Long-Range Plan for Greenbrier Valley Conservation District

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Overview:

The purpose of this document is to initiate a 5-year plan that will describe the natural resources and resource concerns of the area served by the Greenbrier Valley Conservation District, prioritize the concerns, and develop strategies to address the concerns. This plan is a living document that will be updated periodically as resource concerns change. Through this plan will come project proposals that we hope will provide measurable results for treating priority concerns through the Focused Conservation Approach to Environmental Quality Incentives Program (EQIP). Most proposals will require the assistance of our many partners to take advantage of each partner's strengths.

General Information:

The Greenbrier Valley Conservation District is composed of three counties, Pocahontas to the north, Greenbrier in the center, and Monroe to the south. All three counties are rural. Greenbrier and Monroe counties have less than 35 people per square mile, and Pocahontas County is the least densely populated county in WV with under 10 people per square mile. An estimated 18% of the District population are below the poverty rate, slightly less than the WV average.

The District is one of the most highly agricultural areas in WV with over 450,000 acres of land in more than 2000 farms. The District accounts for more than 12% of the farmland and 14.5% of the gross farm sales for the State per the 2012 Census of Agriculture. The average farm size is 226 acres, about 35 percent above the State average and the average gross sales is $59,000, about 56% above the state average.

Agricultural Enterprises

Beef cattle production is the most important agricultural enterprise in the District, with 75,000 head in the three counties per the 2012 NASS. Greenbrier and Monroe counties rank number one and two respectively in WV for cattle production. As expected, hay production is also great, with Greenbrier and Monroe counties ranking one and two in this regard. There are a sprinkling of dairy farms in these two counties, but their numbers have greatly diminished in the past few decades.

Sheep and lambs are an important part of livestock production in the District, with over 8,000 head recorded. Pocahontas, Greenbrier, and Monroe counties rank two, three, and four in WV.

More than 3,000 acres of corn silage is grown in the District, with 53% of the acreage in 3rd ranking Greenbrier County. Another 2,400 acres produces corn for grain, with over 95% of production in 7th ranking Monroe and 9th ranking Greenbrier counties.

Organic farms are a small, but important part of the agricultural enterprises in the District. A handful of small to medium size dairies in Greenbrier and Monroe counties are certified organic, as are several small beef cattle and vegetable producing operations, especially high tunnels. There are local farmers markets in the larger communities, and some producers market their produce in larger cities outside of the rural District. Lewisburg, the largest town in the District with about 3,800 people has two farmer's markets.

The three counties of the District vary in percentage of forestland, but all are highly forested. Pocahontas County is 91% forestland, Greenbrier is 78%, and Monroe County is 61%. No description of the Greenbrier District can go without mention of the Monongahela National Forest. This area was established following passage of the 1911 Weeks Act, which authorized the federal purchase of land for long-term watershed protection and natural resource management. Today there are over 1.7 million-acres within the proclamation boundary of the Forest. It occupies more than 919,000 acres in WV, and dominates Pocahontas and the northern and northeastern portions of Greenbrier County.

Forestland owned by large timber companies and mining interests occupy additional area within the District, leaving about 337,000 acres of non-industrial private forestland in the three counties.

Factors Affecting Agricultural Production:

Geology/Soils/Water:

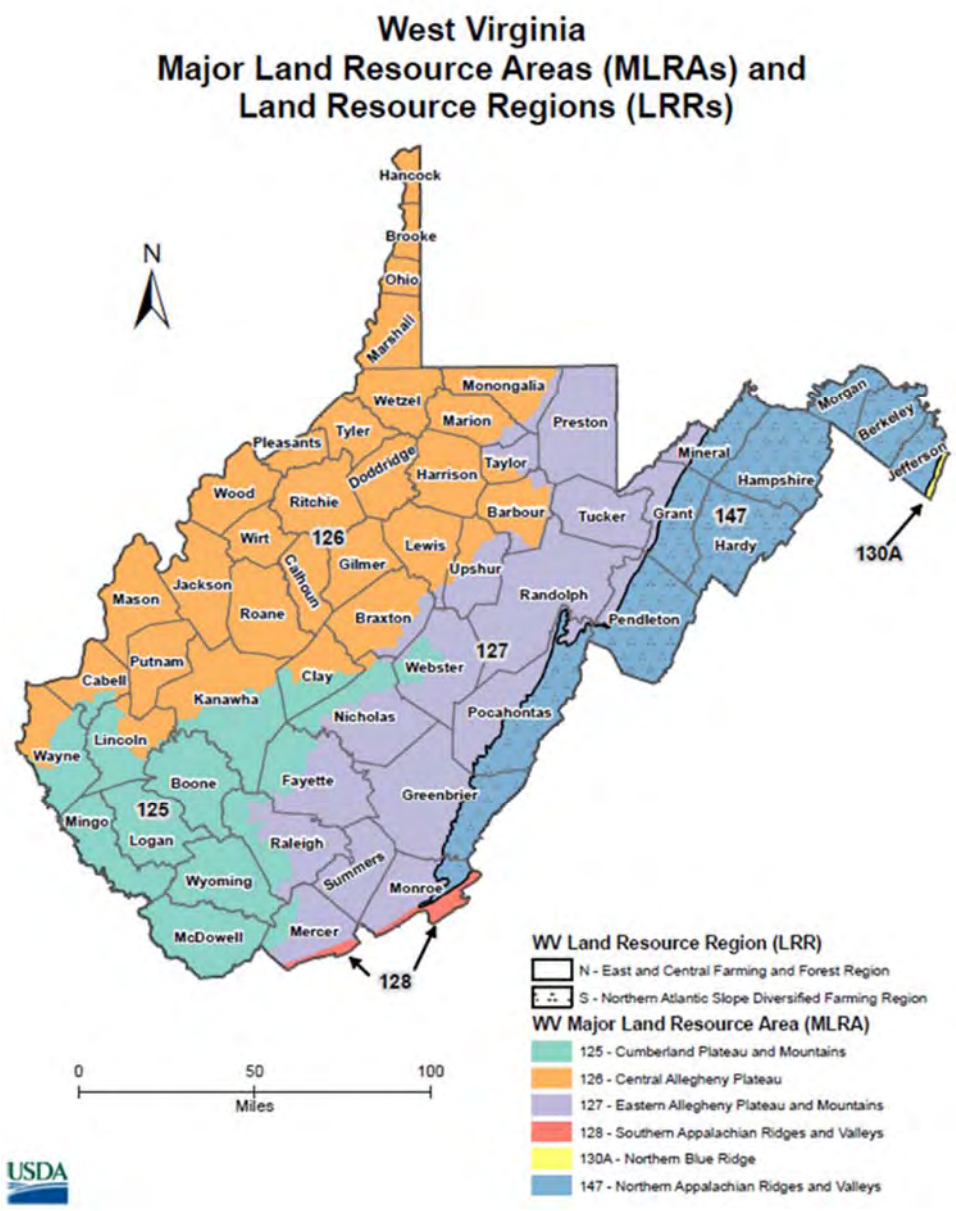
The western two thirds of the District is in the Eastern Allegheny Plateau and Mountains Major Land Resource Area (MLRA 127) and the eastern third is in the Northern Appalachian Ridges and Valleys (MLRA 147). A small area of the southeastern boundary of Monroe County is in the Southern Appalachian Ridges and Valleys (MLRA 128) and drains to the Chesapeake Bay.

