

# WEST HICKMAN CITIZEN ACTION PLAN (CAP)

Hydrologic Unit Code 05100205120

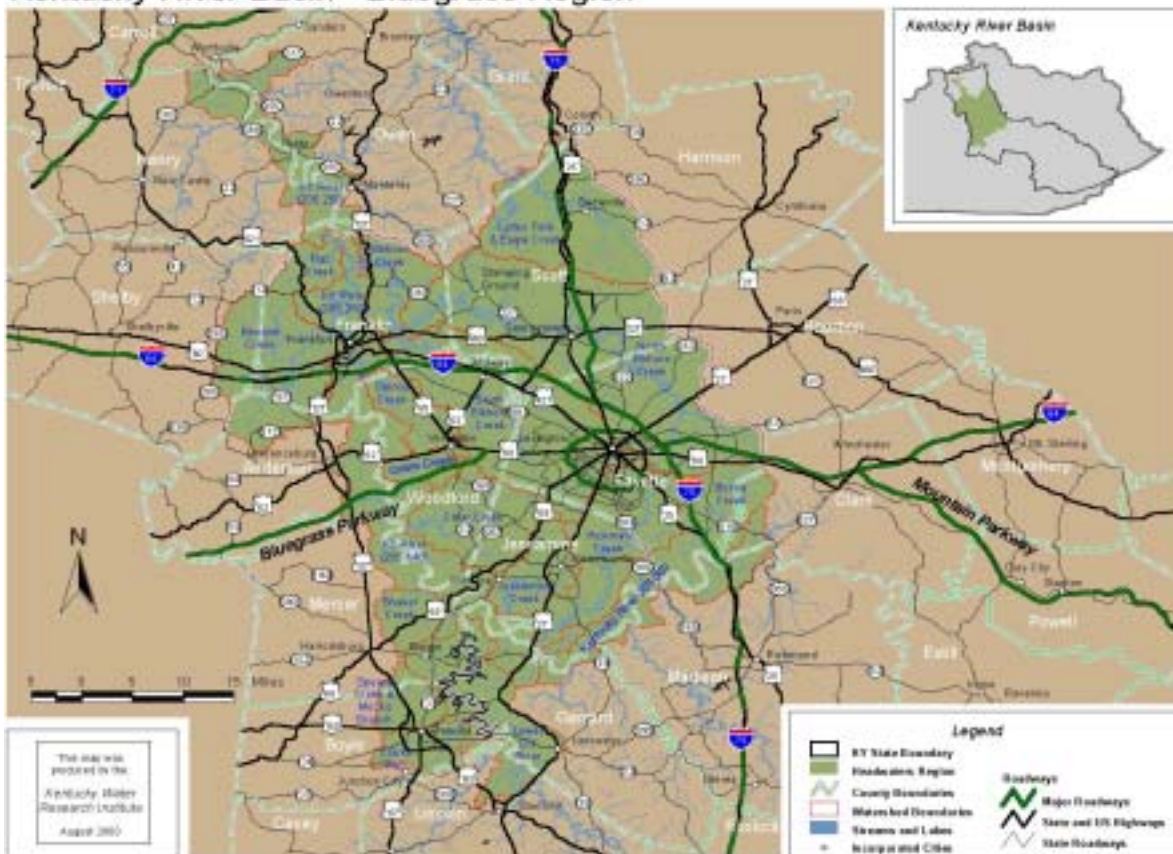
## PART 1: ENVIRONMENTAL AND CULTURAL HISTORY

### OVERVIEW

#### I. Introduction.

The importance of this submission is based upon the listing of West Hickman Creek as one of the top ten contributing watersheds of the Kentucky River watershed system that exhibit high fecal coliform rates. Additionally, there are concerns about high levels of phosphorus. The West Hickman Creek watershed is shown as partially supporting. This local group of water watch participants submit this application as a beginning document to propose an ACORN that functions to identify watershed resources, identify source and non-point source pollution, conduct monitoring, and pursue a plan of action to improve the environmental health of West Hickman Creek (see bookmarks – hickmanmap).

*Kentucky River Basin - Bluegrass Region*



## II. Soils, Geology and Geography.

The Hickman Creek watershed covers south-central Fayette County and northeastern Jessamine County. The land is in the Bluegrass physiographic region, characterized by undulating terrain and moderate rates of both surface runoff and groundwater drainage. Part of the watershed south of Hickman Creek in Jessamine County lies in the hills of the bluegrass subregion, characterized by hilly terrain, very rapid surface runoff, and slow groundwater drainage. Most of the watershed lies above thick layers of easily dissolved limestone that form carbonate aquifers. Groundwater flows through channels in the limestone, so caves and springs are common in regions with this geology. Other areas lie above interbedded limestones and shales (>20% limestone, allowing groundwater flow where the clay content is low enough).

