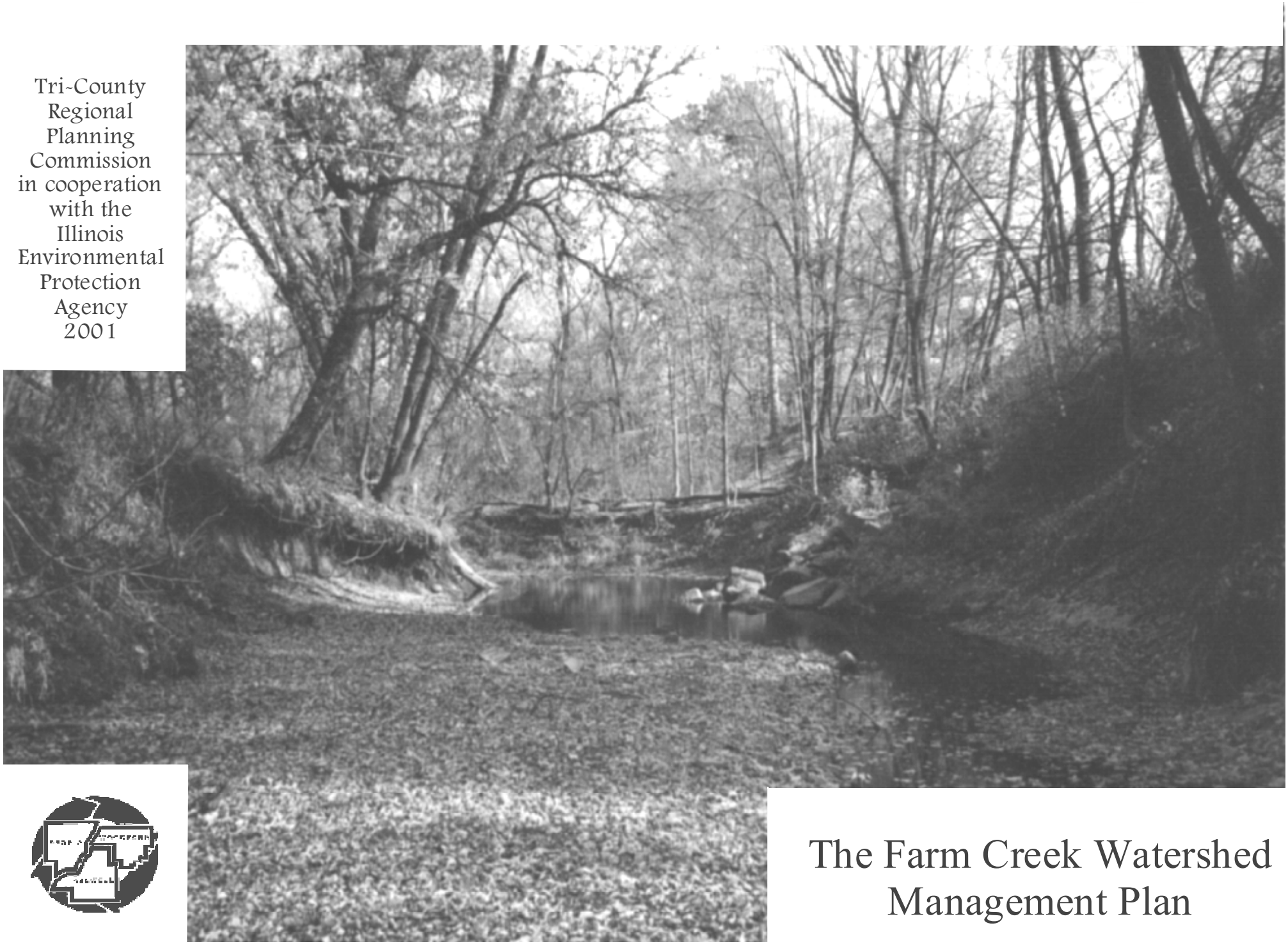
Tri-County Regional Planning Commission in cooperation with the Illinois Environmental Protection Agency 2001



The Farm Creek Watershed Management Plan

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Funding provided (in part) by the Illinois Environmental Protection Agency through Section 104 of the Clean Water Act.

IDNR	Illinois Department of Natural Resources
IDENR	Illinois Department of Energy and Natural Resources
USEPA	United States Environmental Protection Agency
IEPA	Illinois Environmental Protection Agency
USGS	United States Geological Survey
USACOE	United States Army Corp of Engineers
ISGS	Illinois State Geological Survey
INHS	Illinois Natural History Survey
USF&WS	United States Fish & Wildlife Service
ISWS	Illinois State Water Survey
BMP	Best Management Practices
USDA-NRCS	United States Department of Agriculture-Natural Resource Conservation Service
SWCD	Soil & Water Conservation District

Table of Contents

Mission Statement 1

Watershed Description 2

Watershed Activities
- WaterMarks CD-ROM 5
- Farm Creek Tour and Assessment
- CREP Enrollment 6
- Illinois Riverfront Development: Feasibility Study
- Soil Erosion and Sediment Delivery Survey 7

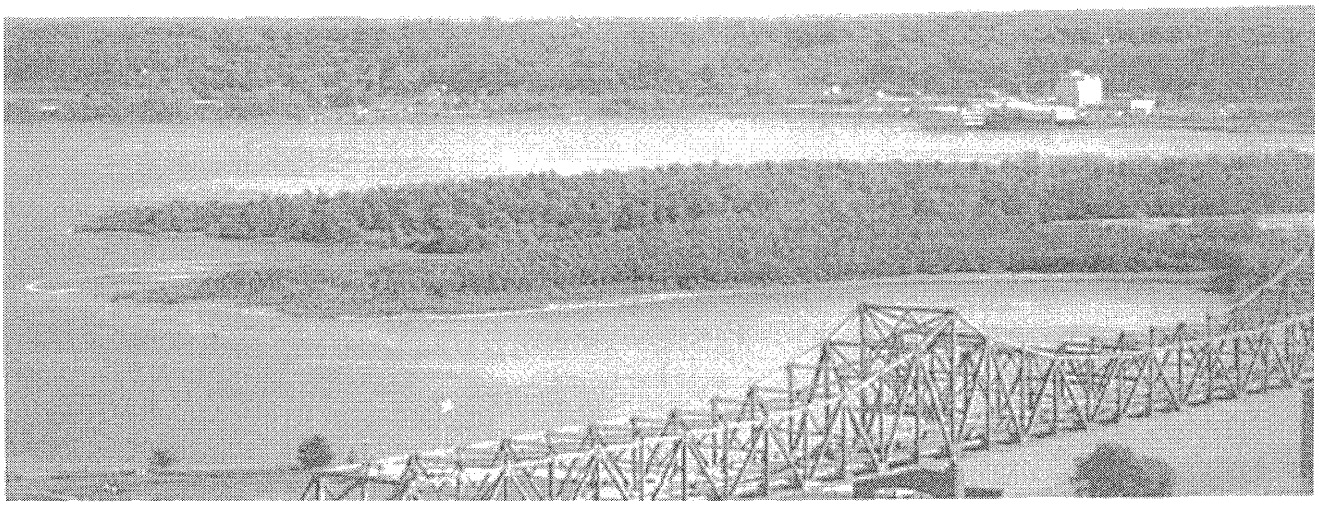
Watershed Resource Inventory
- Waterbodies 9
- Habitat Analysis of Farm Creek 11
- Designated Uses 14
- Designated Use Support 15
- Impairments
- Groundwater
- Irrigation 18
- Drainage 19
- Floodplain Boundaries
- Municipal/Industrial 22
- Hydrologic Modifications 24
- Stormwater Management 27
- Wetlands 28
- Priority Waterbody 31
- Soil Classification
- Soil Erosion 33
  - Soil Erosion & Sediment Delivery Survey 35
- Geology 54
- Topography
- Land Use
- Riparian Corridor 60
- Cultural Resources & Watershed Planning 61
- Greenways 72
- Transportation 75
- Air Quality 76
- Fish
- Wildlife 77
- Socio-Economic/Human Resources 79

Problem Statements 81

Goals/Objectives 83

Alternative Implementation Strategies, Costs & Selected Implementation strategies 87

The Future & Our Success 94

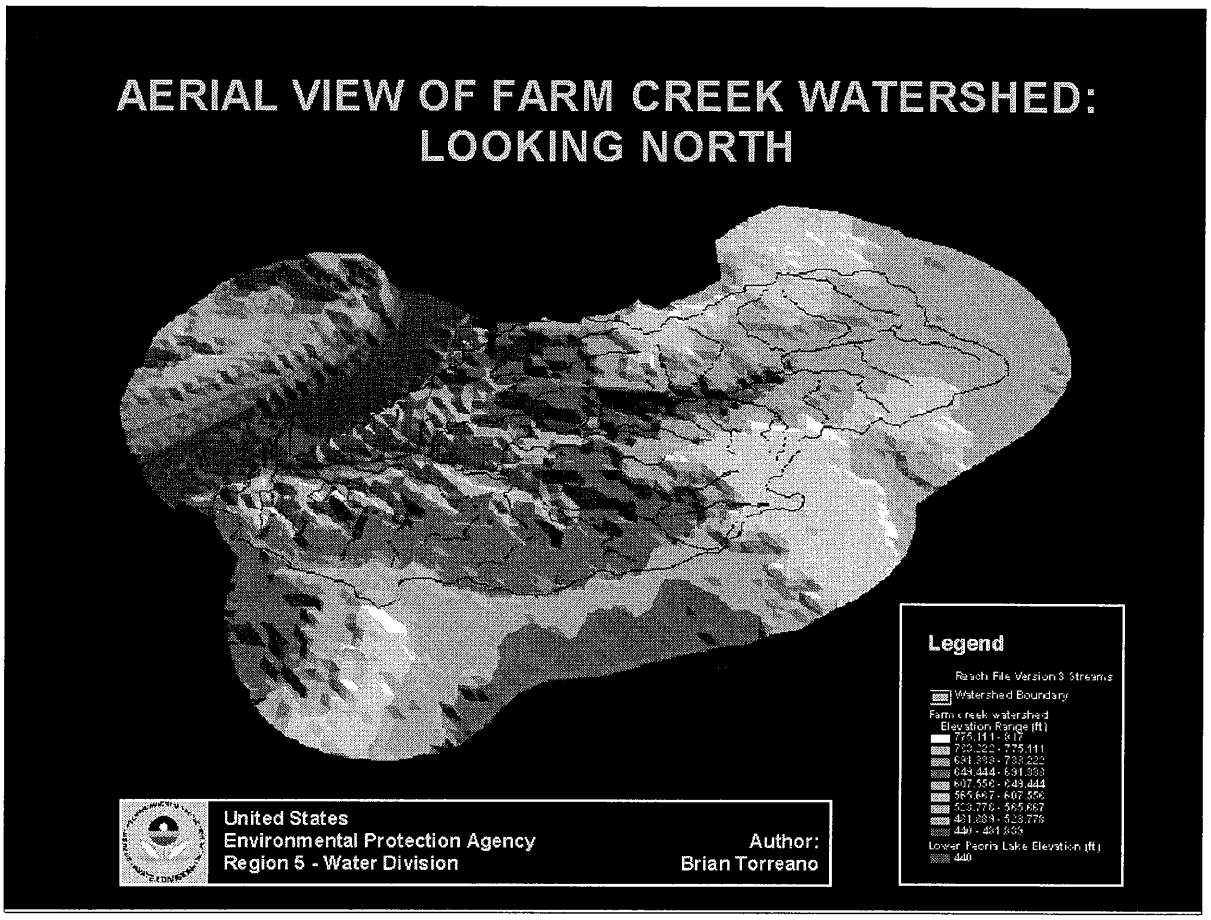


Mission Statement

It is the Mission of the Farm Creek Planning Committee to develop a Watershed Implementation Plan intended to preserve and enhance the natural resources present in the Farm Creek watershed through good management practices, education and voluntary landowner cooperation while respecting property owner rights.

Watershed Description

Farm Creek is in the Illinois River watershed in central Illinois. Its watershed is confined to Tazewell County. The area is roughly oval shaped, containing 60.95 square miles and 39,007 acres. The hydrologic unit is 07130001 and it is a subwatershed of the Lower Illinois-Senachwine Lake Watershed. Farm Creek has its source in the northeastern part of Tazewell County, about two miles north of the town of Washington, Illinois. It flows in a westerly direction to a junction with the Illinois River at East Peoria. Farm Creek is about 19 miles long and follows a somewhat sinuous course. From source to mouth, the fall is approximately 372 feet. The valley is characterized by flat narrow bottoms and very steep side slopes as far upstream as Washington, where it merges with the rolling upland. In the upper reaches, its width is only a few hundred feet, and its maximum width near mile 4.0 is about one half mile. Wooded hills rise



about 200 feet on either side of the valley. Principal tributaries to Farm Creek include Fondulac, Little Farm, School, Cole, Kerfoot, Dempsey and Ackerman Creeks.

The streams found below the bluff line have been extensively modified to control flash flooding. Farm, Cole, Kerfoot and Fondulac Creeks have all had channel modifications for flood control purposes. These improvements included construction of levees, concrete lining of the channels and straightening of the creeks. Two flood control reservoirs are currently found within the watershed. Farmdale dam and reservoir are found on Farm Creek between East Peoria and the City of Washington. Fondulac Dam and reservoir are on Fondulac Creek in the North West portion of the watershed*.

Roughly, 43% (forty-three) of the watershed lies within incorporated municipalities. These include the Village of Morton, City of Washington, City of East Peoria, and the Village of Creve Coeur. The 1990 population within the watershed was 48,009. Population estimates for this area in 1998 suggest a 3.8% growth in population. Tazewell County projected population growth for the next twenty years are approximately 7.5%.

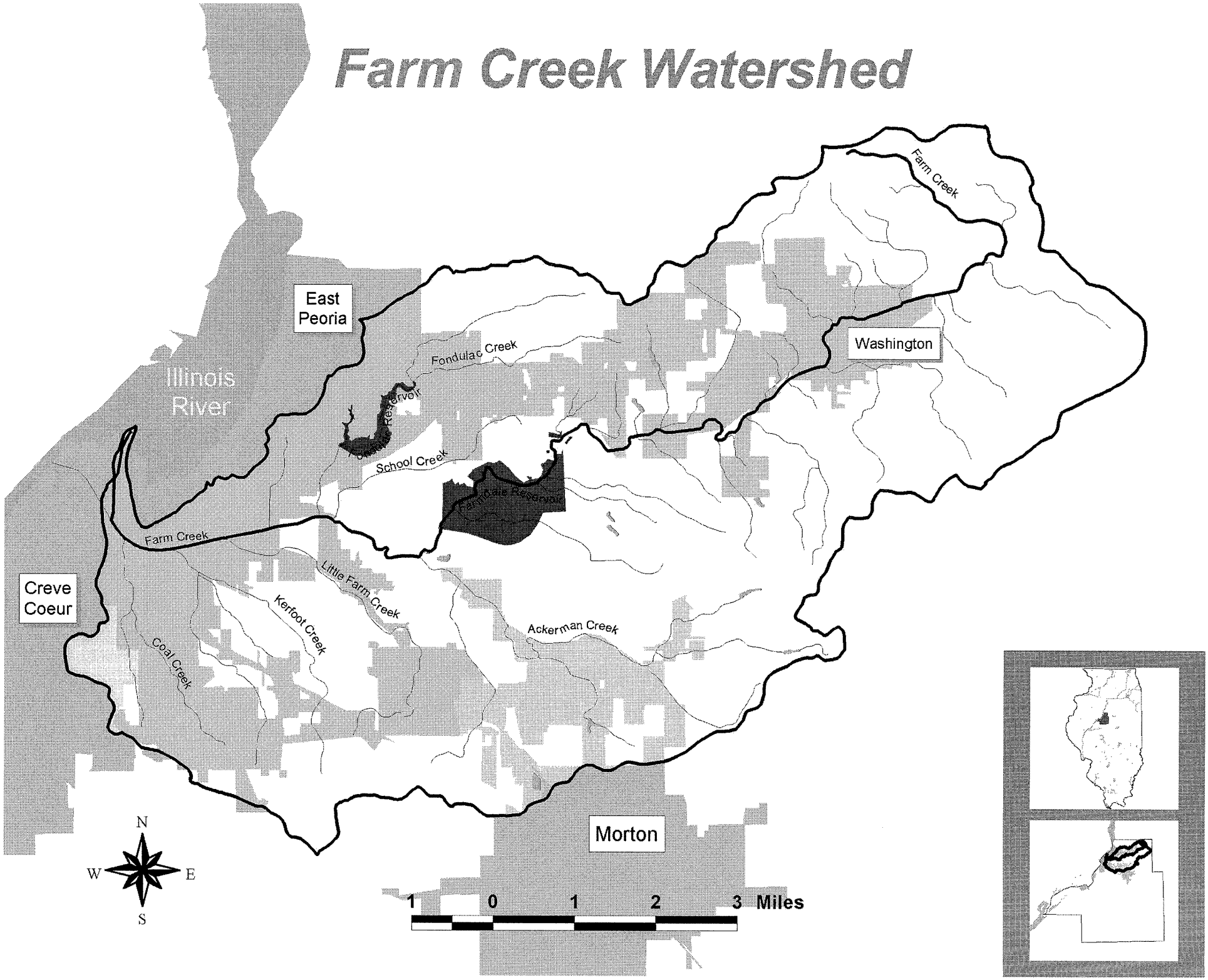
*USACOE, 1995

Tazewell County Population Projections*

1990	*1995*	*2000*	*2005*	*2010*	*2015*	*2020*
123,692	128,500	129,771	131,222	131,537	132,167	133,791

*Census and Data User Services at Illinois State University http://138.87.160.6/cadus/

Farm Creek Watershed



Watershed Activities

1) WaterMarks CD-ROM
2) Farm Creek Tour and Assessment
3) CREP Enrollment
4) Illinois Riverfront Development at Peoria, Illinois
Environmental Restoration Feasibility Study
5) Soil Erosion and Sediment Delivery Survey

WaterMarks CD-ROM: In 1999 TCRPC received funding to begin development of a CD of watershed information. It is to be used as a library from which custom-built presentations can be made. Due to variety of audiences within a watershed, we saw the flexibility of tailoring the presentation to the audience as an advantage. The CD will also be interactive in nature, allowing the user to explore topic areas as he or she sees fit. Currently, a schedule of presentations to be made to various organizations and entities is being developed. The CD was presented in late August to the Lt. Governors Illinois River Coordinating Council. With this management plan development; we will highlight Farm Creek on the CD. The tour of Farm Creek conducted on October 1999 will be the base for a virtual tour of the Farm Creek watershed. The use of this CD and the material it contains will be a vital component to the educational action items outlined in this plan.

