

The Town Branch Environment

An Initial Evaluation

Environmental Quality Committee

Town Branch Trail, Inc.

November 1, 2001

The ultimate success of the

Town Branch Trail is inseparable from the environmental quality of the stream and its surroundings. The stream is a primary attraction, but the condition of its environment could debilitate the trail or simply prevent it from reaching its full potential. If a putrid stench persistently greets trail users, people will avoid the trail. If the primary view along the trail is of junkyards and rundown industrial sites, the trail may be utilitarian but unpleasant. However, with a lush streamside zone surrounded by heavily vegetated visual buffers, the trail will attract wildlife viewers as well as recreational trail users. Its popularity would stimulate the demand for more trails. Clearly, Town Branch provides more than simply a tract of land with minimal road crossings suitable to trail construction; it provides a focal point for the trail, something of interest to give the trail an additional dimension.

We cannot pick out the stream without bringing the whole watershed with it. The water in Town Branch comes from a large portion of the central city. Controlling water quality



Town Branch in late winter.

means controlling runoff from an urban area and all the pollutants that it brings. Trail success is not dependent on solving the problems of the entire watershed. Optimizing the trail experience, however, will require us to address some of the broader community issues. For this reason, improving the environmental quality of Town Branch is a bigger project than the trail itself, continuing long after the trail's dedication. In an optimistic view, the trail will spur both awareness of the creek's environmental problems and the community's will to address them. How much improvement can we hope for, and how much will we need right away for the trail? These are questions the Environmental Quality Committee considered during 2001. This report provides an initial set of answers.

"When we try to pick out anything by itself, we find it hitched to everything in the universe."

—John Muir

Trail users and the environment: what matters most?

The environment of the Town Branch Trail will affect users of the trail at several levels. Most immediately, people will respond to what they smell, see, and hear. In the short run, they will also be concerned about health and safety issues that may not be evident. In the long run, restoration of a healthy ecosystem will sustain and enhance a pleasant, safe trail.

Noses will notice the sewage treatment plant when the wind is right. The city plans to install the latest odor-control technology within the next few years, which should make a substantial difference. Other potential odor sources include a waste-transfer station at the site of the inactive incinerator and the stockyard close by the stream. The routing of the trail will determine whether these are important problems.



Iron oxide stains rocks a brilliant orange at a number of spots on the banks of the creek inside New Circle Road.

The most arresting eyesores along the creek inside New Circle are rubbish, iron seeps, and eroding banks. The rubbish falls into several classes: large items dumped onto the banks, waste material used as fill, metal and glass objects emerging from the landfill, and lightweight trash washed overland or through storm sewers into the streambed. Most could be removed and

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disposed of properly by a contractor or volunteer effort (or a combination). Steps should also be taken to prevent further dumping and reduce littering so that the major cleanup does not need to be repeated endlessly. However, maintenance will be needed to keep the stream and the trail clean. The bright orange and yellow seeps present an alarming appearance, but they are merely signs of iron-rich groundwater, which in itself is not dangerous (however, it is worth considering what else may be dissolved in that seeping water, particularly around the landfill). Eroding banks can be both stabilized and beautified by appropriate plantings. Particularly within the stream channel, the energetics of water flow should be considered to ensure that the remedy is appropriate and that the plants are matched to the slope and erosional forces.

Appropriate plantings are a key element of strategies to address environmental issues, both for users of the trail and to achieve long-term ecological integrity. Screens of trees along the trail can help manage both the viewscape and ambient noise. Traffic, the waste transfer station, and commercial

activity may all generate undesirable noise. (Much of the noisy activity aside from traffic is likely to be conducted during business hours, meaning it may not coincide with peak recreational periods.) Where the trail is near the creek, screens of trees that block out noise and blight might also form part of a streamside buffer zone with deeper environmental benefits. A peaceful environment, rather than silence, should be the goal: people should be able to hear the creek babbling. Even where the route diverges from the stream, plantings will provide an opportunity to create both habitat for wildlife and uplifting surroundings for users of the trail.

The aquatic communities in the creek and the plant communities alongside are degraded, but the stream and the plants still appear natural in contrast to the surrounding industrial zone and are not therefore particularly offensive at first glance. There is plenty of room for improvement, though, and plenty of opportunity. More vigorous, more natural, and more attractive biological communities can

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be established in time (see later sections). Natural areas within the city are a scarce and valued amenity, and reestablishing them can deliver important environmental benefits too. Restoring the ecosystems of the Town Branch trail corridor will

require us to take account of a broader area that constitutes the Town Branch watershed. The watershed is the source of both the water that feeds the creek and of many of the problems that afflict it.

Among these problems are some that constitute health and safety issues for trail users. Improvements will come, but slowly, and the wisest course might be to consider Town Branch a visual asset to the trail and avoid trail designs that would invite users to come into contact with the water. The high levels of fecal bacteria measured in the creekwater mean that there is a strong likelihood that disease organisms such as viruses and bacteria are present in Town Branch at any given time. The sources of these may be anywhere in the watershed. Although efforts to identify the sources are underway, elimination of the contamination is yet far off.