Two major fault systems, the Hickman fault and the Kentucky River fault, and several other smaller ones, occur in this county. The Hickman fault extends from Jessamine County to Bourbon County, roughly parallel to the axis of the Cincinnati Arch. In the southern part of the county, calcareous shale and siltstone are exposed along this fault. The Kentucky River fault intersects the southern tip of Fayette County. It generally marks the dividing line between the Inner Bluegrass and the Hills of the Bluegrass physiographic areas and that between the Farimont-McAfee-Rock land soil association and the Salvisa-Culleoka soil association<sup>1</sup>

Important *karst* features will be investigated to better understand water inputs and outputs. Also, *prime farmland soils* will be identified to gauge their importance as a resource to be conserved and valued for their higher agricultural yield potential. Additionally, the presence of *hyric soils* will be identified as one component of three (hydrology and hydrophytic vegetation) as to the existence of small cells of wetlands and accompanying more diverse species associations. In the tables data, 39.0 acres of wetland are shown to be present.

## III. Waters.

Hickman Creek empties into the Kentucky River at Camp Nelson (near US 27). Among the creeks that feed it are East Hickman Creek, Shelby Branch, West Hickman Creek, Wymers Branch, and Marshall Branch. Surface waters of the watershed contribute to the drinking water for Kentucky-American's system, since the Lexington Reservoir and Lexington Reservoir No. 4 are located on West and East Hickman Creek, respectively. Four businesses and organizations hold permits for discharges into the creeks (see bookmarks – USGS)

Water Quality - Water quality is an important parameter for identifying environmental health concerns of the West Hickman Creek watershed. Information with regards to point source and non-point source pollution of the Creek will focus on many indicators but fecal colliform and phosphorus levels will be more closely scrutinized. Greater investigation will be centered on how best to monitor the watershed with the use of [TMDL](#) data.

Water Quantity – With more recent concerns with respect to water supply during dry summer-fall drought events, research may be beneficial in determining the contributory role West Hickman Creek plays in the hydrologic balance of the greater Kentucky River watershed.

## IV. Animals

Of the approximately 717 described species of vertebrates occurring in Kentucky, at the present time, 474 (66 percent) have been recorded or may reasonably be expected to occur in the Inner Bluegrass. Some groups are much better represented than others, for example, 80

percent of the bird species in the state are represented, 70 percent of the mammals, 53 percent of the amphibians, 52 percent of the fishes, and 50 percent of the reptiles<sup>2</sup>.

The identification of human, domestic and non-domestic animal source inputs to the hydrologic regime will be important to better analyze changes in fecal coliform results in the West Hickman Creek watershed. Information will be gathered from recent narrative and data sources to differentiate which group may be contributing to identified levels of fecal coliform. This information, in association with a more expansive investigation of non-domesticated animals, may be used to gauge the amount of animal *biodiversity* in the West Hickman Creek watershed.

## **V. Plants.**

In a region such as the Inner Bluegrass, where soils are of prime value for crops and pastures and where space for construction is now in great demand at a high price, wooded areas are virtually restricted to steep slopes and narrow stream valleys. It is estimated that natural plant communities here have now been reduced to about 4 percent of the area. No truly virgin tracts remain. A traveler notices the sudden change from pastoral beauty on the Bluegrass Plain to rugged picturesqueness in the deep gorge and steep wooded cliffs of the Kentucky River and its tributaries<sup>3</sup>.

The role of that vegetation plays within the riparian corridors of the West Hickman Creek watershed is important. The vegetative type and density of herbaceous or woody species will be important with regard to determining the role they play with respect to water quality and water quantity of the watershed.

Information will be gathered from recent narrative and data sources to investigate different plant types an attempt to gauge the amount of plant *biodiversity* in the West Hickman Creek watershed.

## **VI. Land and water use.**

Land in the watershed is about 75% agricultural, almost 5% rural and wooded, almost 5% commercial or industrial, and nearly 15% residential. Surface waters of the watershed contribute to the drinking water for Kentucky-American's system, since the Lexington Reservoir and Lexington Reservoir No. 4 are located on West and East Hickman Creek, respectively. Four businesses and organizations hold permits for discharges into the creeks. See tables for details.

