

## **3.0 PROBLEM IDENTIFICATION**

### **3.1 INTRODUCTION**

Stormwater problems were identified from several sources, including staff interviews, developer input, previous reports/studies, and field investigations. This information was compiled and summarized on a Stormwater Problem Map. A selected group of projects were identified for detailed hydrologic/hydraulic analysis (Chapters 5 and 6) and solution development (Chapter 7). The following sections summarize the problem identification process.

### **3.2 INTERVIEWS**

Interviews were completed with staff from Hamilton County, Carmel, and Westfield. The purpose of the interviews was to obtain knowledge of both general and specific problem areas. Specific problem areas were annotated on work maps. More general input is summarized as follows:

- The entire stream is in need of maintenance to address erosion, log jams and beaver dams.
- Most of the streams upstream from 146<sup>th</sup> Street are regulated drains. The Anna Kendall Drain is the only regulated drain on a maintenance assessment.
- There have been several petitions to re-construct the regulated drain down to 146<sup>th</sup> Street.
- Several bridges in the watershed have been replaced or plan to be replaced.
- Many reported problems are on private property.
- Anna Kendall Drain is one of the more problematic tributaries in terms of flooding concerns. Portions of the drain have been reconstructed. The culvert at the abandoned railroad on the drain serves as a control structure to store flood waters. This structure should remain.
- Impacts from the planned upgrades to US 31 should be considered and mitigated.
- Carmel and Westfield should consider additional ordinance language to protect floodplains.

Input on potential problem areas or watershed concerns was also obtained from the Hamilton County Soil and Water Conservation District. Input is summarized as follows:

- Concern with Creek being too close to Grassy Branch Road north of State Road 32. There are general safety concerns and limitations on future expansion.
- Land east of US 31 and between 151<sup>st</sup> street and SR 32 is wooded with rolling hills. Concern that as this land is developed there will be a high potential for sedimentation of Cool Creek and the hydrology of the watershed will change significantly.
- From 126<sup>th</sup> Street to SR 431 there are homes that back up to steep slopes. This area is generally stable but if the channel were to start eroding, there could be homes and property harmed.
- Significant sediment has been deposited on the south side of the 116<sup>th</sup> street bridge and needs to be cleaned out for that structure to have full capacity.
- Cool Creek south and north of 116<sup>th</sup> street is widening and eroding.
- Soils along much of Cool Creek are terrace or floodplain soil. These soils lack the texture, strength, and glacial till that upland soils possess to resist bank erosion.

- Criteria for a riparian corridor should be established for Cool Creek. Programs are available to assist landowners and new developments should be required to establish the buffers.
- Focus should be placed on maintaining the floodplain and not allowing construction even in the fringe. Corridor repair should also be stressed, which is being addressed by new ordinances that Hamilton County has passed.
- There is a need for an established system for construction site inspection. Site visits need to be more frequent.
- Need for a reduced nutrient program (lawns/clippings)

### **3.3 DEVELOPER INPUT**

On October 30, 2002, a meeting was held at the Hamilton County Surveyors Office to obtain input from the development community on stormwater issues affecting the Cool Creek watershed. One of the key drivers of the study was the concern with stormwater impacts resulting from new development, particularly with the upper watershed (Westfield) developing and the lower watershed (Carmel) being already fully developed. Topics covered at the meeting included:

- Overview and purpose of the Cool Creek Watershed Plan
- Existing stormwater problems in the watershed
- Effectiveness of stormwater runoff controls associated with new development
- Regional detention facilities
- Rule 13 requirements and impacts to new development

Key feedback from representatives of the development community included:

- Regional on-line detention has become very difficult to implement because of environmental permitting issues.
- Regional detention for areas less than one square mile can work; however detention basin configurations are often dictated by other engineering issues (need for earthwork fill, limitations on conveyance facility sizes, etc.)
- If regional basins are constructed, credit should be given towards open space requirements.
- If the communities or the County want a particular regional detention basin site, the development community should know this early on so it can be accommodated in the development process.
- Development restrictions in the floodplain should be re-considered in areas of very wide, shallow floodplains.
- Street widths and parking space requirements should be considered when looking at the non-structural aspects of upcoming water quality requirements.

A summary of detailed discussion with the development community representatives is provided in Appendix B.