Likewise, chemical contamination from the landfill will be addressed by formal closure and capping, but the closure will not eliminate all risk from seepage. Periodic chemical spills have discolored the creek several times during recent years. Some such contamination may go undetected. Tracing the origin of such spills is complicated by the age and extent of the storm drains that channel water into Town Branch. We cannot discount



Town Branch ran white in May 1999 after the Town & Ranch fire led to a paint spill.

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the small risk that a spill might endanger the health of trail users, given the urban character of the watershed and the lack of incoming water to dilute pollutants. There might also be risks on land. The potential for soil contamination should be evaluated site by site, as needed. Any hazards posed by metal and glass debris would be eliminated by clearing it away.



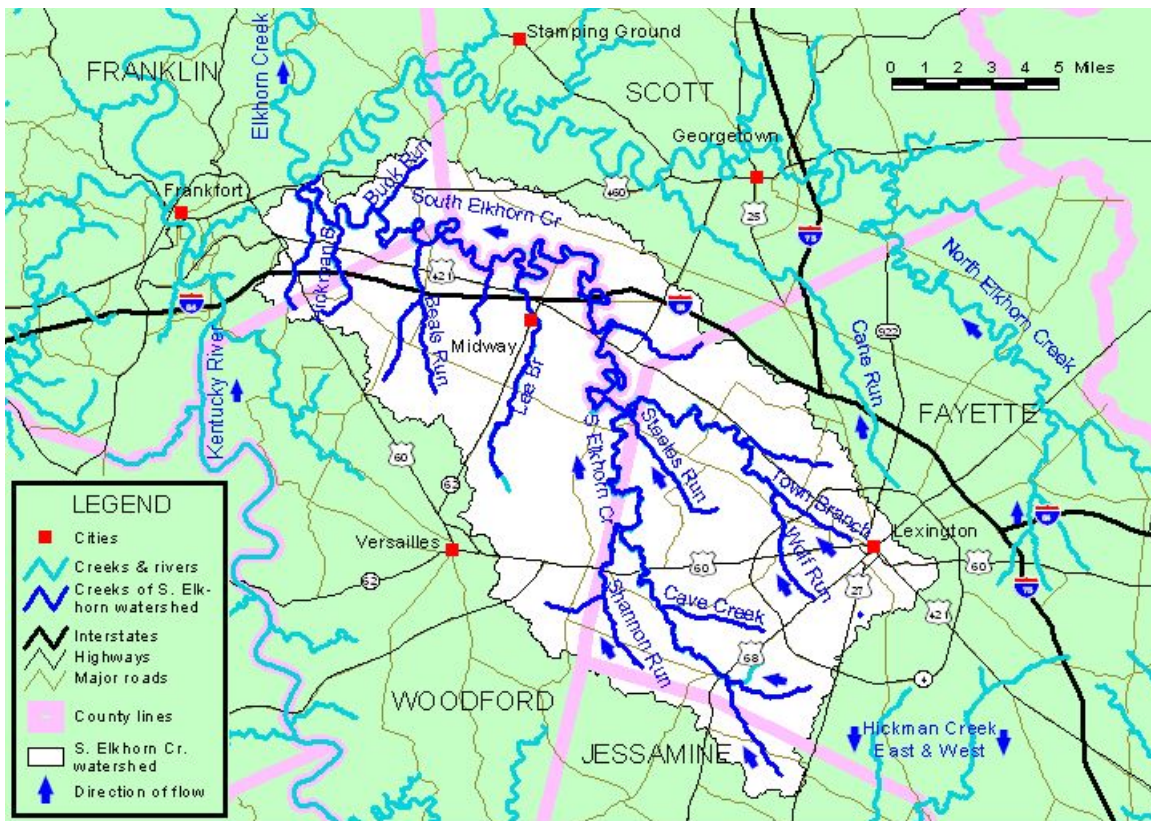
Much of the junk dumped along the banks of Town Branch lies on city land.

We advocate a focus on those aspects of the environment that are most critical to success of the trail as a recreational resource. First among these is replanting wherever practical in the trail corridor, but especially where it will enhance the trail experience by enhancing the sights and sounds surrounding users. Second is promoting a cleaner environment through efforts to remove visible rubbish and minimize any pollution sources that can be identified. As the plan for a trail becomes more definite, we will need to examine the history of specific locations on the route to evaluate the potential for local environmental hazards.

There are also several steps we could take now to support environmental improvements that will benefit the trail in future and prevent conflict with other initiatives. A panel of experts on water (both flow and water quality) should be assembled to serve as consultants as trail design proceeds. Many of the opportunities presented by trail construction for improvement of the habitat and the

channel will require technical expertise. By recognizing and acting on these opportunities early in the process, we can improve both creek and trail. For instance, streamside trail sections could incorporate flood plain to improve flow; stream crossings could incorporate riffles in the streambed to improve oxygenation, provide better aquatic habitat, and make the creek look and sound more appealing. Furthermore, we should establish strong communications with Lexington engineering, because the creek forms an important part of the city's drainage infrastructure. The Engineering Division plans a survey of Town Branch to evaluate changes needed to restore its drainage function, and that could lead to alterations of the routing, banks, and channel that would be significant to the trail. The initiative will also foster better habitat for aquatic life in the creek. Finally, we should forge partnerships with the various organizations working to identify problems, prevent pollution, and improve the environment of the creek. Supporting such efforts is critical to the long-term interests of the trail project.

