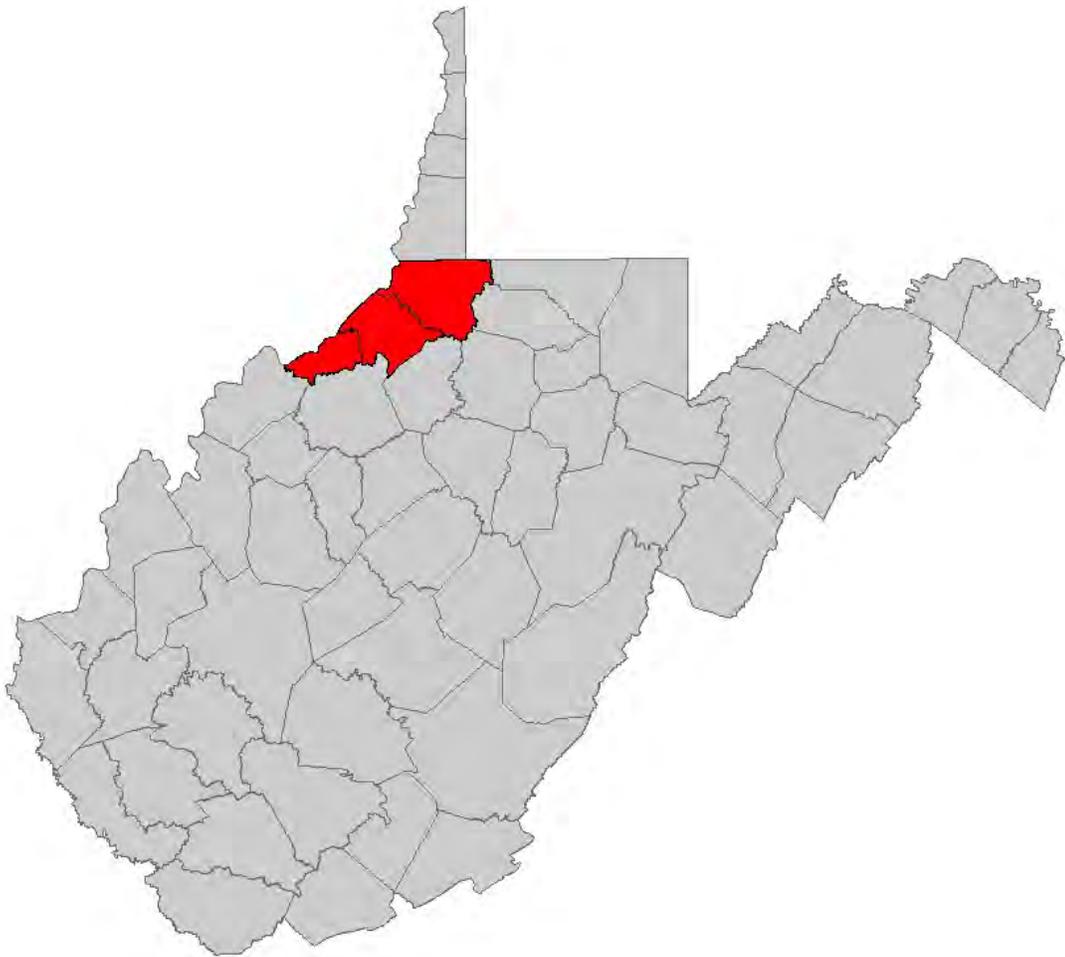


Upper Ohio Conservation District

Long Range Plan

2016 – 2021



Pleasants County - Tyler County - Wetzel County

Prepared by the Middlebourne USDA-NRCS Field Office

**Upper Ohio Conservation District Long Range Plan
Pleasants, Tyler and Wetzel Counties
Fiscal Years 2016 - 2021**

Introduction

The Upper Ohio Conservation District (UOCD) is situated along the Ohio River; it consists of Pleasants, Tyler, and Wetzel Counties and contains portions of (33) 12 digit watersheds over 757 square miles. The District has a population of 32,720.

The purpose of this plan is to define treatable resource concerns in the UOCD for use in long range planning and USDA Program planning. The resource concerns in this plan were determined in conjunction with the UOCD Local Work Group. The Local Work Group met on February 18, 2016 at the New Martinsville Library. Long Range Planning Local Work Groups will convene on a yearly basis to review this document and address any changes to be made in resource concerns, practices or plans to be implemented, outreach activities and partnerships to be pursued and/or formed.

Soils

All acres of the Upper Ohio Conservation District are located within the Central Allegheny Plateau (MLRA 126). The district is comprised of several different soil types with a wide range of slopes. These soils can be grouped into areas of the district based on parent material, landscape position and soil properties.

The soils of the district developed from relatively level bedded shale, siltstone, and sandstone. Beds of red clay shales may contain lenses of limy shales and even a thin band of limestone. The district is dominated on upland areas by Gilpin soils, and Gilpin complexes with Peabody and Upshur soils, with slopes ranging from 3-70%. Other major soils are Vandalia on foot slopes, Sensabaugh, Skidmore, Chagrin, Moshannon, and Nolin soils on floodplains, and Otwell soils on terraces. Slopes on these area generally range from 0-25%.

Most of the district is in woodland, or is reverting back to woodland. Many of these reverting areas are being reseeded naturally to Virginia pine, yellow-poplar, or other hardwoods.

On uplands, the majority of cleared land in the Upper Ohio Conservation District is located on broad ridgetops and hillsides, with Gilpin-Upshur and Gilpin-Peabody soils on slopes ranging from 8 to 70 percent. It is used as pasture and hayland where not restricted by steep slopes. These soils are well drained, have moderate to high clay contents in the subsoil, and may be very stony and/or severely eroded on the steeper slopes. The Upshur and Peabody soils have more limitations than the Gilpin soils due to a higher clay content, but are generally more fertile than the Gilpin soils. The high clay content makes the soil susceptible to rutting and smearing during wet times, and clodding after the disturbed soil dries out. The Upshur and Peabody soils are very susceptible to erosion and soil slippage, and have a high shrink-swell potential.

Bottomlands, terraces, and less sloping footslopes tend to have more cleared land, and are commonly used for hayland, pasture, and some cropland. Cropland is more or less restricted to the wider floodplains and terraces located in the downstream areas of major drainages, and also some areas along the Ohio River. Major soils along these drainages include the Sensabaugh, Chagrin, Moshannon, and

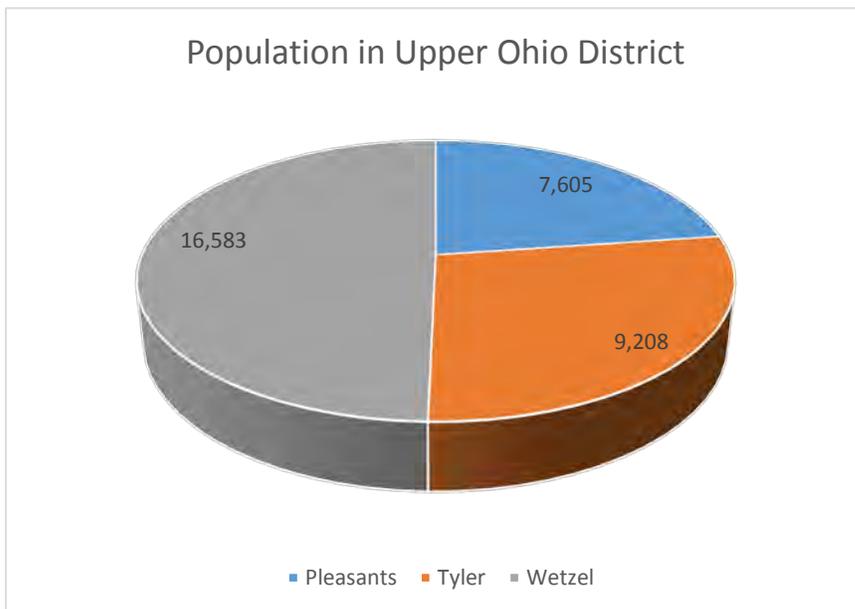
Nolin soils. Otwell soils are the major soils on terraces, while Vandalia soils are located on footslopes. Along the Ohio River, major soils include the Huntington, Ashton, and Wheeling soils. Slopes generally range from 0 to 8 percent on bottomlands, and from 3 to 15 percent on terraces and footslopes. The bottomlands are generally loamy in texture, with low to moderate amounts of clay in the subsoil, and are very deep to bedrock. Occasional flooding can occur in many of these areas. Most areas are well drained, but some bottomlands may have areas of moderately well drained to poorly drained soils in areas away from the main stream channel. Skidmore soils tend to not be used for agricultural purposes due to their location on very narrow, very gravelly floodplains. The nonflooding Otwell soils on terraces are very deep moderately well drained soils with moderate amounts of clay in the subsoil. The surface texture is very silty and highly susceptible to erosion. Otwell soils are also limited by a seasonal high water table due to a fragipan at 24 to 30 inches. Vandalia soils on footslopes are deep and very deep well drained soils with high clay content in the subsoil.

Strip mine soils make up a small part of Pleasants County’s upland areas. The Cedarcreek soils consist of a mixture of soil, rock, and coal fragments. Most areas are unreclaimed, and are best suited for timber production and wildlife habitat. Limitations for most uses include drought during the summer months mainly due to lack of topsoil, low organic matter content, and moderately low available water capacity. Soil pH and fertility levels are generally low on these strip mine soils, making them difficult to reseed into grassland. Maintaining desired grasses is also difficult due to the same limitations.

Socio-Economic

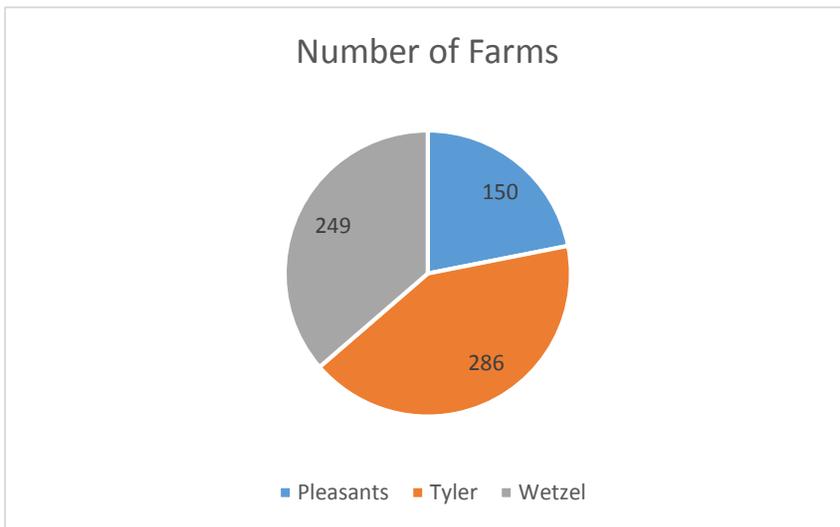
Population and economic characteristics in the Upper Ohio Conservation District (Pleasants, Tyler, and Wetzel Counties) were derived from several references including the US Census and USDA National Agriculture Statistics Service.