Farm Creek Tour and Assessment: In October of 1999, TCRPC staff, Bradley University staff and engineers from ESE Inc. accompanied representatives from the City of Washington and Tazewell County on a tour of Farm Creek. In October, this group began just west of Washington and over two days walked the channel of Farm Creek to Farmdale Dam. At approximately .2-mile intervals, a 360-degree virtual reality (VR) photograph was taken. A Global Positioning

System (GPS) was taken to record our location. TCRPC and Bradley University has made this information part of the WaterMarks CD. The location information can be used each following year to monitor changes in the stream. In November of 1999, a similar survey of Ackerman Creek was conducted to familiarize the Planning Committee with the largest tributary to Farm Creek.

CREP Enrollment: In February of 2000, the Tri-County Regional Planning Commission (TCRPC) staff began working with United States Department of Agriculture Natural Resources Conservation Service (USDA-NRCS) on increasing Conservation Reserve Enhancement Program (CREP) land enrollment within the watershed. All eligible lands were delineated using the Tazewell County Soil Survey. We have developed a landowner list of all potential ground eligible under the CREP program. Sponsors of the program are USDA-NRCS Tazewell County, University of Illinois Extension Service, Tazewell County Farm Bureau, and TCRPC.

Illinois Riverfront Development at Peoria, Illinois

Environmental Restoration Feasibility Study: In November of 1998 the United States Army Corps of Engineers (USACOE) issued the project study plan for a feasibility study to be conducted on the restoration of the Peoria Lakes. They broadly defined the alternatives to be studied as:

1. Measures to reduce the existing sedimentation in the Upper and Lower Peoria Lakes in order to preserve and restore aquatic habitats;

2. Measure to reduce future sedimentation in the Farm Creek Delta and Lower Peoria Lake; and

3. Measures that include restoration of the aquatic and terrestrial conditions within Peoria Lake to a less degraded condition.

In the spring of 2000, USACOE and the Illinois Department of Natural Resources (IDNR) began work on the project. TCRPC staff has been coordinating with Rock Island District COE and the Illinois State Water Survey (ISWS) offices in Peoria, IL. This has included exchanges of relevant information regarding Farm Creek and the distribution of Farm Creek specific Geographic Information System (GIS) data to agencies. Finally, inclusion of the USACOE on the technical and planning committees has been very productive. In the spring of 2000, TCRPC staff will help the USACOE personnel in identifying suitable locations within the watershed for monitoring activities.

Currently, the Planning Committee is coordinating efforts with IDNR and USACOE. We have identified several projects throughout the watershed. It is our intention to have Farm Creek be the model for planning and implementation of watershed management plans. The USACOE and IDNR are both supporting Farm Creek as the first watershed in the area to see implementation as part of the Illinois River Restoration.

Soil Erosion and Sediment Delivery Survey: In February of 2000, TCRPC staff met with the Tazewell county Soil and Water Conservation District Board and USDA-NRCS to discuss the details of the project. The purpose of the project will be to estimate the sediment load at the outlet of the watershed. Identify the proportionate types of erosion occurring in the watershed and estimated each types annual delivery to the streams. On Monday, March 6, 2000, staff from the State NRCS office conducted a training for local NRCS and TCRPC staff. The survey was

completed in February of 2001. The results are included in the Soil Erosion portion of the resource inventory.

Watershed Resource Inventory

Waterbodies

Lakes & Ponds: Most of the wetlands in the Farm Creek Watershed are identified as part of the Palustrine (ponds & marches) wetland system. These ponds and marshes account for 845.81 acres in the watershed. Table 1 shows available information about ten such Lakes in the watershed. Two reservoirs are also present in the watershed. The US Army Corps of Engineers constructed both as flood control structures. We include these because during periods of heavy rainfall they do hold water for extended periods. Finally, a detention facility is currently under construction north west of the City of Washington. We provide a more detailed description and relevant information in the sections on Wetlands and Floodplains. We have not assessed the conditions of these lakes at this time.

TABLE 1

Lakes & Ponds

Name	Location	Surface Acres	Acre Feet	Maximum Capacity
Farmdale Reservoir	East Peoria	385	11300*	15500
Fondulac Reservoir	East Peoria	95	2280*	3780
West Lake	Washington	NA	141	213
Shepherd Pond	Unincorporated	NA	60	70
Pine Lakes Country Club North Pond	Unincorporated	NA	20	41
Pine Lakes Country Club South Pond	Unincorporated	NA	53	66
Kennel Lake	Unincorporated	NA	24	48
Ossami Lake	Morton	NA	NA	NA
Cape Cod Apartments	Morton	NA	NA	NA
Proposed Detention Basin (Pond E)	Washington	10	63	75.5

* These facilities are for storage only, and do not normally have standing water.

Illinois River & Lower Peoria Lake: Peoria Lake is the largest flow through bottomland lake in the Illinois River valley (IDENR, 1993). The Farm Creek watershed discharges at two points along the Illinois River. The first, a diversion channel off the main channel discharges into the Lower Peoria Lake. The main channel, a second discharge point, found near the Bob Michael Bridge discharges directly into the channel of the Illinois River.

The Lower Peoria Lake has experienced a steady decline in depth, over the last seventy-five years, due to sediment deliveries from the upstream watershed and the subwatersheds surrounding the Lake. The 1986 study by Demissie and Bhowmik (IDENR) estimated about 40% of the sediment delivered to the Lake was coming from local subwatersheds.

The following year a US Army Corps of Engineers Reconnaissance study cited similar findings in preparing its recommendations for a plan to restore depth to the Lower Peoria Lake. Both plans detailed many strategies for solving the sedimentation problem in the Peoria Lakes. These included selective dredging, island building, and altering the pool height by raising the dam, implementation of Best Management Practices (BMP) to reduce erosion and control sediment inputs (IDENR, 1986). They recommended that the following measures be considered when addressing tributary stream sediment controls: A(1) Use BMP's in the watersheds to reduce soil erosion; (2) Start appropriate measures to reduce stream bank erosion and gully formation in the watershed; (3) Build sedimentation basins on tributary streams to trap sediment before it reaches the Lake; (4) Increase dredging of sand and gravel at tributary stream channels; (5) Re-divert Farm Creek from its present course to its original course to stop sediment input from Farm Creek to Lower Peoria Lake (IDENR, 1986).

The opportunity exists to address many problems in the Farm Creek watershed with solving the sediment problem in the Peoria Lake. Measures to control flooding in Washington can have beneficial impacts on streambank stability downstream of the locations, by that reducing sediment delivery to the Lake. In addition, we can engineer specific sediment detention capabilities into these structures. Effective implementation of storm water and erosion control ordinances will also reduce flooding and erosion. Finally, water quality will improve from both issues being addressed. The Illinois River and the Peoria Lakes has been the subject of many studies from many disciplines over the years. The reader should consult any of the studies mentioned above for a bibliography of excellent information about the Illinois River and Lower Peoria lakes.

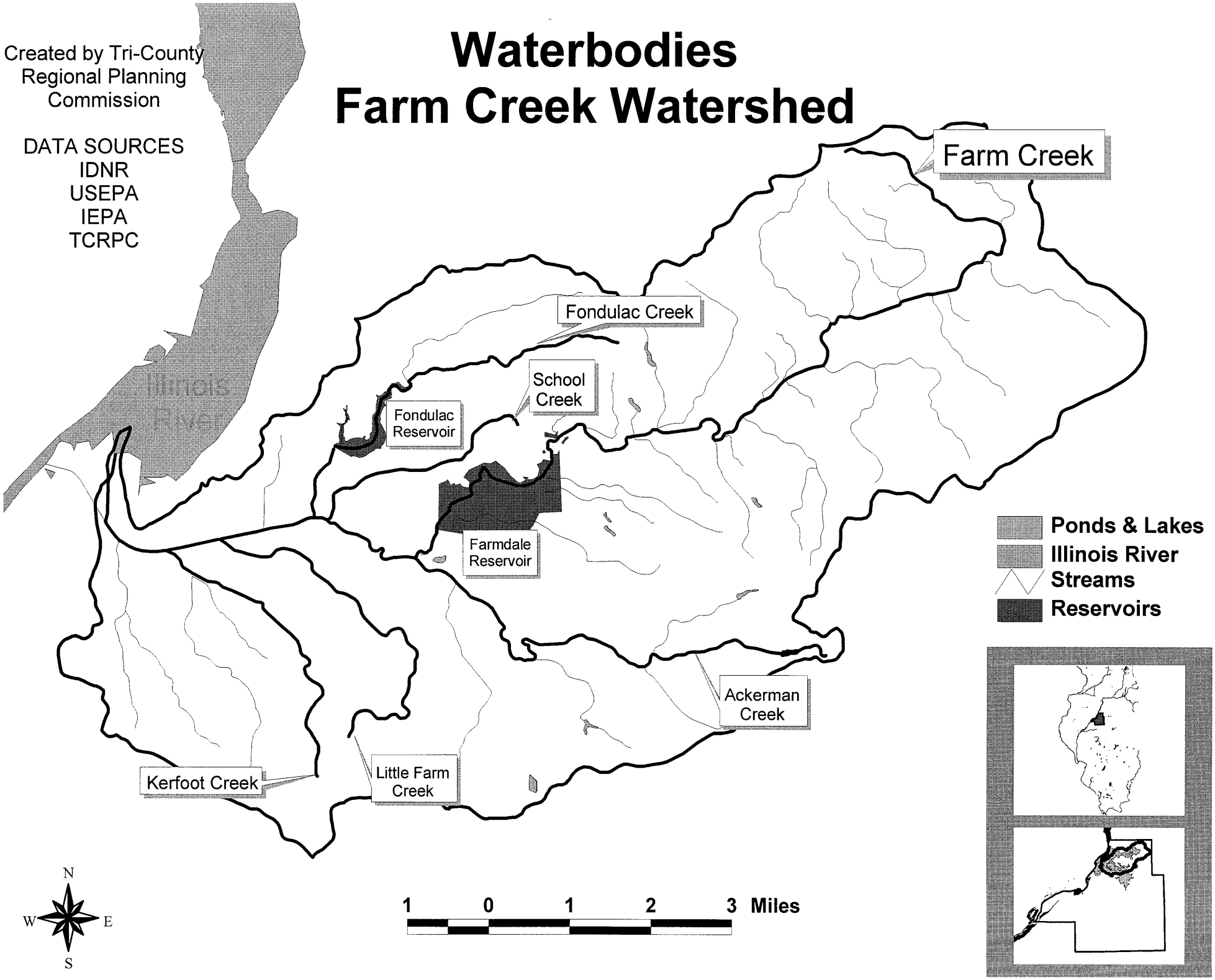
Streams: Farm Creek is a perennial stream, approximately 19 miles in length. It originates North of the City of Washington. It flows westerly through East Peoria where it intersects with the Illinois River. The elevation drops from source to mouth is approximately 372 feet (USACOE, 1998). Water quality trends suggest a decline in water quality, due to slight amounts of nutrients and moderate siltation. The sources of these include slight municipal point sources, slight urban runoff/storm sewers, moderate hydrologic/habitat modification, and moderate flow regulation/modification (IEPA, 1994). The latter two have been added since 1993. Twenty intermittent streams drain the watershed into Farm Creek. Major tributaries to Farm Creek include Fondulac, School, Kerfoot, Cole, Ackerman, and Little Farm Creek. The lower portions of Farm Creek plus Cole and Kerfoot Creeks have been extensively modified for flood control purposes. They have not modified School Creek, however, it does serve as the emergency discharge location for the Farmdale Reservoir emergency spillway.

Data: Farm Creek Watershed has been monitored for various factors over the last three decades. The Illinois Environmental Protection Agency (IEPA) collects and maintains chemical, physical, and biological water quality data in Illinois. Also, IEPA and Illinois Department of Natural Resources conduct joint stream sampling efforts each year, collecting and analyzing data on fisheries, benthic macro invertebrates, stream habitat, sediment and water. This sampling data is used to develop the water quality information described in the next section.

