BEAVER CREEK

WATERSHED ASSESSMENT

D R A F T

THE WATERSHED

The Beaver Creek watershed (Maps 1 and 2) is located entirely within Knox County. Shaped like a long, narrow rectangle, it is roughly 25 miles long and 3.5 miles wide and has a total drainage area of approximately 86 square miles. Beaver Creek winds for 44 miles through north Knox County before emptying into the Clinch River. Watershed communities include Gibbs, Halls, Powell, and Karns.

The topography of the Beaver Creek watershed (Map 3) is characterized by a broad floodplain and some rolling hills between two ridges. The watershed is bordered on the northwest by Copper Ridge and along the southeast by Black Oak Ridge. A third ridge, Beaver Ridge, is contained within the watershed and runs along the south bank of Beaver Creek. The creek has a fairly low gradient, loosing only 300 feet in elevation over its 44 mile length.

Major tributaries of Beaver Creek include Cox Creek, Willow Fork, Hines Branch, Knob Fork, Grassy Creek, Meadow Creek, and Plumb Creek. In general, those tributaries that enter Beaver Creek from the north flow down Copper Ridge. They have smaller drainage basins with more karst topography. Those that enter the creek from the south tend to be larger. They flow parallel to Beaver Creek between Black Oak and Beaver Ridges before turning to flow through gaps in Beaver Ridge on their way to entering Beaver Creek.

Although much of the watershed, especially in the extreme lower and upper sections, is rural, there is also a substantial amount of single family residential area, with pockets of commercial and denser residential areas along the major roadways. The watershed has seen a significant increase in the rate of development in the last 15 years. The Water Resources Research Center (WRRC) at the University of Tennessee used land use data from the Knoxville Knox County Metropolitan Planning Commission (MPC) to estimate the extent of impervious surface in the watershed at 18%. Road improvement projects underway or planned for the near future such as the widening of Emory Road and Middlebrook Pike will likely result in increased development pressure in the watershed.

Water quality in the Beaver Creek watershed can be summarized as poor, although it is somewhat better in the upper reaches of the creek and good on some of the tributaries (Cox Creek, Willow Fork, and Lammie Branch). However, the entire length of Beaver Creek is on the 303(d) list maintained by the Tennessee Department of Environment and Conservation (TDEC). This list is a compilation of Tennessee lakes and streams that violate water quality standards. TDEC has designated Beaver Creek as a “partially supporting” stream, which means that its water quality is too impaired to fully support some of its designated uses such as providing domestic, agricultural, and industrial water supplies, supporting aquatic life and wildlife, and providing recreation. The primary impacts to Beaver Creek include sediment, nutrients and pathogens from agricultural and urban runoff; nutrients and pathogens from municipal point sources such as sewage treatment plants; and habitat alteration due primarily to land development.

THE ASSESSMENT

Knox County Engineering and Public Works and Knox County Parks and Recreation partnered with the Knox Land and Water Conservancy (KLWC) and other interested organizations to produce this assessment of the Beaver Creek watershed. This study will help Knox County plan more effectively for flood control, water quality, and allocation of land for open space, recreation and trails. In addition, the KLWC has received a grant from the Tennessee Valley Authority (TVA) to develop a conservation easement acquisition program for the watershed; data from this assessment will be an important input to that effort.

The assessment was conducted under the guidance of a committee composed of partners including Knox County Engineering and Public Works (Stormwater Management), Knox County Parks and Recreation, the KLWC, TVA, USDA National Resources Conservation Service (NRCS), Knox County Soil Conservation District, Knoxville-Knox County Metropolitan Planning Commission (MPC), Hallsdale-Powell Utility District (HPUD), the WRRC, and AMEC, an engineering consulting firm providing stormwater management services to Knox County Stormwater Management.

ASSESSMENT OBJECTIVES

The primary objectives of this study are:

- Identify focus areas for further study or action
- Identify potential greenway routes
- Identify and recommend measures for watershed protection
- Develop the elements of a conservation easements acquisition program for the KLWC
- Provide data for use as a planning tool to encourage development with low environmental impacts
- Document processes used and lessons learned for use in assessing other local watersheds
- Use as an opportunity for public education and participation on watershed issues

ASSESSMENT PROCESS

Under the direction of a project leader, watershed information was collected from interviews, published sources, databases, and field trips. Data collected included flood studies, water quality sampling data, existing and planned land use data, and information on existing and planned community facilities such as schools, parks, and greenways. The Tennessee Department of Transportation (TDOT) and Knox County supplied information on planned road projects. Data was also collected on water features such as wetlands and springs, topographical information such as land contours, caves, and sinkholes, unique or sensitive plant and animal species and habitats, and cultural and historic sites in the watershed.

Following data collection, the information was shared with the community in a public forum. Community members were invited to contribute additional information and suggest watershed priorities, objectives, and strategies.

After all the data was compiled, the members of the committee divided into three teams to analyze it. One team looked at flooding, one examined general environmental considerations, and a third studied parks and greenway issues. The teams identified possible focus areas for further study or action and developed recommendations in the form of watershed objectives and related strategies. The findings

of the teams were combined, and the objectives were scored on each of four criteria — probability of success, impact, urgency, and synergy. The highest combined score a particular objective could receive was 20; the lowest score was 4. For a detailed explanation of the ranking process and a matrix of final rankings, see the Appendix.

The remainder of this report is dedicated to the findings and recommendations of the assessment team. For presentation purposes, the watershed is divided into twelve study areas (Map 4). These are:

1. Beaver Creek — Upper Section
2. Willow Fork Drainage Basin
3. Cox Creek Drainage Basin
4. Beaver Creek — Brickey Section
5. Hines Branch Drainage Basin
6. Knob Fork Drainage Basin
7. Beaver Creek — Powell Section
8. Beaver Creek — Karns Section
9. Grassy Creek Drainage Basin
10. Meadow Fork Drainage Basin
11. Plumb Creek Drainage Basin
12. Beaver Creek — Lower Section

First, the report presents findings and recommendations that apply to the entire watershed. This is followed by separate discussions of each of the twelve study areas.

FINDINGS AND RECOMMENDATIONS

WATERSHED WIDE

Analysis of the data collected during the assessment reveals two distinct types of findings — those that apply to the entire watershed, and those that are specific to individual drainage basins or other particular geographic locations. This section of the report describes those findings that apply to the entire watershed. Later sections detail findings for each of twelve individual study areas of the watershed.