Within the portion of the watershed monitored by the KRWV team (the area along Tates Creek Road beginning just north of Lansdowne Drive, Saron Drive, and Clearwater Way), the majority of the land has been developed for residential or commercial use. Indeed, within the next five years there will unlikely be any undeveloped land other than that reserved for an elementary school, a city park, and sites located in the flood plain.

Currently the area includes two large strip shopping malls (each bordered at the rear by West Hickman Creek), two smaller strip shopping centers, a small number of office buildings, two churches, one public library, a public park, a fire station, and an elementary school. The remainder of the area is primarily residential, mostly one family houses with a number of apartment complexes and condominiums and a small number of duplexes.

The current development pattern brings with it a high potential for water pollution stemming from storm water runoff from roadways and parking lots as well as phosphorus contamination from fertilizer applications to suburban lawns. In addition the area has a documented history of multiple sanitary sewer overflows along the creek in multiple years.

## **VII. Agency data assessment.**

The assessed creek segments in this watershed include two that do not support some or all of their designated uses, based on biological and/or water-quality data. Two others only partially support uses, and one is threatened. Pathogens and nutrients from urban runoff, storm sewers, and agricultural sources contribute to the impairment of these streams (see bookmarks – tables).

## **VIII. Watershed rankings.**

The ranking formula provides a preliminary ranking by synthesizing a broad spectrum of watershed characteristics, current conditions, and threats. This watershed ranks in the group with the highest need for protection and/or restoration. This rating is for the watershed on average; particular sites and particular waters within the watershed may vary widely (see bookmarks – tables).

## **IX. Volunteer data.**

There are monitoring sites on Hickman and West Hickman. Data from the Hickman Creek site indicate phosphorus levels were almost twenty times the level at which nutrient enrichment problems may be caused (> 0.1 mg/L) (See bookmarks – biodata).

# **PART 2: CITIZEN / SCIENTIFIC EXAMINATION**

Participants that have been active in the West Hickman Creek watershed group are Gary Hahn, a certified Professional Wetland Scientist and area coordinator for KRWW Lexington-Jesamine County, Judy Worth, Debbie and Clint Griffith, James, Kathleen and Colleen Gallagher, and Don Pratt.

# **PART 3: ASSESSMENT**

The West Hickman Creek watershed has widespread water pollution problems due to samples of high fecal coliform and phosphorus, making the water segment impaired for environmental health concerns (see bookmarks – spreadsheet).

# **PART 4: ACTION ITEMS[ACORN]**

**Members of the West Hickman monitoring team have chosen four tasks to accomplish this year:**

- 1) *conduct focus testing of KRWW site #K133;*
- 2) *use ESRI ArcView/GIS and additional thematic data to assist in identification of point source and non-point source pollution;*
- 3) *initiate an environmental restoration stream/wetland project along one of the smaller tributaries of the creek;*
- 4) *educate users of Veterans' Park at KRWW site #K132 of the potential dangers posed by sanitary sewer overflows along the edge of the creek and the soccer field;.*

## **TASK 1: Conduct focus testing of KRWW site #K133**

KRWW site #K133 includes that portion of the West Hickman tributary that runs parallel to Zandale Drive in Lexington, beginning at the bridge across the creek at Landowne Estates Drive and proceeding 100 meters west upstream. Fecal coliform levels obtained at this site during the past two years have been some of the highest among all samples obtained by KRWW. The magnitude of the problem is underestimated in the KRWW report as the stream is intermittent, and it has not always been possible to obtain samples on KRWW's scheduled sampling dates. However, at the request of the Fayette County Neighborhood Council (FCNC), the monitoring team did obtain a number of samples on dates other than those scheduled by KRWW and those results consistently show that this portion of the creek contains unacceptably high levels of both fecal coliform and fecal strep. (See bookmarks – BIODATA 2001 & 2001). Note: No data exists for 2001 for Veteran's Park.

The source of the contamination is currently unknown. However, the LFUCG Division of Sanitary Sewers has done extensive testing of the sewer lines in the area and has identified serious problems with the design of the sewer lines running from the intersection of Zandale and Bellefonte Drives to the intersection of Zandale and Lansdowne Drives. The Division of Sanitary Sewers has planned a one and a half million dollar sewer rehabilitation project for this area, which is to begin in early 2002. The Zandale/Lansdowne Estates location has also been the site of repeated sanitary sewer overflows over the past few years, with water pressure from storm water bleeding into the sewer lines lifting the manhole cover, allowing raw sewage to spill over into the street and the creek.