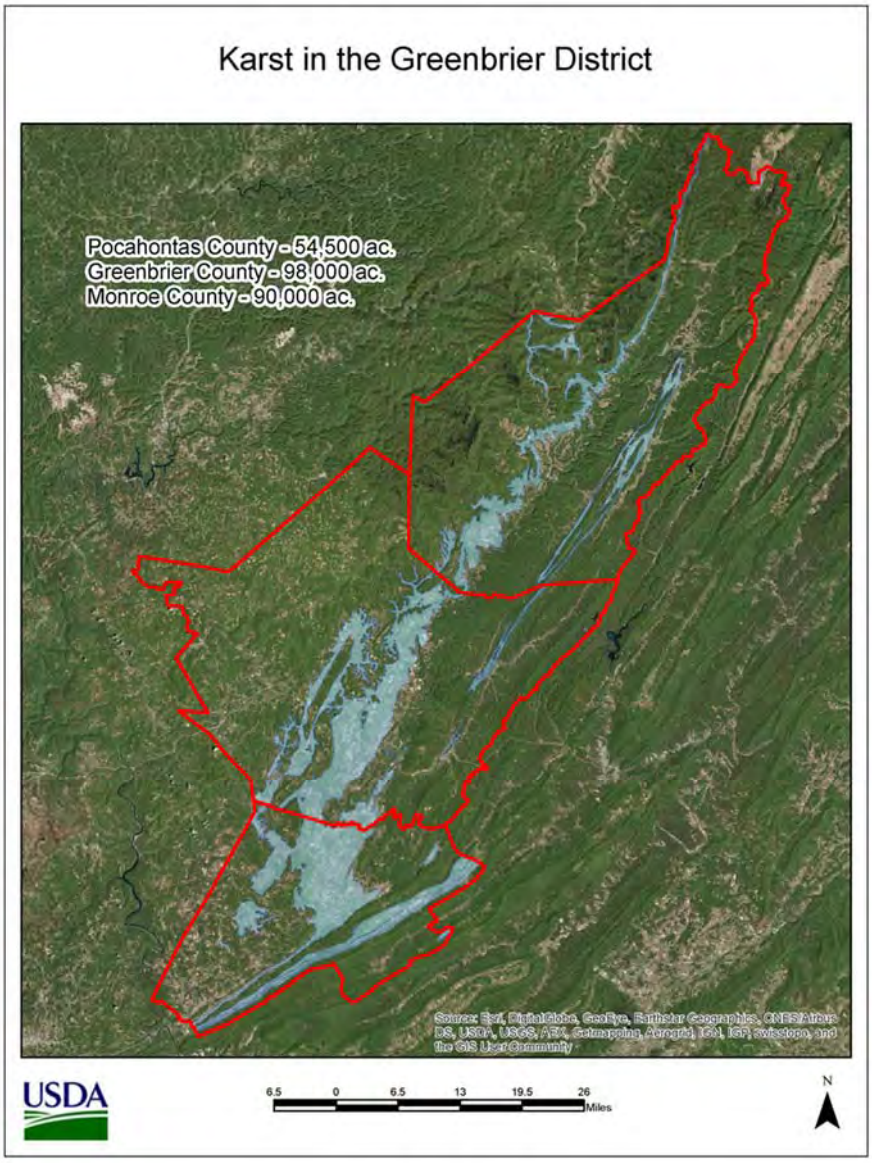
MLRA 127 is a gently to moderately sloping high plateau area, with very steep, deeply dissected gorges. Soils on the plateau can be moderately deep and medium textured, with deep skeletal soils in the

gorges. At higher elevations, soils are skeletal, and soil temperatures are frigid with some areas dominated by red spruce.

MLRA 147 is a folded and faulted area of parallel ridges and valleys that are carved out of synclines, anticlines, and thrust faults. Soils on the ridges are skeletal, moderately deep to shallow, and droughty. Soils in the limestone valleys are heavy textured, fertile, and productive.

MLRA 128 consists of alternating beds of limestone, dolomite, shale and sandstone. Ridgetops are capped with more resistant carbonate and sandstone and shale layers, and valleys have been eroded into the less resistant limestone beds. Soils on the ridgetops are shallow and skeletal. Soils in the valleys are heavy textured, fertile, and productive.