OBJECTIVES

Objectives identified for the Beaver Creek watershed as a whole include:

- Support and encourage community stewardship and involvement in watershed well-being.
- Mitigate future flooding in the watershed.
- Preserve and restore wetlands.
- Protect steep slopes and ridge tops.
- Develop low impact parks and greenways.
- Stabilize streambank for length of streams.
- Develop appreciation of watershed historic sites.

STRATEGIES

It is expected that the watershed assessment partners will take the lead on the implementation of many of the strategies identified in this report. As they seek to implement these strategies, they should investigate possible partnerships with such organizations as the TDEC, the Tennessee Wildlife Resources Agency and the Nature Conservancy.

Community Involvement

Possibly the most important strategy for increasing community involvement in the watershed is the organization of a Beaver Creek Watershed Association. Such an association should be formed and supported by the partners in this study.

Other community involvement strategies include:

- Educating the public with literature, workshops, public meetings, and through the news media.
- Providing good signage at all public areas along the waterways.
- Involving the public in planning for park and trail projects in the watershed.
- Expanding the HPUD-sponsored environmental education partnership with Brickey School to other elementary schools in the watershed.
- Supporting Knox County's Environmental Stewardship Program, the Water Quality Forum, and Adopt-a-Creek programs.

- Implementing stormwater sediment monitoring by schools in the watershed.

Flood Mitigation

The recently adopted Knox County Stormwater Ordinance, by expanding the no build/no fill zone in the Beaver Creek floodplain, should somewhat mitigate potential flooding from new development in the watershed. This ordinance needs to be enforced, and should be made readily available, along with the boundary lines for the no build/no fill zones. Work should continue on the definition of tributary floodplains.

Controlling development, particularly above Maynardville Highway, is perhaps the most effective flood mitigation strategy for this watershed. Low impact development that limits impervious surfaces and manages open space should be encourage and supported. Particular strategies for addressing this include:

- Partnering with developers to determine best use of undeveloped parcels.
- Working with MPC to stress the particular importance of good concept plans for new development in the watershed, particularly upstream of Maynardville Highway.
- Helping contractors develop erosion control and grading plans worded in terms of results, and enforcing such plans.
- Investigating the use of bonds for environmental restoration.
- Encouraging landscape design to provide water quality and quantity mitigation for commercial sites.
- Investigating the possibility of Knox County adoption of landscaping requirements for all commercial and office parking lots.

Another effective strategy for flood mitigation would be to prevent development on sensitive parcels by the use of conservation easements. Purchase or other acquisition of such easements should be investigated for large undeveloped parcels or parcels bordering streams, especially those above Maynardville Highway.

In order to help educate the public on flooding and flood mitigation, a quantity/flood component should be added to Adopt-A-Watershed programs.

Wetland Preservation and Mitigation

Although this study made an initial effort to identify areas with wetland characteristics, much work remains to be done to identify wetlands in the watershed. Watershed partners should continue working with the Army Corps of Engineer (USACE) to identify and delineate non-agricultural watershed wetlands and with NRCS to do the same with agricultural wetlands.

In the meantime, development should be monitored in all known wetlands and in areas identified as having wetland characteristics. Individual action plans should be specified for the most severely impacted or threatened areas. Since the use of conservation easements can be an effective strategy in wetland protection, purchase or other acquisition of such easements should be investigated as a possible component of such plans.

Whenever possible, wetland mitigation due to development in the watershed should also be done in this watershed.

Streambank Stabilization

Streambank stabilization is important for erosion control, flood control, water quality improvement, and wetland protection. The Beaver Creek watershed has an abundant number of sites with degraded streambanks. The most severely impacted sites should be identified and an action plan developed for each one.

Additionally, it is critical to maintain and restore healthy adequately sized riparian buffers with native plants on Beaver Creek and all its tributaries. Ideally, these buffers would be 100 feet wide on either side of the stream; a buffer 50 feet wide on either side of the stream is the minimum acceptable size.

Slope and Ridgetop Protection

Ridgetops and steep slopes should be protected not only for their beauty, but also because the are often unsuitable, if not unsafe, for development. In addition, removing vegetation from steep slopes can contribute to increased erosion and flooding. The Beaver Creek watershed is blessed with relatively undisturbed ridgetops. The top of Beaver Ridge, which runs though the watershed for almost its entire length, is particularly beautiful.

Both ridgetops and slope protection areas, as identified in MPC sector plans, are excellent candidates for conservation easements. In addition, watershed partners should support the adoption of a Knox County ridgetop protection ordinance.

Parks and Greenways

The Knox County Greenway Plan calls for the eventual development of a greenway along the length of Beaver Creek. Knox County should continue working toward this goal, and should also investigate other specific possible greenway routes identified in the later sections of this report. The use of conservation easements for greenway routes should be aggressively pursued, especially with respect to commercial parcels adjacent to the creek, which may represent “low-hanging fruit” for donated easements.

In addition, there is a shortage of parks in the watershed, particularly in its lower section. Later sections of this report identify some possible locations for future parks.

Historic Site Appreciation

The Beaver Creek watershed has a rich history, and contains quite a few historic sites. Some are identified in this report. More work should be done to develop a comprehensive list of historic sites in the watershed. One possible strategy for developing appreciation of watershed history would be to develop a Beaver Creek Watershed Historic Driving Tour to link all the historic/cultural sites in the watershed.