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Map 1. Lexington's streams all flow out of the city (arrows indicate direction of flow). Town Branch drains a part of the South Elkhorn Creek Watershed (white area). See maps 2 and 3 for detail.

Town Branch and its watershed: defining the Town Branch environment

Many cities have successfully transformed urban creeks or rivers in their industrial core into recreational, commercial, and conservation areas. In one respect, Lexington faces an additional challenge that most of these cities did not. Lexington sits at the top of a hill, so that Town Branch—and all the water in it—originates in the city and flows out, rather than flowing into the city from relatively pristine watersheds at higher elevation. This situation affects both the pattern of flow in the creek and the quality of the water, with important implications for both aquatic life and recreational use of the creek. Map 1 illustrates the direction water flows in creeks in central Fayette County, and highlights the South Elkhorn Creek watershed, of which Town Branch forms a part.

Town Branch is an urban stream with an urban watershed. A watershed is the land (and everything on it) from which water drains to a given creek. Town Branch receives water from a large area via creeks, springs, storm drains, surface flow, and subsurface flow.

How big is this area, and what are its boundaries? The land that drains into Town Branch is divided into three watersheds that feed (1) Wolf Run, (2) upper Town Branch (above Alexandria Drive), and (3) lower Town Branch (below Alexandria Drive and the confluence with Wolf Run). Map 2 shows the locations of these watersheds, and Map 3 provides a closer view of the upper

The important short-term issues for the trail are conditions that assault the eyes, nose, or ears of trail users. Visual blight such as trash is among the easier problems to address. New odor controls are already planned for the sewage plant. Noise from New Circle may require creative trail design.

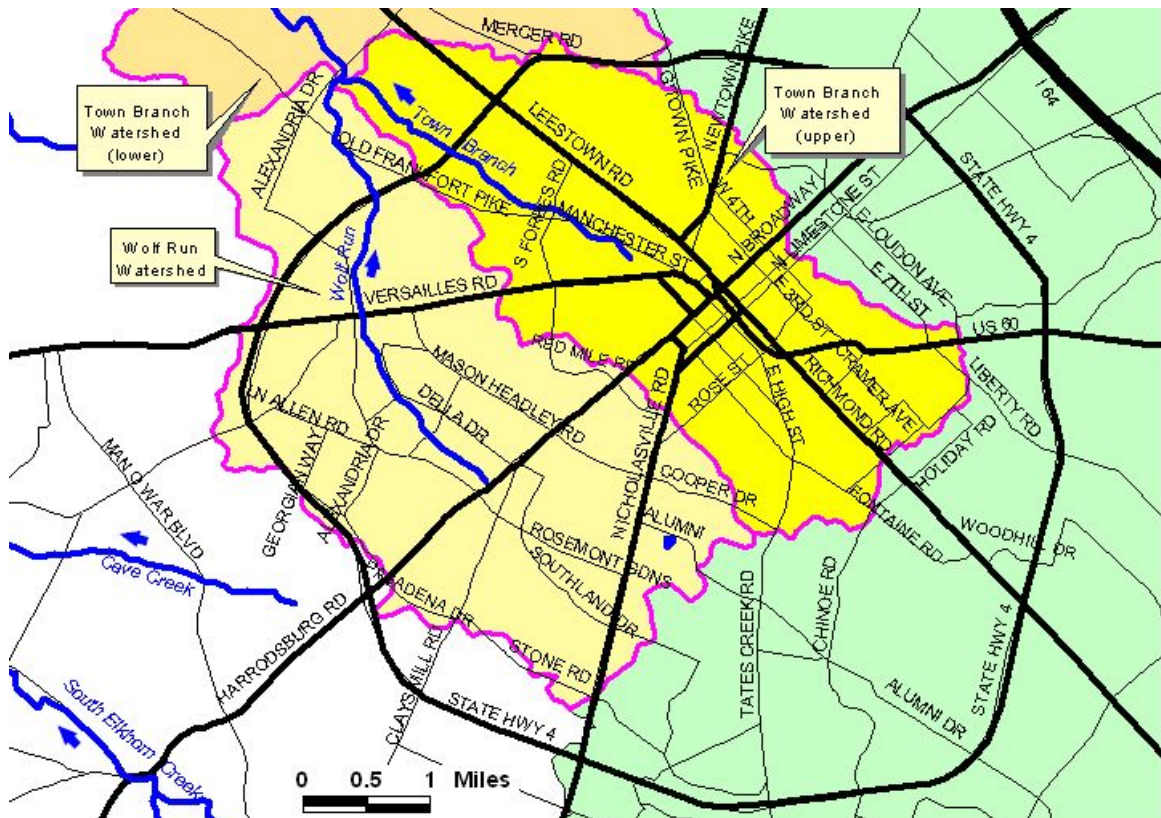
Lexington will remain urban, so we do not expect the creek to become pristine. But much can be done to improve the watershed, the trail corridor, and the creek.

Health and safety must also be ensured. Restoring the creek ecosystem at a more fundamental level will take time. Several initiatives are already underway to strengthen and protect those natural

systems that support clean water, drainage, recreational uses, and healthy plant and animal populations. By supporting such efforts, individually or by forging organizational partnerships, we can promote a creek and a trail that will become valued features of Lexington.