Population: In 2014, there were approximately 32,720 people residing in the district. District wide, there was a population decrease of 1.5% since the 2010 Census.



Income: The average per capita income for the District in 2013 was \$21,401 while median household income is estimated at \$40,624. An estimated 18% of the district population are below the poverty rate. Statewide, per capita income is \$23,237, median household income is \$41,576 and the poverty rate is 18.3%.

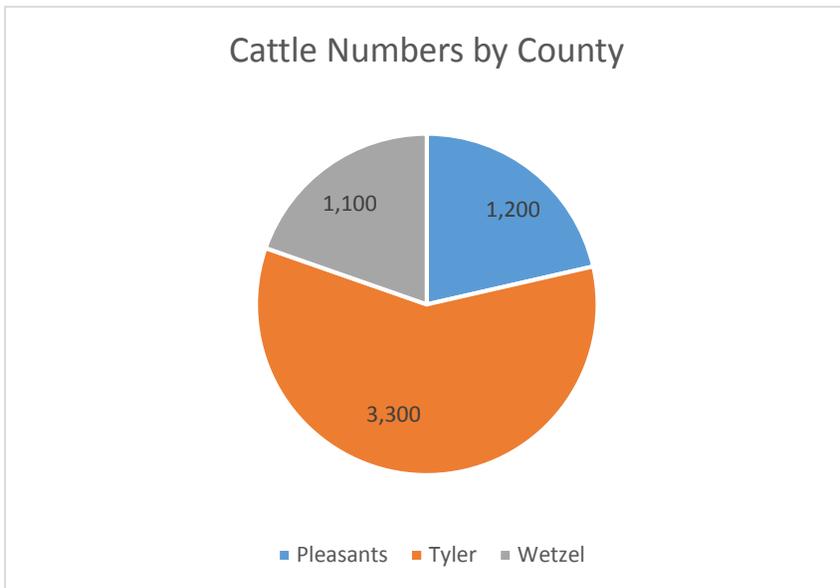
There are approximately 585 farms in the District. The farms span over 107,807 acres with the average farm size around 184 acres. Tyler County has roughly 45% of the total farm acreage in the Upper Ohio District and 42% of the number of farms. The Upper Ohio contains about 3% of the total farmland in West Virginia.



the total farmland in West Virginia.

Like most of WV, the majority of farmers in the District rely on off-farm income.

Cattle are the largest agricultural sector in the District with the majority of farms producing cattle for the beef industry. The following graph shows the distribution of cattle by county within the District.



Forestry Enterprise

- **Pleasant County**

67,202 total acres of forest land divided into 4 Forest-type Groups. The dominant forest-type is the oak/hickory group comprising 36,448 acres (54.2 %). The balance is composed of oak/pine (7,314 ac), elm/ash/cottonwood (6,960 ac), and maple/beech/birch (16,480 ac). 57 acres of EQIP Forestry have been completed in Pleasant County since 2006. 11 Forest Stewardship Plans have been completed on 1,891 acres in Pleasant County

- **Tyler County**
 111,457 total acres of forest land divided into 4 Forest-type Groups. The dominant forest-type is the oak/hickory group comprising 86,465 acres (77.6 %). The balance is composed of oak/pine (7,555 ac), elm/ash/cottonwood (435 ac), and maple/beech/birch (16, 999 ac). 201 acres of EQIP Forestry have been completed in Tyler County since 2006. 30 Forest Stewardship Plans have been completed on 5,400 acres in Tyler County.
- **Wetzel County**
 184,314 total acres of forest land divided into 3 Forest-type Groups. The dominant forest-type is the oak/hickory group comprising 120,481 acres (65.4 %). The balance is composed of elm/ash/cottonwood (10,531 ac), and maple/beech/birch (46,342 ac). 69 acres of EQIP Forestry have been completed in Wetzel County since 2006. 28 Forest Stewardship Plans have been completed on 4,657 acres in Wetzel County.

Established Partnerships

- **Upper Ohio Conservation District (UOCD)**
 The UOCD covers Pleasants, Tyler, and Wetzel Counties and provides guidance and assistance on local conservation issues. The UOCD administers about \$40,000 annually in Agricultural Enhancement Program funds, plans and funds education outreach/education programs and houses a Conservation District Work Crew. The UOCD Crew maintains excavation equipment and agricultural implements for use by the Crew and for rental by local farmers.
- **WV Division of Forestry (WVDOF)**
 The WVDOF provides assistance to local forest managers, the Upper Ohio Conservation District, and the Middlebourne Natural Resources Conservation Service Field Office. WVDOF Foresters are provided to the UOCD through 2 regional offices. Pleasants and Tyler Counties are serviced out of Region 3 (Elizabeth Field Office). Wetzel County is serviced out of Region 1 (Farmington Office). Two Land Owner Assistance Foresters are responsible for providing forest manager assistance, outreach and technical education, forest stewardship planning, and providing technical assistance and determinations to the Middlebourne NRCS Field Office for developing and implementing USDA Farm Bill Programs.
- **WV Conservation Agency (WVCA)**
 The WVCA provides assistance and guidance to the Upper Ohio Conservation District and land managers in the district. The WVCA provides the funding for the Agricultural Enhancement Program; financial and technical assistance for stream blockage, program management guidance, and various other functions. The WVCA houses an employee that is shared by the Upper Ohio and Northern Panhandle Conservation Districts who is responsible for Agricultural Enhancement Program administration, conservation planning, contracting, and soil testing.
- **West Virginia University (WVU) Extension Service**
 The WVU Extension Service provides education and assistance to the Upper Ohio Conservation District. WVU Extension Service staff work directly with farmers, schools and local 4-H clubs to insure that the most recent information and guidance are distributed to those working on the land. Each county in the UOCD has a WVU Extension Service Office. Staffing levels and the areas on which the employees focus vary by county.

Conservation Work Installed

- Conservation work installed in the Upper Ohio Conservation District has primarily focused on resource concerns related to animal agriculture. Other frequently installed practices are focused on resource concerns related to forestry and truck crop production. Below are the 10 most commonly installed practices through the Environmental Quality Incentives Program (EQIP).
 - Waste Storage Facilities- 26
 - Seasonal High Tunnel Systems- 8
 - Fence- 42,754 feet
 - Pipeline- 22,893 feet
 - Watering Facilities- 89
 - Forest Stand Improvement- 182.5 acres
 - Brush Management- 103 acres
 - Forage and Biomass Planting- 141.2 acres
 - Prescribed Grazing- 531.5 acres
 - Heavy Use Area Protection- 48,245 square feet

Resource Concerns

- **Sheet and Rill Erosion**
 - Sheet and Rill Erosion can be found throughout the Upper Ohio Conservation District. Erosion issues in the district are primarily caused by livestock and poor forage management. Cropland acres are limited in the district.
 - Sheet and Rill Erosion being primarily associated with livestock grazing, the resource concern may be treated by installing fences, watering facilities, stabilized walkways, and forage and biomass plantings. The overall goal will be to increase forage stand productivity and increased levels of prescribed grazing management.
- **Soil Condition- Compaction**
 - Soil Compaction can be found throughout the Upper Ohio Conservation District. Compaction is primarily caused by livestock and located in areas of concentration, such as animal trails, watering facilities, food sources and loafing areas.
 - With compaction being located in areas associated with livestock operations, the resource concern may be treated by installing stabilized walkways, heavy use area protection, division fences, and proper grazing management.
- **Water Quality- Nutrients and Organics in Surface Water**
 - Nutrients and Organics in Surface Water issues can be found throughout the Upper Ohio Conservation District and is primarily associated with unfiltered runoff from livestock winter feeding areas located near streams. Appendix E indicates the location of fecal/bacterial impaired streams on the 303d list and their locations within the UOCD.

- With Nutrients and Organics in Surface Water being associated with livestock winter feeding, the resource concern may be treated by installing grassed or riparian buffers, fence, animal trails and walkways, heavy use area protection, roofs and covers, portable watering systems, temporary fence, and increased levels of prescribed grazing management with emphasis on extended grazing and winter feed management.
- **Soil Erosion- Streambank**
 - Streambank erosion can be found along the North and South forks of Fishing Creek, and Middle Island Creek. Site visits have been performed on each of the three streams to assess both natural and livestock related erosion. NRCS customers farming along the streams generally report erosion along crop and hay fields. Livestock related erosion is less severe on Middle Island Creek due to the steepness of the banks and the relative lack of pasture ground along creek bottoms. The forks of Fishing Creek host both pasture and hay ground; livestock based erosion is more prominent.
 - Stream bank erosion occurring along crop and hay fields may be addressed in conjunction with nutrient and sediment runoff issues by installing a riparian area along the streams. Fencing may be used for grazed crop or hay fields; tree/shrub site prep in conjunction with tree/shrub planting can be used to facilitate regeneration of the forested buffer. Natural Stream Regeneration / Design may be used to repair stream channels in areas where potential for loss of land or property are high.
 - Stream bank erosion associated with livestock access may be addressed by removing livestock from the stream with fence and access control. The riparian area can be planted to facilitate regeneration of the forested buffer. Alternative watering sources may need to be developed. Access points for livestock and farm equipment may be installed as stream crossings, access roads, animal trails and walkways, and heavy use area protection.
- **Plants Not Adapted or Suited**
 - Plants that are not adapted or suited for the intended purpose can be found through the Upper Ohio Conservation District and can be located on pasture, hay land and forest land. The condition most often manifests in pastures as undesirable grass species occurring in place of higher quality grasses and legumes. In woodlands the plants can be species that are not adapted or suited to be used as commercial timber, or as a lack of species suitable for use as wildlife food and shelter sources.
 - Conditions where plants are not adapted or suited on grassland can be remedied through the planting of appropriate species (Forage and Biomass Planting); increased levels of grazing management and pasture utilization (Prescribed Grazing); through the implementation of a site specific Nutrient Management Plan and by performing Brush Management.
 - Conditions where plants are not adapted or suited on forest land can be remedied through pre-commercial thinning of low value and noxious/invasive trees (Forest Stand Improvement); removal of other noxious and invasive plants (Brush Management); the planting of higher quality trees for wildlife food and cover (Tree/Shrub Site Preparation, and Tree/Shrub Planting).