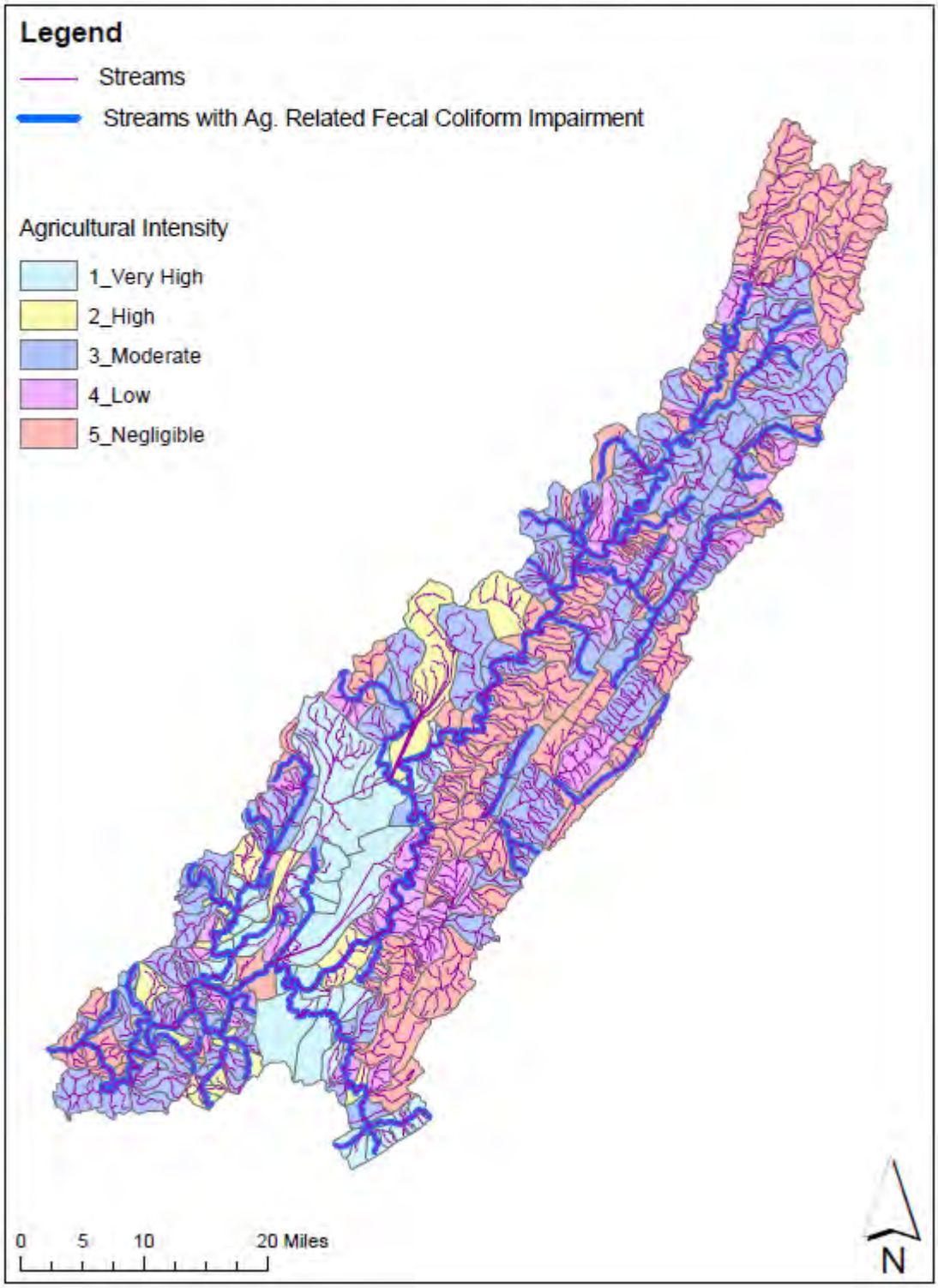


Another major feature of the District is karst topography. More than a quarter of a million acres of karst can be found in the District, starting with a relatively narrow band in Pocahontas County running southwesterly and broadening as it reaches through Greenbrier County and terminating in Monroe County. Much of the pasture and cropland of the District is found in the karst. This area generally lacks surface streams, with most of the water in these flowing in underground channels through caves.

Although the karst region has the potential to be very productive, it is water-poor. Ground water in these areas is also especially susceptible to contamination because of the fast flow rates and little opportunity for filtering of the water. Lewisburg, Union, and Hillsboro are situated on karst sinkhole plains.

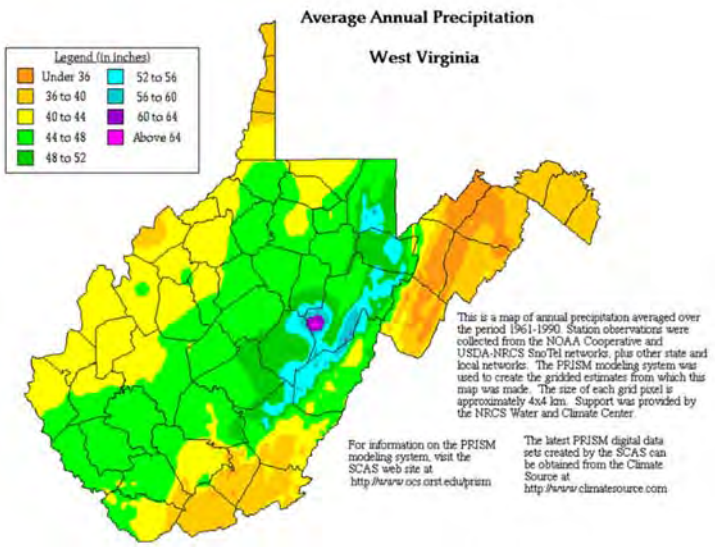
West Virginia's 2006 Section 303(d) list includes 39 impaired streams in the 1,646 square mile Greenbrier River watershed. The impairments are related to water quality criteria for fecal coliform bacteria. Agriculture is the most prevalent landuse within the unforested portions of the Greenbrier River watershed. Source tracking efforts by WV Department of Environmental Protection identified pastures and feedlots throughout the watershed that have significant impacts on instream bacteria levels.

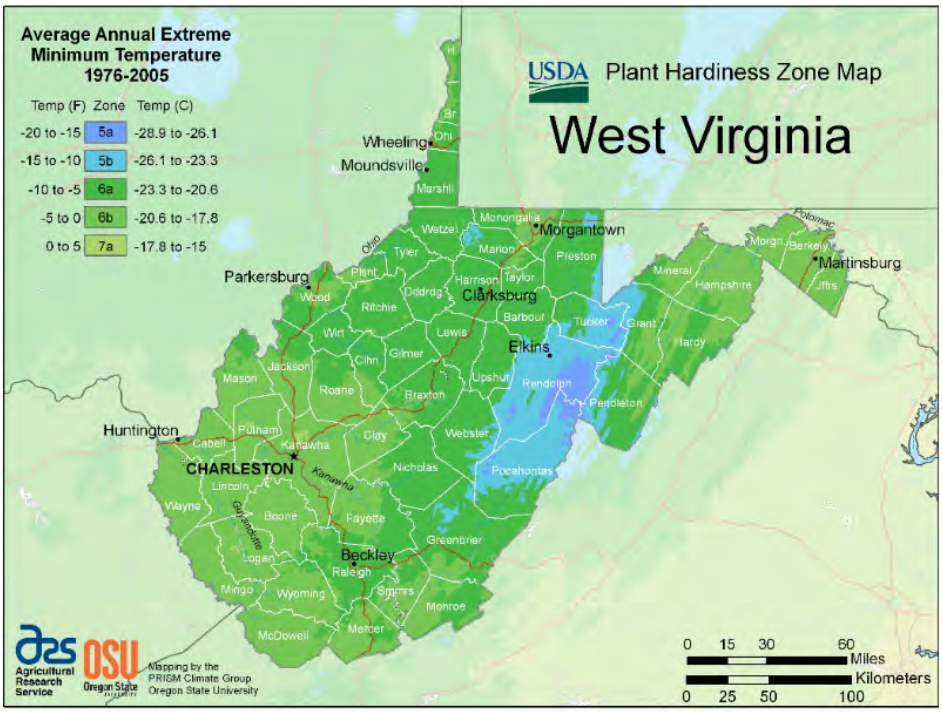
Greenbrier Watershed Impariments



Climate:

Rainfall in the Greenbrier District varies greatly with terrain, with the windward side of the mountain ridges in Pocahontas and Greenbrier counties receiving 50 or more inches per year and other parts receiving 40 inches or less. Snowfall distribution shows a similar pattern, with annual snowfall of 12 to 24 inches in the lower elevations and exceeding 100 inches in the higher elevations of Pocahontas County. Foggy mornings are also prevalent, due to the high evapotranspiration rates from extensive forest cover and rapid nighttime radiation loss of the elevated locations and ensuing cold air drainage that fills the valleys.





Temperatures vary widely throughout the District. The lowest temperature on record for West Virginia occurred in Lewisburg, minus 37 degrees in 1917. USDA Plant Hardiness Zones range from 6b in the southwestern tip of Monroe County to 5a throughout much of Pocahontas County.

Past Conservation Work:

Historically, the most common conservation practices applied in the District are those that support rotational grazing. In the past 5 years over 63 miles of fence, 33 miles of pipeline, 306 watering facilities, 65 water wells, 21 spring developments, and 43 ponds have been completed with EQIP funding. Additional miles of fence and watering systems were applied through Farm Service Agency, Conservation District, and State programs.

Non-structural management practices applied include more than 450 prescribed grazing plans being implemented on 8,745 acres and 312 nutrient management plans on 4,680 acres.

The pilot Seasonal High Tunnel National Initiative that has continued beyond its 3-year introduction has proven to be very popular in the District due to several factors. There is a strong market for locally grown foods that are organic or use minimal inorganic materials. High elevation environments found in the District are not suitable for production of some commodities. Finally, poor economic conditions and limited availability of fresh fruits and vegetables in depressed areas of the District can be helped with the use of these structures. More than 80 high tunnels have been installed to date. About 75% of them take advantage of microirrigation systems and more than 15% utilize water catchment systems as their source of irrigation water.

Established Partnerships:

With the broad agricultural base and diversity that is the Greenbrier District, there are many partners. These include the Farm Service Agency, Rural Development, Greenbrier Valley Conservation District, WV Conservation Agency, WV Department of Forestry, WVU Extension, US Forest Service, US Fish and Wildlife Service, Trout Unlimited, WV Land Trust, farmland protection boards, various watershed associations, and many others.

District-Wide Natural Resource Concerns:

Meetings of the Local Working Group and sub-committees established that the greatest natural resource concerns are those relating to livestock grazing. These include Soil quality Degradation (Organic Matter depletion), Water Quality (Excessive nutrients/sediment in surface/ground water), Degraded Plant Condition (Undesirable plant productivity/health), and Livestock Production Limitation (Inadequate water, inadequate feed/forage).

Additional resource concerns were voiced by our partners involved in forest management, especially as they relate to two issues the lack of current forest management plans for non-industrial private landowners, and the invasion of Non-Native Invasive Species (NNIS) on all land uses. The principal resource concern identified was Degraded Plant Condition (Undesirable plant productivity/health).

Seasonal high tunnels are popular and in demand in all counties, and recently recognized by partners as meeting several local objectives. They allow the cultivation of crops not suited for production in areas of the District that have shorter growing seasons and help to promote better human health, especially in the impoverished areas. The principal resource concerns are Insufficient Water (Inefficient use of irrigation water), Degraded Plant Condition (Undesirable plant productivity/health), and Human Economic and Social Considerations (Public Health/Safety).

Not mentioned as often in the Local Working Group meetings, but emphasized in the survey of resource concerns was that there was concern for fish and wildlife habitat, with the major concern being Inadequate Habitat for Fish and Wildlife (Quantity/quality of cover/shelter).

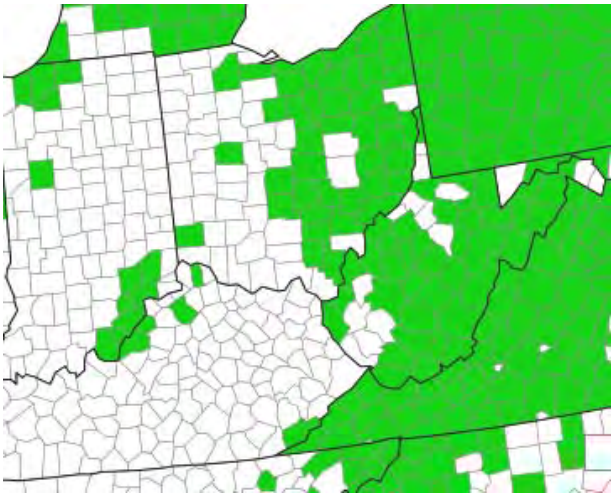
Following are summaries of the agricultural issues voiced as being the most important to the members of the Local Working Group. From these will come the District's project proposals. It is understood that funding, staff resources, inadequate information, or lack of suitable practices may make it impossible to treat every issue. Selection of target issues will result in project proposals in the next phase of Focused Conservation Approach to EQIP funding. These issues are presented below in no particular order.

Issue Identified: Non-Native Invasive Species – Woody and Herbaceous

- Negative Effects: Rapid growth, prolific seeding and sprouting, allopathic chemicals and other factors allow non-native invasive species (NNIS) to displace native species, therefore reducing plant quality in woodland, hayland, pastures, and cropland and negatively affecting wildlife habitat.
- Sponsoring Partner(s): US Forest Service, WV Division of Forestry, WVU Extension, NRCS
- Resource Concerns: Degraded Plant Condition (Undesirable plant productivity and health; Excessive plant pest pressure; Inadequate structure/composition), Inadequate Habitat for Fish and Wildlife (Cover/shelter), Livestock Production Limitation (Inadequate feed/forage),
- Location: Spotty presence throughout the District. The Early Detection & Distribution Mapping System (EDDMapS) website sponsored by the University of GA Center for Invasive Species and Ecosystem Health contains a database of reported locations of the major offenders. It can be found at: http://www.eddmaps.org/Species/subject.cfm?sub=3003

Example NNIS - Meadow Hawkweed

Treatment may slow westward progression.