While the rehabilitation of the sewer line and last year's work on the storm water collection system south of Zandale should eliminate the sanitary sewer overflow, we have no way of knowing whether it will also reduce levels of fecal coliform in the creek. For one thing, we do not currently know whether the fecal coliform contamination derives from human or agricultural sources. In addition, the relationship between the storm water collection and sanitary sewer systems on the north side of Zandale remains problematic. Indeed, LFUCG acknowledges that portions of the storm water collection system in the area remain unmapped. Members of the neighborhood association have also been advised by the Division of Sanitary Sewers that until last year sewer lines running from several homes in the Albany Road area, three streets to the north, were never connected to the sewer system at the time the local min-sewer project for the neighborhood was completed, but were, instead, pouring untreated sewage directly into the ground. Finally, the Division of Sanitary Sewers acknowledges that the sewer rehabilitation project along Zandale may merely move some of the overflow problems downstream, most likely in the area south of the Lansdowne Shoppes.

For all of these reasons, the monitoring group proposes to conduct focus testing in an expanded area that would begin roughly 100 meters west of the intersection of Zandale Drive and Bellefonte, at a point at which the storm water collection system intersects Zandale and extending to a point just below the Landowne Shoppes.

The focus testing would have several goals:

- 1) to determine whether fecal coliform contamination originates in the storm water drainage system above the KRWW original sample site;
- 2) to determine whether the sewer rehabilitation project along Zandale drive reduces the fecal coliform contamination at the original test site;
- 3) to collect base line data below the Lansdowne Shoppes to determine whether the Zandale sewer rehab project indeed simply moves the contamination further down stream; and
- 4) to determine whether the fecal coliform contamination stems from agricultural or human origins.

To successfully complete these goals, the monitoring team will need additional resources, including additional testers and funds to support the additional laboratory analyses needed to achieve the goals. The monitoring team has already received a preliminary offer of support from LFUCG Division of Environmental Engineering to assist with testing the storm water collection system. We would also like to enlist the support of local high school students to assist with sample collection, both as a way to provide additional staffing for the project and to educate the students as to the critical importance of maintaining water quality within urban and suburban areas as a way to ensure the quality of our neighborhoods. One member of the monitoring team has contacts within Fayette County schools, both public and private, and will serve in a key role in recruiting high school students and their teachers for this task. However, we anticipate that we will need additional support from ACORN to complete this task.

## **TASK 2: Use ESRI ArcView/GIS and additional thematic data to assist in identification of point source and non-point source pollution.**

The West Hickman KRWW group seeks to utilize existing software and resources to better identify sources of point and non-point source pollution. Additional information is needed to identify resources in the watershed in the areas of fauna and flora species identification, as well as additional research into geology and karst features, hydric soils, prime farmland, and land use applications. Watershed health can be more readily envisioned if we seek to nurture improved human health, quality of life, and environmental health for a more sustainable community.

## **TASK 3: Initiate a wetland/stream restoration project along one of the smaller tributaries of the West Hickman Creek.**

As is often the case when urban development occurs along natural waterways, a significant portion of the native vegetation has been removed along West Hickman Creek, contributing to the loss of natural pollution filters and storm water retention. A potential stream site has been selected that runs parallel to Saron Drive and is behind the Veterans Park Elementary School in southern Fayette County. This site, which includes a small stand of cattail marsh and a few trees along a stream bed, has along its banks a thick stand of Kentucky 31 fescue, a very aggressive monocultural species with minimal fish and wildlife value (see bookmarks- VPphotos).

The monitoring group would like to use the support of one or more local elementary schools in the stream channel restoration along with the possible creation of a small depressional wetland. The children, their parents, and their teachers could be enlisted to help do restoration plantings of native grasses such as rushes and sedges in the wetland and along the stream bank, creating a more diverse species mixture for new wildlife habitat. The larger created wetland area and stream restoration can serve as a living laboratory for students to conduct science experiments in such areas as biology, botany, zoology, ecology, chemistry and hydrology. Additional benefits will be improved water quality, storm water storage and a source of local pride as an example of local communities working to incorporate biodiversity and environmental health into their local watershed.

To succeed in such an effort, the monitoring group must accomplish the following preliminary tasks:

- 1) finalize the selection of a site for rehabilitation (the site mentioned above would serve as a “bridge” between the school and adjacent neighborhood);
- 2) secure permission from the property owner (most likely, LFUCG) to undertake the project;
- 3) secure the support of school personnel, including the school principal and the science teachers;
- 5) develop a plan for site restoration;
- 6) secure funding to prepare the site and purchase plant material for the restoration;
- 7) determine what steps will be necessary to provide ongoing maintenance of the site and secure the necessary support, financial or other, to perform the maintenance.