- **Plant Condition- Productivity Health and Vigor**
 - Plant productivity, health and vigor concerns can be found throughout the Upper Ohio Conservation District on pasture, hay land and forest land. This resource concern can be caused by stocking rate of trees, inadequate soil fertility, inadequate soil moisture content, grazing pressure, and pest pressure.
 - Plant productivity, health and vigor concerns on pasture and hay land can be remedied by implementing a Nutrient Management Plan; installing an irrigation system; managing grazing pressure through increased levels of Prescribed Grazing Management; addressing plant pest issues through the implementation of Brush Management and/or Integrated Pest Management protocols.
 - Plant productivity, health and vigor concerns on forest land can be remedied by lowering the stocking rate of the timber stand (Forest Stand Improvement) and decreasing competition for resources with noxious and invasive species (Brush Management).

- **Plant Condition- Noxious and Invasive**
 - Noxious and Invasive Plants can be found throughout the Upper Ohio Conservation District in pastures, hay land, and forest land. Noxious and Invasive Species on grassland include Multiflora Rose, Autumn Olive, Japanese Barberry, Tartarian Honeysuckle and Japanese Stiltgrass. Noxious and Invasive Species in woodland include those species listed for grassland in addition to Grapevine and Tree of Heaven. Presence of these Noxious and Invasive Species reduces the productivity of the stands with which they are associated, and are highly prone to spread.
 - Control of Noxious and Invasive Species on grassland and woodland can be achieved by completing Brush Management practices with related long-term maintenance. Chemical, mechanical, and combination methods of brush management may be used to achieve control of noxious and invasive species.

- **Plant Condition- Forage Quality and Palatability**
 - Forage Quality and Palatability issues can be found throughout the Upper Ohio Conservation District and present on pasture and hay land. Forage quality is primarily impacted by the forage species available in the field; many areas tend to be a single forage grass species, 10 percent legume cover and a variety of undesirable species. The species mixture also impacts palatability and can lead to spot grazing.
 - Forage Quality and Palatability can be remedied in the field by installing various types of forage and biomass plantings, attention to species selection, and increased levels of grazing management through the implementation of a Prescribed Grazing Plan. The plan should take into account forage species; livestock grazing patterns; and a nutrient management plan that bolsters existing desirable species, accounts for nutrient demands of new plantings and minimizes the growth of undesirable species by accounting for the timing and placement of nutrients.

- **Fish and Wildlife- Inadequate Cover and Shelter**
 - Inadequate wildlife cover and shelter can be found throughout the Upper Ohio Conservation District. This resource concern is found where forest conditions have been allowed to become mature and even aged. Even aged forests with closed canopies do not allow regenerative growth of young trees, shrubs, or wild herbaceous plants in the understory. Young trees, particularly white pines under 15 feet tall, are critical for the shelter and roosting of many game bird species. Shrubs and wild herbaceous plants provide food sources and browse for most wildlife species present in the forests of the UOCD.
 - Inadequate wildlife cover and shelter can be remedied in the woodland by installing practices designed to decrease the stocking rate of mature timber and open areas to allow for early successional plant growth. Treatment can include: Early Successional Habitat Development/Management, Forage and Biomass Planting, Tree/Shrub Site Preparation and Planting, Conservation Cover Planting, and Forest Stand Improvement.

- **Fish and Wildlife- Inadequate Food**
 - Inadequate wildlife food can be found throughout the Upper Ohio Conservation District. This resource concern is found where forest conditions have been allowed to become mature and even aged. Even aged forests with closed canopies do not allow regenerative growth of soft mast trees, shrubs, or wild herbaceous plants in the understory. Shrubs, soft mast trees, and wild herbaceous plants provide food sources and browse for most wildlife species present in the forests of the UOCD.
 - Inadequate wildlife food can be remedied in the woodland by installing practices designed to decrease the stocking rate of mature timber and open areas to allow for early successional plant growth. Treatment can include: Early Successional Habitat Development/Management, Forage and Biomass Planting, Tree/Shrub Site Preparation and Planting, Conservation Cover Planting, and Forest Stand Improvement.
 - Alternately, inadequate wildlife food on transitional habitat and in open areas can be remedied by installing legume crops; seed crops; soft mast trees; cultural practices that rotate fallow, mowing and disking operations to ensure habitat remains open for early successional plants and does not succeed to permanent grass/legume cover. Treatment can include: Early Successional Habitat Development/Management, Forage and Biomass Planting, Tree/Shrub Site Preparation and Planting, and Conservation Cover Planting.

- **Fish and Wildlife- Habitat Fragmentation**
 - The Upper Ohio Conservation District consists of 362,973 acres of forest. The majority of this forest land is mature timber with a closed canopy; this condition precipitates habitat fragmentation. The majority of wildlife species require a home range that consists of grassed, wild herbaceous, early successional, and mature tree habitat elements. Areas with the proper habitat element, quality, and distribution are increasingly fragmented and unmanaged; these areas are transitioning to mature, closed canopy type habitats.

- Wildlife Habitat Fragmentation can be remedied in the woodland by installing practices designed to decrease the stocking rate of mature timber and open areas to allow for early successional plant growth. Treatment can include: Early Successional Habitat Development/Management, Forage and Biomass Planting, Tree/Shrub Site Preparation and Planting, Conservation Cover Planting, and Forest Stand Improvement.
- **Domestic Animals- Feed and Forage**
 - Farms without adequate livestock feed and forage are present throughout the Upper Ohio Conservation District. This condition is attributable to poor management of fertility and grazing. Inattention to plant nutrient needs can cause poor forage production and poor forage species vitality. Improper grazing management can cause forage species to be grazed below the level at which they can re-grow, spot grazing of more palatable forages, and compaction resulting in poor to no root growth of forage species. The ultimate result of both poor fertility and grazing management is low productivity of forage species, loss of high quality species, the succession to lower quality species/weeds, and plant death causing bare areas and potential erosion.
 - Inadequate livestock feed and forage can be addressed by implementing an appropriate nutrient management plan, increased levels of prescribed grazing management, and associated practices to facilitate higher levels of grazing management (fence, watering facilities, and forage and biomass plantings).
- **Domestic Animals- Stock Water**
 - Farms without adequate stock water can be found throughout the Upper Ohio Conservation District. This condition is often attributable to the cost associated with installing an appropriate number of watering facilities, to insure that livestock feed efficiency and body condition is maintained on difficult terrain. Potential program participants frequently lack livestock watering infrastructure to maximize the grazing potential of their pastures and animals.
 - Inadequate stock water can be addressed by thoughtful water trough and pipeline design and location. Inadequate stock water can be addressed by installing: water wells, spring developments, ponds, pumping plants, pipelines, and watering facilities (tanks, hydrants, and troughs). Occasionally, nontraditional water harvesting methods will be necessitated by location. Roof runoff can be captured in a tank and distributed to troughs on areas where wells, springs, and ponds are not feasible. Below ground pipelines may be installed from a source and through a field with quick connects or frost-proof hydrants to supply portable watering systems. Portable watering systems are a necessity for flexible grazing systems and extended winter grazing.

Social Concerns

- **Land- Land in Production**
 - The amount of cultivated or farmed land has decreased in the Upper Ohio Conservation District. Larger operations have consolidated holdings and smaller scale farms have declined in number. Many areas that are suitable for small scale vegetable growing operations are not currently in use. 1-2 acre parcels of land with minimal slopes could be converted to vegetable production through the use of Seasonal High Tunnels and micro irrigation systems.
- **Risk- Yield**
 - Yield based risk can be mitigated by changes in operational planning and management. Yield risks in the Upper Ohio Conservation District can be split into two classes, forage based risks and crop based risks. To address forage yield risk participants may use plantings, nutrient management, prescribed grazing and structural practices to facilitate increased levels of grazing management (fence, pipelines and watering facilities). Crop based risks are few in scope, but, often serve as a barrier to entry for vegetable/truck cropping. These risks may be mitigated by installing high tunnel systems, irrigation systems and through education of the farming community.
- **Food insecure areas**
 - Food insecurity and access to food have been identified as concerns in Tyler and Wetzel Counties by the USDA Economic Research Service. Please see appendixes I-M for maps identifying food insecure areas. The areas suffer from a combination of low income and/or low access to a vehicle for transportation. Options for access to food are further reduced by the closure of the Tyler County Farmers' Market, and the limited operation schedule of the Wetzel County Farmer's Market. The Wetzel County Farmer's Market runs a limited schedule when local produce is in short supply.

Evaluation of Program Suitability

- **Winter Feeding Management**
 - Increased levels of winter feeding management in the Upper Ohio Conservation District can address multiple resource concerns. By installing a suite of practices (animal trails and walkways; heavy use area protection; water system developments; additional watering facilities) participants will increase access/use of pastures and grazed hay fields into the winter months which will allow for a better utilization of standing forages. Livestock feeding areas can be moved away from stream bottom land; grazing and feeding operations can be more evenly distributed across the grazing units. With adequate education and the additional tools listed above, participants may desire to shift to an extended grazing model and move away from feeding traditional stored forages. The project may be focused on watersheds containing 303d listed streams with fecal/bacterial as the basis for listing.
 - Resource concerns that may be addressed include: plants not adapted or suited, plant condition- productivity health and vigor, domestic animals- inadequate stock water, soil erosion- streambank, soil condition- compaction, water quality- nutrients and organics in water.

- **Focused Forestry**

- The Upper Ohio Conservation District contains 362,973 acres of forestland and is managed for both wildlife and timber production. Noxious and Invasive Species such as Japanese Stiltgrass, Tree of Heaven, Grapevine, Autumn Olive, Multiflora Rose and Tartarian Honeysuckle can be found in wood lots throughout the UOCD. The Noxious and Invasive Plants compete with and can grow on or near valuable timber species. Noxious and Invasive Species can exhibit positive attributes for wildlife food and cover sources; their benefits are outweighed however by the fact that they can displace native early successional plants that benefit specific native wildlife species. Even though Noxious and Invasive Species are located throughout the UOCD approaching control of the species on a watershed basis will allow a more thorough and localized control of the target species before moving to another area within the district.
- Combining Forest Stand Improvement practices with practices to bolster wildlife habitat will allow the participant to more fully realize their individual goals by installing practices with similar implementation methods concurrently.
- Resource Concerns that may be addressed include: plants not adapted or suited, plant condition- productivity health and vigor, plant condition- noxious and invasive, fish and wildlife- inadequate cover and shelter, fish and wildlife- inadequate food, fish and wildlife- habitat fragmentation.