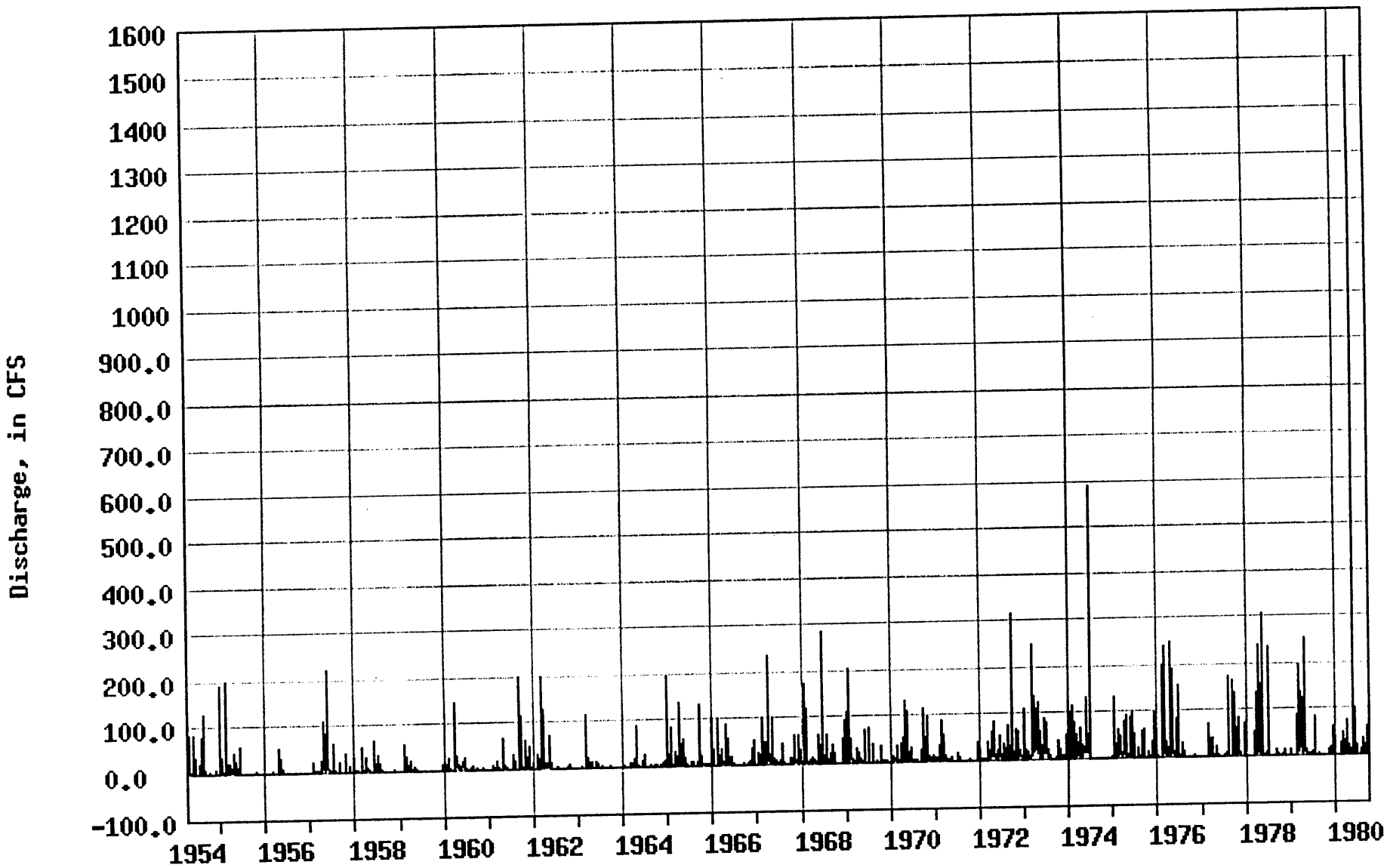
Waterbodies
Farm Creek Watershed

Created by Tri-County Regional Planning Commission

DATA SOURCES
IDNR
USEPA
IEPA
TCRPC

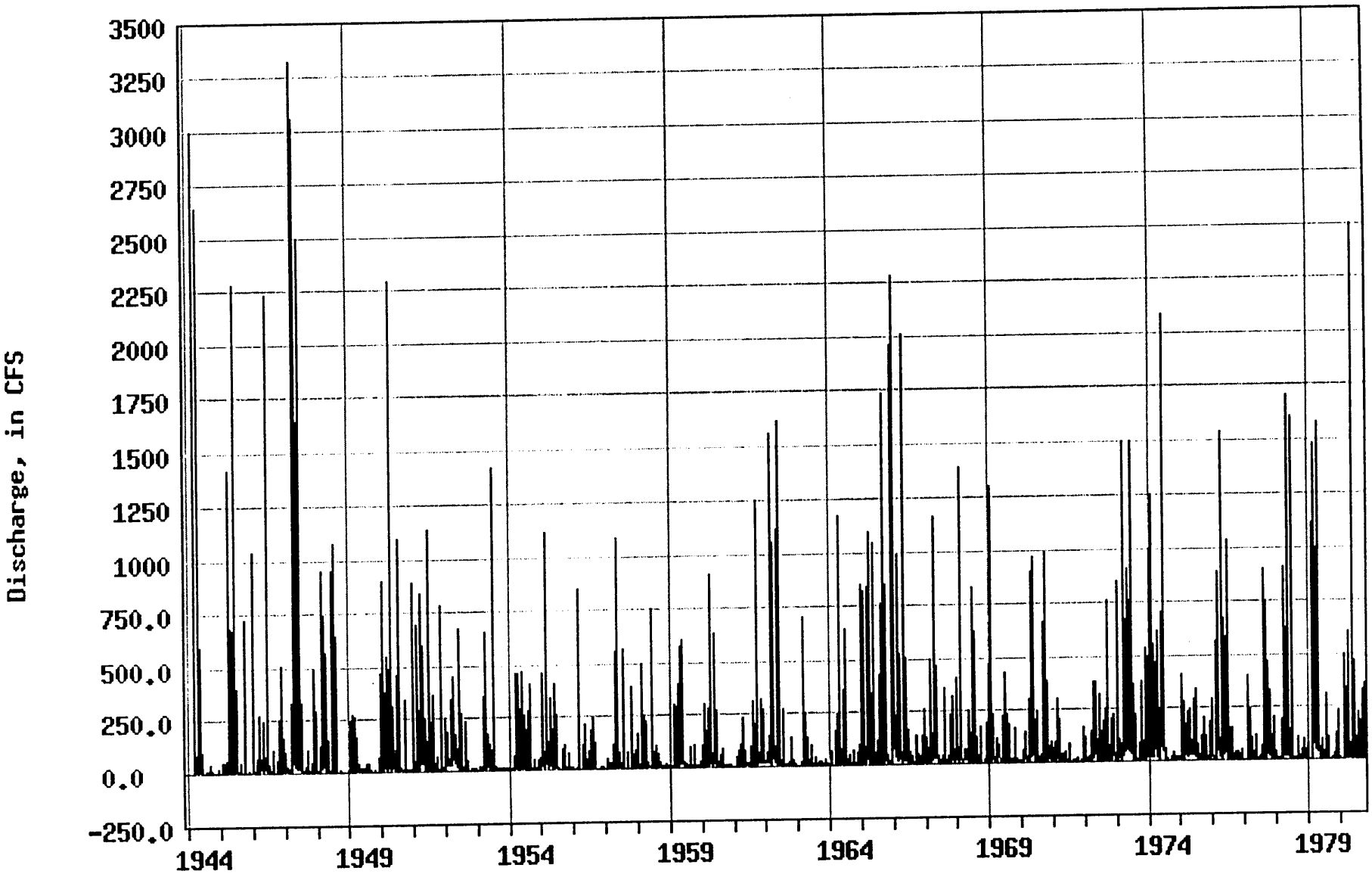


Ackerman Creek At Farndale, Il
Station Number: 05561000



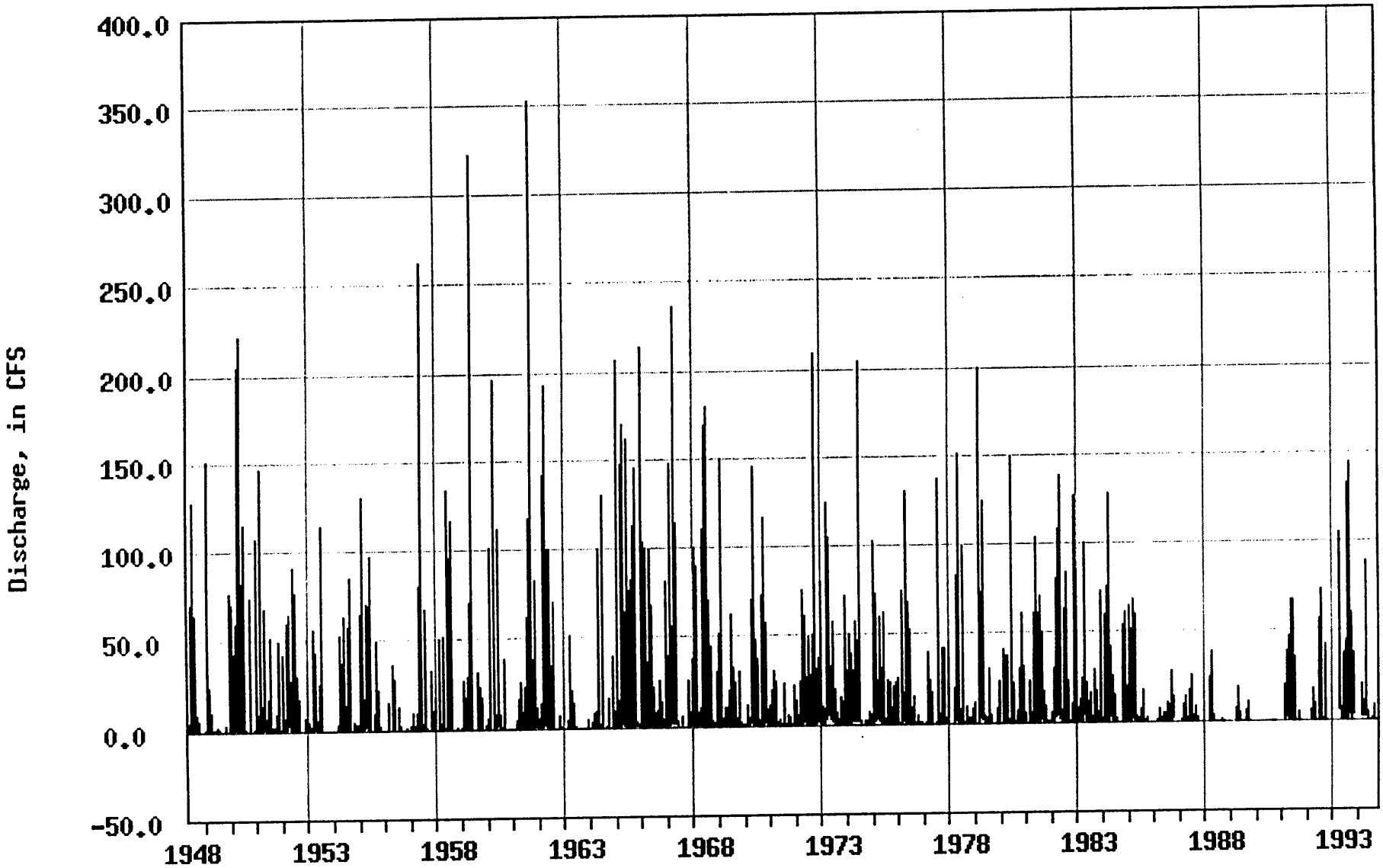
Legend: ——— Discharge, in CFS
——— Estimated Discharge, in CFS

Farm Creek At East Peoria, Il
Station Number: 05562000



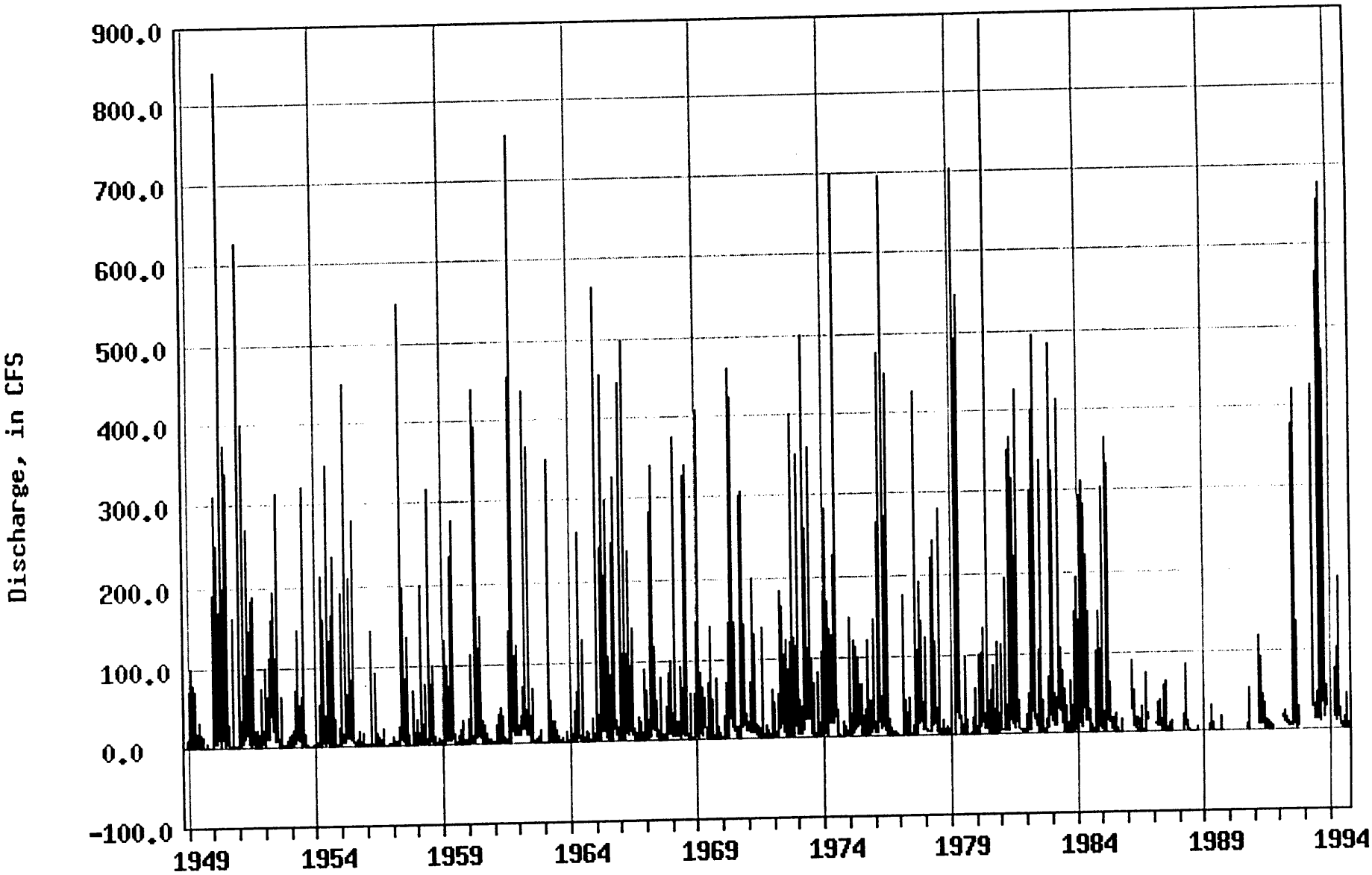
Legend: ——— Discharge, in CFS
——— Estimated Discharge, in CFS

Fondulac Creek Near East Peoria, Il
Station Number: 05561500



Legend: ——— Discharge, in CFS
——— Estimated Discharge, in CFS

Farm Creek At Farndale, Il
Station Number: 05560500



Legend: ——— Discharge, in CFS
——— Estimated Discharge, in CFS

Data about Waterbodies in the watershed is also maintained by the USACOE, USGS, and USEPA. The Corps of Engineers maintains two such monitoring stations in the watershed, at Farmdale and Fondulac Reservoirs. The USGS operated and monitored four stations in the watershed. The USGS stations monitored Cubic Feet per Second discharges at Ackerman Creek, Fondulac Creek, and Farm Creek at two locations (one at Farmdale Reservoir and another further downstream). As can be seen on the chart on the following pages, monitoring took place from 1944 through 1994. These stations ceased to be maintained for funding reasons (www.usgs.gov). The reestablishment of the Ackerman Creek station and the establishment of a new monitoring facility upstream of the Farmdale Reservoir would provide valuable information to various agencies and local municipalities.

Other data that is available includes the following data sets*:

Bacteria Data 1970 - 1997
National Sediment Inventory Chemistry Data 1980 - 1992
National Sediment Inventory tissue Residue Data 1982 - 1992
Water Quality Data 1970 - 1997

*Data Source: U.S. EPA BASINS (Better Assessment Science Integrating Point and Nonpoint Sources)

These data sets cover the Lower Illinois Senachwine Lake Watershed of which Farm Creek is a Subwatershed. They include data for the monitoring stations in Farm Creek. This information is used to complete the annual water quality reports published by the IEPA.

Habitat Analysis of Farm Creek

Summary

During the spring of 2001, Tri-County Regional Planning Commission conducted a stream habitat and aquatic insect survey of Farm Creek in order to investigate the condition of the stream through physical and biological characterization. Farm Creek runs through the City of Washington as well as the City of East Peoria, and as result encounters residential, industrial, and agricultural land. The impacts of land use on the stream included stream bank erosion, sedimentation and habitat degradation. Overall, biotic diversity of aquatic insects was low and few pollution intolerant species were found. This lack of diversity could be the result of 1) a small sample size at each location 2) the study being performed before all insects had a chance to hatch making themselves available for sampling and 3) a degraded stream system incapable of supplying critical habitat necessary for the survival of a multitude of species. Although the biologic study was not intensive by scientific standards, the information collected gives us a valuable understanding of the general conditions along the entire length of Farm Creek.

Methodology

Physical Characterization: Using the Stream Habitat Walk survey created by the EPA (on the web at http://www.epa.gov/volunteer/stream/ds4a.pdf), data was collected every 0.5 ± 0.3 miles beginning 2.7 miles from the source of the stream at Washington and ending near the mouth, approximately 2.5 miles from the Illinois River. A Global Positioning (GPS) Unit was used to determine exact location along the stream.

Background in biological indicators: The general health of a stream can be determined by the analyzing the aquatic insects inhabiting the fresh water system. Benthic macro invertebrates vary in their ability to survive in polluted waters giving rise to certain indicator species that only inhabit streams with limited pollution. Mayflies, Stoneflies, and Caddis flies are examples of indictor species; if these insects are found on the stream bottom, then we can assume that the stream is relatively healthy with limited pollution. Diptera (true flies), on the other hand, can live in an extensively polluted system and are often seen in numerous amounts in streams polluted with sediment, fertilizers, etc.

Not only can scientists examine the presence of certain species, but a quantitative value of the macro invertebrate distribution is also a valuable key to understanding the condition of our streams. A healthy stream is inhabited by many species with similar numbers of individuals in each taxa. Quantitatively, the Shannon-Weiner index takes into account both species richness and evenness with the following equation:

$$H' = -\sum pi \ln pi$$
$$pi = n / \sum n$$

Where *H'* is the Shannon-Weiner index, and *pi* is the proportion of the number of individuals in a single species (n) and the total number of organisms collected ($\sum n$).
The value of H' gives a measurement of uncertainty in the collected organisms. If one were to randomly select organisms from a stream, the H' value would tell the difficulty with which one could correctly predict the species of the next individual to be collected. A high uncertainty value >1 would mean that the stream is inhabited by a diverse array of species somewhat evenly arranged, making it difficult to predict which organism would be randomly selected from the pool. An H' value of low uncertainty would indicate that few species inhabit the stream and perhaps one or two specific species dominate that area making the predictions of randomly selected species easier, or more certain (a dominant species is likely to be pulled).

Biological characterization: All macro invertebrates were collected by scraping the base of the stream with sticks and rocks; the stream sediment and organic mater were then allowed to flow into a net connected to a one-foot square quadrant in which the dredging occurred. At each station, two square feet of stream bottom were sampled. Insects were generally collected in the run of the stream if one existed. All material collected in the net was strained and benthic macro invertebrates were tallied on site to the taxonomic level of Order.

The Shannon-Weiner index was calculated for each collection site and the data was categorized into groups of tolerant, moderately tolerant, and intolerant species according the IDNR pollution tolerance rating used in the River Watch program (http://dnr.state.il.us/orep/inrin/ctap/bugs/default1.htm).

Results and Discussion

All data collected pertaining to the Stream Habitat Walk Survey by the EPA can be seen in Table 1. General observations include large amounts of habitat degradation and a high percentage of embedded rock caused by sedimentation. The destruction of natural ecosystems adjacent to the stream channel results in (1) A decreased amount of vegetation shading the stream. Aquatic organisms need shade for refuge from the hot sun. The shade keeps the water temperature appropriate for these organisms to thrive. (2) A decrease in the organic material within the streambed. Organisms depend on this organic material for the food web. Without this base of decomposing material, the ecosystem is limited in the number of species it can accommodate. (3) Decreased stream bank stability. Without the long rooted vegetation from prairie grasses and other vegetation holding the soil in place, the stream bank has little resistance to erosion. Erosion along a stream bank is especially harmful because 100% of the soil eroded goes into the stream system. The high frequency of the 'vertical' and 'steeply sloping' value under the 'shape of stream bank' field in Table 1 indicates that stream bank erosion is occurring. During the stream walk we would often see signs of active stream banks such as young trees falling into the stream channel and mats of grass and other living vegetation sliding down a vertical cut.

The majority (95%) of the organisms collected in the biological survey were of the order Diptera (Figure 1). These fly larvae are generally tolerant to somewhat polluted and degraded environments. The large percentage of Diptera collected indicates poor habitat conditions in which many intolerant species are unable to colonize leaving vacancies and limited competition for the fly larvae; the tolerant fly larvae then flourish.

Although the Farmdale Dam located 13 miles from the stream head serves as a filter for sediment pollution to the remaining stream, no significant differences in H' values existed between sample stations above and below the dam (Table below). The average H' of the entire stream was 0.41 ± 0.44. This value is relatively low indicating a system with poor diversity of insects.

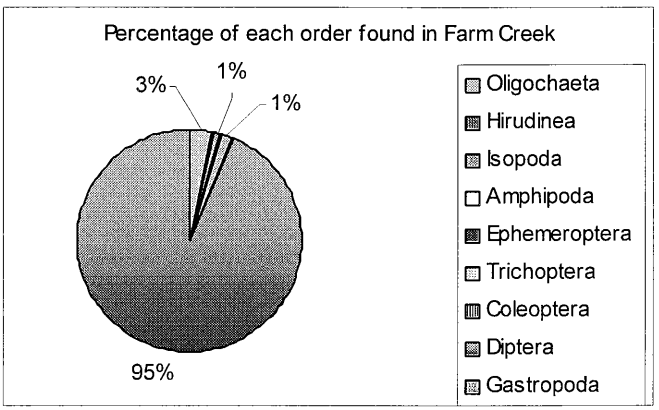


Figure 1 Percentage of each order demonstrates large numbers of Diptera present in samples

Shannon Weiner Index Table
With Reference to Farmdale Dam

Stream Section	Ave H'	Standard Deviation
Above Dam	0.41	0.47
Below Dam	0.42	0.27
Total Stream	0.41	0.44

While tolerant species dominated Farm Creek, intolerant and moderately tolerant species, as defined by The Department of Natural Resources, did exist in certain sections of the stream. Figure 2 is an analysis of the percentages of tolerant, moderately tolerant, and intolerant species as well as H' values as they pertain to distance from the stream head. The 'X' value of stream distance is not to scale, however, samples were taken at relatively equal intervals. Higher diversity (H') values are correlated with the presence of intolerant species; however, there is no pattern to species composition throughout the coarse of the stream.

