and plants that can withstand a variety of environmental conditions.

Despite all the efforts and forward advancements, there are still national and local hunger issues. The USDA even estimates the amount of food waste to be 30-40% in the US. The questions should be asked how we can use West Virginia's environment, how we can utilize the large percentage of family farms, and how we can apply new technology to help feed the most individuals while maintaining a sustainable agroecosystem?

Scenario:

This fictional farm scenario is based in central WV near a rural part of Braxton County along Grasslick Run. You have been called in as a specialist to aid Mr. Brock Ollie Feedemall and his wife, Carly Flower Feedemall. The Feedemalls are retired school teachers who have a passion for helping others, working with the community, and feeding hungry families. They want to retire on "Feedemall Farms", the farm they have inherited. They also desire to supplement their retirement and fulfill their needs for charitable work by converting their farm into a sustainable resource for the community and as an outreach for organizations in their area. Unfortunately, they weren't sure how to go about getting started and needed more information from proper sources. They had heard from a family friend about your organization and how you were better equipped to aid them in their journey.

After receiving a call from the Feedemalls, you prepared for your farm visit by using mapping technology and software to get a better overview of what you might find on the property. You noticed after viewing an aerial photo that the property was approximately 170 acres and comprised of roughly 50 acres of cleared agricultural land and about 121 acres of forested land. After printing a topographic map, it appeared that the valleys were gently sloping, the side slopes were very steep, and the ridge tops were less sloping. The ridge tops ranged from about 15-to 25% slope with an elevation of over 1,400 feet. The very steep forested sections through the middle of the property range from about 35-to 70% slopes. Some steep foot slope areas often contain up to 3% surface stones. The mostly open fields in the valley ranged up to 5% slope, with an elevation of 1,100 feet. Before leaving your office you also used the online soil surveys and found that 118 acres, or 69% of the property was made up of Gilpin Upshur soil map units, and is mostly comprised of the ridges and forested areas. The lower pasture and stream areas were comprised of Pope and Vandalia soil map units making up the other 31% of the property.

Upon your arrival to the farm, Mr. and Mrs. Feedemall invited you into their home (a beautiful hand built cottage) and encouraged you to sit at their table, which had been built by Mr. Feedemall's great grandfather. After listening to their stories and admiring the table, you showed the Feedemalls the maps to start the discussion of you walking their property. Mr. Feedemall stated that he had never used mapping systems for farming before and is very impressed and interested in the findings. He also stated that him and his wife advocates for STEM (Science Technology Engineering and Math) at the school they used to work in. They also stated that they would be interested in using any modern technology that you feel would benefit them on the farm.

The field inspection started with the forested areas. Mr. Feedemall explained that his property was broken into four forested parts and hand drew you a map of the area. You decided to use his crude map as a reference for future mapping. Mr. Feedemall explained that previous logging activity left roads that make it easy to access all areas of the farm. Mr. Feedemall continued to indicate each forested section on the map. You found that stand four was comprised of mostly walnut and hickory with plenty of mast. Stand three was comprised of sugar maple that were once the understory, but were now the dominate species in the stand.

Continuing along the path, you both found your way into an old clearing that was overgrown. This was stand two and it was made up of what used to be an orchard but had since been forgotten. The last stand, stand one, was not included in previous harvesting activities. The stand was comprised of an understory and overstory of white oak and hickory. You also noticed that many of the overstory trees are overmatured. Mr. Feedemall had saved this section of forest as an investment to put money back into the farm after his retirement.

As you exited the forest you noticed a few white boxes in the distance and immediately recognized them as bee boxes, but haven't seen many flowers in bloom. Mr. Feedemall stated that his wife enjoyed working with the bees, and adds that she would like to incorporate the bees into the farming practices.

Above the house, Mr. and Mrs. Feedemall showed you a greenhouse that they were in the process of building. They were considering what technology to use to run water to and for the greenhouse and how to power the heating system. Mrs. Feedemall stated she learned a lot about starting crops early in a greenhouse from her mother and father. While near the greenhouse, you found a small composting bin. Mrs. Feedemall stated that she used it to dispose of organic scraps in hopes they could use it for the greenhouse and reduce waste, but admitted it was at a very small scale. She stated that growing up they used a larger composting process with waste from the farm next door. She continued to state that she would like to increase the capacity of their current system and utilize modern practices and technology.

Afterwards, you inspected the fields on the property and agricultural areas. You found that some areas were indicated as crops and were either hay or corn used for the cattle that were once prevalent on the property. The landowner explained that before he inherited the farm, the cows were sold by his father to supplement his own retirement. You noticed that the fields that had been repeatedly planted to hay and corn had not been recently maintained, and contained vegetation species indicative of poor soil health. You also noticed soil erosion had taken place along the stream sides and in feeding areas. You then observed where Mr. and Mrs. Feedemall had planted some crops in the areas near the house in the past. Mrs. Feedemall stated that they really enjoyed planting garden vegetables, but had issues in the past with pests and disease. They stated that when they planted all tomatoes in a field they were hit with a tomato blight. They also had an infestation of Corn Earworm in another field when they had a healthy crop of Sweet Corn. Mrs. Feedemall then stated after having those issues she researched biodiversity, cover crops, crop rotations, and natural occurring controls, but was unsure what practices were best.