- **Increased Local Food Production**

- According to the USDA Food Access Research Atlas, the majority of Tyler and Wetzel Counties are considered low access to fresh foods between 1 and 10 miles and low access to a vehicle. The majority of Tyler County is considered to have both low access and low income. Farmers' markets in the Upper Ohio Conservation District struggle to maintain an adequate supply of local produce. This lack of local vegetable producers strains the market's ability to maintain a regular schedule of open hours and has caused permanent closure of some farmers' markets, thus compounding the issue of low access to fresh foods.
- Increased outreach to potential vegetable producers and an EQIP Project focused on a specific county will help to increase vegetable production. Increased High Tunnel System usage, and, the installation of both High Tunnel and field based irrigation systems through EQIP will bolster vegetable production by addressing yield concerns and lowering the financial barrier to implementing such systems.
- A focused vegetable production project will help address plant condition and productivity issues, potentially lower sheet and rill erosion in the field and potentially lower nutrient transport to streams. The project will also assist in addressing social concerns related to low access to food. By insuring a larger supply of local produce, farmer's markets will increase the amount of time they can operate, and potentially expand to other areas of a county. Increased partner involvement from the WVU Extension Service, county social service organizations and county schools, produce will be delivered to those in need and increase awareness of food availability related issues.

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Appendix C- Non-Irrigated Capability Class Map

Appendix D- Map of HUC-12 Watersheds

Appendix E- Map of 303d Listed Streams- Fecal/Bacterial Contamination

Appendix F- Map of 303d Listed Streams- Conditions Not Allowable- Biological

Appendix G- Map of 303d Listed Streams- Fecal/Bacterial Contamination- By HUC

Appendix H- Map of 303d Listed Streams- Conditions Not Allowable- Biological- By HUC

Appendix I- Map of Low Income / Low Access (Using Vehicle) Census Tracts

Appendix J- Map of Low Income Census Tracts

Appendix K- Map of Low Access to Grocery Store (1-10 miles) Census Tracts

Appendix L- Map of Low access to Grocery Store (Using Vehicle) Census Tracts

Appendix M- Map of Seniors, Low Access to Store (%) by County

Appendix Printing Instructions:

- Appendices A and B are formatted to 8.5" x 11" (letter) paper, and should be printed in portrait layout.
- Appendices C, D, E, F, G and H are formatted to 11" x 17" (tabloid) paper, and, should be printed in landscape layout.
- Appendices I, J, K, L and M are formatted to 8.5" x 11" (letter) paper, and, should be printed in landscape layout.

Soils Inventory Report

Tue Apr 05 2016 13:55:05 GMT-0400 (Eastern Daylight Time)

Map Unit Symbol	Map Unit Name	Acres	Percent
AsA	Ashton silt loam, 0 to 3 percent slopes	366.8	0%
AsB	Ashton silt loam, 3 to 8 percent slopes	298.9	0%
CeE	Cedarcreek channery silt loam, steep, stony	136.7	0%
Cg	Chagrin loam, 0 to 3 percent slopes, occasionally flooded	1667.1	0%
DuC	Duncannon silt loam, 8 to 15 percent slopes	703.1	0%
DuD	Duncannon silt loam, 15 to 25 percent slopes	303.2	0%
EkB	Elk silt loam, 3 to 8 percent slopes	438.4	0%
GaC	Gallia silt loam, 8 to 15 percent slopes	2310	0%
GaD	Gallia silt loam, 15 to 25 percent slopes	449.6	0%
GpC	Gilpin-Upshur complex, 8 to 15 percent slopes	2612.3	1%
GpD	Gilpin-Upshur complex, 15 to 25 percent slopes	78090.1	16%
GpE	Gilpin-Upshur complex, 25 to 35 percent slopes	46369.5	10%
GpF	Gilpin-Upshur complex, 35 to 70 percent slopes	244778.9	51%
GrF	Gilpin-Rock outcrop complex, very steep	1514.7	0%
GsB	Glenford silt loam, 3 to 8 percent slopes	188.1	0%
GwC3	Gilpin-Upshur complex, 8 to 15 percent slopes, severely eroded	379.5	0%
GwD3	Gilpin-Upshur complex, 15 to 25 percent slopes, severely eroded	10481.1	2%
GwE3	Gilpin-Upshur complex, 25 to 35 percent slopes, severely eroded	8496.2	2%
GxF	Gilpin-Upshur-Rock outcrop complex, 35 to 70 percent slopes	6849.8	1%
Gy	Glenford silt loam, 0 to 3 percent slopes	189.6	0%
HaA	Hackers silt loam, 0 to 3 percent slopes, rarely flooded	359.5	0%
HaB	Hackers silt loam, 3 to 8 percent slopes, rarely flooded	1619.1	0%
Hn	Huntington silt loam	1094.3	0%
Hu	Huntington-Urban land complex	258.5	0%
LaC	Lakin loamy fine sand, 8 to 15 percent slopes	179.3	0%
LkC	Licking silt loam, 8 to 15 percent slopes	209.5	0%
Ln	Lindside silt loam, 0 to 3 percent slopes, occasionally flooded	485.1	0%
Me	Melvin silt loam, 0 to 3 percent slopes, occasionally flooded	210.9	0%
Mo	Moshannon silt loam, 0 to 3 percent slopes, occasionally flooded	2139.7	0%
No	Nolin loam	3770.5	1%
OtA	Otwell silt loam, 0 to 3 percent slopes	206.4	0%
OtB	Otwell silt loam, 3 to 8 percent slopes	1718.1	0%
OtC	Otwell silt loam, 8 to 15 percent slopes	2662.9	1%

Appendix A Continued

Sk	Skidmore gravelly loam	13840.6	3%
Sn	Sensabaugh silt loam, 0 to 3 percent slopes, occasionally flooded	13106	3%
Ta	Taggart silt loam	151.9	0%
UpC	Upshur silty clay loam, 8 to 15 percent slopes	1035.9	0%
Us	Udorthents, smoothed	741.7	0%
VaD	Vandalia silt loam, 15 to 25 percent slopes	17416.2	4%
VaE	Vandalia silty clay loam, 25 to 35 percent slopes	1498.3	0%
VbD	Vandalia silt loam, 15 to 25 percent slopes, very stony	1059.9	0%
VuD	Vandalia-Urban land complex, 15 to 25 percent slopes	432	0%
W	Water	7720.3	2%
WhA	Wheeling silt loam, 0 to 3 percent slopes	405.7	0%
WhB	Wheeling silt loam, 3 to 8 percent slopes	399.1	0%
WnB	Wheeling-Urban land complex, 0 to 8 percent slopes	3011.5	1%
WoC	Woodsfield silt loam, 3 to 15 percent slopes	437.2	0%
Total:		482793.7	100%

Appendix B

Nonirrigated Capability Class

Aggregation Method: Dominant Condition
Tie-break Rule: Higher

Wetzel County, West Virginia
Survey Area Version and Date: 10 - 09/24/2015

Map symbol	Map unit name	Rating	Map unit percent
EKB	Elk silt loam, 3 to 8 percent slopes	2	75
GpD	Gilpin-Peabody complex, 15 to 25 percent slopes	4	70
GpE	Gilpin-Peabody complex, 25 to 35 percent slopes, moderately eroded	6	100
GpF	Gilpin-Peabody complex, 35 to 70 percent slopes	7	80
GrF	Gilpin-Rock outcrop complex, very steep		60
GsB	Glenford silt loam, 3 to 8 percent slopes	2	95
Hn	Huntington silt loam	1	75
Hu	Huntington-Urban land complex		100
No	Nolin loam	2	80
OIB	Otwell silt loam, 3 to 8 percent slopes	2	75
Sk	Skidmore gravelly loam	2	75
Us	Udorthents, smoothed		100
VaD	Vandalia silty clay loam, 15 to 25 percent slopes	4	100
VaE	Vandalia silty clay loam, 25 to 35 percent slopes	6	100
VbD	Vandalia silty clay loam, 15 to 25 percent slopes, extremely stony	7	70
VuD	Vandalia-Urban land complex, 15 to 25 percent slopes		100
W	Water		100
WnB	Wheeling-Urban land complex, 0 to 8 percent slopes		100

Appendix B- Continued

Nonirrigated Capability Class

Aggregation Method: Dominant Condition
Tie-break Rule: Higher

Pleasants and Tyler Counties, West Virginia
Survey Area Version and Date: 9 - 09/24/2015

Map symbol	Map unit name	Rating	Map unit percent
AsA	Ashton silt loam, 0 to 3 percent slopes	1	75
AsB	Ashton silt loam, 3 to 8 percent slopes	2	75
CeE	Cedarcreek channery silt loam, steep, stony	7	85
Cg	Chagrin loam, 0 to 3 percent slopes, occasionally flooded	2	95
DuC	Duncannon silt loam, 8 to 15 percent slopes	3	75
DuD	Duncannon silt loam, 15 to 25 percent slopes	4	75
GaC	Gallia silt loam, 8 to 15 percent slopes	3	75
GaD	Gallia silt loam, 15 to 25 percent slopes	4	75
GpC	Gilpin-Upshur complex, 8 to 15 percent slopes	3	60
GpD	Gilpin-Upshur complex, 15 to 25 percent slopes	4	55
GpE	Gilpin-Upshur complex, 25 to 35 percent slopes	6	55
GpF	Gilpin-Upshur complex, 35 to 70 percent slopes	7	100
GwC3	Gilpin-Upshur complex, 8 to 15 percent slopes, severely eroded	4	100
GwD3	Gilpin-Upshur complex, 15 to 25 percent slopes, severely eroded	6	100
GwE3	Gilpin-Upshur complex, 25 to 35 percent slopes, severely eroded	7	100
GxF	Gilpin-Upshur-Rock outcrop complex, 35 to 70 percent slopes	7	55
Gy	Glenford silt loam, 0 to 3 percent slopes	1	85
HaA	Hackers silt loam, 0 to 3 percent slopes, rarely flooded	1	85
HaB	Hackers silt loam, 3 to 8 percent slopes, rarely flooded	2	100
Hn	Huntington silt loam	2	80
LaC	Lakin loamy fine sand, 8 to 15 percent slopes	4	80
LkC	Licking silt loam, 8 to 15 percent slopes	4	80
Ln	Lindside silt loam, 0 to 3 percent slopes, occasionally flooded	2	90
Me	Melvin silt loam, 0 to 3 percent slopes, occasionally flooded	3	80
Mo	Moshannon silt loam, 0 to 3 percent slopes, occasionally flooded	2	95
OtA	Otwell silt loam, 0 to 3 percent slopes	2	75
OtB	Otwell silt loam, 3 to 8 percent slopes	2	75
OtC	Otwell silt loam, 8 to 15 percent slopes	3	70
Sn	Sensabaugh silt loam, 0 to 3 percent slopes, occasionally flooded	2	95
Ta	Taggart silt loam	3	75
UpC	Upshur silty clay loam, 8 to 15 percent slopes	4	75
VaD	Vandalia silt loam, 15 to 25 percent slopes	4	70
VbD	Vandalia silt loam, 15 to 25 percent slopes, very stony	7	70
W	Water		100
WhA	Wheeling silt loam, 0 to 3 percent slopes	1	85
WhB	Wheeling silt loam, 3 to 8 percent slopes	2	100
WnB	Wheeling-Urban land complex, 0 to 8 percent slopes		100
WoC	Woodsfield silt loam, 3 to 15 percent slopes	3	70