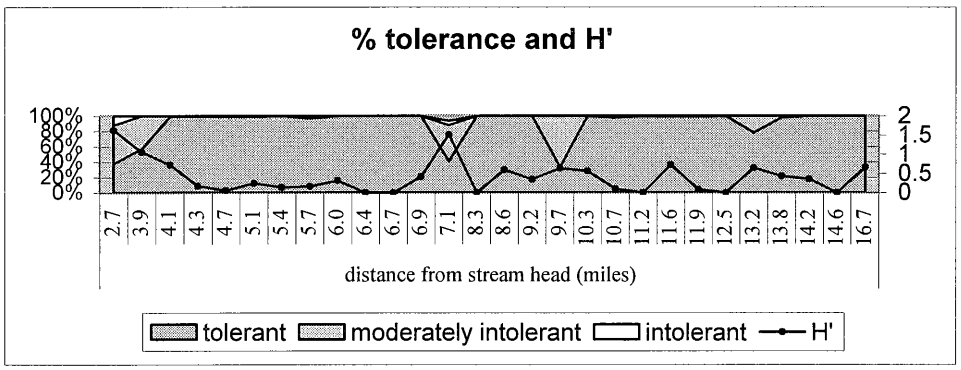


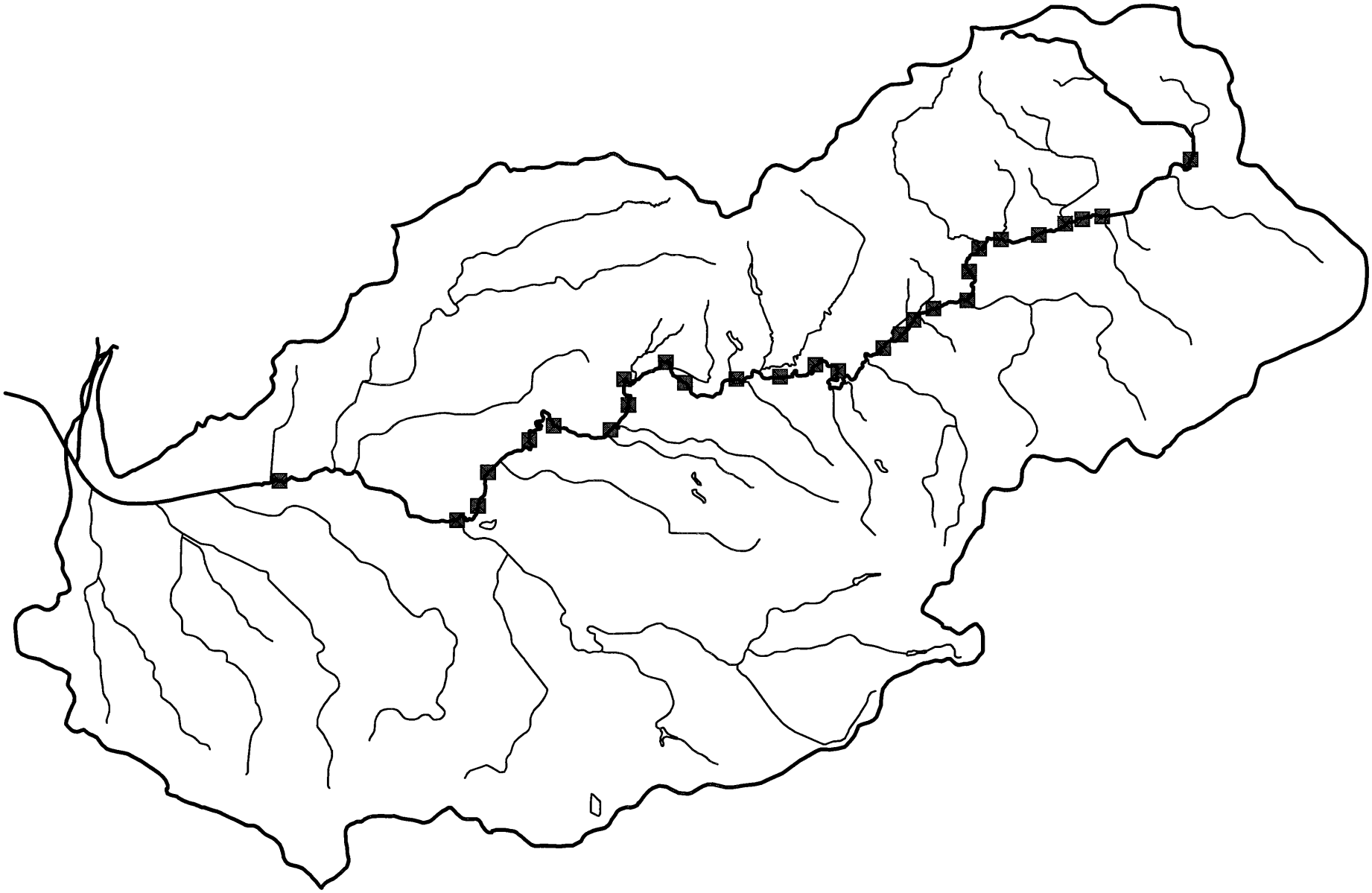
Figure 2 Percent of Orders in each tolerance category and H' values. H' is greatest in areas where intolerant species exist

Once again, the overall diversity of the insects collected in this habitat survey was low indicating a degraded freshwater ecosystem. While it is possible that more species may have inhabit the stream in the summer months as they had a chance to hatch, the large numbers of true flies dominating the stream indicates poor stream health.

Designated Use

Illinois waters are classified for a variety of designated uses. A water body could support the designated use that they have classified it. The ability of a water body to attain a specified use is

Farm Creek Habitat Assessment



Inventory Sites

Farm Creek Stream Assessment					
Physical Characterization	**1**	**2**	**3**	**4**	**5**
Miles from head	3.9	4.1	4.3	4.7	5.1
stream habitats present	pools, riffles, runs		runs	runs	pools, riffles, runs
Nature of Particles					
silt/clay/mud	some	none	some	some	some
sand	some	most	some	most	some
gravel	most	some	some	most	some
cobbles	some	none	none	concrete	none
boulders	none	none	concrete	none	none
bedrock	none	none	none	none	
Extent of embedded rock	0-25%	75%	75%	0-25%	50%
logs/woody debris	none	occasional	occasional	occasional	occasional
organic material	none	occasional	occasional	none	occasional
water appearance	clear	clear	light brown	clear	foamy, light brown
water odor	none	sewage	none	none	none
water temperature					
depth of runs	<1ft	<1 ft	1-2 ft	1-2 Ft	< 1 ft
depth of pools	1-2 ft	1-2 ft			1-2 ft
width of channel	20	20	15	25	20
stream velocity					
shape of stream bank					rail colvert
left	gradual slope	verticle	verticle	verticle	gradual
right	gradual slope	verticle	verticle	verticle	gradual
artificial bank modifications			railroad		
left	50-75% covered	0-25%	0-25%	0-25%	0-25%
right	0-25% covered	0-25%	0-25%	0-25%	0-25%
shape of channel	narrow, shallow	narrow, shallow	narrow, shallow	wide, shallow	narrow, shallow
stream side cover					
trees		lf com, rt pres	lt pres, rt pres	lf pres, rt com	lf pres, rt pres
bushes, shrubs		lf com, rt pres	lf pres, rt pres	lf pres, rt com	lf pres, rt pres
tall grasses, ferns	lf com, rt pres	lf com, rt pres	lf com, rt pres	lf pres, rt com	lf pres, rt pres
lawn			rt com		lf com, rt com

Miles from head	3.9	4.1	4.3	4.7	5.1
stream side cover (cnt'd)					
boulders/rocks			rt com		
gravel/sand					lf com, rt com
bare soil				lf pres	
pavement, structures			rt pres		lf com rt pres
top of stream bank					
trees	lf, rt present	lf com, rt pres	lf pres, rt pres	lf pres, rt com	lf pres, rt pres
bushes, shrubs		lf com, rt pres	lf pres, rt pres	lf pres, rt com	lf pres, rt pres
tall grasses, ferns	lf, rt common	lf com, rt pres	lf pres, rt pres	lf pres, rt com	lf pres, rt pres
lawn	lf common	lf com	lf pres, rt com		lf com, rt com
boulders/rocks		lf com	lf pres		lf com, rt com
gravel/sand					
bare soil	rt common	rt pres		lf com(farm)	
pavement, structures	lf common	lf com	lf pres, ft com		lf com, rt com
% vegetation shading stream	0	50	0	25	75
General conditions of stream banks	streamside plant	banks collapsed	plant cover	lf plant degraded,	plants degraded
	cover degraded	errored	degraded	banks collapsed	banks collapsed
general conditions of channel	some mud, silt,	mud, silt sand	garbage	garbage	garbage, sand
	sand entering stream	entering system			silt
other conditions	tile entering stream		ditches entering		yard waste
			tributary 1		
Residential characteristics	sngl-fam housing	sngl-fam housing	sngl-fam housing	SFH, lawns	SFH, lawns
	lawns	lawns	lawns		commercial
Roads	paved	paved	paved	paved	paved
Construction					
Agriculture	cropland	cropland		cropland	cropland
Recreation					
Other					

Miles from head	3.9	4.1	4.3	4.7	5.1
Biological Characterization					
wildlife		waterfowl, mammals	waterfowl, mamm	mammals	waterfowl, mammals
fish	no	no	no	no	no
barriers	road	none	sewar crossing	none	rail colvert
aquatic plants	attached, plentiful	attached, occasional	attached/runs	occasional	attached, occasional
	in pools and riffles	near riffle	occasional	attached, runs	near riffle
algea	none	brownish, light coating	occasional, light	light coating, brownish	occasional, light coating
		occasional	coating/brown	occasional	brown
filamentous algae	none	occasional	occasional, green	occasional	occasional greenish
		greenish			
mats of algae	none	none	none	none	none
macroinverts present					
Turbellaria (flatworm)					
Oligochaeta (aquatic worms) **6**	3	4	1	2	1
Hirudinea (leeches) **8**					
Isopoda (sowbugs) **6**	6	3		1	
Amphipoda (scuds) **4**					1
Odonata (damselflies) **3.5**					
Odonata (dragonflies) **4.5**					
Megaloptera (alderflies) **3.5**					
Ephemeroptera (mayflies) **3.5**					
Plecoptera (stoneflies) **1.5**					
Trichoptera (caddisflies) **3.5**					
Coleoptera (beetles) **5**					
Hemiptera (true bugs)					
Diptera (common fly) **11**	5	200	100	75	75
Gastropoda (snail) **6.5**				1	
H	1.06	0.71	0.056	0.25	0.14

Miles from head	5.4	5.7	6.0	6.4	6.7
stream side cover (cnt'd)					
boulders/rocks					
gravel/sand					
bare soil			rt pres (farm)	rt com (farm)	
pavement, structures	lf present, rt present	lf common, rt common			
top of stream bank					
trees	lf present, rt present	lf present, rt present	lf pres rt com	lf pres rt com	lf com rt com
bushes, shrubs	lf present, rt present	rt present	lf pres rt com	lf pres rt com	lf com rt com
tall grasses, ferns	lf present, rt present	rt present	lf pres rt com	lf pres rt com	lf com rt com
lawn	lf present, rt present	lf present, rt present	lf pres	lf pres rt com	
boulders/rocks			lf com		
gravel/sand	lf present, rt present				
bare soil				lf pres rt com	
pavement, structures	lf present, rt present	lf common, rt common	lf com		
% vegetation shading stream	50%	75%	75%	50%	75%
General conditions of stream banks	lf plant cover degraded	lf plant degredation	plant degraded	plant degredation,	plant cover degraded
	rt banks collapsed	severe, garbage	banks collapsed	banks collapsed	
general conditions of channel	lf garbage	gargabe	garbage, mud	garbage, mud, silt	mud silt, sand
	rt mud, silt severe		silt, sand		
other conditions	actively discharging pipe	discharging pipes	discarging pipes		
		other pipes	other pipes		
Residential characteristics	SFH, lawns, commercial	SFH, lawns	commercial/	SFH lawns	
	institutional	commercial/instit.	institutional		
Roads	paved	paved	paved	paved	
Construction					
Agriculture			cropland	cropland	cropland
Recreation					
Other	industry grain elevation	Industry	industry		

Farm Creek Stream Assessment					
Physical Characterization	**6** North Tributary	**7**	**8** S. Tributary	**9**	**10**
Miles from head	5.4	5.7	6.0	6.4	6.7
stream habitats present	pools riffles runs	pools riffles runs	pools riffles runs	runs	pools riffles runs
Nature of Particles					
silt/clay/mud	most	none	most	most	some
sand	some	none	most	most	some
gravel	some	some	most		some
cobbles	some	most	most	some	some
boulders	none	none	some	some	none
bedrock	none	none	none	none	none
Extent of embedded rock	50%	0-25%	100%	100%	0-25%
logs/woody debris	occasional	none	plentiful	plentiful	plentiful
organic material	occasional	occasional	occasional	occasional	occasional
water appearance	light brown, greenish	light brown	light brown	greenish	clear
water odor	none	none	none	none	none
water temperature					
depth of runs	1-2 ft	1-2 ft	<1 ft	1-2 ft	1-2 ft
depth of pools	>2 ft	>2 ft	> 2ft		1-2 ft
width of channel	25 ft	20 ft	40	45 ft	50
stream velocity					
shape of stream bank					
left	verticle/undercut	steeply sloping	gradual/ no slope	vertical/undercut	gradual/no slope
right	verticle/undercut	steeply sloping	gradual/no slope	gradual/no slope	
artificial bank modifications					
left	0-25% covered	50-75%	0-25%	0-25	0-25
right	0-25% covered	0-25 %	0-25%	0-25	0-25
shape of channel	wide, shallow	narrow, shallow	wide, deep	wide, deep	wide, shallow
stream side cover					
trees	If present, rt present	If present, rt present	If pres rt com	If pres rt com	If com rt com
bushes, shrubs	If present, rt present	rt present	If pres rt com	If pres rt com	If com rt com
tall grasses, ferns	If present, rt present	rt present	If pres rt com	If pres rt com	If com rt com
lawn	If present, rt present	rt present		If pres	

Miles from head	5.4	5.7	6.0	6.4	6.7
Biological Characterization					
wildlife	mammals	mammals	mammals	mammals	reptiles, mammals
fish	no	no	yes, but rare	no	no
barriers	rail, old colvert	railroad culvert	none	none	none
aquatic plants	none	none	none	none	none
algea	plentiful, heavt coating,	plentiful, heavy coating	occasional	occasional, light	occasional, light coating
	brown	brownish	heavy coating	coating brownish	green
filamentous algae	none	none	occasional	none	none
			green/brown		
mats of algae	none	none	none	none	
macroinverts present					
Turbellaria (flatworm)					
Oligochaeta (aquatic worms)	2	3			
Hirudinea (leeches)		4			
Isopoda (sowbugs)		4			
Amphipoda (scuds)					
Odonata (damselflies)					
Odonata (dragonflies)					
Megaloptera (alderflies)					
Ephemeroptera (mayflies)					
Plecoptera (stoneflies)					
Trichoptera (caddisflies)		5			
Coleoptera (beetles)					
Hemiptera (true bugs)					
Diptera (common fly)	50	250	15	5	30
Gastropoda (snail)					
H	0.163	0.310	0	0	0

Farm Creek Stream Assessment					
Physical Characterization	**11** downstream WSTP	**12**	**13**	**14**	**15**
Miles from head	6.9	7.1	8.3	8.6	9.2
stream habitats present	pools riffles runs	pools, riffles, runs	riffles, runs	pools, riffles, runs	poola, riffles, runs
Nature of Particles					
silt/clay/mud	some	some	some	none	none
sand	some	most	most	none	none
gravel	most	some	some	some	most
cobbles	most	some		most	some
boulders	none	some	none	some	
bedrock	none		none	none	none
Extent of embedded rock	75%	75%	75%	50%	50%
logs/woody debris	occasional	plentiful	occasional	plentiful	plentiful
organic material	occasional	none	occasional	occasional	occasional
water appearance	clear	light brown	light brown	light green	light brown
water odor	sewage	none	none	none	none
water temperature					
depth of runs	<1 ft	<1 ft	<1 ft	1-2 ft	<1 ft
depth of pools	1-2 ft	1-2 ft	1-2 ft	1-2 ft	1-2 ft
width of channel	50	55 ft	60-70 ft	40-50 ft	30-40 ft
stream velocity		.5 ft/s	1 ft/sec	.3	.8 ft/sec
shape of stream bank					(rail)
left	vertical/undercut	verticle/undercut	steeply sloping	verticle/undercut	vertical/undercut
right	vertical/undercut	steeply sloping	steeply sloping	gradual	gradual, no slope
artificial bank modifications					
left	0-25	0-25%	0-25%	0-25 %	50-75%
right	0-25%	0-25%	0-25%	0-25%	0-25%
shape of channel	wide, shallow	wide, shallow	wide, shallow	wide, shallow	wide, shallow
stream side cover					
trees	lf com rt com	lf com rt com	lf com rt com	lf pres rt pres	lf pres rt com
bushes, shrubs	lf com rt com	lf com rt com	lf com rt com	lf pres rt pres	lf pres rt com
tall grasses, ferns	lf com rt com	lf com rt com	lf com rt com	lf pres rt pres	lf pres rt com
lawn					

Miles from head	6.9	7.1	8.3	8.6	9.2
stream side cover (cnt'd)					
boulders/rocks					
gravel/sand					lf pres (rail)
bare soil		lf com rt com			
pavement, structures			lf com rt com		lf pres (rail)
top of stream bank					
trees	lf com rt com	lf com rt com	lf com rt com	lf com rt com	lf pres rt com
bushes, shrubs	lf com rt com	lf com rt com	lf com rt com	lf com rt com	lf pres rt com
tall grasses, ferns	lf com rt com	lf com rt com	lf com rt com	lf com rt com	lf pres rt com
lawn					
boulders/rocks					lf pres
gravel/sand			lf pres rt pres		
bare soil					
pavement, structures					lf pres
% vegetation shading stream		50%	100%	50%	50%
General conditions of stream banks	banks collapsed/ eroded	banks collapsed/	banks collapsed/	plant cover degraded/	plant cover degraded
		eroded, garbage	eroded, garbage	eroded banks, garb.	garbage
general conditions of channel	garbage	garbage	garbage	garbage	garbage
other conditions	pipes entering stream		livestock, main		
	(active)		sewer line		
Residential characteristics	SFH			SFH, lawns	
Roads	paved	rail bridge	bridges		
Construction					
Agriculture			once grazed land		
Recreation					
Other					sewer line