In thinking about the environment of Town Branch and the trail, we must consider three distinct zones: (1) the creek and its banks, (2) the trail corridor, which includes the trail itself, as it is eventually designed, surrounding neighborhoods, and the land that can be seen from the trail, and (3) the watershed of the creek, which extends well beyond the corridor. In most respects, the trail corridor (if not the trail itself) bounds the experience of trail users. When the flow of water and the water quality (what's in it) are concerned, then the environment of the creek and the trail is influenced by the entire watershed.

Map 3. The upper Town Branch watershed takes in most of central Lexington. Water flow and water quality in the creek can be affected by activities throughout its watershed.



Vegetation and animal habitat in the trail corridor

The once-forested trail corridor is now mostly urban land or open pasture. Habitat for wildlife is not very diverse or complex. Much of the tree canopy that remains stands close along the creek. Vegetated areas beside the creek are particularly valuable because streamside trees, shrubs, and other plants stabilize banks with their root systems and can buffer the stream from some types of pollutants, particularly sediment and nutrients in surface runoff. However, the zones of vegetation along Town Branch within the urban services boundary are mostly too narrow to form effective buffers or habitat. Moreover, much of the regrowth in the trail corridor consists of weedy trees such as bush honeysuckle that constitute relatively poor wildlife habitat and do not effectively shade the creek. The area would benefit from management to protect existing streamside vegetation, to promote wider buffers, and to reintroduce plants that support a richer wildlife community and have deep root systems for better soil stabilization. Such changes would provide an attractive setting for the trail as well as upgrading the natural habitat.

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Widening and upgrading zones of trees near the creek would deliver a wealth of benefits.

Because of their many benefits, streamside buffer zones have been extensively examined, and many programs and publications address their design. They go by many names (often including the term “riparian,” which simply means “located on a stream bank”): riparian buffers, riparian zones, riparian areas, forest buffers, vegetated buffers, buffer strips, vegetated filter strips, setbacks, and so on. Different plantings can provide various benefits. The critical point for trail planning is this: to

achieve meaningful environmental effects, a riparian buffer zone must be not a few feet of vegetation, but 30 to 120 feet on each bank of the creek. We need trees right along the creek in those first 30 feet, but shrubs and tall grasses can be incorporated in various ways, depending on the objectives and the constraints of the site. Urban sites will impose constraints, and a narrow buffer is better than nothing, but there are significant gains to be realized by establishing true riparian buffer zones.

Native trees appropriate for such streamside buffers include sycamore, boxelder, black walnut, black locust, white/green ash, and slippery/American elm, (hackberry and cherry will fill themselves in anyway before long). These are all easily grown local species that can be obtained from state forestry or eventually, if need be, from a more defined nursery source with special focus on projects like this. Other appropriate trees would be burr oak, shumard oak, chinquapin oak, swamp white oak (on truly

hydric sites), blue ash (on adjacent slopes), shellbark hickory, Kentucky coffeetree, and Ohio (stinking) buckeye. For deeper shade, especially on north/northeast slopes with more protection, it would be best to plan eventual restoration of sugar/black maple, basswood, etc. (and more spring wildflowers).

For shrubs, roughleaf dogwood and cane, plus willows in the scoured channel, would be ideal. Other species can be used on drier, well-drained terraces/slopes, in full sun. These might include *Rosa setigera*, *Viburnum prunifolium & ruidulum*, *Rhamnus caroliniana*, *Crataegus mollis & crus-galli*, etc. But these are often not available from local nurseries, so a special propagation effort might be necessary. Some herbs and grasses may also be desirable, but there is more uncertainty about what the best species to use would be and what the results would be. Trial plantings of various trees, shrubs, and non-woody plants at appropriate places would allow us to experiment with several methods and demonstrate what works best.

Town Branch and its water

Much of Town Branch and its tributary creeks throughout the watershed have been covered over or diverted into culverts. The sewage treatment plant, just inside New Circle Road, provides a large, steady source of water (25 million gallons per day) to the part of the creek downstream of the outfall pipe. This is water that is diverted from the Kentucky River into Town Branch through our homes and businesses by way of the water and sewer systems. Because the wastewater has been treated, it is in many respects cleaner than the creek water into which it flows. Inside New Circle and upstream of the sewage plant, the main source of the water in the creek is stormwater runoff from downtown, UK, and the neighborhoods to the southeast (including Chevy Chase, Ashland Park, Kenwick).

Although the public still tends to think of industrial pipes as the sources of water pollution, most water pollution in the US today comes from more diffuse sources and is washed into streams by rainwater flowing over yards, streets, fields, and businesses. So-called nonpoint source pollution of

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this sort contributes substantially to conditions in Town Branch, and originates throughout the watershed in residential, commercial, industrial, and agricultural

areas. The storm drain system is designed to channel water away when it rains, and it carries pollutants along with the water. Water that flows into street drains is not treated, so these pollutants flow directly into the creek.