Nonirrigated Capability Class

Rating Options

Attribute Name: Nonirrigated Capability Class

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are included in this data set.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value to represent the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. The components in the map unit name represent the major soils within a map unit delineation. Minor components make up the balance of the map unit. Great differences in soil properties can occur between map unit components and within short distances. Minor components may be very different from the major components. Such differences could significantly affect use and management of the map unit. Minor components may or may not be documented in the database. The results of aggregation do not reflect the presence or absence of limitations of the components which are not listed in the database. An on-site investigation is required to identify the location of individual map unit components.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

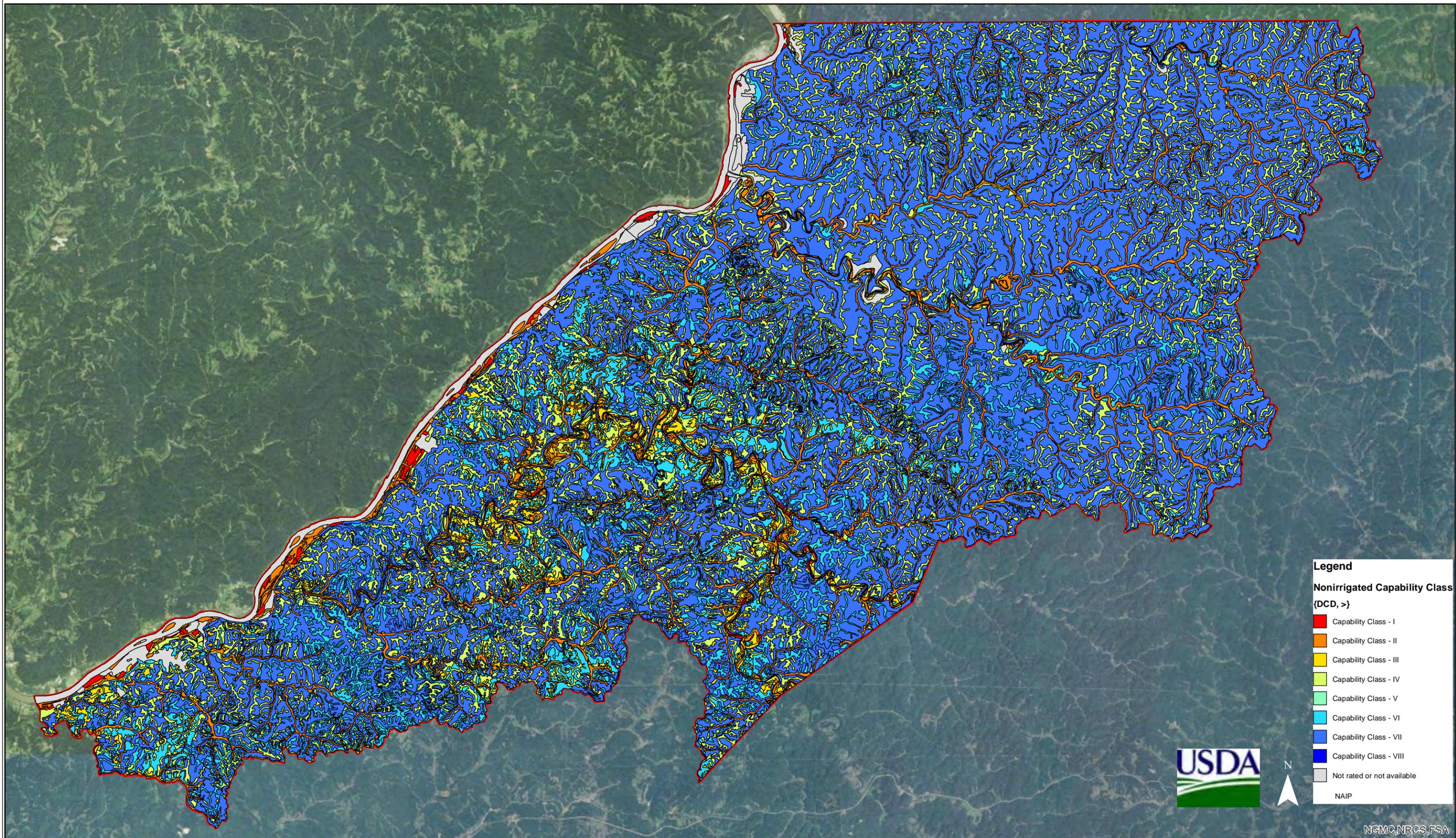
For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be generated. Aggregation must be done because, on any soil map, map units are delineated but components are not.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

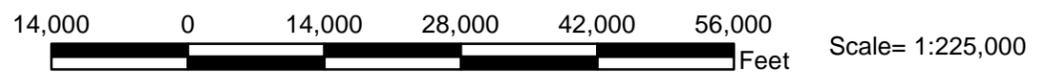
Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

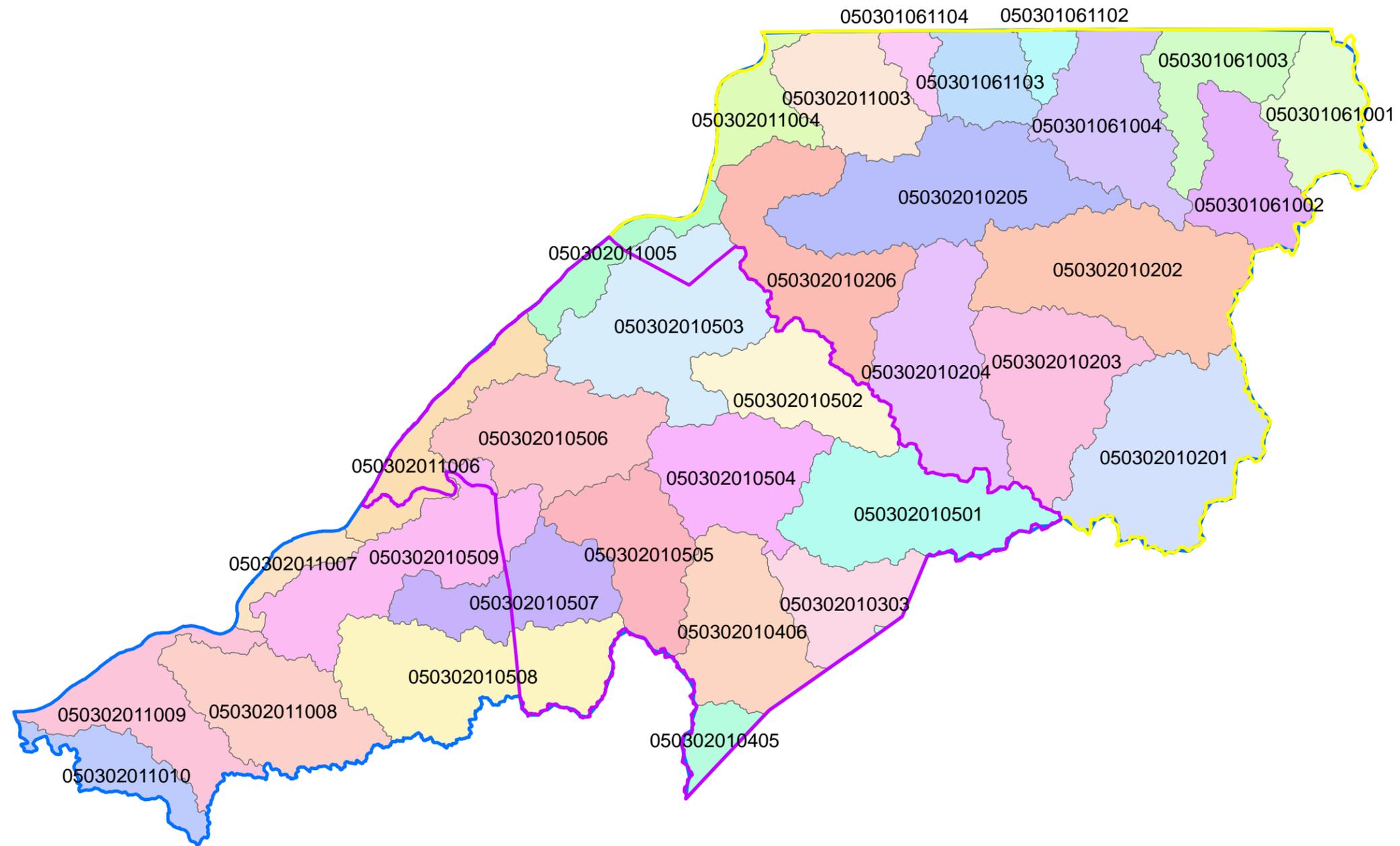
Non-Irrigated Land Capability Class: Pleasants, Tyler and Wetzel Counties