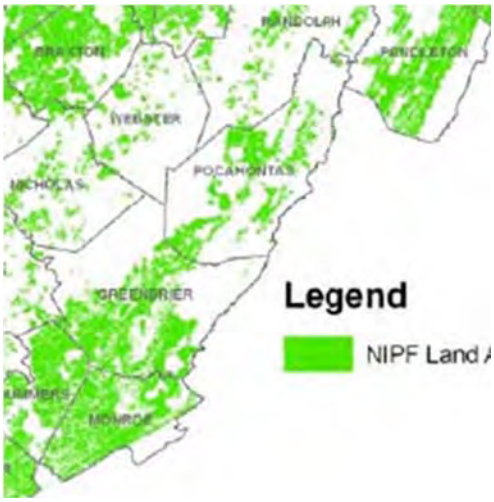


- Extent: The total acreage of infestation varies considerably by species, but several NNIS are increasing at alarming rates. Partner agencies feel that early detection and control can have a great effect on reducing the spread. US Forest Service has been very active at treating infestations on public land, but without treatment of adjacent/nearby lands, treatment is much less effective and the infestation on public land quickly rebounds.

- Measure of Success: Identification of infestation areas and addition of these areas to a database such as the EDDMapS website. Reduction in the number/extent of target areas through various control methods.
- Practices: Herbaceous weed control (not currently available), brush management, forest stand improvement, critical area planting, tree/shrub establishment, fence, access control.
- Partner Contribution: Greenbrier Valley Conservation District, US Forest Service, WVU Extension and WV Department of Forestry may cooperate with educational workshops, identification aids, treatment recommendations, evaluation/monitoring of treatments.
- Resources Needed: Infestation areas are generally small – usually just a few acres. NRCS currently has not adopted herbaceous weed control as a cost-sharable practice. Pending funding, the Greenbrier Valley Conservation District will cost share on brush management for woody invasives this year and potentially in the future. Projects for herbaceous species control through NRCS are dependent upon adoption of the herbaceous weed control practice. NRCS involvement for the time span covered by the LRP would be to provide some staff resources for outreach. Estimated 80 man-hours per year for field staff and 4 man-hours per year for public affairs staff. Additional staff/financial resources would be provided by listed partners for identification, treatment recommendations, and evaluation.

Issue Identified: Few Timberland Owners Have Current Forest Stewardship Plans

- Negative Effects: The entire District is heavily forested, with over 337,000 acres of non-industrial private forestland, but there are very few current Forest Stewardship Plans (currently 24 in Pocahontas County, 13 in Greenbrier, and 24 in Monroe). Many of the existing plans are old and out of date. The result is that there are many missed opportunities to improve forest health and productivity and enhance wildlife habitat through properly designed and applied forest management activities.
- Sponsoring Partner(s): WV Division of Forestry, NRCS
- Resource Concerns: Degraded Plant Condition (Undesirable plant productivity and health; Excessive plant pest pressure; Inadequate structure/composition; Wildfire hazard), Inadequate Habitat for Fish and Wildlife (Quantity, quality of cover/shelter; Quantity, quality of food; Habitat continuity)
- Location: Throughout the District.
- Extent: Districtwide.
- Measure of Success: Significant increase in number of Stewardship plans written/updated.



- Practices: Forest Stewardship Plans are currently written by WV DOF. CAP-106 plans are not currently utilized by WV NRCS. TSP's are available in WV and others are willing to travel from neighboring states to do large plans or multiple tracts. Additional forestry consultants would register as TSP's if the practice were offered.

- Partner Contribution: Through outreach by NRCS and WV Division of Forestry, the number of applicants for Stewardship plans will increase, quite possibly beyond what WV DOF can provide. It is recommended that NRCS begin to offer CAP-106 plans.
- Resources Needed: Until such time that NRCS offers CAP-106 plans, NRCS involvement would be to provide some staff resources for outreach to promote WV DOF plan writing. Estimated 80 man-hours per year for field staff and 4 man-hours per year for public affairs staff are required.

Issue Identified: More High Tunnels Needed to Improve the Supply/Distribution of Fresh Foods.

- Negative Effects: While the Greenbrier District contains a great deal of land suitable for agricultural production, many residents of the Greenbrier District have low "food security", and lack access to a sufficient supply of nutritious and safe food. Low income, scattered population, short harvest windows, and growing seasons unsuitable for production of some staple crops are contributing factors. Residents of the Greenbrier District consume about a pound of fruits and vegetables per person per day. Roughly 30% of the consumption is canned and another 25% is frozen. High tunnels can extend harvests, allow production of crops suitable for markets, and provide nutritious locally grown food, with ancillary economic benefits of creating jobs, circulating dollars locally, contributing to public health, and reducing energy consumption of transport of goods.

- Sponsoring Partner(s): NRCS, WVU Extension
- Resource Concerns: Degraded Plant Condition (Undesirable plant productivity and health); Excess/Inefficient Water (Inefficient use of irrigation water); Inefficient Energy Use (Farming/ranching practices and field operations); Human Economic and Social Considerations (Public Health)
- Location: Districtwide, but reasons differ across the Greenbrier District. High elevation areas encompassing much of Pocahontas County and the NW one third of Greenbrier County have short growing seasons. Other areas have outlets such as farmers markets and small food stores, but limited production nearby. Small population centers such as Quinwood have neither.
- Extent: About 80 high tunnels have been installed through EQIP and another 20 are currently contracted, with very strong demand as indicated by application backlog. A goal of adding 100 properly managed high tunnels, particularly in low food security areas, could produce 100-200 tons of fresh vegetables for distribution.

- Measure of Success: High tunnels installed, tons of fresh vegetables and fruits produced for local consumption, and Farm Irrigation Rating Index (FIRI) for irrigation water savings.
- Practices: High tunnel, microirrigation system, irrigation pipeline, well, irrigation reservoir, irrigation water management, pumping plant, roof runoff structure, underground outlet, water harvesting catchment.
- Partner Contribution: WVU Extension has been and continues to be a valuable partner with their workshops that promote high tunnels and educate producers on selection of high value crops that are in demand locally and best take advantage of the benefits of the high tunnel.
- Resources Needed: Following through with a 2-year proposal to construct 100 additional high tunnels would cost about $1,000,000 and require 800 man-days.