They also showed you an empty barn that was in good shape on the upper field above the greenhouse. While there you noticed a well that was not being used. Mr. Feedemall stated that it was a good well, but they hadn't used it much in the last couple of years. He also pointed out two springs in the fields on each side of the barn that had water in them all year and explains how his grandfather used them when he was young. It was for this reason Mr. Feedemall learned that water was an important resource, but should be used conservatively. He continues to state that his interest in new technology and water conservation has made him curious about what sustainable technology he could use to water his crops.

Instructions:

Your group has been assigned to this farm as conservationists, soil scientists, wildlife biologists, forest managers, agricultural scientists, economists, and nonprofit organizers. Your goal is to aid Mr. and Mrs. Feedemall with creating a managed property that meets the landowner's objectives of feeding and distributing food to individuals while maintaining a sustainable agroecosystem. This task should be completed while considering modern technology, resources available, government assistance, and sustainability.

Take time to study the scenario. This will act as the field visit to the property. Use this information to find what has happened on the property in the past and present. This will help to decide what needs to be done in the future. Consider if there are any issues that need to be resolved on the property. You will also want to consider any unused resources. Think about what food resources you are wishing to produce on the farm. Keep in mind when choosing your crops what planting arrangements and techniques will be used, whether you will use genetically modified organisms (GMOs) and or pesticides, what technology you will use to maintain these crops and resources, and how these decisions will financially affect the bottom line. Also look for other resources on the property other than crops that can be utilized as a food resource. Finally, how will you distribute these foods to have the most impact? To assist you in preparing for your presentation, the landowners have provided the following questions they would like for you to answer during your presentation

1. Were there any environmental issues currently that need addressed on the farm (water, soil, etc.)?
2. Are there any investments or government assistance programs that can help pay for the farming activity needed?
3. What crops or food resources would you recommend be planted or used on the farm to produce the greatest impact on the local community?
4. What sustainable planting arrangements or systems should we use to provide the greatest yields and maintain sustainability?
5. Should we use GMOs, Pesticides, or more natural systems to eliminate or prevent pest. Also, how will we administer these tools to crops in the most sustainable way?
6. How can we use the most modern technology and engineering to conserve natural resources and prevent conditions that can be caused from farming actives?
7. What is the best way to spread the food produced on the farm to have the greatest impact to local food insecurity?

Learning Objectives:

Once research and completion of training has taken place students should be able to:

1. Define food insecurity and understand the impacts.
2. Know how government organizations, non-profit groups, and farmers aid with food insecurity at the national, state, and local level.

3. Know how growing populations affect the need for increased agriculture.
4. Define agroecosystems, agroeconomic, and sustainable agriculture.
5. Understand sustainable agriculture on large and small scale operations as well as indicators of sustainable farming.

6. Understanding how sustainability and best management farming practices enhance and protect environmental resources.

7. Understanding differences in monoculture versus polyculture in agricultural environments.
8. Define sustainable planting techniques such as cover crops, crop rotations, and vertical farming as a benefit to management strategies.

9. Know how sustainable agriculture increases biodiversity while limiting or preventing pests and disease presents and detrimental effects.
10. Evaluate the practices and implementation of biocontrol and chemical applications.
11. Define NWFP (Non-Wood Forest Products) and their purpose in agroforestry for food production.

12. Understand how forest management can be utilized as an investment and re-managed before and after harvest activities for different objectives.

13. Understand what roles pollinators play in sustainable agriculture productions?
14. Understand the impacts that soil health has on an agroecosystem and what tools can be used to manage soil conditions.

15. Understand how GIS, Drones, GPS, and Environmental testing can aid in determining sustainable farming practices to be applied.

16. Understand how modern technology is being used through natural resources like solar, wind, and water for productivity while managing for these resources.

Reference Links and Maps

These are meant to be an aid to be used for understanding the key topics and learning objectives. Feel free to use other aids, materials, and contacts to improve your knowledge of the subjects presented in the learning objectives. Maps are also at the end of the document to aid with presenting the scenario.