The following is a representative but incomplete list of historic sites in the Beaver Creek watershed:

- Beaver Dam Baptist Church in Halls, the oldest church in Knox County
- Nicholas Gibbs House, Tazewell Pike
- Murphy House, Tazewell Pike
- Spring Haven/Truan House, Tazewell Pike
- Jack Harrell House, c. 1857, 4511 Harrell Lane
- York Road House, c. 1920, 4505 York Road
- Stockley-Donelson-Bishop House, 1792, 7924 Bishop Road
- Brown House, c. 1850-1867, 7235 Brickyard Rd
- Italianate House, c. 1850, 8046 Heiskell Rd
- Powell House, c. 1850, 2518 Emory Road
- Powell Community Historic District, Depot Street
- Historic springhouse next to Beaver Creek in Powell
- Old railroad bridge to brickyard behind Powell High School
- Former location of Menifee Station, Emory Road at Clinton Highway
- Fox-Duncan House, 1837, 3800 Copper Ridge Road
- Masonic Temple-Church, Emory Road at Copper Ridge Road
- Lockhart Place, 1798, 2516 Gray-Hendrix Road
- Coward Mill Bridge over Beaver Creek, 1894-95

FINDINGS AND RECOMMENDATIONS

BEAVER CREEK — UPPER SECTION

DESCRIPTION AND CURRENT CONDITIONS

The upper section of the Beaver Creek watershed (Map 5) consists of the Beaver Creek drainage basins above the confluence of Allen Branch and Beaver Creek (above SM 36.1). This area roughly corresponds to all of the watershed east of Maynardville Highway, along with a the North Fork and Allen Branch drainage basins west of Maynardville Highway. The Gibbs community and much of the Halls community are located in this section of the watershed. Tributary drainage basins in addition to North Fork and Allen Branch include Kerns Branch, Willow Fork, and Cox Creek. The Willow Fork and Cox Creek drainage basins are discussed separately in the next two sections.

Currently most land above Maynardville Highway is classified as agricultural or rural residential. However, the area along Emory Road is developing rapidly. The area around Halls Crossroads is primarily single family residential, with a pocket of commercial use along Maynardville Highway.

Future land use plans call for maintaining the current land use pattern, with some conversion of agricultural land to low density residential. The Halls area and the area along Emory Road to the watershed's eastern boundary are in the planned growth area (PGA) of the Knox County Growth Plan. The remaining, northern section of this part of the watershed is in the rural area (RA).

Several significant development projects are underway in this area. TDOT's planned widening of Emory Road from Allen Branch to Norris Freeway will involve bridges over Allen Branch and North Fork and will impact the Shalimar Pointe wetland. A large parcel along North Fork on Old Andersonville Pike has recently been rezoned for commercial development, and sensitive site planning will be required for this site.

Knox County is currently constructing the Halls Greenway. This greenway will connect several subdivisions, the new Halls library, and the Halls Community Park. The greenway crosses Beaver Creek and Willow Fork and runs along a wetland area.

Water quality in this portion of the watershed is poor. Sampling on Beaver Creek at both Gibbs and Halls resulted in poor grades. North Fork appears to be badly degraded, although no water quality sampling has been done on this stream.

FOCUS AREAS

All large undeveloped tracts upstream of Maynardville highway are important because this is the area with the most impact on future flooding. The highest priority for mitigation of future flooding is the Kerns Branch drainage basin. Other specific focus areas include:

- An area centered on the new Halls Greenway, starting at the parcel on the north side of Crippen Road just east of Halls Community Park, along Beaver Creek through the Park, across Maynardville Highway, through the vacant parcels west of Maynardville Highway, and along the creek to the Shalimar Pointe wetland. The developer of the Crippen Road property has agreed to an extension of the Greenway onto that property. Because the developer also has an option on

the property just across Crippen Road, it may be possible to extend the greenway across the road to the top of Beaver Ridge. The undeveloped parcels west of Maynardville Highway contain wetland areas. Also, there is high interest in future extension of the greenway through these parcels to the Shalimar Pointe wetland. Two areas which experience flooding from Beaver Creek — commercial property in Halls Plaza and houses on Marshall Drive in Hallbrook — are adjacent to this area. (Area A on Map 5).

- A possible extension to the Halls Greenway would begin at Maynardville Highway, follow Norris Freeway to North Fork, and then follow North Fork to the recently rezoned commercial property along North Fork on Old Andersonville Pike. This greenway could be extended to Halls Elementary, Middle, and High Schools (Area B on Map 5).
- There is potential for an open space designation and greenway development in Gibbs, starting behind the schools, connecting to the Nicholas Gibbs House property, crossing Emory Road, and following Beaver Creek to Tazewell Pike. (Area C on Map 5).
- The parcel along Beaver Creek just above the confluence of Allen Branch and Beaver Creek (SM 36.1). Much of this fairly large parcel is within the floodway, and most of the rest is within the 100 year floodplain. It has very limited road access. The apparently residential structure on the parcel is within the floodway. (Area D on Map 5).
- The area adjacent to Beaver Creek between Stormer Road and East Beeler Road. This area is important for riparian area protection and to protect the small pocket wetland at Stormer Road. It is also a candidate area for a future park. (Area E on Map 5).
- Areas with known flooding problems:
    - North Fork at Lena Lane upstream of East Emory Road.
    - North Fork at Stillbrook Lane near Temple Acres Drive.
    - Beaver Creek at Rollins Road.

OBJECTIVES (total points received)

- Restore healthy and adequately sized riparian buffers (15).
- Minimize impact of nonpoint source water pollution from land use changes (15).
- Preserve and restore wetland areas at Maynardville Highway and Norris Freeway (14).
- Minimize impact of Emory Road widening (14).
- Control stormwater volume (13).
- Develop park/greenway in the Gibbs community (13).
- Extend the Halls Greenway (13).
- Preserve Shalimar Pointe wetland area (12).
- Remove the flood hazards at Halls Plaza/Marshall Drive, Lena Lane, Stillbrook Lane, and Rollins Road (11).
- Minimize impacts from agricultural use (10).
- Preserve and restore pocket wetland area on Stormer Road (6).

STRATEGIES

- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Meet with MPC to stress the particular importance of good concept plans for any development in the watershed upstream of Maynardville Highway.
- Develop volume control design requirements for the Kerns Branch, Thompson School Branch, South Fork, and upper Beaver Creek drainage basins.
- Use voluntary property acquisition at Halls Plaza/Marshall Drive and to remove flood hazards.

Maintain the property for flood storage and drainage easements.