Issue Identified: Inadequate Management of Cropland/Hayland

- Negative Effects: Surface water degradation from sediment and nutrients as a result of excessive soil erosion, reduction in productivity due to excessive soil loss, increase in amount of pesticide and manure solid applications, and wildlife nesting season adversely affected by mowing in nesting season.
- Sponsoring Partners: NRCS, FSA, GVCD, WVCA, WVUCES
- Resource Concerns: Degraded Plant Condition (undesirable plant productivity and health), Soil Quality Degradation (organic matter depletion), Soil Erosion (sheet and rill), Livestock Production Limitation (inadequate feed and forage), and Inadequate Habitat for Fish and Wildlife (cover/shelter, food)
- Location: Crop (crop and hay) fields districtwide.
- Extent: There are 81,582 acres of crop (crop and hay) within the district. Based on field staff experience, approximately 25% of those fields have at least one of the above resource concerns that should be addressed.
- Measure of Success: Improvement shown in RUSLE2 Soil Loss (erosion) and Soil Conditioning Index (soil health), increased use of Soil Sampling for nutrients, Nitrate Testing, Forage Testing, and acres of enhanced Cover Crop and Conservation Crop Rotation applied.
- Practices: Cover Crop, Conservation Crop Rotation, Filter Strip, Nutrient Management, Forage & Biomass Planting, Riparian Herbaceous Buffer, and Riparian Forest Buffer.
- Partner Contribution: GVCD & WVUCES may host farm field days; NRCS/GVCD/WVCA may assist the landowners with taking soil samples and interpreting results; GVCD/WVCA may assist the landowners with taking forage samples and nitrate samples and interpreting results. The WVU Extension may also be available to provide assistance with education (dinner meetings, workshops, etc.).
- Resources Needed: Roughly 500 of the 2,000 farms in the District are estimated to have at least one of the identified resource concerns. Treating all of them in the 5-year span of this LRP is unrealistic. Projects of selected high-priority areas may come out of this concern addressing on the order of 250 farms or 10,000 acres in the span of the LRP. Total project costs within the LRP would require about $2 million. Staff resources would be roughly 2,000 man-days for NRCS field staff, 2 days for NRCS public affairs staff, 100 man-days for GRCD/WVCA staff, and 3 man-days for WVU Extension staff.

Issue Identified: Inadequate Grazing Management

- Negative Effects: Surface water quality has declined due to livestock having free access to water bodies (ponds, creeks, streams, springs), plant condition is inadequate due to improper grazing management, soil health is declining and production levels are decreasing due to improper forage management and maintenance, and non-native invasive species are increasing.
- Sponsoring Partners: NRCS, FSA, GVCD, WVCA, WVU Extension, USFWS, TU
- Resource Concerns: Water Quality Degradation (excess nutrients in surface water); Degraded Plant Condition (undesirable plant productivity and health); Soil Quality Degradation (Organic matter depletion); and Livestock Production Limitation (inadequate livestock water).
- Location: Pasture fields districtwide.
- Extent: There are 164,059 acres of pasture fields within the 3 counties of the GVCD (Pocahontas, Greenbrier, and Monroe). Within this area, approximately 70% of the District pasture acres have at least one resource concern that results in negative effects as above.
- Measure of Success: Improved pasture fields (quality and quantity of forage available; improved grass and legume composition); increase in soil fertility; decrease in soil erosion and increase in soil quality. Tools to be used to measure the success include RUSLE2 soil loss, RUSLE2 soil health (Soil conditioning index), Pasture Condition Score, Prescribed Grazing plans written/applied, and soil test results.
- Practices: Access Control, Animal Trails and Walkways, Fence, Heavy Use Area Protection, Nutrient Management, Prescribed Grazing, Waste Storage Facility, Watering Facility, Pipeline, Well, Pond, Spring Development, Roofs & Covers, Critical Area Planting, Forage & Biomass Planting, Brush Management, and Buffers (Filter Strips),
- Partner Contribution: The GVCD, WVUCES, and WVCA are able to host farm field days / grazing demonstrations. NRCS, GVCD, and WVCA are able to assist the landowners with taking proper soil samples and interpreting the results for proper nutrient application. All Sponsoring Partners assist with the evaluation of the above mentioned resource concerns throughout the GVCD. WVCA has volunteered stream monitoring assistance. Trout Unlimited may provide a low-cost alternative for exclusion fencing.
- Resources Needed: The cost of treating this widespread concern completely would be very large and beyond the scope of the LRP. Within the District at least 1,400 farms containing over 100,000 acres are estimated to require treatment. Projects of selected high-priority areas may come out of this concern addressing 250-350 farms and 25,000 acres over the course of the LRP. The total cost would be about $10 million and require 2,500 man-days of field office staff, 4 days of State Office public affairs staff, and 200 man-days for GVCD/WVCA staff.

Issue Identified: Inadequate Livestock Water

- Negative Effects: Inadequate livestock water continues to be a major concern within Greenbrier, Monroe and Pocahontas Counties. In some areas of the District, naturally occurring springs, streams, and manmade ponds provide livestock water, but the locations of these water bodies limit grazing distribution. In karst topography, surface water is very limited or absent. Limited availability and distribution of clean water for livestock hampers implementation of prescribed grazing, resulting in uneven grazing pressure in pastures. Overgrazed areas have reduced plant productivity, more weeds, greater soil loss, and reduced soil health. Unfenced and unprotected ponds, springs, streams and/or open karst limestone sink holes increases the

potential risk of pollution from fecal matter and high nutrient content from runoff into the surface and ground waters.