WV Envirothon -- http://www.wvca.us/envirothon/

National Competition for 2019-- https://www.envirothon.org/the-competition/current-competition

National Competition Key Topics Web Links--
https://www.envirothon.org/media/attachments/2018/11/02/2019-ncf-envirothon-ci-resources-11-02-2018.pdf

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Food Insecurity

Feeding America-- https://www.feedingamerica.org/hunger-in-america

https://www.feedingamerica.org/hunger-in-america/west-virginia

http://map.feedingamerica.org/county/2016/overall/west-virginia

Food in schools-- https://www.fns.usda.gov/farmtoschool/fact-sheets

GIS used to map Food Insecurity--
http://wvu.maps.arcgis.com/apps/webappviewer/index.html?id=eb8012e7b2d843dbadca323a856575d8

Mountaineer Food Bank-- https://www.mountaineerfoodbank.org/

Facing Hunger Food Bank-- https://www.facinghunger.org/

Farmers Markets and buying local--
https://agriculture.wv.gov/divisions/marketinganddevelopment/Documents/WV%20Farm%20Mkt%202015%20PDF%20.pdf

Food Transportation footprint-- https://www.oregon.gov/deq/FilterDocs/PEF-FoodTransportation-ExecutiveSummary.pdf

Ecological footprint-- https://www.earthday.org/take-action/footprint-calculator/?gclid=EAIaIQobChMI28jG2djF3wIVQkSGCh0hRgpxEAAYASAAEgJ6U_D_BwE

Agriculture

Intoduction to history-- https://www.ck12.org/earth-science/agriculture-and-human-population-growth/lesson/Agriculture-and-Human-Population-Growth-HS-ES/

2018 Farm Bill-- https://www.agriculture.senate.gov/2018-farm-bill

2014 Farm Bill-- https://www.nrcs.usda.gov/wps/portal/nrcs/main/wv/programs/farmbill/

Sustainable Agriculture Terms-- https://www.nal.usda.gov/afsic/sustainable-agriculture-definitions-and-terms-related-terms#term27

agroecosystems -- https://www.youtube.com/watch?v=hWkYtZxpQUo

https://www.northcentralsare.org/Educational-Resources/SARE-Project-Products/Towards-a-Sustainable-Agriculture-A-Curriculum-for-High-School-Classes

http://www.foodsystemprimer.org/food-production/ecological-and-urban-agriculture/index.html

sustainable agriculture-- http://asi.ucdavis.edu/programs/sarep/about/what-is-sustainable-agriculture

Monoculture Vs Polyculture-- https://www.youtube.com/watch?v=cMuBIhx8oRI

Chemical and Biological controls in agriculture-- https://www.youtube.com/watch?v=GLllZ-qiXJA

GMO's-- https://www.youtube.com/watch?v=aMDhUsxom0U

Cover Crops-- https://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version/Cover-Crops/Types-of-Cover-Crops

---https://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version/Cover-Crops/Cover-Crop-Management

--- https://www.envirothon.org/images/2019/Cover-Crops-for-Organic-Farms.pdf

Crop Rotations--- https://www.ucsusa.org/food_and_agriculture/solutions/advance-sustainable-agriculture/crop-diversity-and-rotation.html#.XCuVhNJKjIU

--- https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/?cid=nrcs142p2_044349

Vertical Farming-- https://www.pbs.org/video/good-stuff-are-vertical-farms-future-agriculture/

https://cals.ncsu.edu/crop-and-soil-sciences/

GIS, Drones, GPS, and Environmental testing-- https://www.bae.ncsu.edu/research/#machine

https://video.nationalgeographic.com/video/magazine/food-by-the-numbers/00000146-a587-d733-a5c7-b78f98250000

https://www.youtube.com/watch?v=Qmla9NLFBvU

Understand how modern technology-- natural resources like solar, wind, and water for productivity

--https://www.ucsusa.org/clean_energy/smart-energy-solutions/increase-renewables/renewable-energy-and.html#.XCwQuNJKjIU

WVU Extension Directory-- https://employees.extension.wvu.edu/files/d/c7e8e0b2-ba67-4862-869a-4900040ac65b/2018-extension-directory.pdf

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Soils

Web Soil Survey-- https://websoilsurvey.nrcs.usda.gov/app/

--https://extension.wvu.edu/files/d/59bc3eb7-2bab-4c6f-8d9d-c842930044d6/wvues-fertility-recommend-tool-with-veg-crops-n-bmps.pdf

Soil Quality Indicator Sheets-- https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/health/assessment/?cid=stelprdb1237387

Soil Health-- https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/assessment/

EQIP-- https://www.nrcs.usda.gov/wps/portal/nrcs/main/wv/programs/financial/eqip/

Composting-- https://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version/Making-and-Using-Composts/Advantages-of-Composting

USDA NRCS West Virginia Website-- https://www.nrcs.usda.gov/wps/portal/nrcs/site/wv/home/

Local NRCS Contacts-- https://www.nrcs.usda.gov/wps/portal/nrcs/main/wv/contact/local/

Water Resources

Riparian Buffer Zones-- https://content.ces.ncsu.edu/agricultural-riparian-buffers

--https://dep.wv.gov/WWE/getinvolved/sos/Documents/More/RiparianBufferScience.pdf

Irrigation Systems-- https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_006847.pdf