The speed with which rainwater reaches the creek and the path it follows have important effects of their own. A high proportion of the surface area in the Town Branch watersheds (especially inside New Circle) consists of impervious surfaces such as roofs, roads, and pavement. The

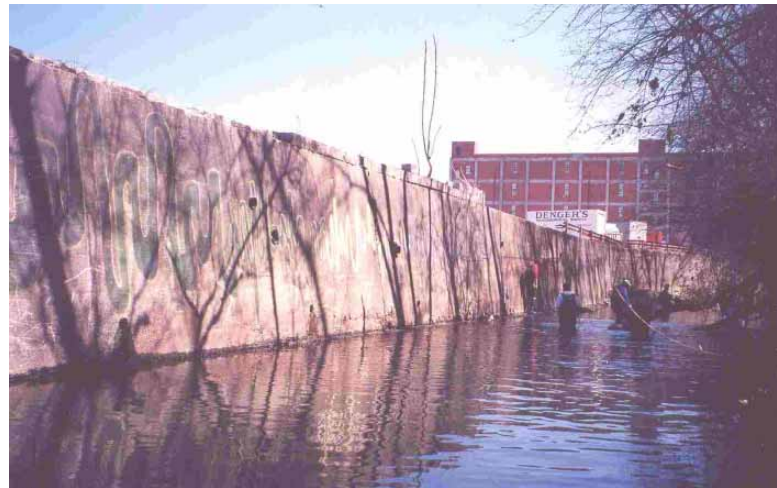
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proportion of watershed surface that is impervious has a dramatic effect on creek flow and creek life. Water runs off these surfaces instead of soaking into the soil. A highly impervious watershed like this results in a “flashy” response to rainstorms. Instead of flowing slowly to the creek beneath the

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surface, rain reaches the creek quickly over the impervious surfaces and through a stormwater system designed to remove water rapidly. Flow in the creek is therefore heavy when it rains but otherwise very low, and the water rises and recedes much faster than in a more natural watershed. Even in the absence of pollutants, these conditions hinder the establishment of a healthy biological community in the creek, by reducing the water level between storms and leading to frequent, violent rushes of water during periods of rain. The danger of flash floods is also heightened.

The banks of Town Branch have been built up (and, in places, lined with rock walls or concrete), which eliminates the natural flood plain. At peak flow, the water cannot spill into a broad flood plain alongside. Instead, it scours the narrow channel, compounding the problems of flow and aquatic habitat.



The condition of the creek

Town Branch has been monitored since 1992 by the city government’s contractor, Commonwealth Technology. This monitoring is designed to characterize the quantity and quality of runoff during conditions ranging from dry to heavy rain. Originally, sampling focused on storm sewers, but a station in Town Branch itself was added in the mid 1990s. Chemical analyses were recently supplemented with analysis of the life in the stream. Some data were also collected during 1999-2000 by the Kentucky Division of Water to assess the impacts of the old Lexington landfill and a spill from the Town & Ranch Paint factory fire. Water quality and biological data have consistently shown that the creek does not support healthy aquatic communities and that it is unsafe for contact recreation because of bacteria in the water.

Modifications of stream channels alter the dynamics of flow and redirect the energy of the water, but channel walls and other structures are common features of urban streams like Town Branch.

The citizen-led group Watershed Watch monitors two sampling stations on Town Branch. Data from summer 1999 and 2000 indicate that oxygen levels tend to be low and that bacterial counts are often high.

Since the 1980s, the Kentucky Division of Water has listed Town Branch as impaired in biennial Water Quality Reports to Congress [305(b) reports]. These reports identify the degree to which waterways support healthy aquatic life and whether they are safe for fishing, swimming, and drinking water supply. Reports are submitted to the US EPA by each state in compliance with section 305(b) of the Clean Water Act. Recent reports have not assessed the suitability of Town Branch for fishing, but Town Branch segments have been evaluated for swimming and aquatic life. In 1998, the Division of Water determined that Town Branch and Wolf Run failed to support either one. In 2000, the Division assessed three separate segments of Town Branch and determined that none fully meet their uses. This time, the creek was rated as partially supporting aquatic life, and it again failed to meet standards for swimming, due to high pathogen concentrations. (The part of the creek above the sewage plant was evaluated only for aquatic life and not for swimming.) Wolf Run likewise failed to support swimming and partially supported aquatic life.

Agriculture, municipal sewage, urban runoff, storm sewers, and alterations in the stream's flow were cited as probable contributors to the water quality problems in Town Branch. Partly because of the condition of Town Branch, the South Elkhorn watershed of which it is part ranked among the watersheds most

Casual contact with the water in the creek, such as wading, is not advisable after a rain.

in need of action in the first Kentucky River Basin Assessment Report (Kentucky Watershed Management Framework, 2000). Town Branch was also listed as a stream most in need of remediation in the Kentucky Nonpoint Source Pollution Assessment Report (UK College of Agriculture for KWRI and the Division of Water, 1999).