- Sponsoring Partners: NRCS, FSA, GVCD, WVCA, WVU Extension, USF&WS.
- Resource Concerns: Livestock Production Limitation (inadequate livestock water), Soil Quality Degradation (Organic matter depletion), Degraded Plant Condition (Undesirable Plant Productivity and Health), Water Quality Degradation (Excess nutrients in surface and ground waters).
- Location: Districtwide, on pasture land and hay land that is grazed in late fall after hay cropping.
- Extent: There is approximately 186,000 acres of pasture within the Greenbrier Valley District. There is also nearly 84,000 acres of crop/hay land of which 30% is late summer and fall grazed. Nearly 75% of the total grazing land does not have adequate water distribution resulting in at least one or more of the listed resource concerns.
- Measure of Success: Number of farms enrolled and livestock watering systems/facilities applied in regard to land use and acres affected. Measure of acres of prescribed grazing which is an indirect effect of proper watering facility locations. Tools to measure success would include pasture condition score (PCS), RUSLE2 soil loss, RUSLE2 soil health (Soil conditioning index) and soil test results.
- Practices: Access Control, Heavy Use Area Protection, Pipeline, Pond, Spring Development, Watering Facility, Well, Pumping Plant.
- Partner Contribution: Greenbrier Valley CD may assist with supplemental funding of watering facilities, as they have supported such with AEP in the past. WVCA has volunteered to provide water quality sampling/monitoring. Trout Unlimited may provide a low-cost alternative for exclusion fencing.
- Resources Needed: Inadequate livestock water is almost universal among farms in the District, but participation in other programs lowers the expectations of this bare-bones project that simply supplies a single watering system. Nevertheless, the need is great for a quick-fix solution that could be applied in concert with other projects. Based on 300 farms participating in this program, a total of $5,400,000 would be needed during the next five years for two-year projects in several target areas and would address roughly 24,000 acres. The projects would require 1,800 man-days from field staff, 2 days from State Office public affairs staff.

Issue Identified: Livestock Accessing Woodlands

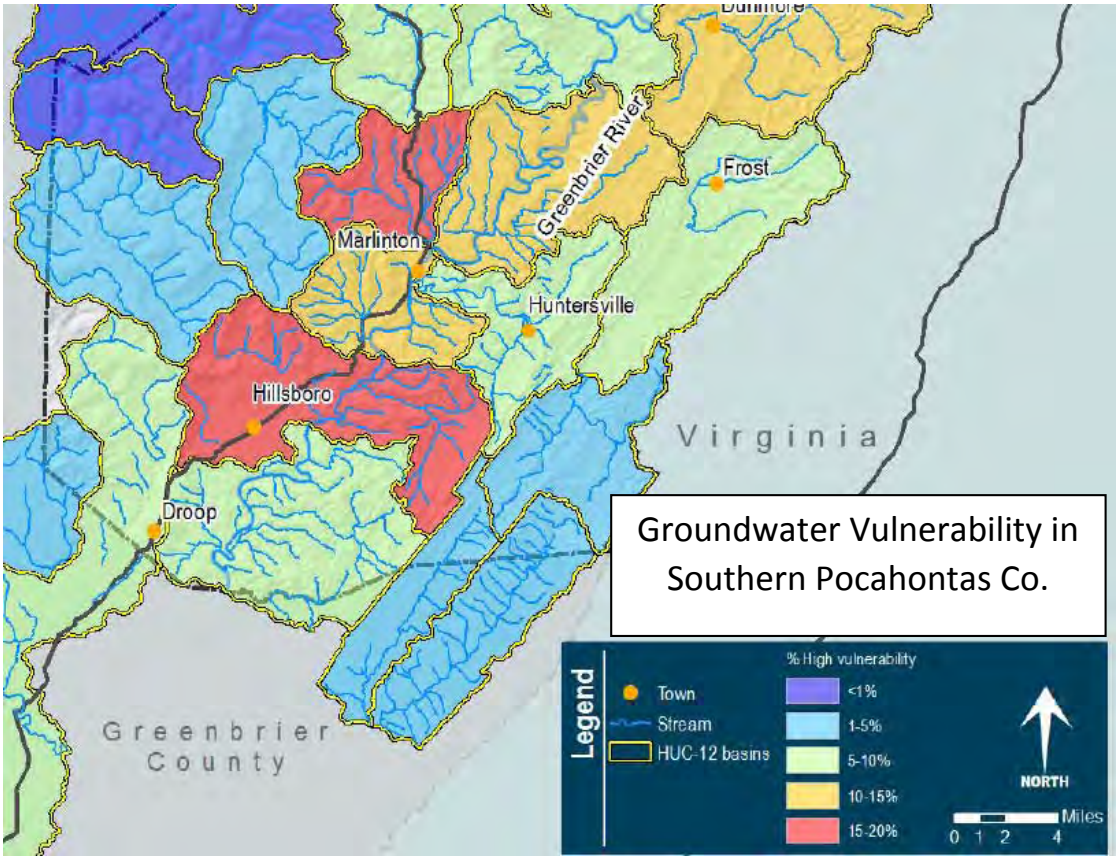
- Negative Effects – Livestock having unrestricted access to forestland impacts the productivity, diversity, and structure of woodland stands and relocates nutrients from the pasture system to the woodland and causes a nutrient deficit that must be addressed with additional nutrient applications.
- Sponsoring Partners – NRCS, FSA, GVCD, WVCA, WVU Extension, USF&WS, TU, WVDOF
- Resource Concerns – Soil Erosion (Sheet & Rill), Soil Quality Degradation (Compaction, Organic Matter Depletion), Degraded Plant Condition (Undesirable Plant Productivity and Health, Inadequate Structure and Composition).
- Location – Districtwide. Most farms throughout the District have some extent of impacted woodlots.

- Extent – There are 337,000 acres of privately owned woodland within the District. Within that land use, roughly 50% of the acreage is impacted and has at least one resource concern that needs to be addressed.
- Measure of Success – Improved Woodland Productivity Score, RUSLE2 Decreased Soil Erosion, RUSLE2 Improved Soil Quality (Soil Conditioning Index), acres of Access Control
- Practices – Fence, Access Control, Forest Stand Improvement (to restore/improve structure) and Tree/Shrub Establishment.
- Partner Contribution – WV Division of Forestry may assist by writing forest management plans that will identify woodland tracts with these concerns, GVCD & WVU Extension will assist with outreach and TU will assist with fence construction.
- Staff Resources Needed – A staff of nine full-time NRCS employees with assistance from one shared position with the WVCA, 2 District Employees, 3 Extension Agents and 3 WVDOF Employees and an ACES employee.
- Resources Needed – An estimated 168,500 acres of woodland on 800 farms within the District has at least one of the above listed resource concerns. Treating such a large expanse is well beyond what could be accomplished within the term of the LRP. Based on an estimated participation of 200 farms, about $1.5 million would address this concern on about 40,000 acres utilizing a series of 2-year projects. About 1,000 man-days would be required of NRCS field staff, 2 man-days for State Office public affairs staff, and 50 man-days for WV DOF.