--https://fas.org/sgp/crs/misc/R44158.pdf

Spring Developments-- https://www.nrcs.usda.gov/wps/portal/nrcs/detail/?cid=nrcs144p2_027172

Pond Development-- https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_030362.pdf

High Tunnel Irrigation--
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/wv/programs/financial/eqip/?cid=stelprdb1236860

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=stelprdb1046250

Erosion control-- https://crops.extension.iastate.edu/soil-erosion-and-water-quality-0

Water Quality and Agriculture-- https://www.nal.usda.gov/waic/water-quality

Pesticides and Water Pollution-- https://www.safewater.org/fact-sheets-1/2017/1/23/pesticides

WVDEP-- https://dep.wv.gov/Pages/default.aspx

Wildlife

WV DNR Contacts-- http://www.wvdnr.gov/contact.shtm

Bee Links and pollinators--

https://efotg.sc.egov.usda.gov/references/public/WV/327wvjsccfp.pdf

https://efotg.sc.egov.usda.gov/references/public/WV/327wsgwvjs-poll.pdf

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/wv/newsroom/?cid=nrcs143_022326

https://www.youtube.com/watch?v=JilYBVrFiLA

Forestry

Forestry nationally-- https://www.americanforests.org/wp-content/uploads/2017/09/Coop-Report-2017_Web-Edition.pdf

Go Nuts DNR-- http://www.wvdnr.gov/Wildlife/Nuts.shtm

WV investing in forestry -- http://www.wvpublic.org/post/wva-timber-yes-money-can-grow-trees#stream/0

--http://www.wvcommerce.org/info/west-virginia-edge/wv-edge-issue3-2013/benefits-of-being-green/wv-is-rich.aspx

Maple Syrup production-- http://www.wvpublic.org/post/maple-syrup-production-growing-west-virginia-thanks-new-technologies#stream/0

NWFP (Non- Woody Forest Products)

https://blogs.loc.gov/folklife/2018/04/food-from-the-forest/

https://wvtourism.com/trail-foraging/

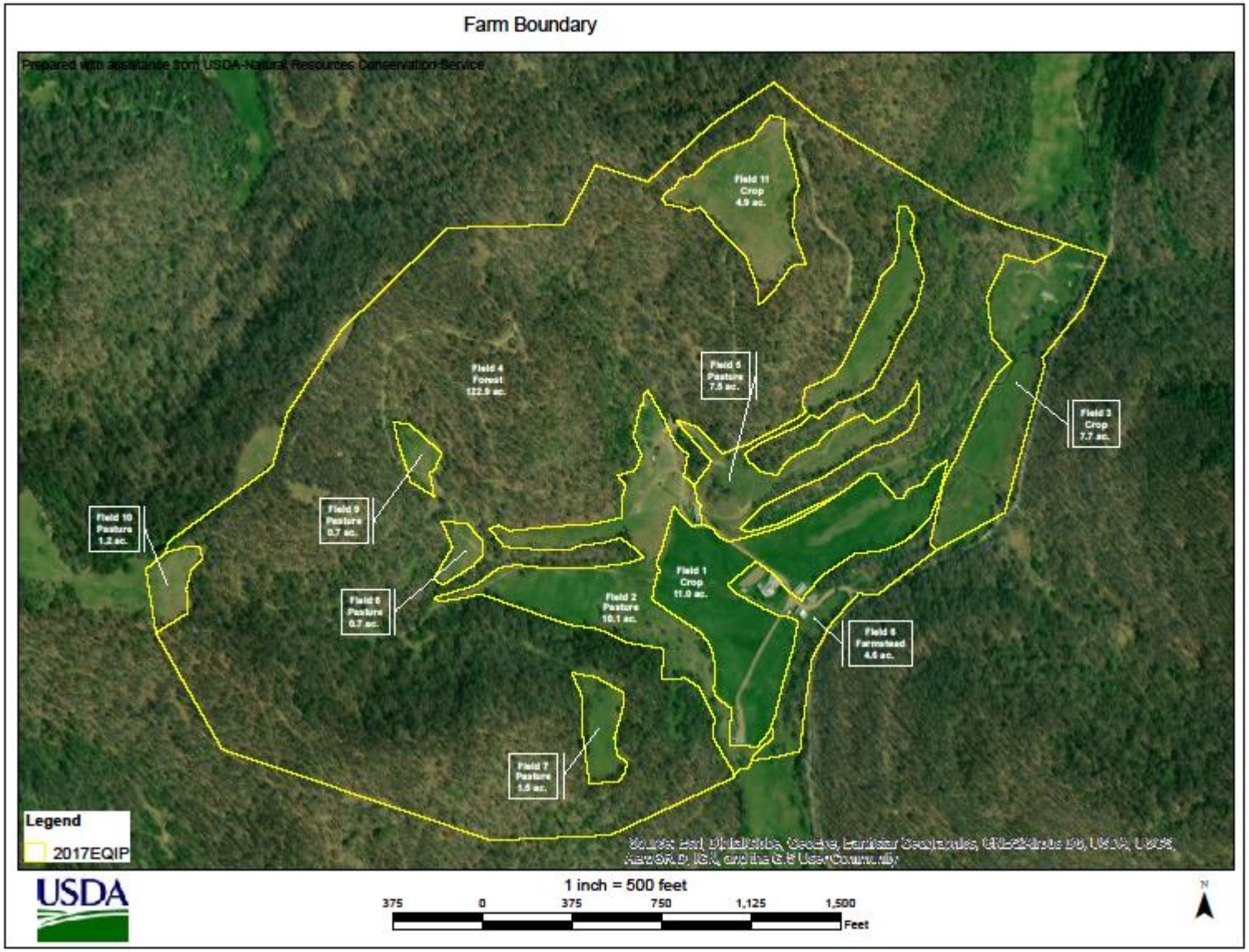
https://www.npr.org/sections/thesalt/2015/05/28/410304919/somethings-spawning-on-appalachias-forest-farms