### **3.4 PUBLIC INPUT**

Public input was obtained through two public meetings held in the spring of 2002, one in Westfield and one in Carmel. A total of approximately 70 people attended the meetings. A copy of the presentation handout and meeting summaries is provided in Appendix C. Each meeting included introductions, a presentation on the scope of the project, and a description of findings to

date. After the presentation and question and answer session, work maps were available for residents to identify specific problem areas. Key input and areas of concern are summarized as follows:

- Several residents expressed concern with filling or development taking place within the floodplain.
- A general desire was expressed to maintain the aesthetic value of the creek, including preservation of riparian areas.
- Concerns about water quality were discussed. Residents showed interest in continued sampling and monitoring of the quality of water in the creek. Comments were expressed that we should strive to improve the water quality, not just maintain it.
- Concern was expressed regarding the amount of native plant growth residing in the riparian areas adjacent to the creek and the invasion of non-native plants. It was suggested that a bio-diversity assessment of the creek/watershed system be considered.
- General concern was expressed regarding blockages in the creek.
- Interest was expressed to have information available on the Internet
- There were some questions regarding the future expansion of US 31 and its impact on the watershed.
- Residents displayed interest in performing channel clean out, erosion control, streambank stabilization, and general creek maintenance.
- Residents showed interest in Rule 5 compliance (erosion control) within the watershed.

### **3.5 PROBLEMS IDENTIFIED IN PREVIOUS STUDIES AND REPORTS**

The primary source used in problem identification was the Flood Insurance Studies for Hamilton County, Westfield, and Carmel. These reports, along with the accompanying floodplain/floodway maps and the hydrologic/hydraulic analyses performed in this study, were used to identify flooding problems such as roadway overtopping or other structures at risk from flooding. A summary of stream related flooding in the three jurisdictions in the watershed is as follows:

#### *Carmel*

- Cool Creek – No roadway overtopping problems along the main Cool Creek channel
- Hot Lick Creek – Overtopping at Carmel Drive during 10-year event (creates about 3 feet of backwater)
- Highway Run – Overtopping at Walter Street and Walter Court during 25-year and greater events.
- Highway Run – Overtopping at Thornberry Drive during 25-year and greater events.

#### *Westfield*

- Cool Creek – E. 151st Street overtopping during 10-year event
- Cool Creek – Oak Road just overtopped during 100-year event
- Cool Creek – S. Union Street/Westfield Boulevard overtopping or nearly overtopping during 10-year event (at two stream crossing locations)
- Cool Creek – Private Drive overtopped during 10-year event
- Cool Creek – Oak Road just overtopped during 10-year event

- Cool Creek – 171st Street almost overtopped during 10-year event
- Anna Kendall Drain – Four (4) Private Drives overtopped during 10-year event.
- Anna Kendall Drain – Gurley Street and Cherry Street overtopped during 50-year event
- Anna Kendall Drain – Park Street overtopped during 10-year event
- Anna Kendall Drain – Abandoned railroad embankment overtopped during 10-year event
- J. M. Thompson Drain – W. Jersey Street overtopped during 10-year event

#### *Hamilton County Unincorporated Areas*

- H. G. Kenyon Drain – Two private gravel drive crossings with small culverts overtop during even small storms
- Mary Wilson Drain – 151st Street overtopped during 10-year event
- Mary Wilson Drain – One private drive overtopped during the 10-year event.

As highlighted above, conveyance problems at stream crossings are more pronounced in Westfield, with several undersized bridges and culverts on both Cool Creek and Anna Kendall Drain. Flooding problems along Cool Creek in Carmel is not a major problem. Erosion is more of a concern along Cool Creek in Carmel.

### **3.6 FIELD RECONNAISSANCE**

A field reconnaissance of Cool Creek and its major tributaries was performed during the spring of 2002. The purpose of the field reconnaissance was to:

- Assess the general condition of the riparian corridor
- Photograph and note areas with erosion problems
- Note areas with log jams or debris build up
- Measure and record location and size of storm sewer outfalls
- Check outfalls for evidence of scour
- Note any illegal dumping of trash
- Photograph and note flood prone areas

The following photographs illustrate the types of problems that were recorded.