Issue Identified: Ground Water Quality Impacts from Livestock

- Negative Effects – Livestock in the karst areas of the District impact ground water quality due to improperly managed animal waste, lack of access control, and inadequate or absent buffers adjacent to sinkholes and streams. Streams and surface waters entering sinkholes or caves bypass natural filtration through the soil and provide direct conduits for contaminants. Several communities within the District such as Hillsboro in Pocahontas County utilize public wells as their municipal drinking water source.
- Sponsoring Partners - Pocahontas Co. Local Government, NRCS, FSA, GVCD, WVCA, WVU Extension, USFWS, TU, WVDOF
- Resource Concerns – Water Quality (Nutrients in Ground Water)
- Location – All Karst Areas within the District
- Extent – There are approximately 250,000 acres of karst land within the District. Of that acreage, 18% or 47,000 acres are in need of treatment for the resource concern water quality, nutrients in ground water.
- Measure of Success - Reduced fecal coliforms and nitrates in water tests, acres/feet of buffer, tons of manure stored properly and utilized efficiently, acres of nutrient management applied.
- Practices – Access Control, Fence, Animal Trails and Walkways, Filter Strip, Heavy Use Area Protection, Nutrient Management, Prescribed Grazing, Streambank and Shoreline Protection, Tree & Shrub Establishment, Waste Storage Facility, Waste Utilization, Watering Facility, Roofs & Covers

- Partner Contribution – Pocahontas County Local Government will provide well water testing and historic water data for Hillsboro water source, GVCD & WVU Extension will assist with outreach, WVCA will assist with water sampling, & TU will assist with fence construction



- Resources Needed – Treating this need would result in a relatively small number of large contracts (roofed HUA's and waste storage facilities) and a larger number of smaller exclusion contracts. Full treatment of the estimated 47,000 acres would exceed $10 million, but based on anticipated participation rates, project costs would be $4 million for a series of 3-year projects covering about 18,800 acres in the highest groundwater vulnerability areas. Staff resources would include 2000 man-days from field staff, 30 man-days from Area engineering staff, 3 days from State Office public affairs. Partners above will provide assistance with water testing and outreach.

Issue Identified: Streambank Erosion

- Negative Effects: The Greenbrier Valley District has many miles of surface and subsurface streams within its bounds. Factors such as slope gradient, bedrock, parent material and soil type can influence stream behavior. Streams often fill with gravel and boulders that have washed down from steeper gradients and in the flatter regions the streams begin to meander thus creating large cuts and curves within the landscape. Vast amounts of soil are lost every year from crop and pasture lands as streams cut away the stream banks. The cost to repair, coupled with environmental regulations for entering and working in stream channels has prohibited many landowners from keeping their stream channels open and stabilizing stream

banks. Streambanks also become eroded from livestock traffic, with the potential for increased amounts of fecal matter and high nutrient content entering surface waters.

- Sponsoring Partners: NRCS, FSA, GVCD, WVCA, USFWS, plus local Watershed Associations.
- Resource Concerns: Soil Erosion (Excessive bank erosion from streams), Water Quality Degradation (Excessive nutrients in surface and ground waters), Livestock Production Limitation (Inadequate livestock water).
- Location: Districtwide, along larger blue-line streams with bank erosion and/or have livestock entry.
- Extent: It is estimated that more than 90% of pastures with streams have free livestock access to the stream or inadequate buffers. Many crop fields are vulnerable to heavy soil loss from unprotected stream banks. The extent of need is harder to quantify and projects will be restricted to a portion of a watershed, similar to the National Water Quality Initiative (NWQI) Knapp's Creek project in Pocahontas Co.
- Measure of Success: Footage of stream bank/shoreline protected (armed) with rip rap and/or natural vegetation. Number of in-stream structures that allow for directional stream flow resulting in stream bank protection. Footage or acreage of riparian buffers created. Footage of livestock exclusion fence. Number of alternative livestock watering systems applied as a result of excluding livestock from streams.
- Practices: Channel bed stabilization, stream bank and shoreline protection, access control, fencing, stream crossings, heavy use area protection, livestock watering facilities, well, spring developments, ponds and pipeline.
- Partner Contribution: GVCD could assist with developing alternative watering facilities and conducting water tests. The FSA could assist with increased CREP enrollment. The USFWS could assist with stream fencing. Local watershed associations could assist with stream monitoring and securing additional funding from outside sources.
- Resources Needed: Cost is based on 2 or 3 project proposals of 3 year duration on selected reaches of affected streams with approximately 50 total farms participating and covering about 12 miles of stream. Total estimated budget would be $8 million. Due to the complexity of the projects, significant Area engineering staff resources would be necessary and projects should be staggered to not overwhelm engineering resources. NRCS local field staff would provide about 800 man-days, engineering staff about 200 man-days, and State Office public affairs about 4 days.

Other Issues:

Inadequate Habitat for Wildlife

- This issue was identified during Local Working Group and sub-committee meetings, with much less emphasis than the other concerns listed above. For the time being, wildlife concerns will be treated through regular EQIP National Priorities such as the Golden Winged Warbler Initiative.

Closing Remarks:

The area served by the Greenbrier Valley Conservation District is one of the most highly agricultural areas in West Virginia. It is also one of the most diverse, with large variations in soils, temperature, elevation, population, and economic characteristics. Karst topography presents unique challenges for providing water for agricultural uses and keeping ground and surface water free of contaminants.

Additional factors such as the vast acreage of land in the public domain or held by large timber corporations present challenges to working together to treat resource concerns.

NRCS field staff in the Buckeye, Lewisburg, and Union field offices are well equipped to handle the challenges and are accustomed to a high contract workload. More than a thousand Farm Bill contracts (not including CRP/CREP and easement) have been serviced by staff in the last 10 years, totaling more than $12 million. A sustainable workload for the 10 full-time employees would be roughly 100 new contracts per year, depending on the complexity of practices in the contract. It is understood that the agricultural issues presented in this Long Range Plan cannot all be addressed within the 5-year span of the plan. The Local Working Group and subcommittees will work together to prioritize issues most important to them to enter the project proposal phase, where target areas and measures of success will be clearly defined.

Many thanks go to the members of the Local Working Group and the NRCS staff for the time and energy that they put into developing this first issue of the LRP. It is hoped that we assembled a good framework for a working document that can be refined as we continue to serve our agricultural community in the future.

Endorsements:

South Area Assistant State Conservationist for Field Operations	Date
NRCS District Conservationist	Date
Greenbrier Valley Conservation District Chair	Date