WVDOF BMP Manual-- http://www.wvforestry.com/DOFbmpManual2014.pdf

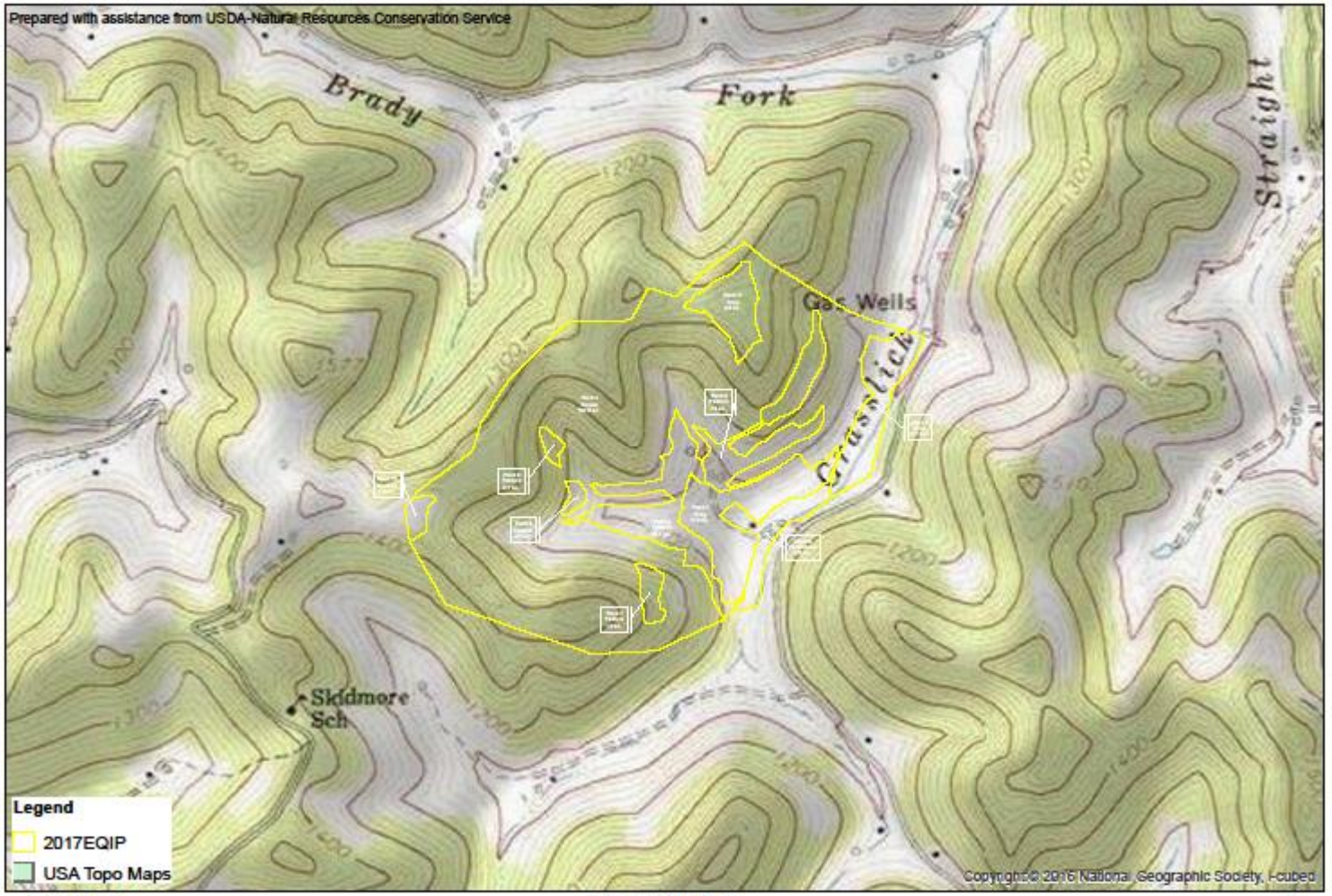
WVDOF Website-- http://www.wvforestry.com/