NGMC, NRCS, FSA



UOCD HUC-12



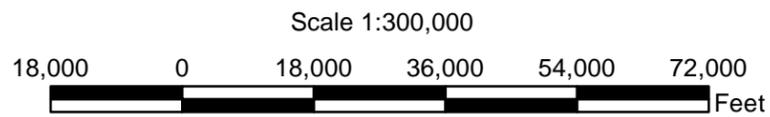
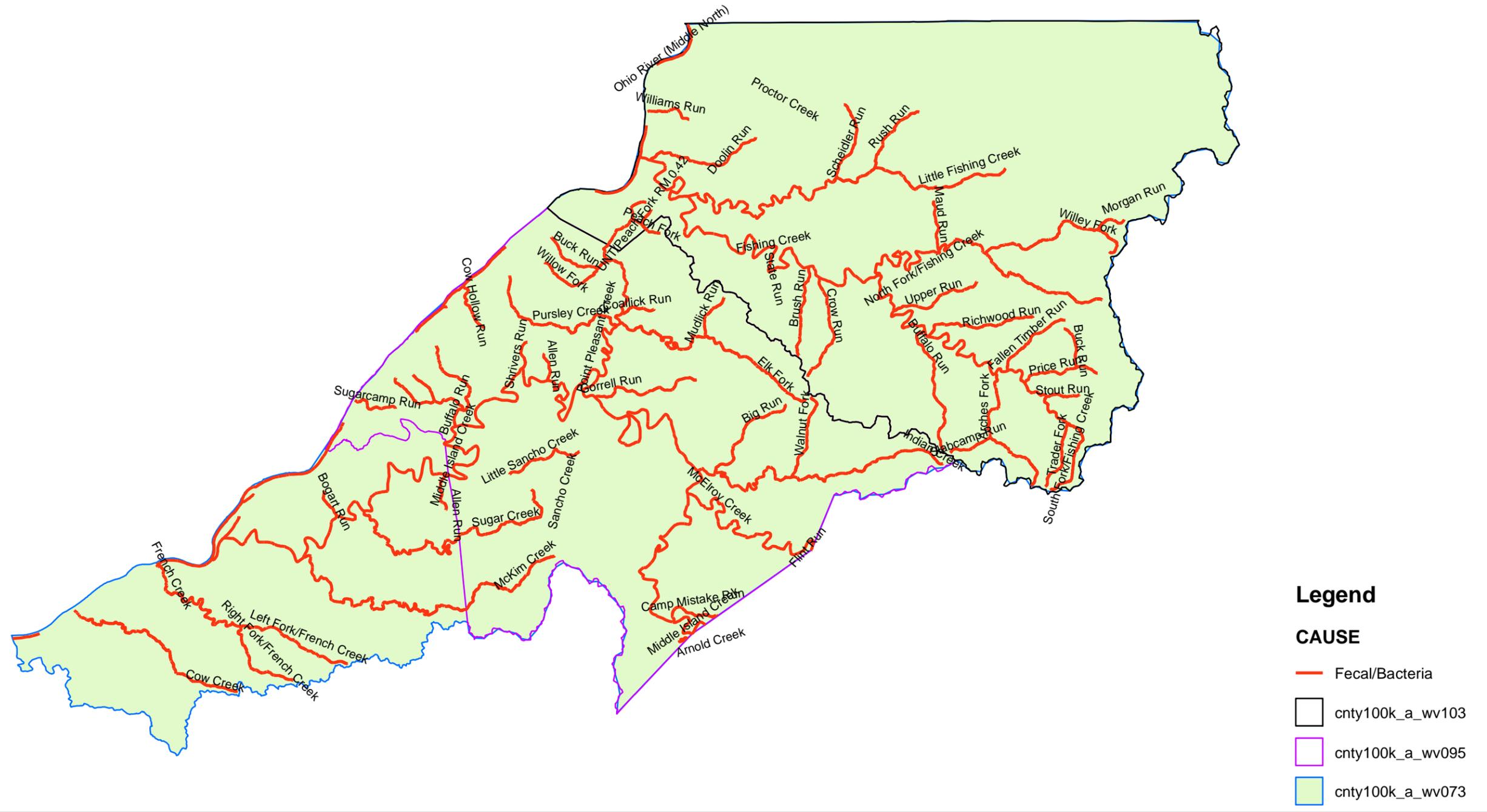
Legend

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- cnty100k_a_wv103
- cnty100k_a_wv073

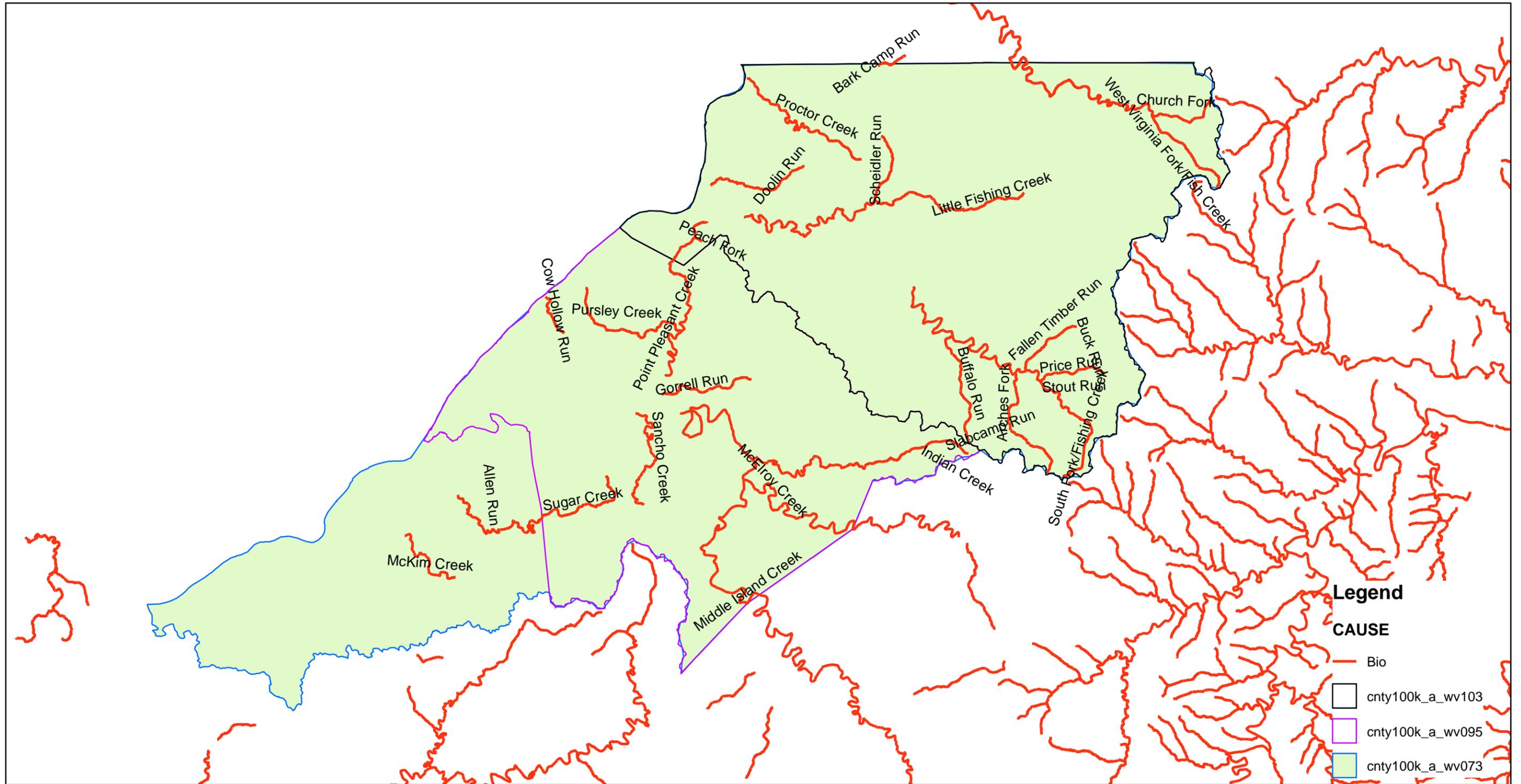
Scale 1:300,000



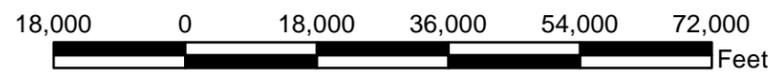
303d List Streams- Fecal / Bacterial Contamination



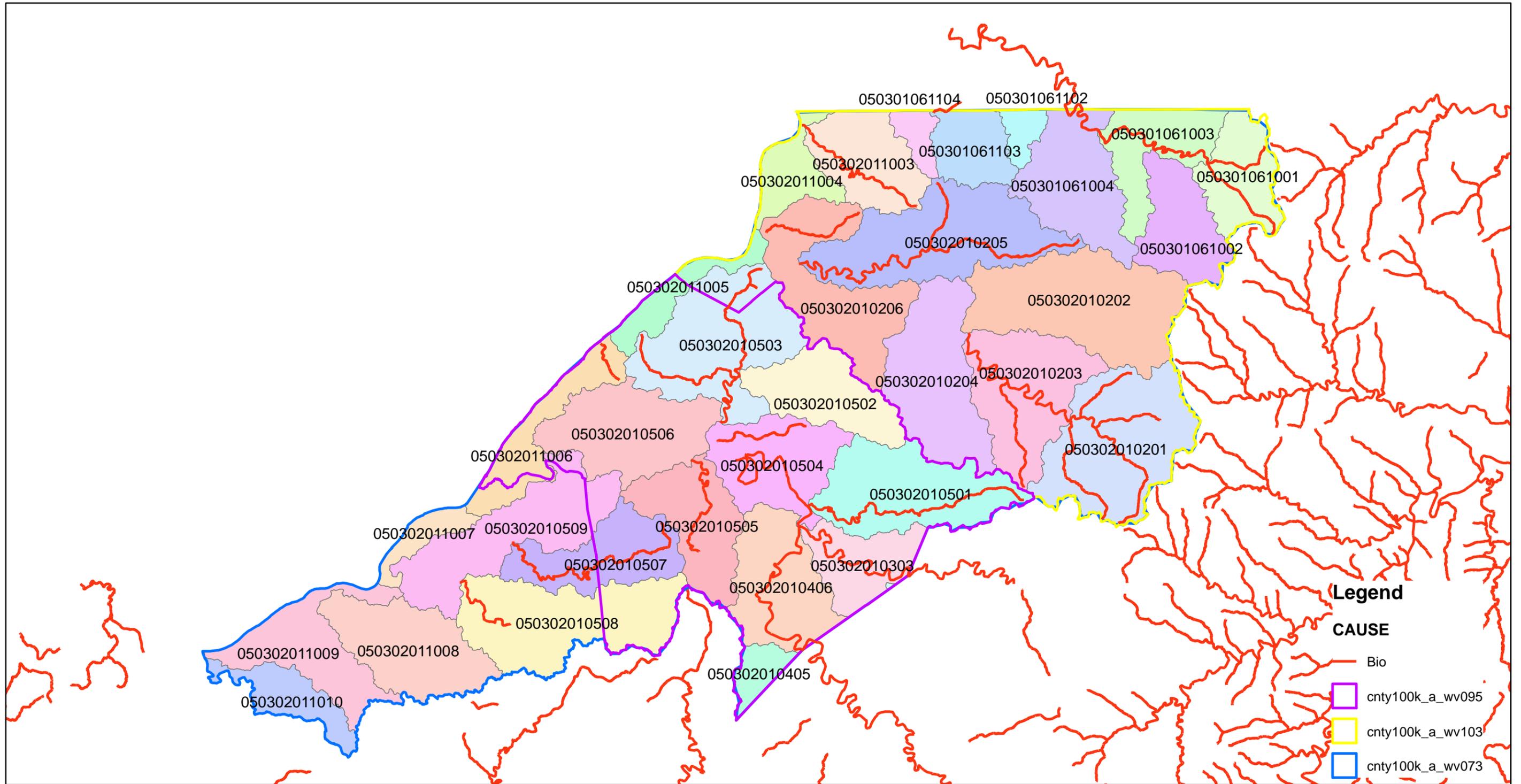
303d List Streams- Conditions Not Allowable - Biological