Bacteria (and other pathogens, such as viruses) are the primary threat to human health and recreational use of Town Branch, although other contaminants also pose potential problems. The



Heavy rains wash lightweight trash into the streambed, where it accumulates. Stormwater runoff will also carry unseen contaminants from the city into the creek.

creek is unsafe for swimming because of high levels of pathogens, as indicated by measurements of fecal coliform bacteria. The fecal coliform analysis is an assay that demonstrates a creek has been contaminated with human or animal waste. Fecal coliform bacteria (which include *Escherichia coli*) are only rarely harmful themselves, but their presence in a waterbody signals that disease-causing viruses, bacteria, or parasites may have been discharged into the water at the same time. Even casual contact

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with the water in the creek, such as wading, is not advisable after a rain. Identification and elimination of the sources of bacterial contamination is made more difficult by the complex underground stormwater system. Only a targeted monitoring program can pinpoint the sources. The entry of contaminants into the stream may be seasonal and highly variable in response to rain. Malfunctioning sanitary sewer components might be expensive to fix if they prove to contribute, but would be simpler to address than more diffused problems such as waterfowl or pet waste.

The health of the aquatic ecosystem is a function of both the water quality and the flow and channel conditions that affect natural habitat. From 1996 to 1999, biological monitoring was conducted at Darby Dan Farm, at Alexandria Drive, and just upstream of the treatment plant. Not surprisingly, the biological monitoring results indicate that habitat for aquatic life is most favorable at the most downstream and rural station. Biological ratings for fish and aquatic insects ranged from very poor to poor-fair. The numbers of mayflies, stoneflies, and caddisflies, usually an indicator of good conditions, were very low at all three sites. So, stream life is in bad shape throughout the creek, but the situation is worse at the upstream end.

The habitat for aquatic life in the creek has become degraded by elevated nutrient levels, organic enrichment, and too little dissolved oxygen. Organic matter such as lawn clippings or animal waste consumes scarce oxygen as it decays. (The bourbon spilled into the Kentucky River in May 2000 produced the same effect, with disastrous results for aquatic life.) Organic material also contains nutrient chemicals that are essential to life but can cause problems by overfertilizing the water. Excessive inputs of nutrients like phosphorus can lead to excessive algal growth, unhealthy ecosystems, and oxygen depletion. Phosphorus is a major component of fertilizers, human and animal waste, detergents, and some local soils, all of which may contribute to the problems in Town Branch. Toxic compounds may also lead to the elimination of sensitive species from streams: in Town Branch, few of these compounds have been tested for directly.

Where does the pollution in Town Branch come from? What can be done?

Numerous pollution sources potentially affect the water quality of Town Branch. Chemicals, excess nutrients, and pathogens get into the water from both point sources (like waste pipes) and nonpoint sources (more diffuse sources, such as fields and yards to which herbicides and fertilizers are applied). Potential sources in the Town Branch watershed include inactive (“brownfield”) and active industrial sites; the Town Branch Wastewater Treatment Plant; an abandoned landfill and other waste or junk sites; a quarry; a stockyard staging area; petroleum transfer facilities; spills and leaks; domestic animals, waterfowl, and other wildlife; illicit sewer connections and/or straight pipes; streets

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and parking lots (from which rain washes metals, grease, and other material); railroad tracks and yarding areas; and neighborhoods where home and lawn chemicals are used. Some of these sources must and do have permits, but many are unregulated. Although it is easy to see the potential for contamination from all these sources, it is—in many cases—much more difficult to identify which are the most important contaminants and to trace them to specific points or to specific areas of the watershed.

The Town Branch sewage treatment plant meets the particular limits specified in its permit, and the effluent of the plant regularly passes stringent toxicity tests. Treatment at the plant is thought to prevent significant bacterial contamination. Although the sewage plant is in full compliance, the treated effluent is rich in phosphorus, which is not limited by the permit and which can overfertilize the creek and downstream waters. Tight limits will eventually be enacted and met through new technology. Permit renewal is slated for 3/31/03, and it is expected that the next permit will limit total phosphorus to 1 mg/l. Water quality downstream of the sewage outfall (and in South Elkhorn Creek) improved considerably in the late 1980s when upgrades were last made to the treatment plant.

Although the sewage plant is in full compliance with current regulation, the treated effluent is rich in phosphorus, which can overfertilize the creek and downstream waters.

The inactive landfill – located over a sinkhole and mounded high beside the creek – is unlined and is leaching pollutants into the creek.

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Debris is eroding from the landfill into the creek as well. We have not identified the precise nature and degree of the chemical contamination. Discolored seeps from the landfill are visually evident, and Division of Water data indicate that heavy metals (especially iron and manganese) are quite high in some water from the landfill. The wastewater treatment plant discharges such a high volume of water that the pollutant loading from the landfill seeps should be rapidly diluted, if it remains in solution and does not settle into the sediments of the creek. The state's Division of Waste Management and the city reached agreement in 2001 on a plan to cap the landfill and monitor the water that continues to leach out through the buried waste. When the cap is completed, it should



An historic dry-laid stone wall testifies to the long and continuing interrelationship between Lexington and Town Branch.

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reduce the amount of water flowing through the landfill and help minimize contamination of the stream. However, trash and debris (and possibly incinerator ash) have been used as fill elsewhere in the drainage area of the creek, posing continuing potential sources of contamination.

The most pressing problems in Town Branch itself are bacteria, nutrients, contaminated stormwater, and habitat/flow. In the long run, improvements expected at the treatment plant and old landfill will certainly help, and stream corridor improvements such as tree plantings, bank restoration, and developmental setbacks could also improve the quality of the Town Branch environment. However, to significantly improve the situation will require much more action throughout the creek's watershed.