- Study/monitor North Fork to identify the factors impacting it and possible mitigation measures.
- Expand the Adopt-a-Watershed programs in the Gibbs and Halls schools.
- Encourage/support use of agricultural BMPs, especially to keep livestock out of streams. Investigate use of cost share programs for this purpose.
- Encourage the use of native plants at the Shalimar Pointe wetland.
- Pursue commercial parcels adjacent to Beaver Creek along Tazewell Pike as "low-hanging fruit" for possible donations of conservation or greenway easements.
- Consider purchasing conservation easements on large undeveloped parcels, especially those bordering streams.
- Work with USACE to verify non-agricultural wetlands and with NRCS to verify agricultural wetlands.
- Monitor development in wetland areas.
- Use donated or purchased conservation easements to protect areas with wetland characteristics, particularly those at the Maynardville Highway/Norris Freeway intersection.
- Be proactive in working with TDOT on wetland preservation and stream impacts as Emory Road is widened.
- Ensure that all TDOT mitigation due to the Emory Road project is done in the Beaver Creek watershed
- Begin planning for Gibbs Greenway. Tour the potential greenway area with community members. Meet with appropriate personnel from Knox County Schools. Hold a planning session with the community.
- Begin work on Halls Greenway extension. Meet with MPC, appropriate commercial developers, and representatives from Halls schools. Investigate possible opportunity from TDOT plans to widen Emory Road. Hold planning session with community on possible extensions.
- Enhance the wetland at the Halls Greenway. Use the greenway as an educational opportunity on the importance of wetlands.
- Include the area along Beaver Creek between Stormer and East Beeler Roads in park planning.

FINDINGS AND RECOMMENDATIONS

WILLOW FORK DRAINAGE BASIN

DESCRIPTION AND CURRENT CONDITIONS

The Willow Fork drainage basin (Map 6) lies along the side of Copper Ridge on both sides of Maynardville Highway north of Halls Crossroads. Mill Branch and Lammie Branch are two important tributaries of Willow Fork. The Willow Fork drainage basin is approximately 4 square miles in size. Willow Fork enters Beaver Creek at approximately SM 37.8.

Most of this drainage basin is currently classified as agricultural or rural residential. Future land use plans maintain this pattern. The upper reaches of the basin are in the RA. However, the section below the ball fields on Quarry Road is in the PGA, making it more susceptible to development pressure.

Water quality in most of this drainage basin is better than in most of the Beaver Creek watershed. Sampling results in a grade of good for Lammie Branch and fair for Willow Fork. Mill Branch appears to be badly degraded, although no water quality sampling has been done on this stream. HPUD has a water intake site at Granny Bright Spring at the source of Willow Fork.

FOCUS AREAS

Because the areas with the largest impact on future flooding in the watershed are those above Maynardville Highway, and because the Willow Fork Drainage Basin falls into this area, all large undeveloped tracts are potential focus areas. Specific additional areas include:

- Wellhead protection zone around Granny Bright Spring. (Area A on Map 6).
- Willow Fork from its confluence with Beaver Creek upstream to the area around the ball field at Quarry Road. This is a very scenic area with wetland characteristics. The lower part of this area is included in the Halls Greenway project and there is interest in a possible extension upstream along Willow Fork. The ball fields at Quarry Road have the potential to be expanded into a larger park. (Area B on Map 6).
- Areas adjacent to Willow Fork from Quarry Road to Granny Bright Spring for water quality protection. (Area C on Map 6).
- Areas adjacent to Lammie Branch for water quality protection. (Area D on Map 6).
- Emory Road at Willow Fork is an area with known flooding problems.

OBJECTIVES (total points received)

- Protect and restore wetland areas along Willow Fork (16).
- Minimize impact of nonpoint source water pollution from land use changes (15).
- Maintain good water quality in Willow Fork and Lammie Branch (12).
- Protect wellhead protection zone around Granny Bright Spring (12).
- Minimize impacts from agricultural use (10).
- Remove flood hazard at Emory Road/Willow Fork (4).
- Develop park and/or greenway route along Willow Fork (not rated; added after rankings were completed).

STRATEGIES

- Work with USACE to verify non-agricultural wetlands and with NRCS to verify agricultural wetlands.
- Use donated or purchased conservation easements to protect areas with wetland characteristics.
- Include the area from the confluence with Beaver Creek to the ball fields at Quarry Road in future park/greenway planning. Actively pursue opportunities to purchase or obtain easements on property in this area.
- Work with HPUD to develop protection plan for wellhead protection zone.
- Make sure wellhead protection zone boundaries are part of MPC's GIS database.
- Clean out and protect sinkholes in the Granny Bright Spring wellhead protection zone.
- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Include this area in discussions with MPC about the importance of good concept plans for any development above Maynardville Highway.
- Encourage/support use of agricultural BMPs, especially to keep livestock out of streams. Investigate use of cost share programs for this purpose.
- Study/monitor Mill Branch to identify the factors impacting it and possible mitigation measures.
- Include Emory Road at Willow Fork in Knox County Flood Hazard Management Plan.
- Educate public on why this drainage basin is in relatively good shape and how they can help keep it that way.

FINDINGS AND RECOMMENDATIONS

COX CREEK DRAINAGE BASIN

DESCRIPTION AND CURRENT CONDITIONS

The Cox Creek drainage basin (Map 7) lies to the east of Maynardville Highway, between Beaver and Black Oak Ridges. It is approximately 3.7 square miles in size. Current land use along the western tributary to Cox Creek (west of Brown Gap Road) is single family residential; the remainder is primarily agricultural. Future land use plans call for maintaining this pattern. The watershed of the western tributary is in the PGA; the rest of the watershed is in the RA.

Although samples indicate that water quality in Cox Creek is good, recent walks along the creek by Americorps personnel have identified some problems with straight pipes draining directly into the creek. Cox Creek enters Beaver Creek around SM 39.9.

FOCUS AREAS

Because the areas with the largest impact on future flooding in the watershed are those above Maynardville Highway, and because the Willow Fork Drainage Basin falls into this area, all large undeveloped tracts are potential focus areas. Also, the entire drainage basin above Tazewell Pike is an exceptionally beautiful area. Specific additional areas include:

- The county owns a large parcel along Cox Creek where it crosses Tazewell Pike. This parcel was originally identified as a potential site for a new Gibbs Middle School and is a candidate site for a new park (Area A on Map 7).

OBJECTIVES (total points received)

- Minimize impact of nonpoint source water pollution from land use changes (15).
- Maintain good water quality in Cox Creek (14).

STRATEGIES

- Investigate and address problem with straight pipes.
- Educate public on why this drainage basin is in relatively good shape and how they can help keep it that way.
- Monitor the County's plans for the property on the creek at Tazewell Pike. Include the site in park planning.
- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.