These tasks will require assistance from ACORN, both in securing the cooperation of the various entities involved and in securing the financial resources to complete the project. This project is primary in attempting to foster private landowner pride in cleaner and healthier neighborhoods and watersheds.

To foster interest in this effort, a major theme in the ACORN and related activities will be with the use of a wetlands character named Swampy (an acronym for soils, water, animals, mankind uses, plants & you!), a character created by Gary Hahn, as an educational tool to link resources together (see bookmarks – SWAMPYsignage1).

Also, since a majority of the streets nearby are named after water-related features such as in the names River Oak Drive, Ridgewater Court, Alderbrook Way, and Clearwater Drive (the street that runs in front of Veteran’s Park Elementary), a “clean streams” theme will be used to reinforce the vision of what the group is working towards – cleaner streams (see bookmark – street photos).

#### **TASK 4: Educate users of Veterans’ Park at KRWW site #K132 of the potential dangers posed by sanitary sewer overflows along the edge**

KRWW site #132 includes that portion of the West Hickman tributary that runs through Veterans’ Park, along the soccer fields. We have selected that site not only because it has evidenced occasional elevations of fecal coliform, but also because it has been the site of repeated sanitary sewer overflows. Indeed, manhole overflows were so bad several years ago that raw sewage and toilet paper spread for yards along the edge of the soccer field after every major rain event. As a result of the efforts of members of the monitoring group, the Fayette County Neighborhood Council, and some of the local media, the Division of Sanitary Sewers removed the flume that once carried raw sewage from manhole overflows directly into West Hickman Creek and raised the elevation of some of the manholes to reduce the frequency of the overflows.

Despite these efforts, the manholes still overflow at times of high storm water, with the result that children play soccer on fields whose borders are lined not to mark the soccer field boundaries but to neutralize the potential health hazards related to raw sewage along the edge of the field (see bookmark – fieldphotos).

What the monitoring group proposes is to undertake some type of educational program to make users of the Park aware of the potential health hazards posed by the sanitary sewer overflows. At a minimum, we would like to see appropriate signage, perhaps by using the same wetlands character Swampy that will allow for the signage that fosters an awareness to potential health problems of the stream and that caution is advised as reading dictate high levels of stream degradation, such as areas adjacent to the manholes (see bookmark-SWAMPYsignage2).

We would also like to provide information to various groups using the park, alerting them to the potential risks following the sanitary sewer overflows. Groups that we might target for education include the Lexington Youth Soccer Association, the Friends of the Parks, and the local homeowners' and or neighborhood associations. We would hope to enlist the support of the Department of Parks and Recreation and the Fayette County Health Department in these efforts as well.

To succeed in this task, we will need the assistance of ACORN in securing the cooperation of the various groups named above and in locating a small amount of financial assistance to pay for signage and any print materials we might use in our educational efforts.

## PART 5: SUMMARY

In summary, the West Hickman Creek local citizens group of volunteers has developed an initial proposal and model to use as a tool for analyses of the current health of the watershed. The proposal includes additional monitoring, a movement toward greater understanding of watershed resource identification via GIS technology, and an environmental education project that will focus on clean stream themes with help from a public outreach character named Swampy, to bring together schools, neighborhoods, industry and academia together in the improvement of the West Hickman Creek watershed.

The group will pursue funding sources for the ACORN and serve as a resource to comment on activities within the West Hickman Creek and Hickman Creek watersheds. Also, important in this effort is a better understanding of TMDL's and their applicability with respect to monitoring location(s) in the watershed.

---

Name

---

Date

---

Name

---

Date

Approved by the Kentucky River Watershed Watch (KRWW) Steering Committee:

---

Name

---

Date

### Contact information:

**Gary Hahn, PWS**

**388 Ashmoor Drive**

**Lexington KY 40515**

**Phone: UKY.4WATERS/859.492.8377**

**Email: [gospwampy@swampy.org](mailto:gospwampy@swampy.org)**

**URL: <http://members.aol.com/gwhahn/index.htm>**

#### (Footnotes)

<sup>1</sup> U.S.D.A., Soil Conservation Service. 1968A. *Soil Survey, Fayette County, Kentucky*. Washington, D.C.: U.S. Government Printing Office. Pg. 58.

<sup>2,3</sup> Wharton, Mary E. And Roger W. Barbour. 1991. *Bluegrass Land and Life*. Lexington: Univ. Press of Kentucky. Pg. 159, 51.