Because urban runoff provides most of the water for the upper, urban section of Town Branch, stormwater is an important source of contamination. Unlike the wastewater in the sanitary sewer system, which is treated at the sewage plant, the water collected in the city's storm sewer system discharges into creeks without

being treated. Stormwater from the city carries metals, oils and grease, and bacteria. It may carry other chemicals. Spills, such as that during the paint plant fire, remain a risk, as does illegal disposal

Stormwater collected in the city's storm sewer system discharges into creeks without being treated. Stormwater from the city carries metals, oils and grease, and bacteria.

of oil or waste into street drains or ditches. Overenrichment of the creek can occur when the rain washes in lawn fertilizer, organic matter, detergents (from washing of cars, for instance), or animal wastes. Overenrichment can drive oxygen concentrations in the water below the level needed to sustain life. A study of the sources of excess nutrient enrichment (focusing especially on phosphorus) through the state regulatory process (TMDL program) was initiated in 2000, but the implementation of a solution will take several years at least. The same is true of an analysis of bacterial contamination that is expected to be funded in 2002.

Controlling stormwater contamination will require changes in the city's infrastructure. Runoff should be captured by means of detention basins, to increase the infiltration of water into the soil in the urban environment, to allow pollutant particles to settle out, and to better equalize flow over time. The design of such basins differs when the goal is water quality control or flood control. Other practices or technologies, such as constructed wetlands, may also be appropriate, but urban settings require expert evaluation because of space constraints and other considerations. Reduction of stormwater pollution will require a large commitment of human and monetary resources from the city, because such strategies all require maintenance for continued effectiveness. As is evident from the contamination sources, people's behavior is another important factor in polluting the creek: improvement will also hinge on changes in how people in Lexington handle waste oil, pet waste, lawn and garden chemicals, grass clippings, and car washing. The trail project can raise awareness of these and related issues.



Town Branch remains largely unseen and therefore unthought of, but a greenway trail will bring people back to the creek

Sources of contamination other than urban runoff may also exist in the watershed. No specific soil or groundwater contamination has been identified outside the landfill, but the industrial character of the area makes that a distinct possibility. The source of the high levels of bacteria in the upper watershed is not fully understood as yet, although the planned state study (under the TMDL program) may shed light on this subject.

There is one known sanitary sewer overflow in the watershed, according to the city engineer. In addition, small-scale dumping of refuse appears to be common along the creek inside New Circle Road, particularly on city-owned land. Trash washed through storm drains accumulates along the banks and on snags in the channel. Most trash is more of an aesthetic problem than a threat to water quality, but some types of refuse can produce serious contamination problems.

All of these problems require attention, and some action is already underway. The LFUCG Division of Engineering plans to inspect all permits in the Town Branch watershed (discharge permits, stormwater permits, etc.) and ask for documentation on the water sampling required under the permits. Enforcement of permits is a state responsibility. The city antidegradation regulations are very strict, but violators must presently be taken to district court. An administrative procedure to streamline this process is under consideration.

In response to new federal requirements on stormwater, the city has mounted a number of projects to promote better water quality, including public education components. Public education to prevent pollution of stormwater is critical to better water quality in Town Branch. The trail project can help draw more attention to the creek and could promote understanding of the ways that runoff can contaminate the creekwater. The city also plans to participate in a Kentucky Watershed Management Framework task force that will focus on the South Elkhorn watershed generally and perhaps on the Town Branch watershed in particular.

Public education to prevent pollution of stormwater is critical to better water quality in Town Branch.

This group will seek local solutions to water quality problems, with technical support from the Framework. In addition, LFUCG's engineering consultants are developing a model of stormwater flow for each watershed in the county, and the city plans to conduct an analysis of the channel of Town Branch to evaluate how well it functions. Modifications to the stream's route that might be

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recommended could interfere with trail siting or provide new opportunities for the trail and its features. The extension of Newtown Pike, likewise, could become an opportunity or a complication with regard to environmental improvement. To take full advantage of opportunities such as these, we must remain informed of and involved in many relevant activities.

Conclusions and recommendations

The Environmental Quality Committee sees the environmental situation of Town Branch as a multi-tiered challenge. The first tier consists of issues that are crucial to success of the trail itself. These tend to be either sensory or related to safety, and they must be addressed in the short term. Some, such as rubbish in the creek, lend themselves to short-term solutions. Others can be solved (or worked around) in the design and construction of the trail. The second and third tiers take in goals for the longer term. In the second tier

are issues of how the trail relates to other activities in the immediate area. These activities, current and future, are those that affect land use, patterns of water flow, and the quality of the water. The trail project can contribute to improvements in these areas, most notably by incorporating streamside vegetation into the trail plan. But we will also need to support the efforts of others to better the local environment if we are to achieve



Town Branch in summer.

improvements that will add value to the trail experience, such as cleaner water and wildlife habitat of higher quality. Issues in the third tier are those related to a broader restoration of the health of the creek and its watershed, keeping in mind that an urban creek will never return to its presettlement condition. These include the creek's function in transporting water, the watershed's function of feeding water into the creek, and the stream ecosystem's ability to absorb wastes from our city. Present and future efforts in these directions will clearly involve federal, state, and local government. This tier also includes the potential for positive (or negative) impacts that might arise from local redevelopment. We need to remain aware of progress on these fronts, both for the benefits that will accrue to the trail and for potential effects of the initiatives on the trail project. So, we recommend that the trail project focus on first- and second-tier issues during planning and completion of the trail, while keeping an eye on the third-tier issues.