Miles from head	6.9	7.1	8.3	8.6	9.2
Biological Characterization					
wildlife	mammals, waterfowl	ducks, deer	mammals	mammals	mammals, crane, frog
fish	no	no	no	none	yes, rare
barriers	none	none	exposed swr line	none	
aquatic plants	none	none	none	none	none
algea	occasional, light coating	light coating, green	none	none	none
	brownish	occasional			
filamentous algae	occasional greenish	occasional green	none	green occasional	none
mats of algae	none	none	none	none	none
macroinverts present					
Turbellaria (flatworm)					
Oligochaeta (aquatic worms)	2	4	1	5	8
Hirudinea (leeches)					
Isopoda (sowbugs)					
Amphipoda (scuds)					
Odonata (damselflies)					
Odonata (dragonflies)					
Megaloptera (alderflies)					
Ephemeroptera (mayflies)		1			
Plecoptera (stoneflies)					
Trichoptera (caddisflies)		7			
Coleoptera (beetles)		1			
Hemiptera (true bugs)					
Diptera (common fly)	12	3		2	1
Gastropoda (snail)		1			
H	0.410	1.512	0	0.598	0.349
Farm Creek Stream Assessment					

Physical Characterization	**16**	**17**	**18**	**19**	**20** inside Farmdale
Miles from head	9.7	10.3	10.7	11.2	11.6
stream habitats present	pools, runs	pools, riffles, runs	braided, p.,r.r.	riffles and runs	pools, riffles, runs
Nature of Particles					
silt/clay/mud	none	some	some	most	little
sand	some	some	some	some	some
gravel	most	some	some	little	most
cobbles	some	most	most		some
boulders	some	none	none		none
bedrock	none	none			
Extent of embedded rock	50%	0-25%	50%	75%	50%
logs/woody debris	occasional	plentiful	plentiful	occasional	none
organic material	none	occasional	plentiful	occasional	none
water appearance	light brown	light brown	clear	clear	none
water odor	sewage	sewage	light sewage	fishy, Cl, Swge	clear
water temperature					
depth of runs	<1 ft	1-2 ft	<1 ft	1-2 ft	<1 ft
depth of pools	<1 ft	1-2 ft	1-2 ft		1-2 ft
width of channel	40-50 ft	40-50 ft	65	50-60 ft	65 ft
stream velocity	1.2 ft/sec	.4 ft/sec	.3	1.2	.5
shape of stream bank	(rail)				
left	vertical/undercut	gradual	steep	gradual	verticle/undercut lf
right	gradual	gradual	steep	gradual	steeply sloping rt
artificial bank modifications					
left	50-75 %	0-25 %	0-25	25-50	0-25 %covered
right	0-25 %	75-100%	25-50 (concrete)	25-50	0-25 %covered
shape of channel	wide, shallow	wide, shallow	wide shallow	wide, shallow	wide, deep
stream side cover					
trees	lf pres rt pres	lf pres rt pres	lf com rt com	rt com, lf com	lf com, rt com
bushes, shrubs	lf pres rt com	lf pres rt pres	lf com rt com	rt com, lf com	lf com, rt com
tall grasses, ferns	lf pres rt com	lf pres rt pres	lf com rt com	rt com, lf com	lf com, rt com
lawn		rt com		rt com	

Miles from head	9.7	10.3	10.7	11.2	11.6
stream side cover (cnt'd)					
boulders/rocks					
gravel/sand	lf pres				
bare soil		lf pres			
pavement, structures	lf pres		rt broken concrt	rt, lf broken concrt	
top of stream bank					
trees	lf pres	lf com	lf com rt com	lf com, rt com	lf com, rt com
bushes, shrubs	lf pres	lf com	lf com rt com	lf com, rt com	lf com, rt com
tall grasses, ferns	lf pres	lf com	lf com rt com	lf com, rt com	lf com, rt com
lawn				rt pres	
boulders/rocks	lf com				
gravel/sand					
bare soil		lf com			
pavement, structures	lf com (rail)	rt treatment plant	rt old barn		
% vegetation shading stream	25%	25%		25%	75%
General conditions of stream banks	plant cover degraded,	plant cover degraded	lf eroded, garbage	lf,rt eroded,	lf, rt eroded
	eroded banks, garbage	eroded banks	foam, rt eroded	lf, rt garbage	
general conditions of channel	garbage/junk in stream	garbage in stream	milk crate		lf garbage
			tires in stream		
other conditions	rail embankment	pipes (treatment out		pump rt.	
		fall)			
Residential characteristics			SFH	SFH, lawns	
Roads		paved roads	rail bridge	paved roads	
Construction					
Agriculture	grazed land (not active)				
Recreation					
Other	landfills (treatment)				

Miles from head	9.7	10.3	10.7	11.2	11.6
Biological Characterization					
wildlife	frogs, mammals	amphibians, mammals	water fowl, mam	frog, ducks,mammals	frogs, ducks, mammals
fish	no	no	yes, many small	no	yes, rare, small
barriers	none	none	none	none	corps access road
aquatic plants	none	none	none	none	none
algea	none	none	plentiful, heavy	occasional, heavy	plentiful, heavy, brown
			brown	brownish	
filamentous algae	none	none	occasional	none	occasional, green
			green		
mats of algae	none	none	none	none	none
macroinverts present					
Turbellaria (flatworm)					
Oligochaeta (aquatic worms)	1	3			
Hirudinea (leeches)					
Isopoda (sowbugs)					
Amphipoda (scuds)					
Odonata (damselflies)					
Odonata (dragonflies)					
Megaloptera (alderflies)					
Ephemeroptera (mayflies)					
Plecoptera (stoneflies)					
Trichoptera (caddisflies)	2		8		3
Coleoptera (beetles)					3
Hemiptera (true bugs)					
Diptera (common fly)		1	388	30	500
Gastropoda (snail)					
H	0.637	0.562	0.099	0	0.726

Farm Creek Stream Assessment					
Physical Characterization	**21**	**22**	**23**	**24**	**25**
Miles from head	11.9	12.5	13.2	13.8	14.2
stream habitats present	pools, riffle,run	pools, riffles, runs	riffles, runs	pools, riffles, run	pools, riffles, runs
Nature of Particles					
silt/clay/mud	some	some	some	some	none
sand	some	most	some	most	most
gravel	most	some	some	most	none
cobbles	some	little	most	some	some
boulders	none		some	none	none
bedrock				none	none
Extent of embedded rock	0-25 %	75%	75%	100%	100%
logs/woody debris	plentiful	plentiful	none	occasional	occasional
organic material	occasional	occasional	none	occasional	none
water appearance	clear	clear	clear	clear	clear
water odor	none	none	slight fishy	none	none
water temperature					
depth of runs	1-2 ft	<1 ft	<1 ft	1-2 ft	1-2 ft
depth of pools	<1 ft	1-2 ft		1-2 ft	1-2 ft
width of channel	80	55	60 ft	50	80
stream velocity	.4	.4	.7	.8	.6
shape of stream bank					
left	gradual	steeply sloping	farmdale dam	steeply sloping	steeply sloping
right	gradual	steeply sloping	]	steeply sloping	steeply sloping
artificial bank modifications					
left	0-25 %	0-25%	75-100% covered	0-25 %	0-25 %
right	0-25%	0-25%	75-100%	0-25%	0-25%
shape of channel	wide, shallow	wide deep and shallow	narrow, shallow	wide, shallow	wide, shallow
stream side cover					
trees	lf com, rt com	lf com rt com		lf com, rt pres	lf pres, rt pres
bushes, shrubs	lf com, rt com	lf com rt com		lf com, rt pres	lf pres, rt pres
tall grasses, ferns	lf com, rt com	lf com rt com		lf com, rt com	lf pres, rt pres
lawn					

Miles from head	11.9	12.5	13.2	13.8	14.2
stream side cover (cnt'd)					
boulders/rocks				rt com	lf pres, rt pres
gravel/sand					lf pres, rt pres
bare soil					lf com, rt com
pavement, structures		2 rail bridges lf, rt	dam	lf com, rt com (culvert)	lf pres, rt pres
top of stream bank					
trees	lf com, rt com	lf com rt com		lf com, rt com	lf pres, rt pres
bushes, shrubs	lf com, rt com	lf com rt com		lf com, rt com	lf pres, rt pres
tall grasses, ferns	lf com, rt com	lf com rt com		lf com, rt com	lf com, rt com
lawn					
boulders/rocks					lf com, rt com
gravel/sand					
bare soil					
pavement, structures			dam	lf com, rt com	lf pres, rt pres
% vegetation shading stream	25%	75%	100%	100%	0%
General conditions of stream banks		lf, rt eroded	lf, rt plant cover	rt plants degraded	lf, rt plant degraded
			degraded	banks eroded	lf, rt eroded
general conditions of channel			garbage	mud, silt entering	
				stream rt	
other conditions					
Residential characteristics					
Roads					
Construction					
Agriculture					
Recreation	camping, hiking				
Other					

Miles from head	11.9	12.5	13.2	13.8	14.2
Biological Characterization					
wildlife	amph, bird, snake, mam	Amph, birds, mammal	none	amph, birds, mammal	waterfowl, mammals
fish	yes, abundant, small	yes, abundant, small	none	yes, rare, medium	yes, small, abundant
barriers	none	none	dams	road barriers	none
aquatic plants	none	none	none	none	none
algea	plentiful, heavy	plentiful, heavy	none	occassional, brown	plentiful, green
	brown	greenish		light coating	
filamentous algae	occasional, green	none	plentiful, greenish	ocassional, green	occasional, green
mats of algae	none	none	none	none	none
macroinverts present					
Turbellaria (flatworm)					
Oligochaeta (aquatic worms)	1 (red)		1 (RED)	4	24
Hirudinea (leeches)					
Isopoda (sowbugs)					
Amphipoda (scuds)					
Odonata (damselflies)					
Odonata (dragonflies)					
Megaloptera (alderflies)					
Ephemeroptera (mayflies)	1				
Plecoptera (stoneflies)					
Trichoptera (caddisflies)			9	1	
Coleoptera (beetles)					
Hemiptera (true bugs)					
Diptera (common fly)	150	150	30	50	200
Gastropoda (snail)				1	
H	0.079	0	0.644	0.433	0.356

Farm Creek Stream Assessment					
Physical Characterization	**26**	**27**	**28**		
Miles from head	14.6	16.7	2.7		
stream habitats present	riffle, run	pools	pools, runs		
Nature of Particles					
silt/clay/mud	little	most	most		
sand	some	none	none		
gravel	some	none	none		
cobbles	most	none	none		
boulders	little	none	none		
bedrock	none	none	none		
Extent of embedded rock	0-25%	100%	100%		
logs/woody debris	none	occasional	none		
organic material	none	occasional	none		
water appearance	clear	dark brown	clear		
water odor	none	fishy, sewage	none		
water temperature					
depth of runs	<1 ft		1-2 ft		
depth of pools			1-2n ft		
width of channel	80 ft	80 ft	20		
stream velocity	.4	0	.1		
shape of stream bank					
left	gradual, no slope	gradual, no slope	gradual, no slope		
right	gradual, no slope	gradual, no slope	gradual, no slope		
artificial bank modifications					
left	0-25% covered	0-25 %	0-25%		
right	0-25% covered	0-25%	0-25%		
shape of channel	wide, shallow	wide, shallow	narrow, shallow		
stream side cover					
trees	lf pres, rt pres	lf com rt com	lf pres		
bushes, shrubs		lf com rt com	lf com, rt com		
tall grasses, ferns	lf com, rt com	lf com rt com	lf com, rt com		
lawn					

Miles from head	14.6	16.7	2.7		
stream side cover (cnt'd)					
boulders/rocks					
gravel/sand					
bare soil			lf com, rt com		
pavement, structures					
top of stream bank					
trees	lf com, rt com	lf com rt com			
bushes, shrubs		lf com rt com			
tall grasses, ferns	lf com, rt com	lf com rt com			
lawn					
boulders/rocks					
gravel/sand					
bare soil			lf com, rt com		
pavement, structures					
% vegetation shading stream	25%	0%	0		
General conditions of stream banks	lf banks eroded	lf, rt plant cover degraded	plant cover degraded		
general conditions of channel			mud entering stream		
other conditions					
Residential characteristics					
Roads					
Construction					
Agriculture					
Recreation					
Other					

Miles from head	14.6	16.7	2.7		
Biological Characterization					
wildlife	mammals	amph., bird, rept., mam			
fish	no	yes, abundunt, large	no		
barriers	none	none	road barriers		
aquatic plants		none	none		
algea	none	none	none		
filamentous algae	none	none	none		
mats of algae	none	none	none		
macroinverts present					
Turbellaria (flatworm)					
Oligochaeta (aquatic worms)		15			
Hirudinea (leeches)			2		
Isopoda (sowbugs)			10		
Amphipoda (scuds)			3		
Odonata (damselflies)					
Odonata (dragonflies)					
Megaloptera (alderflies)					
Ephemeroptera (mayflies)					
Plecoptera (stoneflies)					
Trichoptera (caddisflies)					
Coleoptera (beetles)			3		
Hemiptera (true bugs)					
Diptera (common fly)	75	25	5		
Gastropoda (snail)			3		
H	0	0.662	1.63		

influenced by the activities within the watershed. The IEPA routinely assesses Farm Creek by means of fixed station chemical & physical monitoring. Designated uses are identified by the following use types.

Overall Use
Fish Consumption
Aquatic Life
Swimming
Secondary Contact
Public Water Supply

Designated Use Support

They rate Farm Creek overall use at Partial Support with Minor Impairments. Fish consumption is a designated use. However, no data is available to assess it. Finally, they assess aquatic life at Partial Support with Minor Impairments. Swimming, Secondary Contact, and Public Water Supply designated uses are not applicable to Farm Creek. Partial Support with Minor Impairments means that they have impaired water quality, but only to a minor degree. There may be minor exceedences in applicable water quality standards or criteria for assessing the designated use attainment.

Impairments

The causes of these minor impairments include Slight Nutrient and Moderate Siltation problems. The sources of these causes of impairment are as follows:

Source	**Examples**
-Slight Municipal Point Sources	Wastewater treatment, NPDES sites
-Slight Urban Runoff Storm Sewers	Stormwater runoff
-Moderate Hydrologic Habitat Modification (added since 1992-93)	Wetland drainage, development
-Moderate Flow Regulation (added since 1992-93)	Stream Channelization

Groundwater

The Sankoty sand aquifer underlies the Farm Creek watershed and has an average thickness of 100 feet (Burch, 1993). Except a small portion of the watershed between the I-74/I-474 interchange and Creve Coeur, the watershed sits atop the Sankoty aquifer. The map on the following page shows the approximate boundary where the aquifer changes between a confined

and unconfined state. The confined area of the aquifer is where pressure causes the water levels in wells reaching into the aquifer to rise above the aquifers top elevation (Burch, 1993). Groundwater tends to flow in the watershed, and regionally, toward the Illinois River seeking out areas of lowest elevation.

A 1993 study of the Peoria-Pekin area, conducted by the Illinois State Water Survey, found that no significant regional water quality problems. The overall quality of the ground water was considered excellent. This was contrary to what they originally thought was the case due to the presence of hazardous substances related to heavy industry being near ground water users. The study also found that since the flow of groundwater does move toward the Illinois River the ground water system factors into maintaining base flow in the Illinois River.

Table 2 is a listing of well sites in the Farm Creek Watershed that they tested as part of the study in 1993. Geographically they are found throughout the watershed. The locations of these sites can be found in the report. The map on the following page also shows the general location and types of wells present in the watershed as of 1995.

Table 2

Results of Ground Water Sampling at Locations in the Farm Creek Watershed**

Parameter (Milligrams/Liter)

	Sample Station Number						
	16	27	28	29	30	41	42
Major Constituents							
Calcium	153.9	72.6	121	104	85.2	83	3.9
Magnesium	59.6	31.8	51.3	47.5	37.5	37.8	8.8
Sodium	141.6	39.2	45.3	21.4	24.1	59.2	220
nitrate	0.8	<0.1	12.4	0.4	<0.1	<0.1	<0.1
Sulfate	190	<0.9	82	104	94	<0.9	89
Chloride	208	9.8	87.2	37	57.8	26.9	39.6
Alkalinity	486	405	393	365	261	464	372
TDS	1100	433	661	553	464	494	594
Secondary Constituents							
Iron	0.16	3.31	<0.02	0.08	2.54	2.13	0.09
Manganese	0.278	0.112	0.006	0.017	0.089	0.102	0.019
Potassium	4.6	2.1	4.8	2.5	2.2	2.1	<1.3
Fluoride	0.9	0.2	0.4	0.3	0.2	0.3	0.4
Ammonia	0.04	0.16	<0.02	<0.02	<0.02	0.78	<0.02
Boron	0.52	0.24	0.28	0.08	0.06	0.24	0.06
Trace Constituents							
Aluminum	<0.025	<0.027	<0.027	<0.027	<0.027	<0.027	<0.027

Antimony	0.37	<0.16	<0.16	<0.16	<0.16	<0.16	NA
Arsenic	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	0.11	0.05	0.13	0.06	0.23	0.3	<0.01
Beryllium	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chromium	<0.008	<0.010	<0.010	<0.010	<0.010	<0.101	<0.010
Copper	0.032	<0.009	0.009	<0.009	<0.009	<0.009	<0.009
Lead	<0.03	<0.033	<0.002	<0.033	<0.033	<0.033	<0.033
Mercury	<0.1	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05
Molybdenum	<0.008	<0.014	<0.014	<0.014	<0.014	<0.01	<0.01
Nickel	<0.018	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Orthophosphate	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus	<0.06	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Selenium	0.1	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Silicon	8.41	7.98	5.99	7.18	3.87	8.34	7.29
Silver	<0.016	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Strontium	0.494	0.123	0.214	0.165	0.138	0.28	0.005
Sulfur	64.6	<0.11	26.6	32.6	30.9	<0.11	30.9
Thallium	0.36	<0.15	0.16	<0.15	<0.15	<0.15	<0.15
Vanadium	<0.006	<1.013	<0.013	<0.013	<0.013	<0.013	<0.013
Zinc	0.39	0.08	0.141	0.173	0.1	0.133	0.123
Organic Compounds							
TOC - 1st round	1.6	3.5	0.6	<0.5	0.6	5.8	1.4
POC - 1st round	0.18	<0.05	<0.05	<0.05	<0.05	<0.03	<0.01
NPOC - 1st round	1.41	-	-	-	-	-	-
TOC - 2nd round	-	-	-	-	-	-	-
POC - 2nd round	-	-	-	-	-	-	-