WVDOF Service Foresters Contacts-- http://www.wvforestry.com/WV%20DOF%20staff%20assignments%205-22-18.pdf

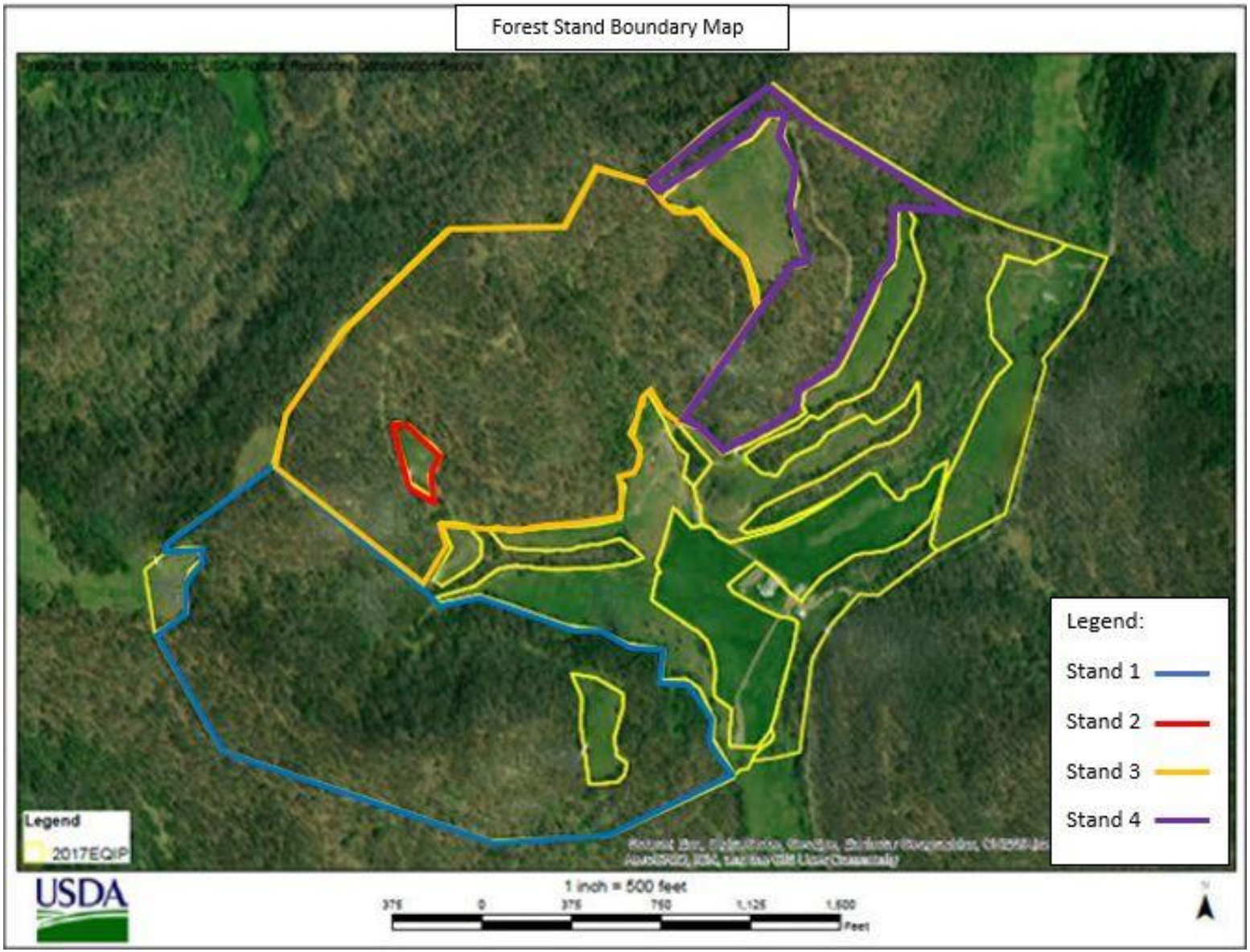
Farm Boundary



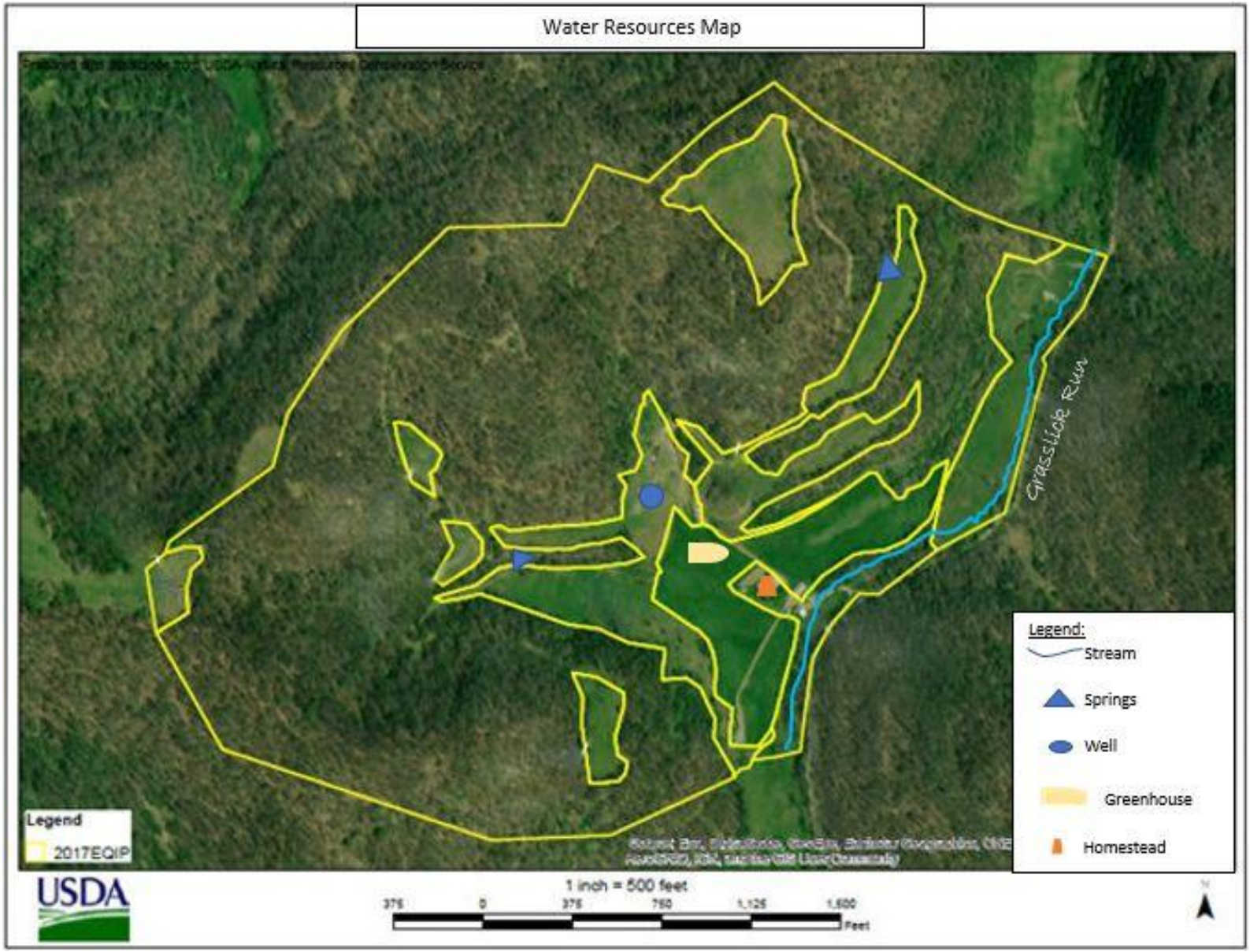
Farm Boundary



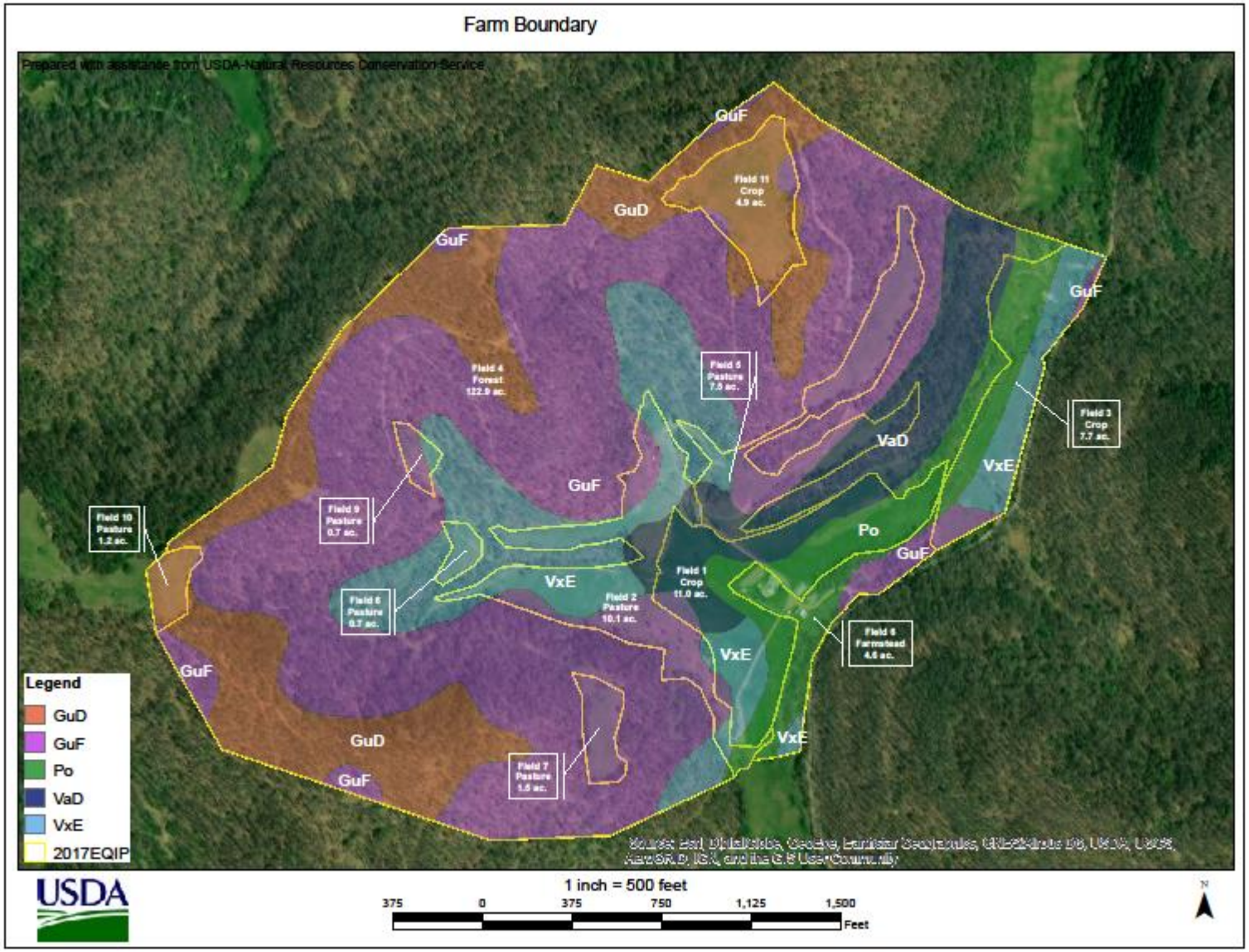
Forest Stand Boundary Map



Water Resources Map



Farm Boundary



Soils Inventory Report

Map Unit Symbol	Acres	Percent
GuD	32.1	19%
GuF	86.3	50%
Po	13.5	8%
VaD	15.1	9%
VxE	26.4	15%
Total:	173.4	100%

Map Unit Description

Braxton County, West Virginia

[Minor map unit components are excluded from this report]

Map unit: GuD - Gilpin-Upshur silt loams, 15 to 25 percent slopes

Component: Gilpin (45%)

The Gilpin component makes up 45 percent of the map unit. Slopes are 15 to 25 percent. This component is on hillslopes on hills. The parent material consists of residuum weathered from sandstone and siltstone. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 70 percent. Below this thin organic horizon the organic matter content is about 2 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

Component: Upshur (30%)