*Debris Jam and Streambank Erosion*



*Unknown Leachate*



*Culvert in Need of Sediment Cleanout*



*Culvert Pipe Collapse and Erosion*

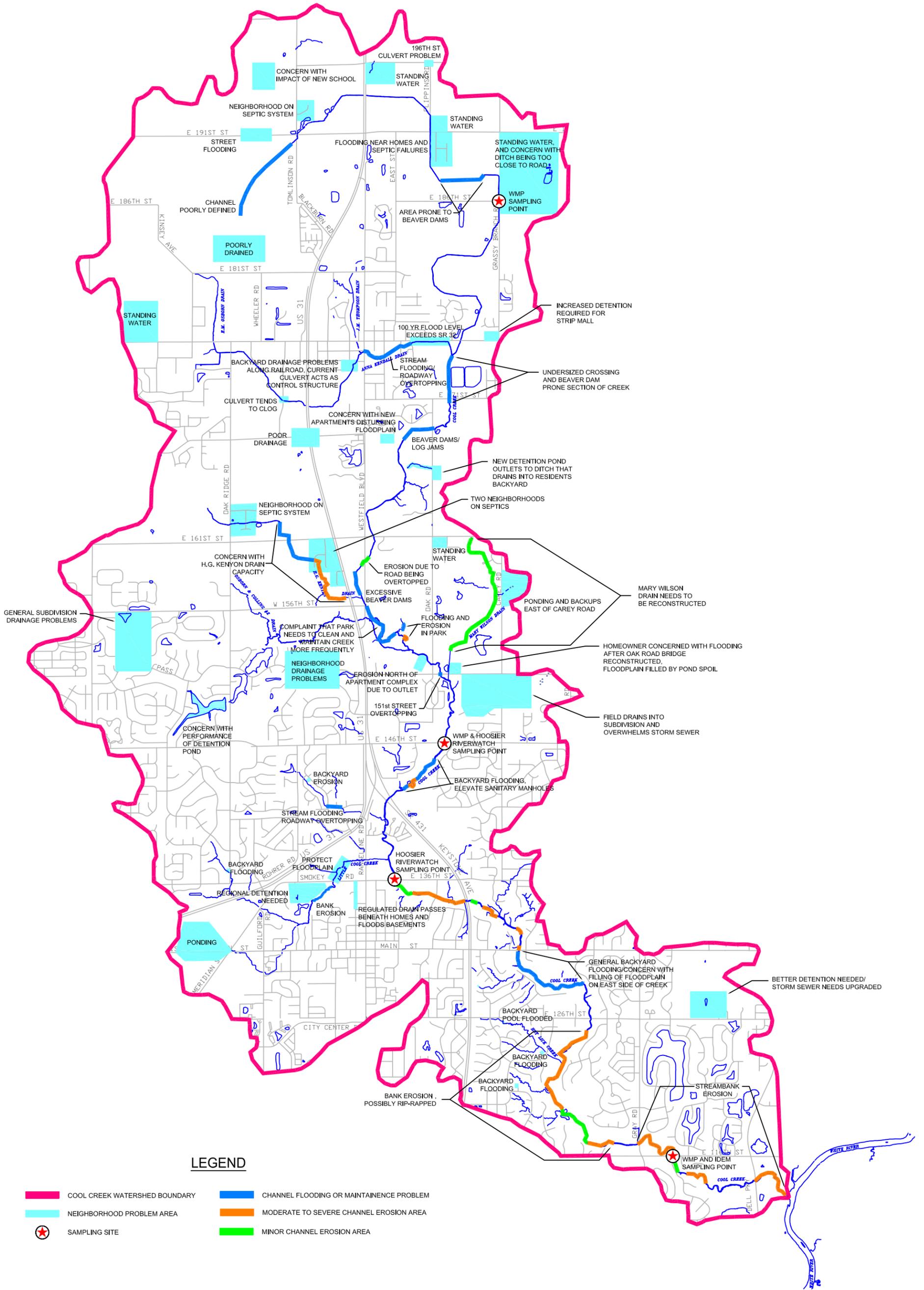
### **3.7 PROBLEM AREA MAP**

Problem area information obtained from the various sources is summarized on the Problem Area Map, provided in Figure 3-1. The map shows the areas of channel erosion, localized flooding problem areas (neighborhood areas), and stream reaches with reported flooding problems, and other problems or concerns reported through the interviews and public meetings.

A second set of more detailed maps was also prepared and transmitted separately from this report. This map set, titled “Cool Creek Stream Inventory Maps”, is comprised of 13 sheets (24” x 36”) covering the main Cool Creek channel and floodplain. This map set provides a baseline condition inventory from which to compare and assess future watershed conditions. The maps show the following information:

- 100-year base flood elevation reference marks
- 100-year floodplain delineation
- Structures located in the floodplain
- Cross-section locations from the Flood Insurance Study hydraulic models
- Approximate wetland locations from the National Wetland Inventory Maps
- Location and size of stormwater outfalls
- Photographs of channel erosion, debris blockage and other areas of interest

Selected problem areas were targeted for more detailed analysis and solution development. These areas are presented in Chapter 7.



**LEGEND**

- COOL CREEK WATERSHED BOUNDARY
- CHANNEL FLOODING OR MAINTENANCE PROBLEM
- NEIGHBORHOOD PROBLEM AREA
- MODERATE TO SEVERE CHANNEL EROSION AREA
- SAMPLING SITE
- MINOR CHANNEL EROSION AREA



NOT TO SCALE

COOL CREEK WATERSHED MANAGEMENT PLAN  
**FIGURE 3-1**  
PROBLEM AREA MAP