FINDINGS AND RECOMMENDATIONS

BEAVER CREEK — BRICKEY SECTION

DESCRIPTION AND CURRENT CONDITIONS

This area includes the section of the watershed from the confluence of Beaver Creek and Knob Fork at SM 29.25 to the confluence of Beaver Creek and Allen Branch at SM 36.1 (Map 8). The area lies from just west of I75 to just west of Halls. Important tributaries in this section are Hines Branch, and Knob Fork. The Knob Fork and Hines Branch drainage basins are discussed separately in the next two sections.

Existing land use in this area is mostly single family residential along Emory and Cunningham Roads and agriculture/rural residential in the northernmost sections. Beaverbrook Country Club maintains a golf course on Cunningham Road. There are commercial uses along Emory Road close to I75.

Future land use plans call for this section to be almost entirely low density residential, with commercial, office, and industrial uses clustered around I75. This is consistent with the Growth Plan, which places most of this section of the watershed in the PGA. The northernmost part is in the RA and a small section around I75 is in the urban growth boundary (UGB) of Knoxville.

Several significant development projects are underway in this area. TDOT's planned widening of Emory Road across the length of the area will include bridges over several unnamed tributaries of Beaver Creek. It may also impact the Powell Airport wetland. Brickey Elementary School, which is on Beaver Creek at Dry Gap Pike, is slated to be demolished when a new school is built on the site.

The Powell Airport may be developed in the near future. Development on this site has large potential impact on Beaver Creek and the wetlands located here. The site has recently been annexed into the City of Knoxville so consideration of the impact of development will require coordination with the City. In any case, coordination with the City is required for effective planning with respect to this section of the watershed since the entire area around the I75/Emory Road interchange is inside the city limits.

HPUD maintains a drinking water intake and a water quality laboratory on Beaver Creek at Dry Gap Pike (SM 32.4). This provides an opportunity to pursue funding for source water protection. Another opportunity is the environmental education partnership that HPUD is currently establishing with Brickey School.

Beaver Creek's water quality in this section of the watershed is poor.

FOCUS AREAS

- An area of possible "low-hanging fruit" for a greenway or linear park begins around Brickey School and runs along Beaver Creek to the west end of the Powell Airport at Central Avenue. Much of this route would be across commercial parcels. KLWC is transferring ownership of one parcel along this route to Knox County. The middle section of this route is inside the city limits of Knoxville; Knoxville already holds an easement across a piece of this property close to I75.

(Area A on Map 8).

This area contains three important areas with wetland characteristics:

1. Behind the Food Lion at the corner of Emory Road and Dry Gap Pike.
2. Next to Prestige Cleaners on Emory Road along a small unnamed tributary to Beaver Creek.
3. The Powell Airport wetland, as well as a wetland area immediately across I75 from the airport.

- Several large undeveloped parcels along Beaver Creek between Dry Gap Pike and Emory Pointe Lane. This is also a candidate area for a linear park extending to Brickey School. (Area B on Map 8).
- The area along Emory Road at Dixon Springs Lane is one of great beauty. (Area C on Map 8).
- There are known flooding problems from Beaver Creek at the end of Brickey Lane.

OBJECTIVES (total points received)

- Protect and restore the areas with wetland characteristics behind the Food Lion at Emory Road and Dry Gap Pike (16).
- Protect and restore wetland area at Powell Airport (16).
- Protect and restore wetland area behind self-storage warehouse units and Prestige Cleaners along Emory Road (14).
- Minimize the impact of the Emory Road widening (14).
- Minimize impact of nonpoint source water pollution from land use changes (11).
- Remove flood hazard at end of Brickey Lane (4).
- Develop a greenway/linear park (not rated; added after rankings were completed).

STRATEGIES

- The three wetland areas in this section of the watershed are major ones and should be considered prime candidates for donation or purchase of conservation easements.
- Work with USACE to verify wetlands.
- Monitor development in areas with wetland characteristics.
- Be proactive in working with TDOT on wetland preservation and stream impacts as Emory Road is widened.
- Ensure that all TDOT mitigation due to the Emory Road project is done in the Beaver Creek watershed
- Meet with Boys and Girls Club, KUB, business property owners, etc. to assess linear park/ greenway potential.
- Pursue donation of conservation or greenway easements along Beaver Creek on commercial parcels.
- Begin talks with the City of Knoxville about partnering on linear park/greenway and on issues involving Powell Airport site development.
- Partner with the Girls and Boys Club and with the Environmental Education partnership of Brickey School and HPUD.
- Investigate funding sources for drinking water protection.
- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Develop upstream flooding plan for Brickey Lane flood hazard.

FINDINGS AND RECOMMENDATIONS

HINES BRANCH DRAINAGE BASIN

DESCRIPTION AND CURRENT CONDITIONS

The Hines Branch drainage area (Map 9), which is approximately 2.3 square miles in size, is unique in the Beaver Creek watershed in that it is less developed in its lower reaches than in its upper reaches. The watershed lies just east of Maynardville Highway, south of Beaver Creek. Hines Branch enters Beaver Creek at SM 35.75.

This drainage basin displays a patchwork of current land uses. The lower reach is single family and rural residential. The upper reach is single and multi-family residential, including both low-density residential subdivisions and several mobile home parks.

Future land use plans call for the entire area (except for the top of Beaver Ridge) to be low and medium density residential, office, and commercial. The Hines Branch drainage basin is almost entirely within the PGA.

Water quality in Hines Branch is poor.

FOCUS AREAS

- The commercial areas along the creek off Maynardville Highway contain a solid waste facility, a branch of the Co-op, and a feed lot. This is a potential area for demonstration projects. There is also serious flooding in this area (Area A on Map 9).
- Hines Branch currently causes serious flooding to some mobile home parks off Mynatt Drive. (Area B on Map 9).
- There are known flooding problems on Cunningham Road at Hines Branch.

OBJECTIVES (total points received)

- Reduce commercial stormwater runoff (15).
- Remove flood hazard at trailer park (14).
- Minimize impact of nonpoint source water pollution from land use changes (11).
- Restore riparian buffers (9).
- Remove flood hazard at Cunningham Road (4).

STRATEGIES

- Work with the Co-op to develop a stormwater pollution prevention plan; explore use of cost share funding.
- Explore use of constructed wetland or other filtration techniques at the Co-op and feed lot.
- Use property acquisition at trailer park. Maintain property for flood storage and drainage easements.
- Encourage/support low impact development that limits impervious surfaces and manages open space.
- Develop upstream flood plan for Cunnigham Road flood hazard.