Parameter (Milligrams/Liter)

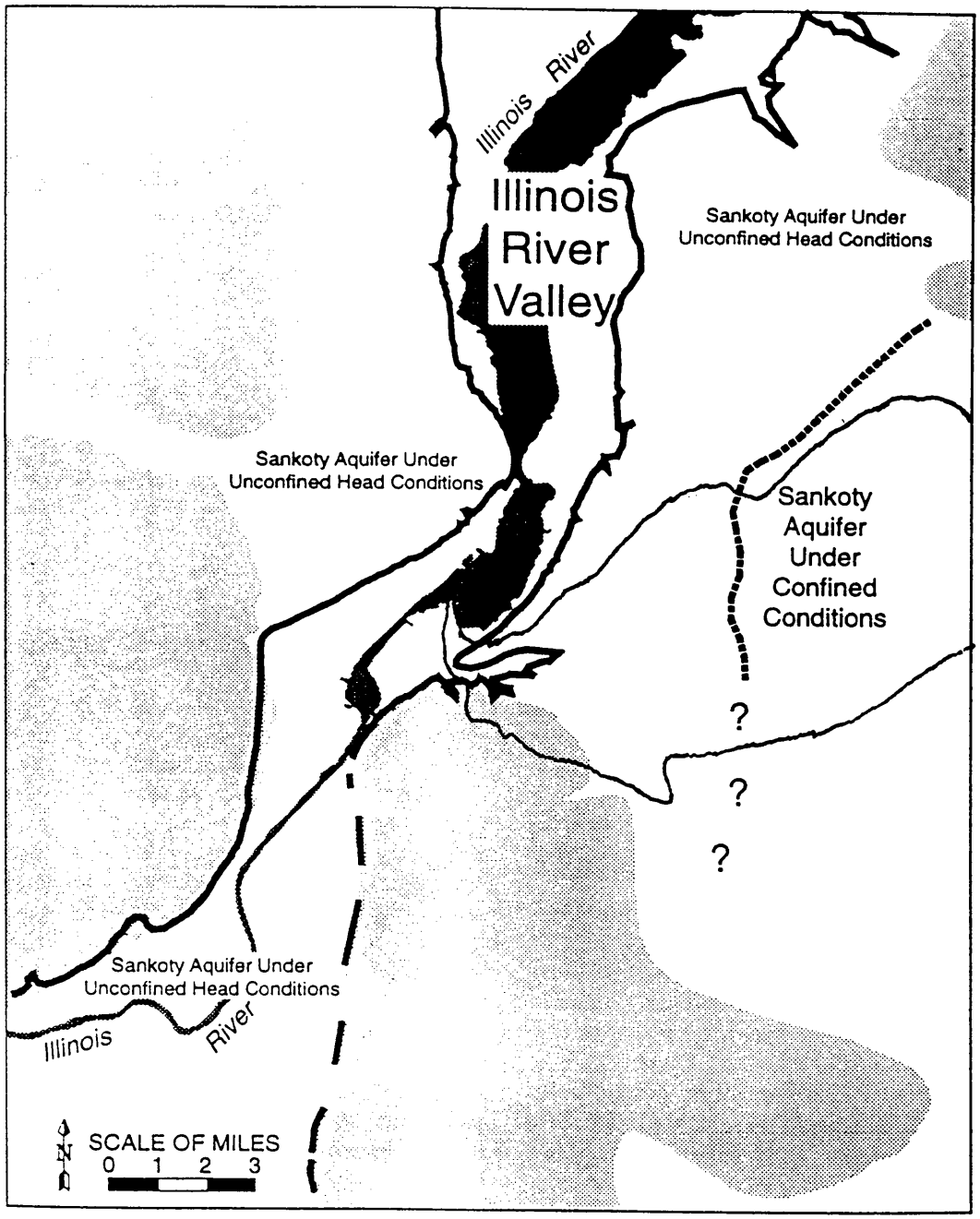
	Sample Station Number						
	43	51	71	72	74	75	76
Major Constituents							
Calcium	71	178	71.4	67.1	62.5	66	*
Magnesium	32	81.6	33.5	30.6	29.9	32.2	-
Sodium	22.8	129	24.2	8.84	7.82	27.8	-
nitrate	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
Sulfate	0.9	141	<0.9	<0.9	<0.9	<0.9	-
Chloride	1.8	407	4.1	1.2	1.1	4.4	-
Alkalinity	367	522	383	321	305	371	-
TDS	364	1324	375	310	289	355	-
Secondary Constituents							

Iron	2.68	6.09	0.01	1.27	0.7	0.35	-
Manganese	0.047	0.18	0.039	0.095	0.059	0.268	-
Potassium	1.4	3.7	1.2	1	0.88	0.99	-
Fluoride	0.2	0.8	0.2	0.1	0.1	0.2	-
Ammonia	0.74	1.07	0.54	0.11	0.17	1.13	-
Boron	0.11	2.23	0.13	<0.04	<0.04	0.07	-
Trace Constituents							
Aluminum	<0.027	<0.024	<0.024	<0.024	<0.024	<0.024	-
Antimony	<0.16	<0.15	<0.15	<0.15	<0.15	<0.15	-
Arsenic	<0.05	<0.04	<0.04	<0.04	<0.04	<0.04	-
Barium	0.22	0.11	0.15	0.14	0.13	0.16	-
Beryllium	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	-
Cadmium	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	-
Chromium	<0.010	<0.008	<0.008	<0.008	<0.008	<0.008	-
Copper	<0.009	0.009	<0.006	<0.006	<0.006	<0.006	-
Lead	<0.033	<0.024	<0.024	<0.024	<0.024	<0.024	-
Mercury	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-
Molybdenum	<0.01	<0.008	<0.008	<0.008	<0.008	<0.008	-
Nickel	<0.017	<0.015	<0.015	<0.015	<0.015	<0.015	-
Orthophosphate	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
Phosphorus	<0.17	<0.15	<0.15	0.18	<0.15	<0.15	-
Selenium	<0.6	<0.5	<0.5	<0.5	<0.5	<0.5	-
Silicon	7.34	8.36	7.35	7.94	7.78	8	-
Silver	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-
Strontium	0.222	0.299	0.27	0.183	0.195	<0.373	-
Sulfur	<0.11	46.2	<0.10	<0.10	<0.10	<0.10	-
Thallium	0.18	<0.12	0.12	0.12	0.12	0.12	-
Vanadium	<0.013	<0.008	<0.008	<0.008	<0.008	<0.008	-
Zinc	0.091	0.315	0.022	0.096	0.07	0.126	-
Organic Compounds							
TOC - 1st round	2.9	4.3	3.8	2.3	1.9	6.4	-
POC - 1st round	<0.01	1.6	0.61	1.2	0.44	3.7	-
NPOC - 1st round	-	-	-	-	-	-	-
TOC - 2nd round	-	6.9	3.8	2.8	1.6	4.1	-
POC - 2nd round	-	<0.05	0.81	1	0.06	3.6	-

* This well site data was not considered due to suspected softening of the water before collection.

** We extracted this information from the Research Report 124: Peoria-Pekin Ground Water Quality Assessment. Illinois State Water Survey.

Irrigation



Areas where aquifer is not present

Boundary of Illinois River Valley

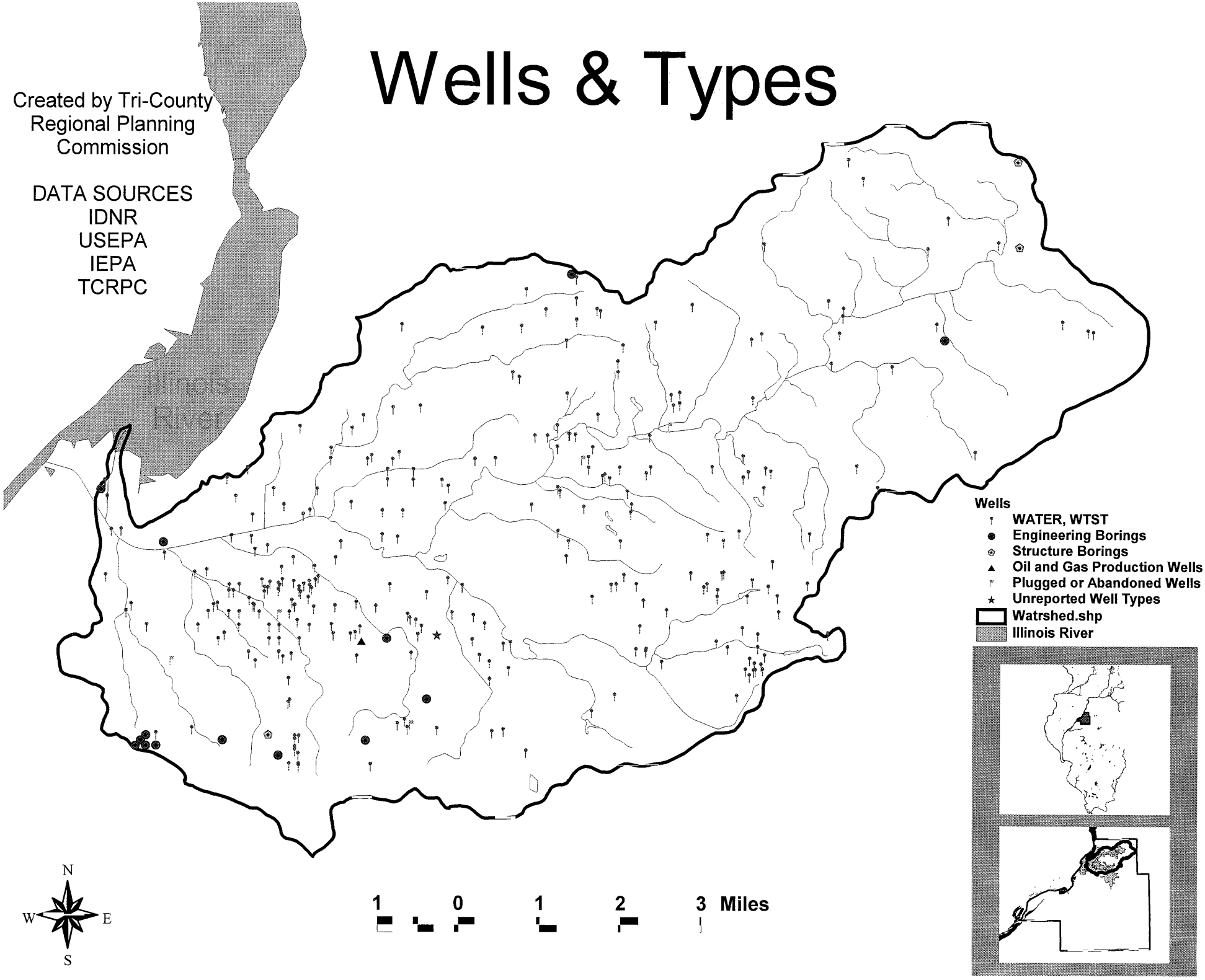
? Approximate boundary between confined and unconfined hydraulic conditions. Question mark where inferred

Figure 7. Areas of confined and unconfined aquifer conditions in the Illinois River valley

Wells & Types

Created by Tri-County Regional Planning Commission

DATA SOURCES
IDNR
USEPA
IEPA
TCRPC



Information available on irrigation is limited to Tazewell County level data provided in the 1997 Census of Agriculture. From 1987 to 1997 the number of cropland acres decreased by roughly 6% or 18,464 acres in Tazewell County. During the same period, the number of irrigated acres increased by 44% or 14,097 acres. In summary, 5% of the counties agricultural land was irrigated in 1987 compared to 10% in 1997.

Table 3

Changes in Tazewell Co. Irrigate Acres Compared to Total Cropland Acres

	1997	1992	1987
Total Cropland	305386	313429	323850
Total Cropland Farms	854	941	1076
Total Irrigated Acres	30487	22625	16390
Total Irrigated Farms	107	93	84

Drainage

Subsurface tiles drains= drain agricultural fields in the Farm Creek watershed, and many other regions in the state. Few records, other than those kept by landowners, show the location of such drainage systems. At this time, no mapping or survey has been completed of the drainage systems found within the Farm Creek Watershed or Tazewell County. The only active drainage district is the East Peoria Drainage and Levee District. A more thorough description of their function and activities is found in the section on Floodplain Boundaries.

Floodplain Boundaries

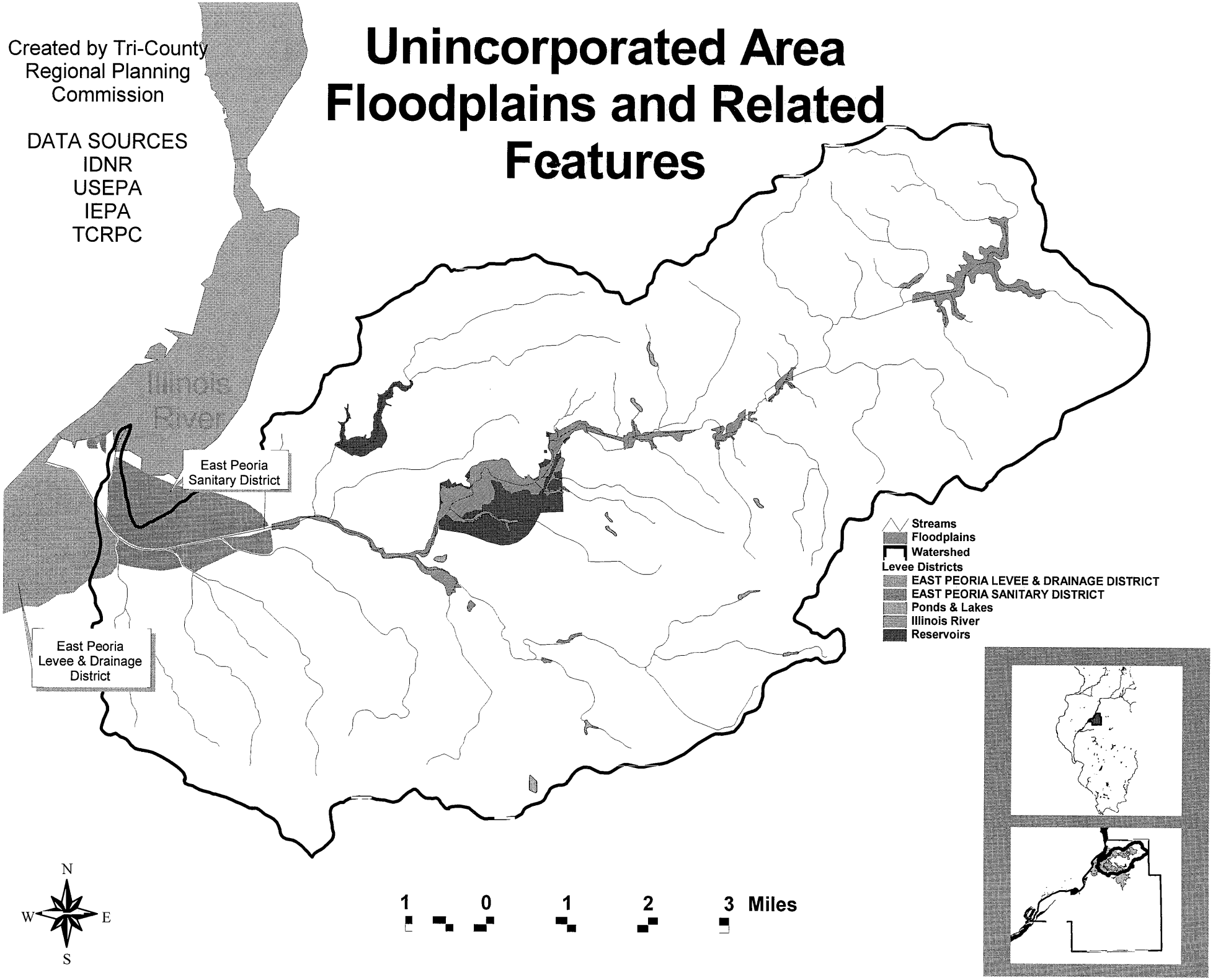
Two urban areas in the watershed have, or are currently experiencing, flooding problems. Additionally, other areas of unincorporated land flood upstream and downstream of the City of Washington. We delineate these areas on the map on the following page.

Farm Creek Flood Control Project; East Peoria: The East Peoria Drainage and Levee District and the East Peoria Sanitary District levee system runs along the northern edge of the city of East Peoria and is found between Illinois River mile 160.5 and 162.0. The existing 3.2-mile long zone of protection extends along Farm Creek on the upstream flank, follows the Illinois riverfront on the main stem, and ties off at a point along Wesley Slough on the downstream end of the levee district, and protects roughly 1,000 acres (USACOE, 1996).

Unincorporated Area Floodplains and Related Features

Created by Tri-County Regional Planning Commission

DATA SOURCES
IDNR
USEPA
IEPA
TCRPC



As described in the Periodic Inspection Report No. 7, dated July 28, 1998: AThe Farm Creek Flood Control Project affords the City of East Peoria a high degree of protection against floods in the Farm Creek Basin. This protection is accomplished by two detention reservoirs, Farmdale and Fondulac, and by channel improvements in the lower reaches of Farm Creek, Cole Creek, and Kerfoot Creek. The reservoirs are normally empty, with the dry weather flow in the creeks passing through the outlet conduits. Temporary storage in the reservoirs will commence only when the flow in the feeder streams exceeds the outlet capacity. During periods of intense rainfall and run-off in the watershed, floodwaters from 31.9 square miles of drainage area, 52.3 percent of the Farm creek watershed, will be impounded temporarily in the Farmdale and Fondulac Reservoirs. Thus, during such periods the flow in the lower reaches of Farm Creek will be limited to the floodwaters from 29.1 square miles of uncontrolled outlets below the dams. The improved channel in the lower reach of Farm Creek increased the capacity to 22,000 cubic feet per second. This capacity in conjunction with the reservoirs, affords East Peoria protection in excess of the largest flood of record that occurred on May 18, 1927.≅ The Reservoir facilities are managed and operated by the Peoria Project Office. The responsibility of maintaining the channel improvements and internal levees is under the jurisdiction of the East Peoria Sanitary District and the East Peoria Drainage and Levee District. Please see the map on the previous page for more information on the extent and location of the above-mentioned facilities and structures.