Scale 1:300,000



UOCD HUC-12 303d- Conditions Not Allowable - Biological

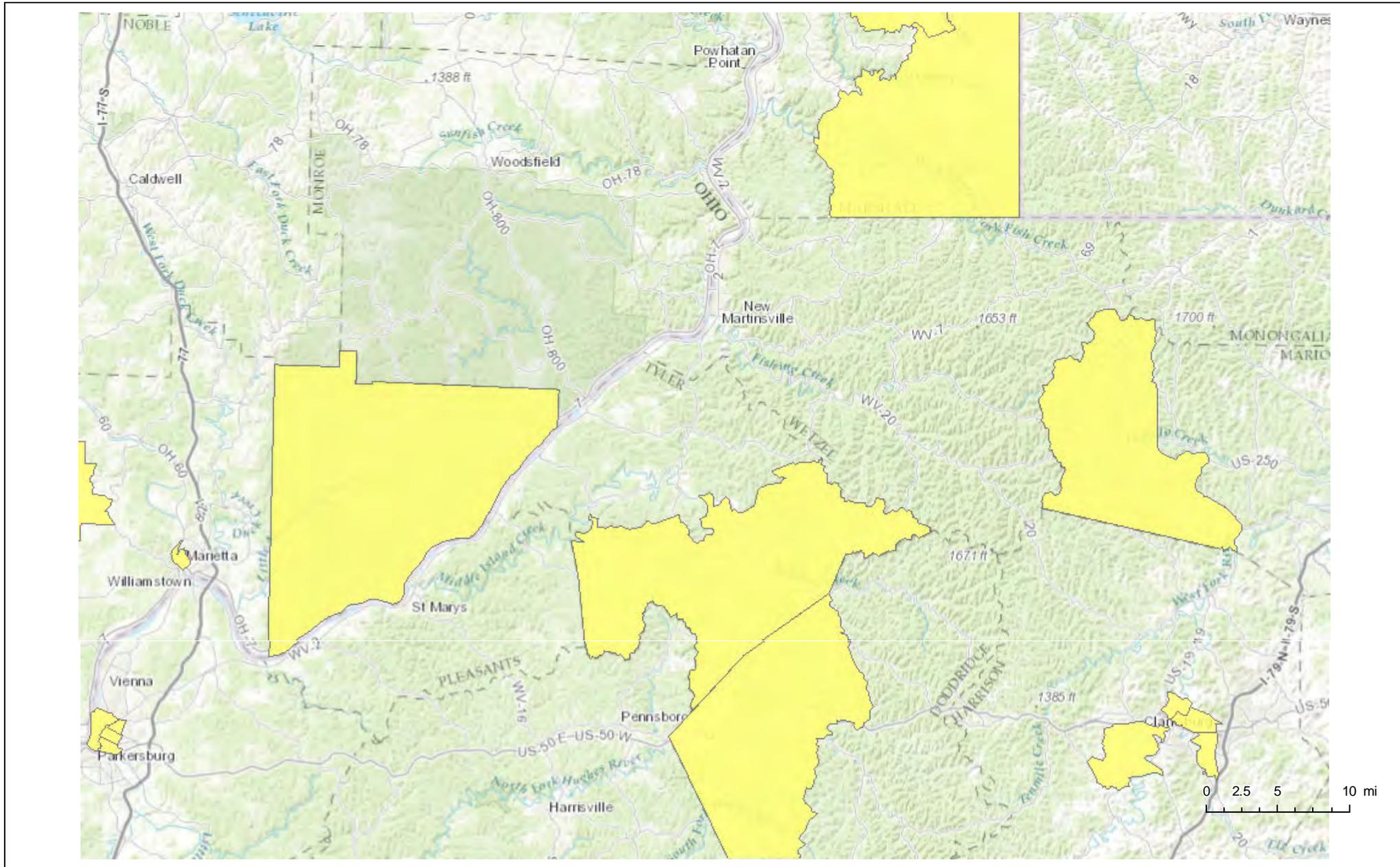


Scale 1:300,000



UOCD Low Income - Low Access (using vehicle)

Date: 4/11/2016 Source: USDA Economic Research Service, ESRI. For more information:



 LILA using Vehicle Access

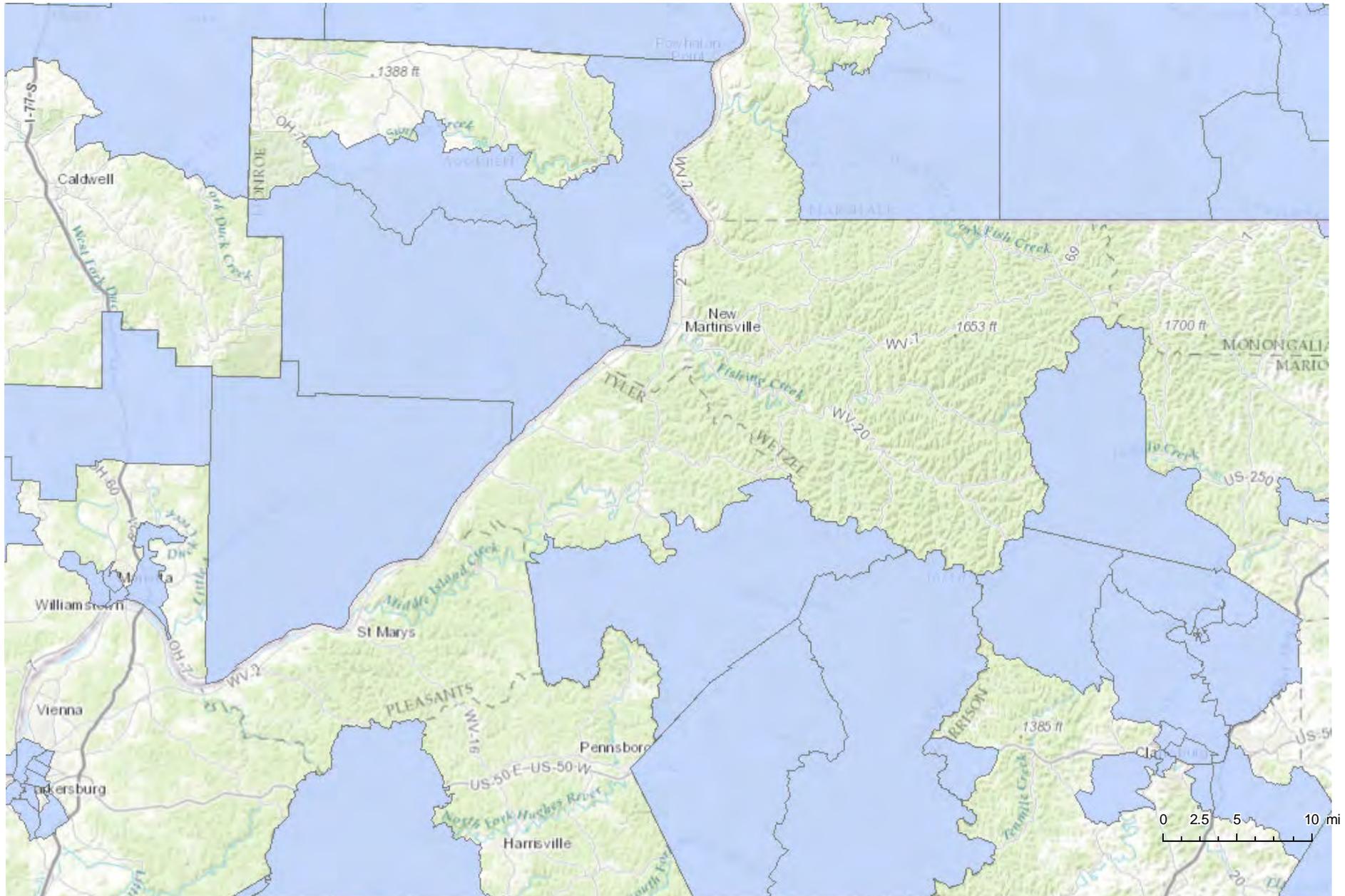
<http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx>