FINDINGS AND RECOMMENDATIONS

KNOB FORK DRAINAGE BASIN

DESCRIPTION AND CURRENT CONDITIONS

The Knob Fork drainage basin (Map 10), which lies along both sides of I75 south of Beaver Creek, is approximately 4.2 square miles in size. The drainage basin is currently zoned primarily single family residential, with agricultural zoning along the side of Beaver Ridge. There are some commercial uses along Callahan Road at I75. The upper reaches of Haw Branch (a tributary to Knob Fork) are in a heavily commercial area along Clinton Highway at Callahan Road. The Development Corporation of Knox County (TDC) is developing a light industrial park on Rifle Range Road along the upper reaches of Knob Fork.

Future land use plans call for low and medium density residential use, with commercial uses continuing to cluster along Callahan Road at Clinton Highway and I75. The Knob Fork drainage area is almost entirely within Knoxville's UGB. Since this means the area is available for annexation, coordination with the City will be crucial to plans for this drainage basin.

This drainage basin is under heavy development pressure. Callahan Road is being widened, and in some places, relocated, along Haw Branch from I75 to Clinton Highway. Commercial development along this corridor will likely continue to increase. Residential development along Knob Fork east of I75 is also likely to continue. The County is currently building the Sterchi Hills Park and Greenway in this area. Also the County has recently completed soccer fields along Rifle Range Road.

Water quality in Knob Fork is poor. Knob Fork enters Beaver Creek at SM 29.25.

FOCUS AREAS

- Development in the Sterchi Hills area has left large areas bare and eroded. A park and greenway are currently under development in this area. There is potential to extend the greenway to make a loop across the top of Beaver Ridge. (Area A on Map 10).
- Knob Fork from its confluence with Beaver Creek upstream to I75 because of its importance as a flood buffer. (Area B on Map 10).
- Knob Fork just downstream of Jim Sterchi Road, especially the south bank. The western end of Sterchi Hills forms the north bank of this section. The south bank is still undeveloped and provides a riparian buffer. (Area C on Map 10).

OBJECTIVES (total points received)

- Preserve existing riparian buffers (15).
- Minimize impact of nonpoint source water pollution from land use changes (11).
- Mitigate flood volume increases (8).

STRATEGIES

- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Investigate using donated or purchased conservation easements to protect the south bank of Knob

Fork west of Jim Sterchi Road.

- Reclaim pervious areas to mitigate volume increases.
- Establish floodplains along Haw Branch.
- Work with the City of Knoxville to have county floodplain regulations apply to the watershed in the event that the area is annexed.
- Talk with TDC and the Sterchi Hills developer about extending the Sterchi Hills greenway to and along the top of Beaver Ridge.

FINDINGS AND RECOMMENDATIONS

BEAVER CREEK — POWELL SECTION

DESCRIPTION AND CURRENT CONDITIONS

This area encompasses the portion of the watershed from approximately Clinton Highway to the confluence of Beaver Creek and Knob Fork just west of the Powell Airport at SM 29.25 (Map 11). It includes the Powell community and is primarily single family and rural residential, with commercial, industrial, and public uses along Emory Road and W. Beaver Creek Drive in Powell, and along Clinton Highway. Future land use plans maintain this pattern. This section of the watershed is almost entirely within the PGA.

TDOT will soon begin building a relocated Emory Road through this part of the watershed. The route of the new road will run close to the creek, and threatens to have a negative impact on water quality and on local wetland areas. However, this road construction also represents an opportunity for greenway development.

Knox County is currently constructing the Powell Greenway along (existing) Emory Road. There is a high degree of community support for this greenway and for a future extension along Beaver Creek. Community interest in water issues is evidenced by both Powell High and Powell Middle Schools sponsoring Adopt-A-Watershed programs.

HPUD has a water intake site at Fowler Spring just over the northern boundary of the watershed in the Bull Run watershed. However, a part of the wellhead protection zone for the spring is in the Beaver Creek watershed.

Water quality in this section of Beaver Creek is poor.

FOCUS AREAS

- There is high interest in extending the Powell Greenway across Emory Road and along Beaver Creek from Powell Middle School east across Brickyard Road and back to Emory Road. This route would run by or through areas with wetland characteristics. It includes the springs and historic springhouse along Emory Road. The area east of Brickyard Road on either side of the relocated Emory Road is a candidate for a new park. (Area A on Map 11).
- Fowler Springs wellhead protection zone. (Area B on Map 11).
- A possible pocket wetland at the intersection of East Beaver Creek Drive and Beelertown Road. (Area C on Map 11).
- A beautiful high place — a good location for a park - is an undeveloped parcel in Powell north of Emory Road between Brickyard Road and the railroad tracks. (Area D on Map 11).

OBJECTIVES (total points received)

- Protect and enhance wetlands (16).
- Develop a linear park along Beaver Creek adjacent to new Emory Road (16).
- Minimize impact on flooding, wetlands, and riparian buffers from Emory Road relocation (14).
- Minimize impact of nonpoint source water pollution from land use changes (11).

- Protect the wellhead protection zone around Fowler Springs (10).

STRATEGIES

- Work with USACE to verify wetlands.
- Review Emory Road plan for impacts and to suggest possible mitigation strategies.
- Work with TDOT on wetland preservation as Emory Road is relocated. Contact TDOT wetland specialist Dan Eager as soon as possible.
- Use donated or purchased conservation easements to protect areas with wetland characteristics.
- Use "uneconomic remnants" from Emory Road relocation as stream buffers and possible greenway route and/or park site.
- Work with Powell High School to preserve riparian buffer behind the school along Beaver Creek and to develop greenway connections as the existing high school expands.
- Work with Izaak Walton League and other interested partners to monitor Emory Road construction.
- Ensure that all TDOT mitigation due to the Emory Road project is done in the Beaver Creek watershed.
- Contact appropriate Knox County Commissioners and State Representatives about support for a linear park/greenway.
- Use Emory Road and Powell Greenway construction as opportunities for community education.
- Make sure Fowler Springs wellhead protection zone boundaries are part of MPC's GIS database.
- Work with HPUD to develop plan for Fowler Springs wellhead protection zone.
- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Seek conservation easements along lower portion of Beaver Creek (just east of Clinton Highway).