The Upshur component makes up 30 percent of the map unit. Slopes are 15 to 25 percent. This component is on ridges on hills. The parent material consists of residuum weathered from shale and siltstone. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 48 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 70 percent. Below this thin organic horizon the organic matter content is about 3 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

Map unit: GuF - Gilpin-Upshur silt loams, 35 to 70 percent slopes

Component: Gilpin (50%)

The Gilpin component makes up 50 percent of the map unit. Slopes are 35 to 70 percent. This component is on hillslopes on hills. The parent material consists of residuum weathered from sandstone and siltstone. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 70 percent. Below this thin organic horizon the organic matter content is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Upshur (30%)

The Upshur component makes up 30 percent of the map unit. Slopes are 35 to 70 percent. This component is on hillslopes on hills. The parent material consists of residuum weathered from shale and siltstone. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 48 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 70 percent. Below this thin organic horizon the organic matter content is about 3 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Map unit: Po - Pope sandy loam, 0 to 3 percent slopes, occasionally flooded

Component: Pope (85%)

The Pope component makes up 85 percent of the map unit. Slopes are 0 to 3 percent. This component is on flood plains on valleys. The parent material consists of coarse-loamy alluvium derived from sedimentary rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria.

Map Unit Description

Braxton County, West Virginia

Map unit: VaD - Vandalia silt loam, 15 to 25 percent slopes

Component: Vandalia (75%)

The Vandalia component makes up 75 percent of the map unit. Slopes are 15 to 25 percent. This component is on hillslopes on hills. The parent material consists of colluvium derived from shale and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is high. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.

Map unit: VxE - Vandalia silt loam, 15 to 35 percent slopes, very stony

Component: Vandalia (80%)

The Vandalia component makes up 80 percent of the map unit. Slopes are 15 to 35 percent. This component is on hillslopes on hills. The parent material consists of colluvium derived from sandstone and siltstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 7 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.