UOCD Low Income

Appendix J

Date: 4/11/2016

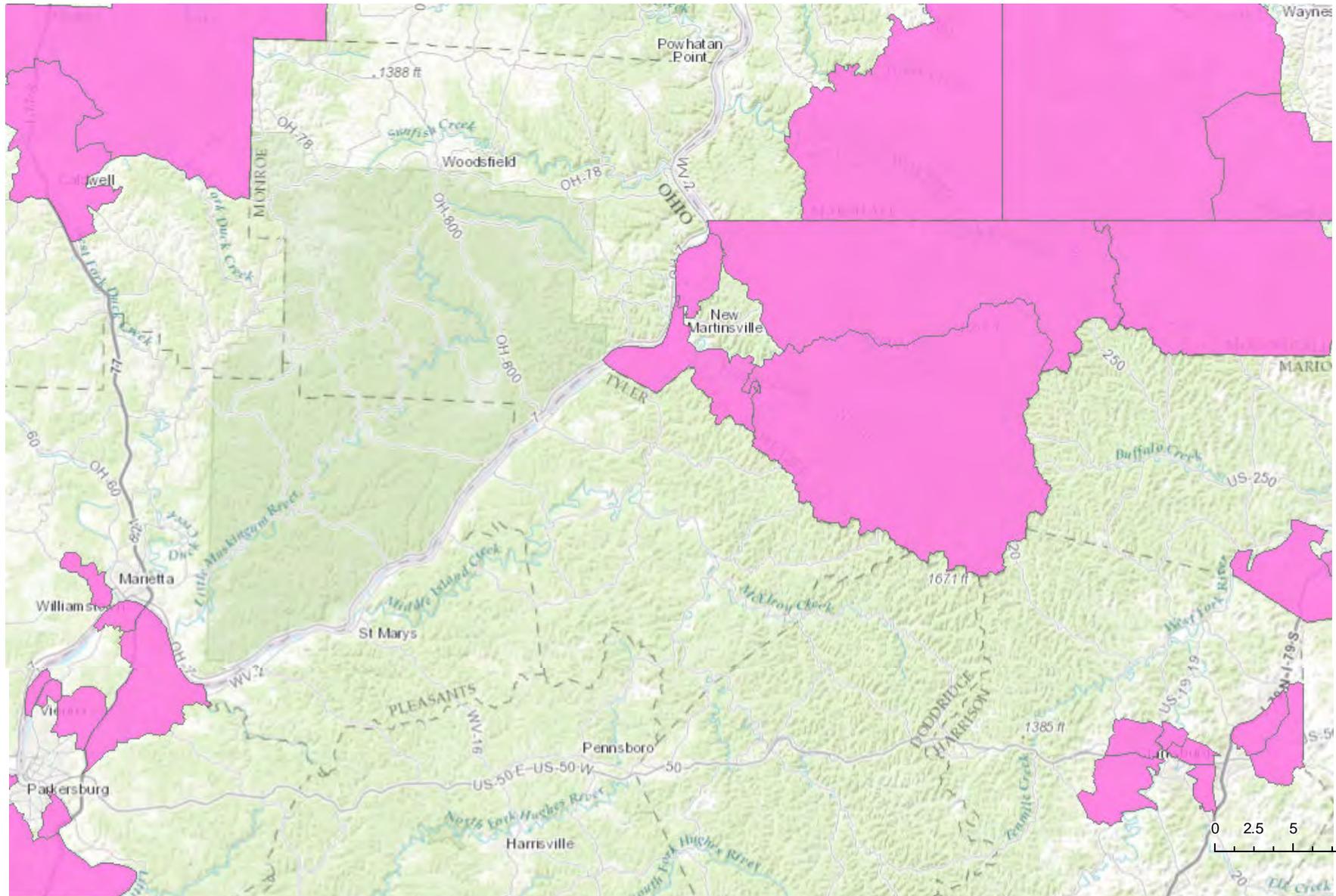
Source: USDA Economic Research Service, ESRI. For more information:



 Low Income

Low Access to Grocery Store Between 1 and 10 Miles

Date: 4/11/2016 Source: USDA Economic Research Service, ESRI. For more information:
<http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx>

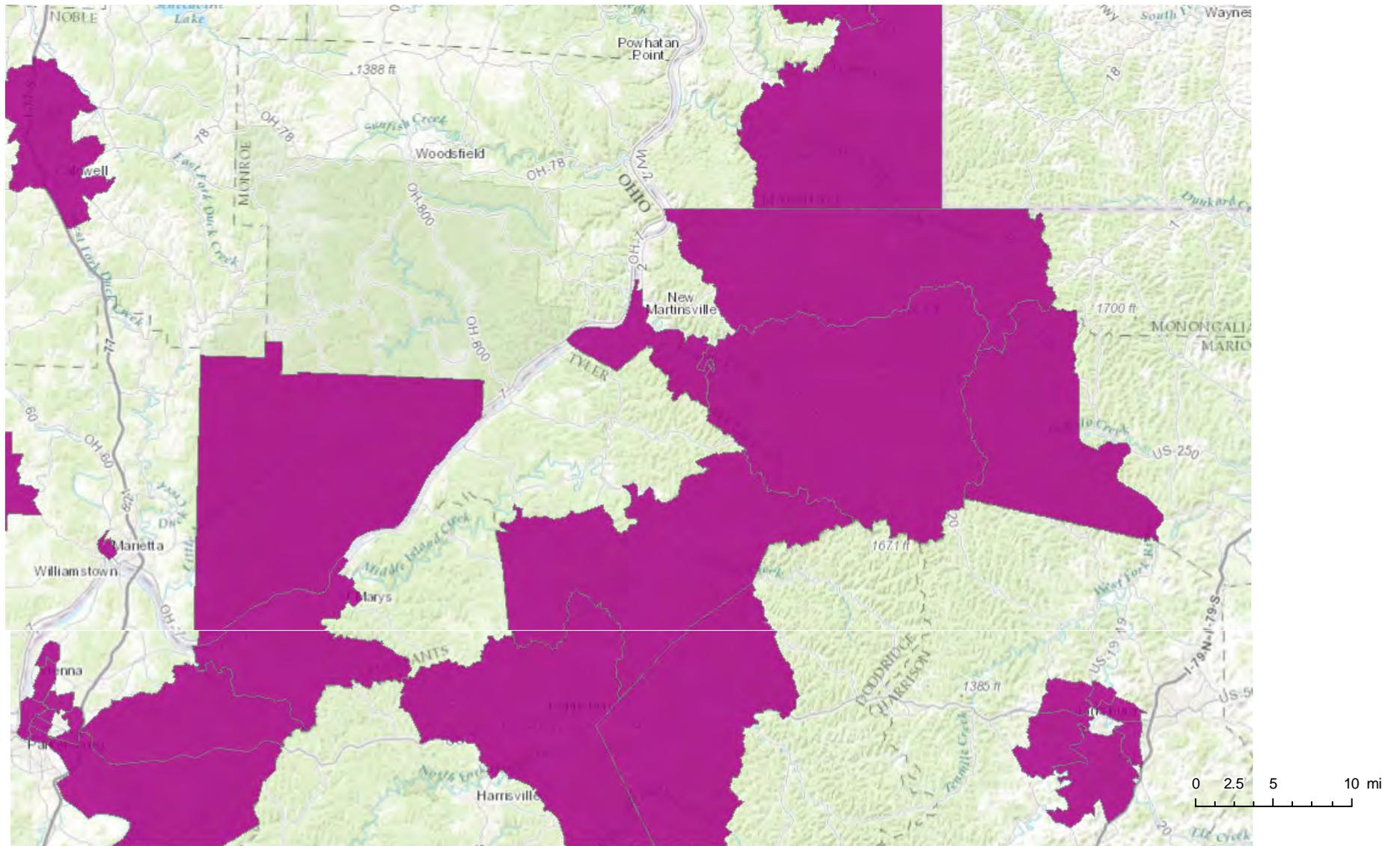


 Low Access 1 and 10

Appendix L

Areas With Low Vehicle Access

Date: 4/11/2016 Source: USDA Economic Research Service, ESRI. For more information:
<http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx>



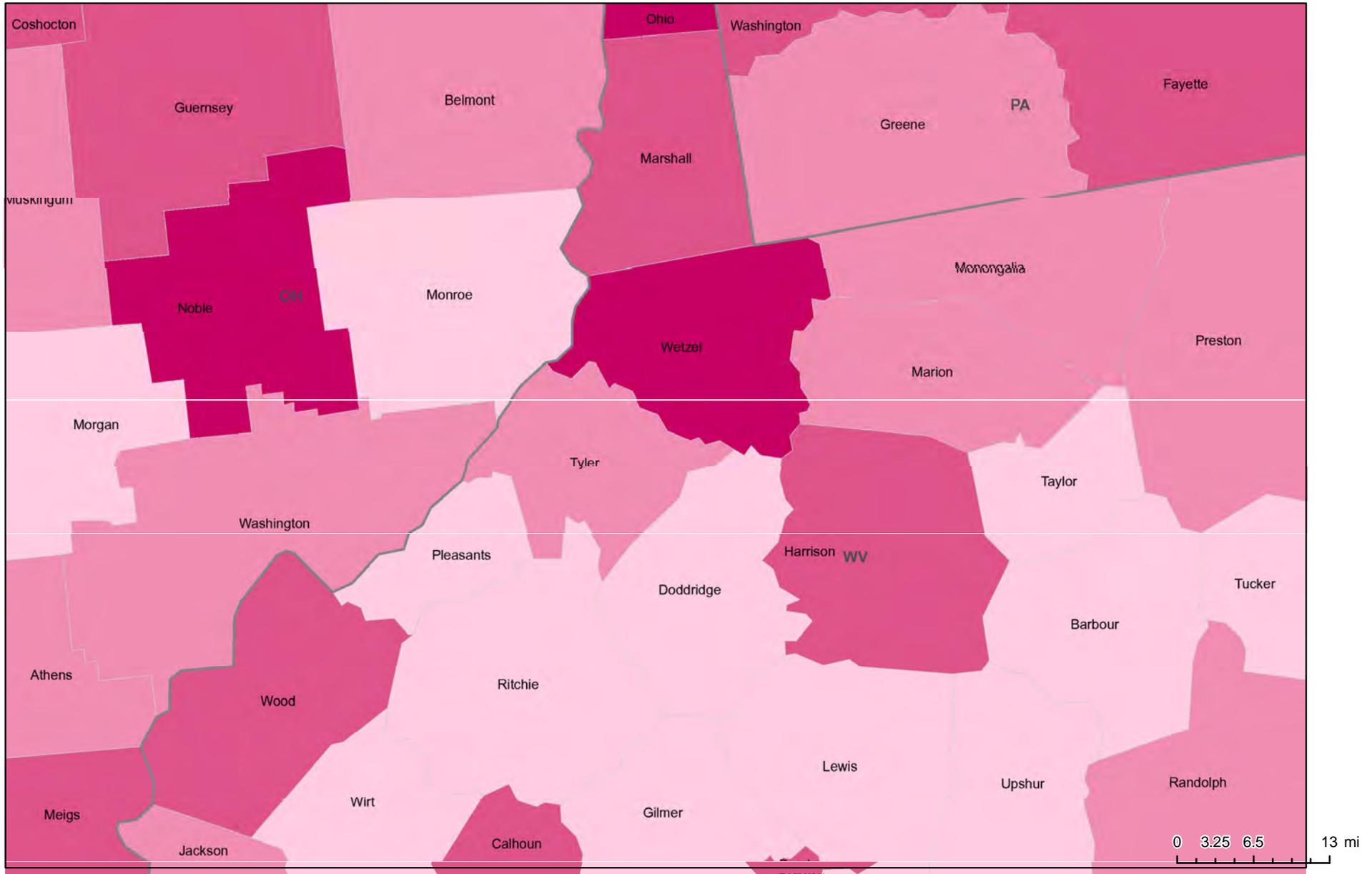
 Low Vehicle Access

Seniors, low access to store (%), 2010

Appendix M

Date: 4/12/2016 Source: USDA Economic Research Service, ESRI. For more information:

<http://www.ers.usda.gov/data-products/food-access-research-atlas/documentation.aspx>



0 3.25 6.5 13 mi