FINDINGS AND RECOMMENDATIONS

BEAVER CREEK — KARNS SECTION

DESCRIPTION AND CURRENT CONDITIONS

This section of the watershed begins approximately at the West Knox Utility Sewage Treatment Plant at SM 11 and continues to approximately Clinton Highway (Map 12). Existing land use in this area, which includes the Karns community, is a mixture of single family and rural residential, with some commercial along Oak Ridge Highway in Karns and along Clinton Highway. Starting just above SM 10, Beaver Creek makes a three and one-half mile loop around Westbridge Business Park, which is owned by TDC. There are other industrial uses close to the business park.

Future land use plans maintain the existing pattern. This section of the watershed is primarily located within the PGA. A small portion north of Oak Ridge Highway, west of where it crosses Beaver Creek, is in the RA.

A proposal under design by Knox County to build an Emory Road/Solway Road connector to Westbridge Business Park would involve at least one (possibly more) creek crossings. Knox County is currently planning to develop a softball park along Beaver Creek just north of Oak Ridge Highway.

Drainage basins of the three primary tributaries in this part of the watershed — Grassy Creek, Plumb Creek, and Meadow Creek — are discussed separately in following sections.

Water quality in this part of Beaver Creek is poor. Both HPUD (at SM 23.75) and West Knox Utility District (at SM 11) maintain sewage treatment plants that discharge into Beaver Creek.

FOCUS AREAS

- A possible future extension to the softball park is to build a greenway to the east, along Beaver Creek to the Karns Intermediate and Primary Schools. A park could be located on the wide floodplain of Beaver Creek across from these schools. Another extension is a greenway from the ballfields to the southwest, along the proposed new Emory Road connector to Karns High, across the street to Westbridge Business Park, and following Beaver Creek as it loops around the business park. (Area A on Map 12).
- Two large undeveloped parcels along both sides of East Emory Road (down to Beaver Creek and up to the top of Copper Ridge) across the creek from HPUD's Sewage Treatment Plant. This parcel may already have some development restrictions. (Area B on Map 12).
- Potential wetlands along unnamed tributaries to Beaver Creek north of Beaver Ridge Road in Karns. (Area C on Map 12).
- Beaver Creek currently causes serious flooding along Oak Ridge Highway in Karns.

OBJECTIVES (total points received)

- Minimize impact from Emory Road/Solway Road connector (16).
- Plan and develop a Karns Greenway (16).
- Preserve and enhance wetlands (11).
- Minimize impacts from agricultural use (10).

- Minimize impact of nonpoint source water pollution from land use changes (9).
- Remove flood hazards (4).

STRATEGIES

- Monitor progress of Emory Road/Solway Road connector. Ensure that the final route has as few creek crossings as possible.
- Begin planning for Karns Greenway. Have a public planning meeting on greenway route. Meet with representatives from Knox County Schools. Coordinate with County Engineering on piggy-backing greenway onto Emory Road/Solway Road connector route.
- Meet with representatives of TDC to discuss greenway in Westbridge Business Park
- Encourage TDC to preserve/restore a riparian buffer along Beaver Creek at least 50' wide at Westbridge Business Park
- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Research deed restrictions on the Emory Road parcels across the creek from HPUD's sewage treatment plant. Explore the use of conservation easements for this property.
- Encourage/support use of agricultural BMPs, especially to keep livestock out of streams. Investigate use of cost share programs for this purpose.
- Some small, localized flood-proofing may be useful in this area.
- Conduct a Rosgen stream morphology study.
- Work with USACE to verify non-agricultural wetlands and with NRCS to verify agricultural wetlands.
- Use donated or purchased conservation easements to protect areas with wetland characteristics.
- Monitor development in areas with wetland characteristics north of Beaver Creek Road.
- Start an Adopt-a-Watershed program at Karns schools.

FINDINGS AND RECOMMENDATIONS

GRASSY CREEK DRAINAGE BASIN

DESCRIPTION AND CURRENT CONDITIONS

The Grassy Creek drainage basin (Map 13), approximately 6.8 square miles big, lies south of Beaver Creek and west of Clinton Highway. Its upper reaches extend to a heavily commercial and rapidly developing area on Clinton Highway at Schaad Road. The City of Knoxville operates a public golf course along one branch of the creek along Schaad Road. The remainder of the drainage basin (west of Oak Ridge Highway) is primarily agricultural and rural residential.

Future land use plans call for most of the drainage basin to remain agricultural and rural residential. However, most of the area is within Knoxville's UGB, making coordination with the city on drainage basin issues crucial. The remainder of the drainage basin is in the PGA.

Schaad Road is currently being widened and in some places relocated from Oak Ridge Highway to Clinton Highway. Commercial development is accelerating on the east end of this corridor and can be expected to spread westward, especially since Knox County plans to relocate and improve Ball Camp Road through this section of the drainage basin. However, much of this area is currently unsewered and is unsuitable for septic tanks.

Water quality in Grassy Creek is poor. Grassy Creek enters Beaver Creek at SM 21.75.

FOCUS AREAS

- From confluence with Beaver Creek upstream to Oak Ridge highway. This area contains a large contiguous mostly forested wetland. Most of this area is within the floodplain of either Beaver or Grassy Creek and might be a good site for a future park (Area A on Map 13).

OBJECTIVES (total points received)

- Protect large wetland area (14).
- Minimize impacts from septic systems (12).
- Minimize impacts from agricultural use (10).
- Minimize impact from Ball Camp Road relocation (not rated; added after rankings were completed).
- Minimize impact of nonpoint source water pollution from land use changes around Clinton Highway and Schaad Road (not rated; added after rankings were completed).

STRATEGIES

- Work with USACE or NRCS as appropriate to verify wetland area.
- Use donated or purchased conservation easements to protect wetland.
- Include the wetland area site in future park planning.
- Encourage/support use of agricultural BMPs, especially to keep livestock out of streams. Investigate use of cost share programs for this purpose.
- Monitor situation to assess the impact of possible failing septic systems.
- Monitor progress of Ball Camp Road relocation and its impacts on the creek.