Illinois River: East Peoria Flood Damage Reduction Study: In 1995, the U.S. Army Corp of engineers undertook a study to evaluate alternatives for increasing flood protection at East Peoria. The East Peoria Drainage and Levee District supported the Plan. Major features of the plan included raising the levee along Farm Creek and Wesley Slough, and the addition of positive closure structures in the Farm Creek segment of the system. Finally, replacement of pumps housed in a pumping station at Illinois River Mile 160.7, to provide a 60,000 gallon per minute capacity (USACOE, 1996). At the time, the Rock Island District Commander recommended proceeding to the plans and specifications and construction phase.

City of Washington: The City of Washington has experienced flooding for many years. The City has approached this problem in two ways. First, through its Subdivision Code, the City essentially requires no net increase in runoff from proposed development. Second, the City has embarked on a plan to construct several upstream detention facilities in order to reduce flood damages within the City.

In 1987, the U.S. Army Corp of Engineers conducted an Inventory and Analysis of Urban Water Damage Problems. The purpose of the study was to assess the flooding problems in the city and development of annual flood damage estimates (USACOE, 1987). At the time, they estimated that average annual damages were $72,000 for Farm Creek and $900 for an unnamed tributary flowing from north of the city. The damage expected from a 100-year flood event was around $770,500. They estimated a further $16,400 in annual damages for another unnamed tributary. Generally speaking, the study found that flooding was related to intense local rainfalls that tend to recede within a twenty-four hour period. Several bridges and other restrictive areas were

found to increase upstream flood elevations. The study recommended that the channel obstructions such as debris, woody vegetation, and sediment buildup be removed near the bridges structures. In addition, removal of one bridge deck, and reconstruction of the other bridges would alleviate the flooding problem. When a cost analysis was done on the proposed bridge adjustments and replacements, the costs were found excessive.

In 1990, the City commissioned a Preliminary Storm Water Management Study for Detention Basin Feasibility: City of Washington, Illinois (Daily & Associates, Engineers, Inc.). The purpose of the study was to learn the feasibility of constructing several detention facilities, upstream of the City, in order to reduce flooding. They also developed cost estimates in order to compare this alternative to reconstruction or rebuilding of the bridge obstructions identified in the U.S. Army Corp. of Engineers study. The study looked at six potential sites for detention facilities. One such location was found unsuitable for a detention facility. One location, known as Pond E, was found to have the best overall ranking. The City has purchased the required land and is currently preparing for construction. The capacity and other information on this facility can be found on Table 1 in the section on Waterbodies. Beyond the floodwater detention capability they designed this facility to achieve, the City was awarded (Summer 1999) $10,000 under the C-2000 program through the Illinois Department of Natural Resources, to incorporate a wetland bottom along with re-vegetation of the banks with native plants. Finally, the City has recently purchased a 67-acre parcel that will serve as the location for a future detention facility.

As the City of Washington continues to pursue means by which to reduce flood damages to its homes and commercial establishments within the city, the opportunity exists to tackle many problems facing the Farm Creek Watershed. Detention facilities upstream will not only serve to trap sediments before they make their way to the Peoria Lake, but will maintain or reduce the runoff in the stream channels, potentially reducing streambank instability and further erosion. Opportunities to restore upland wetlands should also be explored. This will have the benefit of adding flood storage capacity, habitat for wildlife, and recreational opportunities to the upland areas of the drainage basin. Finally, they should explore opportunities to work with the agricultural community by building on programs already available.

Municipal/Industrial

There are many municipal and industrial discharge sites within the Farm Creek Watershed. As was mentioned in the Impairments section, slight municipal and industrial point sources were identified as causes of impaired water quality in Farm Creek.

Table 4 lists sites within the watershed that are responsible for reporting under the Resource Conservation and Recovery Act (RCRA). RCRA requires that those who generate, transport, treat, store, or dispose of hazardous waste provide information concerning their activities to state environmental agencies (USEPA-BASINS). The purpose of the RCRIS database is for use by the EPA to support its implementation of RCRA, as amended by the Hazardous and Solid Waste Amendments of 1984 (HSAA). The system is primarily used to track handler permit or closure

status, compliance with Federal and State regulations, and cleanup activities.

Table 4

Hazardous & Solid Waste Permit Sites (1997)

Facility Name	*Location*	*Facility Name*	*Location*
150 AUTOBODY	EAST PEORIA	LARRYS AUTOBODY	WASHINGTON
ADVANCED TECHNOLOGY SERVICES	EAST PEORIA	NORTHWESTERN MUTUAL LIFE	EAST PEORIA
ALS AUTO BODY	WASHINGTON	ODEAS CLEANERS	WASHINGTON
AMERICAN ALLIED RAILWAY EQUIP	WASHINGTON	P AND G ELECTRICAL REBUILDERS INC	EAST PEORIA
ANR FREIGHT SYSTEM INC	MORTON	PAFCO TRUCK BODIES	EAST PEORIA
AT&T LONG LINES SUNNYLAND	SUNNYLAND	PAINTERS PAINT SHOP	WASHINGTON
AUTOMOTION AUTOMOTIVE INC	WASHINGTON	PEORIA AUTO BROKERS INC	EAST PEORIA
BEARCE FORD JOHN	WASHINGTON	QUAD CITY PETERBUILT INC	MORTON
BUDS AUTO BODY INC	EAST PEORIA	R P SHORTRUN	WASHINGTON
CASEYS GENERAL STORES	WASHINGTON	RISINGER BROS TRANSFER INC	MORTON
CASEYS GENERAL STORES INC	WASHINGTON	SOPHER MACHINE AND MANUFACTURING	EAST PEORIA
CASEYS GENERAL STORES INC	MORTON	STENSTROM DON AND JOYCE	WASHINGTON
CLARK GAS STATION	PONTIAC	SUNNYLAND CABINETS	SUNNYLAND
CLARK OIL STATION 1139	WASHINGTON	SUNOCO SERVICE STATION	WASHINGTON
CONVENIENT FOODMART	SUNNYLAND	SUNOCO SERVICE STATION	EAST PEORIA
DEALERS COMMERCIAL AUTO BODY INC	MORTON	SUNSHINE LAUNDRY AND DRY CLEANER	WASHINGTON
GATEWAY FREIGHTLINE INC	EAST PEORIA	TAZEWELL R D F	EAST PEORIA
GAUNT DICK TRUCKING AND EXCAVATING INC	WASHINGTON	TOLEDO PEORIA AND WESTERN RAILROAD	EAST PEORIA
GEE WHIZ SVCS STATION	EAST PEORIA	TOLEDO PEORIA AND WESTERN RAILWY	EAST PEORIA
HAGLE METAL FABRICS	EAST PEORIA	TOTAL PETROLEUM	WASHINGTON
ILLICO APOLLOMART CITGO	EAST PEORIA	UFTRING CHEVY OLD	WASHINGTON
ILLICO KERR MDGEE	WASHINGTON	UFTRING CHEVY OLDS	WASHINGTON
ILLINOIS DEPT OF TRANSPORTATION	MORTON	WASHINGTON ABILITY DRUM SERVICE/IEPA	WASHINGTON
K MART AUTO CTR	WASHINGTON	WASHINGTON CITY OF	WASHINGTON
WASHINGTON COMMUNITY H S	WASHINGTON		

Table 5 lists National Pollutant Discharge Elimination System sites within the watershed. The NPDES permit program regulates direct discharges from municipal and industrial wastewater treatment facilities that discharge into the navigable waters of the United States. Wastewater treatment facilities (also called "point sources") are issued NPDES permits regulating there discharge.

Permit Sites

Created by Tri-County Regional Planning Commission

DATA SOURCES
IDNR
USEPA
IEPA
TCRPC

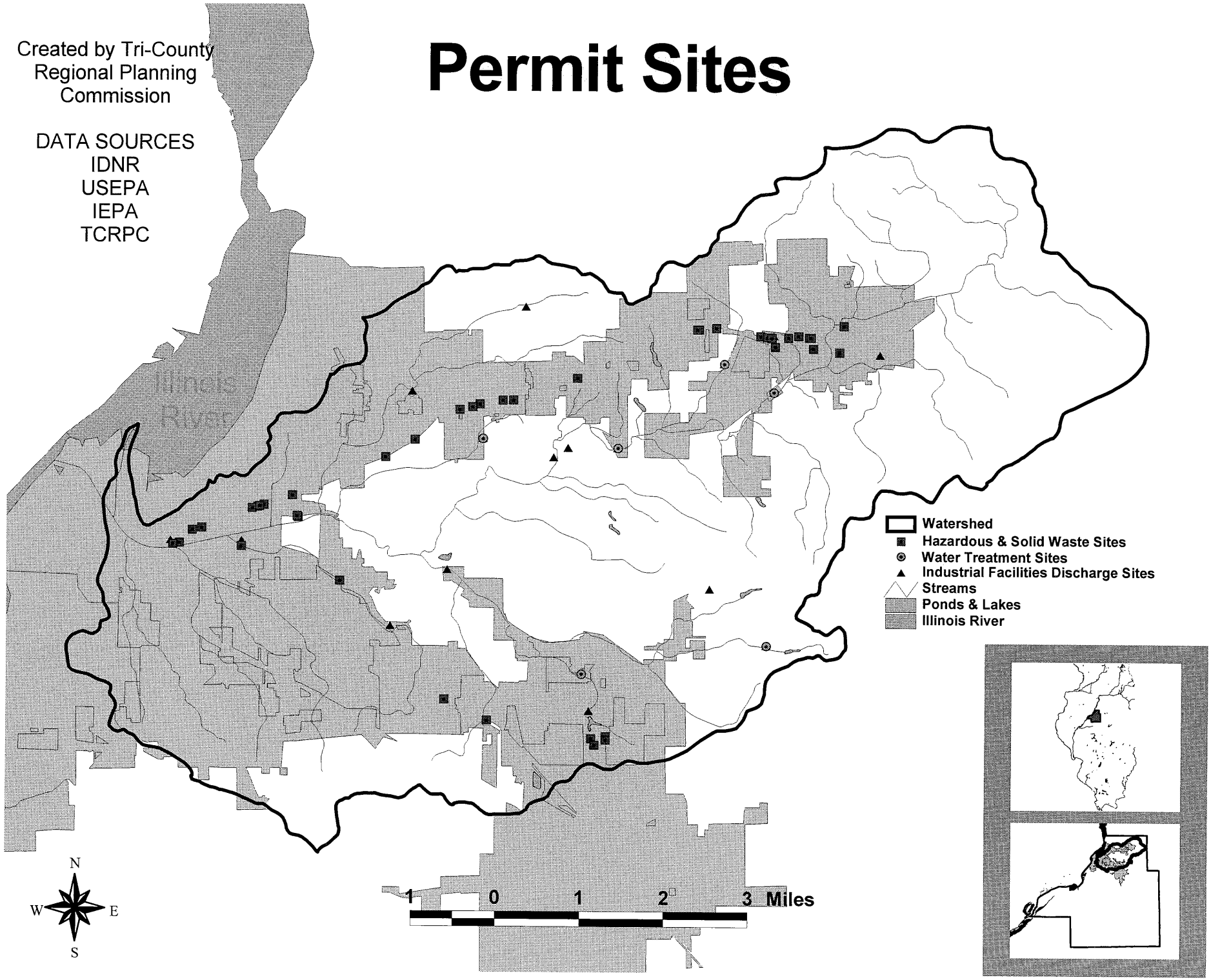


Table 5

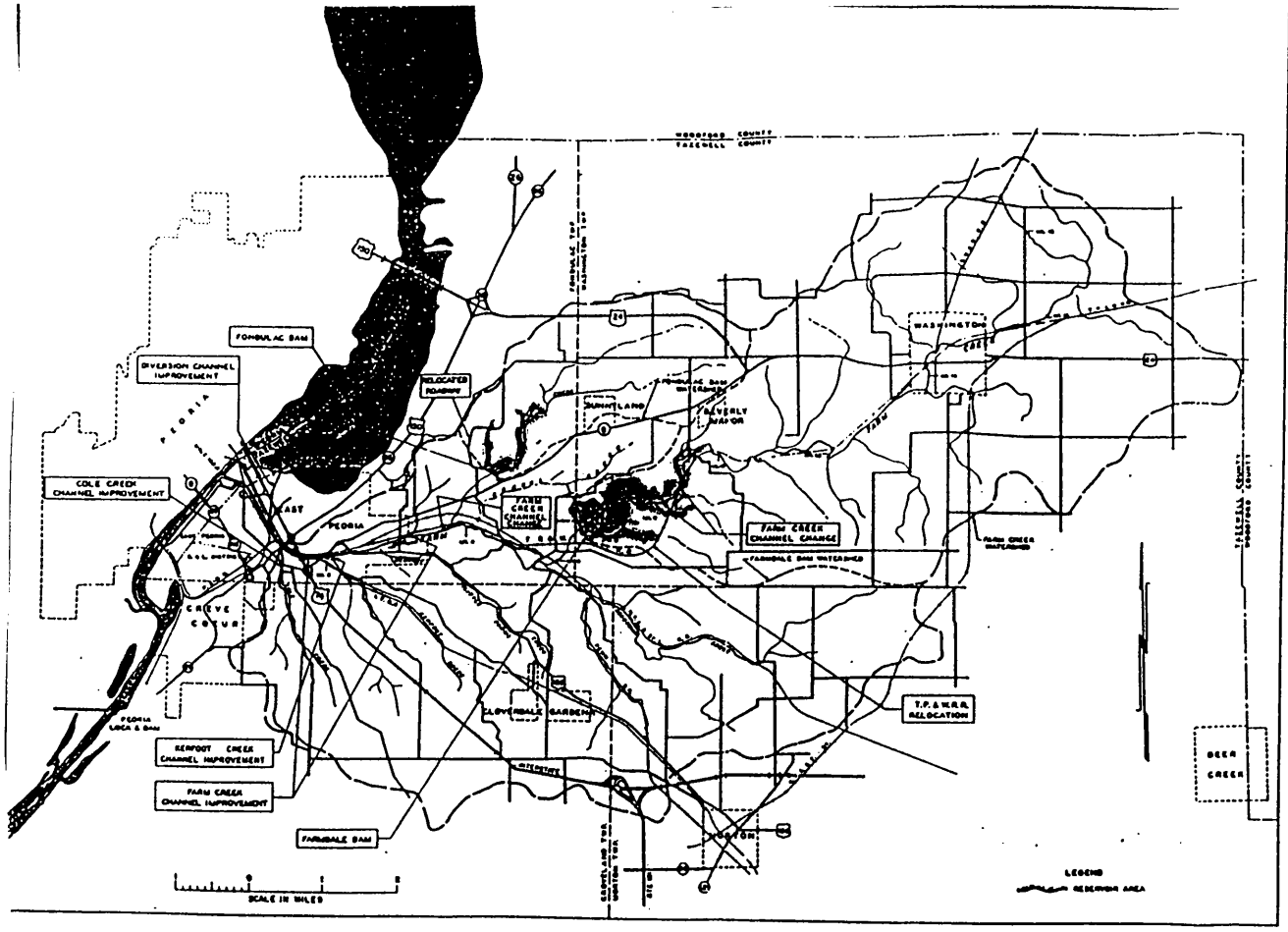
NPDES
(1997)

Facility	*Location*	*Discharge Stream*
ABILITY DRUM SERVICE, INC.	WASHINGTON	FARM CREEK
EAST PEORIA WASTEWATER PLT #2	EAST PEORIA	LITTLE FARM CREEK
FIRST NATIONAL BANK OF PEKIN	Morton	
GRIMMS TRUCK STOP	MORTON	ACKERMAN CREEK
HIGHVIEW ESTATES MCKINNEYCONS.	WASHINGTON	FONDULAC CREEK
HIRAM WALKER & SONS INC	EAST PEORIA	FARM CREEK
MORTON SEWAGE TRETMENT PLANT NO3	MORTON	FARM CREEK
NORTH TAZEWELL WATER TREATMENT FACILITY	EAST PEORIA	FARM CREEK
OAKLANE ACRES SEWAGE TREATMENT PLANT	MORTON	ACKERMAN CREEK
PINE RIDGE PORK RCH 001N	MORTON	ACKERMAN CREEK
SUNDALE SEWER CO	WASHINGTON	FARM CREEK
SUNDALE SEWER CORP-HIGHLAND HI	WASHINGTON	FARM CREEK
SUNDALE SEWER CORP-ROBINDALE W	WASHINGTON	FARM CREEK
SUNDALE SWR CORP-ROBINDALE WST	WASHINGTON	FARM CREEK
WASHINGTON #1	WASHINGTON	FARM CREEK
WASHINGTON ESTATES INC	WASHINGTON	FARM CREEK
WASHINGTON ESTATES INC	WASHINGTON	FARM CREEK
WASHINGTON SEWAGE TREATMENT PLANT 2	WASHINGTON	FARM CREEK
WASHINGTON SEWAGE TREATMENT PLANT 2	WASHINGTON	FARM CREEK
WASHINGTON WATER TREATMENT PLANT-CITY	WASHINGTON	UNNAMED TRIBUTARY

Hydrologic Modifications

Streams within the watershed have been modified to various extents, with most alterations occurring within the last fifty years. The road and rail network within the watershed is extensive, resulting in many realignments of the streams to adapt to these facilities. Early efforts at flood control have also resulted in massive alterations to the hydrology, in particular areas below the bluff line in East Peoria. Agriculture drainage has also had an immeasurable impact upon the watershed hydrology as indicated in the Drainage section above.

Farm Creek Watershed has roughly 340 miles of surface transportation infrastructure. An average density of approximately 5.68 miles of pavement per square mile exists within the watershed. From 1995 aerial photographs, 185 distinct bridges or culvert structures were identified intersecting major streams throughout the watershed. At each of these locations, we can assume some modification of stream courses. In addition, many sections of stream course have been straightened to parallel transportation routes. Due to the topography of the watershed, this frequently results in stream flow being channeled between roadbeds and steep bluff areas. The resulting streambank erosion from the bluffs is a contributor of sediment to the streams. Finally, with no ability to dissipate energy through a meandering stream course, streambed down cutting is taking place.