The committee sets out more specific recommendations in this report, including the following:

- 🌳 Town Branch should be considered a visual asset, but trail designs should not invite the user to come into contact with the water.
- 🌳 Safety issues, such as hazards posed by metal and glass, should be dealt with before or during construction of the trail. As specifics of the trail location are finalized, efforts should be aimed at identifying any other, less obvious, local environmental hazards.
- 🌳 Wherever possible, planning should incorporate generous buffer zones of native vegetation, ideally 30 to 100 feet wide, alongside the stream. Planting trees and other plants near the stream provides a wealth of benefits: they will stabilize stream banks, enhance the view, abate noise, prevent erosion and keep the water clearer, improve water quality through nutrient uptake, shade the stream and the trail, provide wildlife habitat, enhance aquatic habitat, and help balance the water cycle.
- 🌳 Stream flow and water quality experts should consult on the design of the trail so that environmental aspects can be integrated with other elements. The technical aspects of many issues that could affect the trail or the environment require specific expertise this committee and this report cannot provide.
- 🌳 Strong communications are essential between Town Branch Trail, Inc. and other groups working on the creek, such as Lexington's Division of Engineering, state agencies, the South Elkhorn Creek Watershed Task Force, and the Kentucky River Watershed Watch, in order to coordinate the many environmental quality activities simultaneously progressing in the Town Branch corridor.
- 🌳 In particular, the trail project must stay abreast of stormwater management activities, road construction activities, and land development activities that could impact trail location, and should advocate with the city for improvements to the stream morphology, restoring pools, riffles, flood plains, and meanders.
- 🌳 Public awareness is the key to a better environment for Town Branch and the trail. The trail itself will help show people our creek. The trail group can also play an active role in building awareness of how our city and its water are connected. Signs along the trail or other materials could educate the public about how personal behavior affects water quality, stream life, and wildlife.

The Environmental Quality Committee membership has also considered how to best organize within Town Branch, Inc. to accomplish the tasks ahead. The committee sees information exchange as the critical factor. This report is meant as a resource for the group. The committee can continue to provide a forum to connect Town Branch to other environmental activities. In the main, however, we feel it will be most effective to integrate attention to the environmental, historical, cultural, and recreational dimensions which are so thoroughly intertwined in the trail we hope to create.

THE TOWN BRANCH TRAIL

The Town Branch Trail is a proposed greenway and trail, or linear park, that will begin in downtown Lexington and follow the Town Branch Creek (where possible) as it flows west. The Town Branch Trail will link downtown to a variety of recreational, historic, and environmental resources, provide alternate transportation routes from neighborhoods to downtown, and improve the habitat and water quality of the stream next to which the city of Lexington was founded.

TOWN BRANCH TRAIL, INC.

Town Branch Trail, Inc., (TBT) is a 501(c)3 nonprofit group organized to promote, plan, develop, and maintain the Town Branch Trail greenway. Contact Van Meter Pettit, President (vanmeterp@aol.com), 155 Constitution St., Lexington, KY 40507. For additional information, please see the TBT web site at www.townbranch.org.

THE TBT ENVIRONMENTAL QUALITY COMMITTEE

Objective: To improve the environmental quality of Town Branch and the surrounding land in support of a cleaner, healthier recreational area. This will be achieved in part by the streamside vegetation and other improvements associated with the trail itself.

The Environmental Quality Committee serves as a network that: (1) keeps TBT in touch with developments that will threaten or promote the environment of Town Branch, (2) links TBT to other organizations working to restore the creek and its watershed, (3) exchanges information internally on environmental aspects of trail planning, public relations efforts, and fundraising, and (4) communicates TBT's plans and vision to others in the environmental and regulatory communities. We encourage those with interests in the environment to participate in the activities of the other committees of TBT and also to sign on as members of the Environmental Quality Committee network. For further information, please contact Greg Epp (KyRiver@engr.uky.edu or 257-5387).

ABOUT THIS REPORT

The Environmental Quality Committee collected information about the condition of the environment of Town Branch during 2001. This report presents our findings and conclusions. Among the report's recommendations are trash cleanup, extensive streamside zones of native trees and other plants, public education, partnerships with other environmental organizations, and technical consultations on stream morphology and water quality issues. The report is available on the web (as a PDF document) at www.uky.edu/WaterResources/Watershed/TBER.htm.

Members of the committee who participated in the compilation of the report included Ray Barry, Eric Christianson, Adria Elskus, Greg Epp, David Gabbard, Hilary Lambert Hopper, Yvette Hurt, John Kiefer, Brett Palmer, Ron Simon, Jay Taylor, Steve Uecker, and Tom VanArsdall. The final document was produced by Ray Barry, Adria Elskus, Greg Epp, and Tom VanArsdall, with a contribution from Julian Campbell, and designed and edited by Greg Epp.