- Work with the City of Knoxville to have county floodplain regulations apply to the watershed in the event that the area is annexed.
- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Investigate obtaining urban forestry grants for reforestation of the ridges affected by commercial development along Schaad Road.
- Conduct streambank restoration project along stream inside the golf course.

FINDINGS AND RECOMMENDATIONS

MEADOW CREEK DRAINAGE BASIN

DESCRIPTION AND CURRENT CONDITIONS

The Meadow Creek drainage basin (Map 14), 3.7 square miles in size, lies south of Beaver Ridge and east of Middlebrook Pike. Existing land use in this drainage basin is a mixture of single family and rural residential and agriculture. Future land use plans call for primarily low density residential use. The Meadow Creek drainage basin is entirely within the PGA.

Until recently, an oil recycling facility had a permitted discharge into Meadow Creek close to its confluence with Beaver Creek. According to TDEC, this facility is no longer operating.

A portion of the Ball Camp Road relocation project runs through the drainage basin. The planned route crosses an area with wetland characteristics.

Water quality in Meadow Creek is poor. Meadow Creek enters Beaver Creek at SM 12.75.

FOCUS AREAS

- Two large undeveloped parcels just downstream from where the creek flows through a gap in Beaver Ridge. (Area A on Map 14).
- The area bordering the creek between Crosslane Drive and the confluence with Beaver Creek is a possible park site. (Area B on Map 14).
- Area with wetland characteristics off Andes Road (Area C on Map 14).

OBJECTIVES (total points received)

- Define and reduce flood hazards (16).
- Minimize impact of nonpoint source water pollution from land use changes (9).
- Minimize impacts from agricultural use (8).
- Minimize impact of Ball Camp Road relocation, especially to area with wetland characteristics (not rated; added after rankings were completed).

STRATEGIES

- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Consider use of conservation easements along the creek on two large undeveloped parcels.
- Encourage/support use of agricultural BMPs, especially to keep livestock out of streams. Investigate use of cost share programs for this purpose.
- Develop detailed flood study for submission to FEMA.
- Monitor progress of Ball Camp Road relocation.
- Include the area below Crosslane Drive in future park planning.

FINDINGS AND RECOMMENDATIONS

PLUMB CREEK DRAINAGE BASIN

DESCRIPTION AND CURRENT CONDITIONS

The Plumb Creek drainage basin (Map 15) is approximately 3.4 square miles in size. It lies south of Beaver Ridge, east of Pellisippi Parkway. Existing land use in the Plumb Creek drainage basin is a mixture of single family and rural residential and agriculture. The drainage basin is developing rapidly and future land use plans call for primarily low density residential. The Plumb Creek basin is entirely within the PGA.

TDOT plans to widen Middlebrook Pike from the basin boundary to Hardin Valley Road. This could impact both the stream and significant areas with wetland characteristics that lie along it.

No water quality sampling has been done on Plumb Creek. Plumb Creek enters Beaver Creek at SM 12.5.

FOCUS AREAS

- From the Ball Camp/Middlebrook intersection upstream along both branches of Plumb Creek to Chesney Road. Features in this area include wetlands, spring, cave, and a fair amount of county owned property. The City of Knoxville owns a parcel along the creek at the upper end of this area. Plumb Creek currently causes serious flooding along Chesney and Bob Kirby Roads. (Area A on Map 15).

OBJECTIVES (total points received)

- Protect and restore wetland areas (14).
- Minimize impact on wetlands, water quality, and flooding from Middlebrook Pike widening (14).
- Minimize impact of nonpoint source water pollution from land use changes (9).
- Reduce/mitigate flood hazards (8).

STRATEGIES

- Work with USACE to verify wetlands.
- Use donated or purchased conservation easements to protect areas with wetland characteristics.
- Review Middlebrook Pike plan for impacts and to suggest possible mitigation strategies.
- Work with TDOT on wetland preservation as Middlebrook Pike is widened. Contact TDOT wetland specialist Dan Eager as soon as possible.
- Use “uneconomic remnants” from Middlebrook Pike widening as stream buffers
- Work with Izaak Walton League and other interested partners to monitor Middlebrook Pike construction.
- Ensure that all TDOT mitigation due to the Middlebrook Pike project is done in the Beaver Creek watershed.
- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Discuss plans for future use of city- and county-owned parcels with appropriate officials.
- Develop detailed flood study for submission to FEMA.

FINDINGS AND RECOMMENDATIONS

BEAVER CREEK — LOWER SECTION

DESCRIPTION AND CURRENT CONDITIONS

This section of the watershed begins at SM 0 and ends at the West Knox Utility Sewage Treatment Plant at SM 11 (Map 16). Land use in this part of the watershed is predominately agriculture, with land along Pellissippi Parkway designated as a "technology park." Future land use plans call for maintaining this pattern. The section of this area north of Oak Ridge Highway and most of the area west of Pellissippi Parkway is in the RA. The rest is in the PGA.

Pellissippi State Technical College is in this part of the watershed. Some faculty and students have expressed an interest in working on watershed issues.

Water quality in this section of Beaver Creek (sampled at Solway Road and at Swafford Road) is poor.

FOCUS AREAS

- A potential blueway could begin on Beaver Creek along Rather Road and extend to the mouth of the creek. (Area A on Map 16).
- Solway Park is located across Solway Road from Beaver Creek. The park could possibly be enlarged to include the area next to the creek. (Area B on Map 16).
- There is high interest in extending the Pellisippi Greenway north along a tributary of Beaver Creek to Beaver Creek. (Area C on Map 16).

OBJECTIVES (total points received)

- Determine feasibility of blueway. If feasible, develop blueway. Acquire land for put in and take out areas (13).
- Minimize impacts from agricultural use (10).
- Minimize impact of nonpoint source water pollution from land use changes (9).

STRATEGIES

- Organize a creek float to assess blueway potential and appropriate access points.
- Apply for state recreation trails grant or paddle trail grant.
- Encourage/support low impact development that limits impervious surfaces and manages open space. Partner with developers to determine best use of undeveloped parcels.
- Encourage/support use of agricultural BMPs, especially to keep livestock out of streams. Investigate use of cost share programs for this purpose.
- Include possible enlargement of Solway Park in park planning.
- Explore ways to involve Pellissippi State students and faculty in watershed issues.

BEAVER CREEK

WATERSHED ASSESSMENT

APPENDIX

RANKING OF OBJECTIVES