CHANNEL IMPROVEMENTS

FARM CREEK	
Concrete Lined Channel	5460 Ft
Earth Channel	1250 Ft
Levee Improvements	3000 Ft
FARM CREEK SPILLWAY CHANNEL	
Concrete Lined Channel	550 Ft
Earth Channel	5800 Ft
Levee Improvements	3400 Ft
COLE CREEK	
Concrete Channel (U-Frame)	1820 Ft
Earth Channel	500 Ft
Levee Improvements	600 Ft
KERFOOT CREEK	
Concrete Lined Channel	150 Ft
Earth Channel	930 Ft
Levee Improvement	1080 Ft

FONDULAC RESERVOIR

RESERVOIR

Area At Spillway Crest	97 Acres
Capacity At Spillway Crest	2280 Acre Feet
Drainage Area	5.4 Square Miles Or 3456 Acres

ROADWAY RELOCATION

Length	1.8 Miles

FARMDALE RESERVOIR

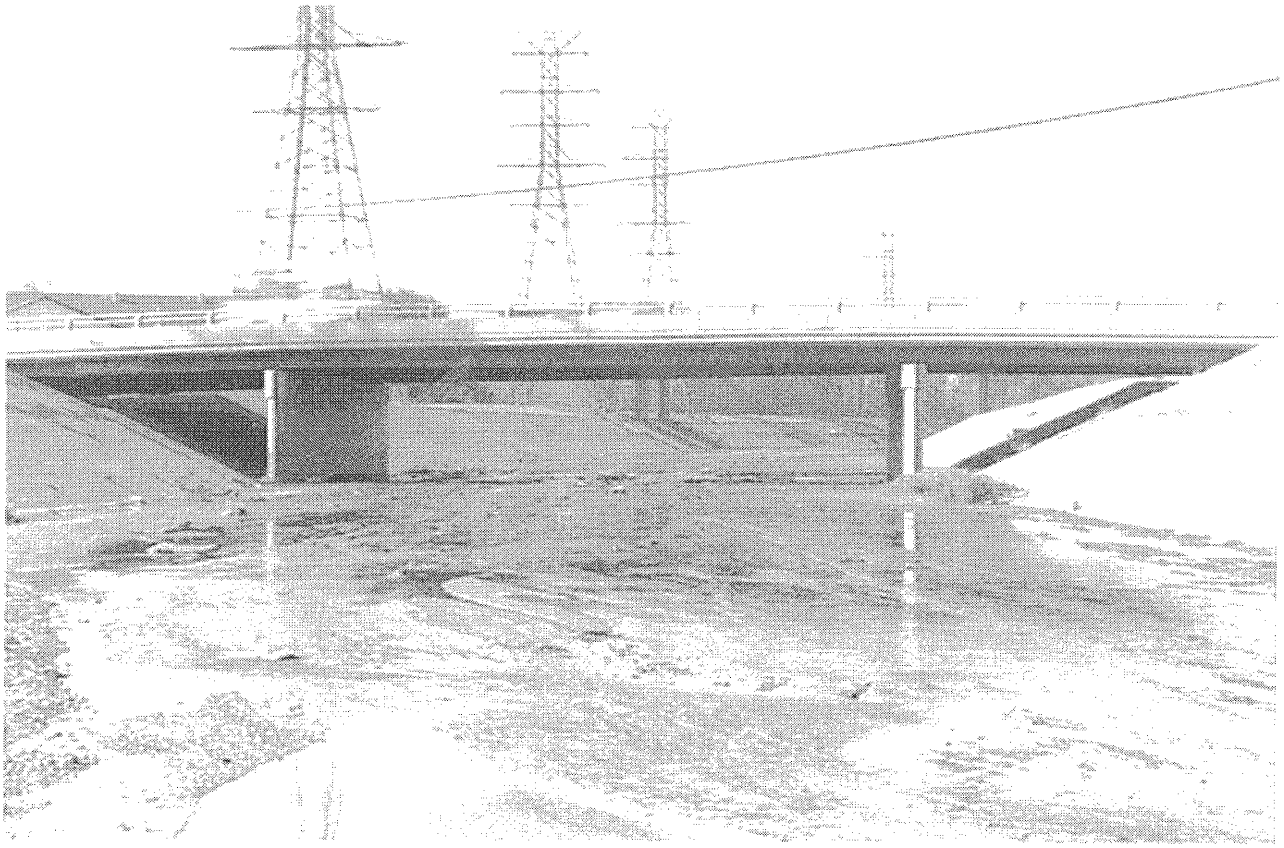
RESERVOIR

Area At Spillway Crest	385 Acres
Capacity At Spillway Crest	11,300 Acre Feet
Drainage Area	26.5 Square Miles Or 16,960 Acres

RAILROAD RELOCATION

Length	4.44 Miles

FARM CREEK RESERVOIRS
FARM CREEK, ILLINOIS
FLOOD CONTROL PROJECT
SCALE AS SHOWN
ROCK ISLAND DISTRICT
30 SEPTEMBER 1980



As was discussed in the *Farm Creek Flood Control Project; East Peoria* section under Floodplain Boundaries above, they made many channel improvements to Farm Creek and her tributaries in East Peoria. Below are the location, types, and extent of channel modifications done by the Corps of Engineers.

FARM CREEK

Concrete Lined Channel	5460 Ft.
Earth Channel	1250 Ft.
Levee Improvements	3000 Ft.

FARM CREEK DIVERSION CHANNEL

Concrete Lined Channel	550 Ft.
Earth Channel	1250 Ft.
Levee Improvements	3400 Ft.

COLE CREEK

Concrete Channel (U-Frame)	1820 Ft.
Earth Channel	500 Ft.
Levee	600 Ft.

KERFOOT CREEK

Concrete Lined Channel	150 Ft.
Earth Channel	930 Ft.
Levee Improvements	1080 Ft.

Stormwater Management

Currently, Tazewell County, Morton, Creve Coeur, and Washington have some type of Stormwater Control mechanism. Tazewell Co. and Morton require Post-Development runoff to equal Pre-Development runoff. The City of Washington requires that Post-Development runoff be less than Pre-Development runoff. Table 6 shows the differences among the various ordinances in effect within the watershed. The ordinances that are in place mainly address runoff and flood control issues. While not addressed directly, erosion control and increased streambank stability are probably benefits of proper enforcement of these ordinances.

Table 6

Summary of Stormwater Control Ordinances

Unit of Government	**Tazewell County**	**Morton**	**East Peoria**	**Washington**
Location of Requirements	Regional Ord.	SWDP (1)	City Code	Subdivision Ord.
Storm Water Controls				
Residential	X	X		X
Commercial	X			
Storm Water Design Standards				
Post-Dev.=Pre-Dev.	X	X		
Post Dev.<Pre-Dev.				X
not specified				
Baseline storm event frequency	2-yr. & 25-yr.	5-yr., 10 yr., 30 min.		25-yr.
Retrofitting component				
Erosion & storm water standards from	IL Urban Manual	IDOT, Green Book		Best Engineering Practices
Administration				
SW Permit Required	X			
Permit Fee	$50-$100		$25	
Set Application Review Period	X			
Duration of Permit	2 yrs.			
Financial Assurance	X		X	X
Enforcement				
Penalty for Violation	X			
Stop work order	X		X	
Appeals Process	X-regional board			

(1) Storm Water Detention Policy

(2) Adopted Tazewell Co. ordinance; currently not enforcing

(5) Certificates of Occupancy will serve as security except in cases where no building permit is required

Wetlands

AWetland≅ is a broad term that encompasses many different ecosystems that may include but not be limited to prairie, marches, bogs and swamps (USEPA, 1996). They are often transitional zones between more traditional open water and dry land. They serve as a unique resource and habitat for fish and wildlife species. Wetlands do not have to be wet year round. They define

wetlands as Athose areas that are inundated or saturated by surface or ground water a frequency and duration to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (USEPA, 1996).≅

The U.S. Environmental protection Agency and the U.S. Army Corp of Engineers have joint responsibility in regulating wetlands. The wetlands= information about the Farm Creek watershed comes from the National Wetlands Inventory initiated by the U.S. Fish and Wildlife Service. The map on the following page shows those wetlands in the Farm Creek watershed.

The Farm Creek Watershed has several wetlands of various types and sizes. Three hundred and fifty (350) wetlands of twenty-nine (29) different types are present in the watershed. A total of 880.95 acres is classified as wetlands that accounts for .21% of the total Watershed acreage. 305.16 acres are the result of excavation or impoundment. Operators currently farm 10.30, with the rest forming natural wetlands. The table below lists the National Wetlands Inventory Code and description, with the number of said types present in the watershed and the average acres of the type listed. We do not know the existing condition of these wetlands. A study to assess the conditions of these areas would be helpful in determining what opportunities exist for restoration or preservation activities. Please see appendix 1 for a description of the classification system (**Code**) on the map and in the table below.

Wetland Areas

Created by Tri-County Regional Planning Commission

DATA SOURCES
IDNR
USEPA
IEPA
TCRPC

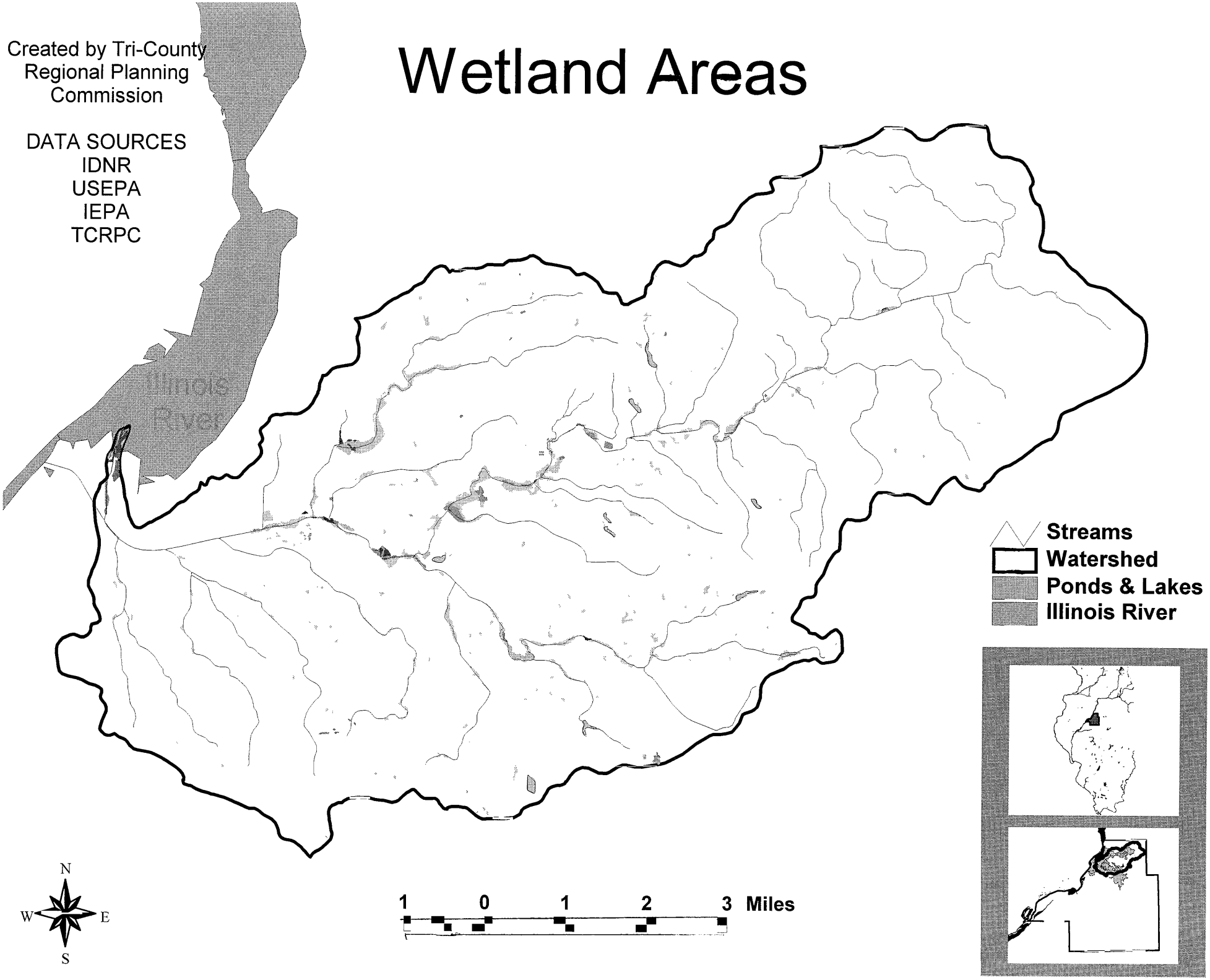


Table 7

Wetlands Types of the Farm Creek Watershed

Code	Wetland Type	Number	Average Acres
PEM/FO1A	Palustrine-Emergent-Forested Broad Leaved Deciduous-Temporarily Flooded	1	1.3000
PEMA	Palustrine-Emergent-Temporarily Flooded	17	1.7453
PEMAF	Palustrine-Emergent-Temporarily Flooded-Semipermanently Flooded	24	0.4067
PEMAX	Palustrine-Emergent-Temporarily Flooded-Excavated	1	0.5600
PEMC	Palustrine-Emergent-Seasonally Flooded	8	1.6275
PEMCD	Palustrine-Emergent-Seasonally Flooded-Partially Drained & Ditched	2	7.3000
PEMCF	Palustrine-Emergent-Seasonally Flooded-Farmed	1	0.5400
PEMCH	Palustrine-Emergent-Seasonally Flooded-Diked & Impounded	7	4.1729
PEMCX	Palustrine-Emergent-Seasonally Flooded-Excavated	2	0.7500
PEMFX	Palustrine-Emergent-Semipermanently Flooded-Excavated	3	0.4833
PFO1A	Palustrine-Forested Broad Leaved Deciduous-TemporarilyFlooded	93	4.7317
PFO1AH	Palustrine-Forested Broad Leaved Deciduous-TemporarilyFlooded-Diked & Impounded	6	4.3533
PFO1C	Palustrine-Forested Broad Leaved Deciduous-SeasonallyFlooded	4	0.6300
PFO1CH	Palustrine-Forested Broad Leaved Deciduous-SeasonallyFlooded-Diked & Impounded	3	14.3567
PSS1/EMA	Palustrine-Scrub Shrub Broad Leaved Deciduous-Emergent-Temporarily Flooded	2	8.5700
PSS1/EMC	Palustrine-Scrub Shrub Broad Leaved Deciduous-Emergent-Seasonally Flooded	1	0.8300
PSS1/EMCH	Palustrine-Scrub Shrub Broad Leaved Deciduous-Emergent-Seasonally Flooded-Diked & Impounded	2	10.2300
PSS1A	Palustrine-Scrub Shrub Broad Leaved Deciduous-Temporarily Flooded	6	1.9283
PSS1C	Palustrine-Scrub Shrub Broad Leaved Deciduous-Seasonally Flooded	3	0.7200
PUB/ABGH	Palustrine-Unconsolidated Bottom-Aquatic Bed-Intermittently Exposed-Dike & Impounded	1	0.4700
PUBG	Palustrine-Unconsolidated Bottom-IntermittentlyExposed	5	0.8140
PUBGH	Palustrine-Unconsolidated Bottom-IntermittentlyExposed-Diked & Impounded	105	1.2638
PUBGX	Palustrine-Unconsolidated Bottom-IntermittentlyExposed	22	0.9914
PUBKH	Palustrine-Unconsolidated Bottom-Artificially Flooded-Diked & Impounded	1	0.8600
PUBKX	Palustrine-Unconsolidated Bottom-Artificially Flooded-Excavated	4	1.6400
PUSAX	Palustrine-Unconsolidated Shore-Temporarily Flooded-Excavated	1	3.1900
PUSKH	Palustrine-Unconsolidated Shore-Artificially Flooded-Diked & Impounded	1	7.6300
R2UBHX	Riverine-Lower Perennial-Unconsolidated Bottom-Permanently Flooded-Excavated	3	3.1900
R2USA	Riverine-Lower Perennial-Unconsolidated Shore-temporarily Flooded	16	1.5981

Priority Waterbody

In 1998 several agencies and NGO=s (Non-Governmental Organizations) came together to establish mutual natural resource priorities in Illinois. Three such entities identified Farm Creek Watershed at the that time as a priority. The Illinois Environmental Protection Agency, Illinois Department of Natural Resources, and The Nature Conservancy all identified Farm Creek as a priority for restoration efforts.

Since 1998 the USACOE has initiated the Illinois Riverfront Development at Peoria, Illinois Environmental Restoration Feasibility Study. A stated goal being the development of feasible alternatives to address soil erosion and resulting sediment delivery to the Illinois River from the Farm Creek Watershed.

In Spring of 2000, Tazewell County Soil and Watershed Conservation District committed staff resources to the development of a Soil Erosion & Sediment Delivery Survey for the Farm Creek Watershed. This study, organized by NRCS field staff, will develop a baseline figure for sediment delivery to the Illinois River. Additionally, they will analyze various types of erosion to detect their proportionate contribution to the sediment load in Farm Creek.

Soil Classification

Five general soil associations dominate the Farm Creek watershed. Table 8 shows the total number of acres in the watershed for each soil association and its percentage of the watersheds total acres. In addition, we show the percentage of the particular association of the county. The Ipava-Sable association is typically, level, somewhat poorly drained and poorly drained, with silty soils formed of fine grained material, mostly of silt sized particles between 0.002 and 0.05 millimeters (USDA, 1996). The major soils of this association are suited for cultivated crops. The Tama-Ipava Sable association is nearly level to sloping, and well drained to poorly drained. Again, the major soils of this association are well suited to cultivated crops (USDA, 1996). Rozetta-Stronghurst associations are nearly level and gently sloping soils that are moderately well drained and somewhat poorly drained in areas. Cultivated crops generally do well in this soil association, with some areas being moderately suited for dwellings (USDA, 1996). The Birkbeck-Miami-Hennepin association is typically sloping to very steep in nature and moderately to well drained. This association is the location of mostly a woodland and woodland wildlife habitat. Some areas could support cropland or pastures. The slope typically found in this association is a major limitation to intensive land uses such as dwellings, local roads and streets. Additionally, erosion is a major hazard related to the steep slope of this soil association (USDA, 1996). Titus-Ambraw-Beaucoup soil associations are nearly level, poorly drained soils. The major soils are well suited to cultivated crops and generally unsuited to dwellings (USDA, 1996).

Table 8

General Soil Association

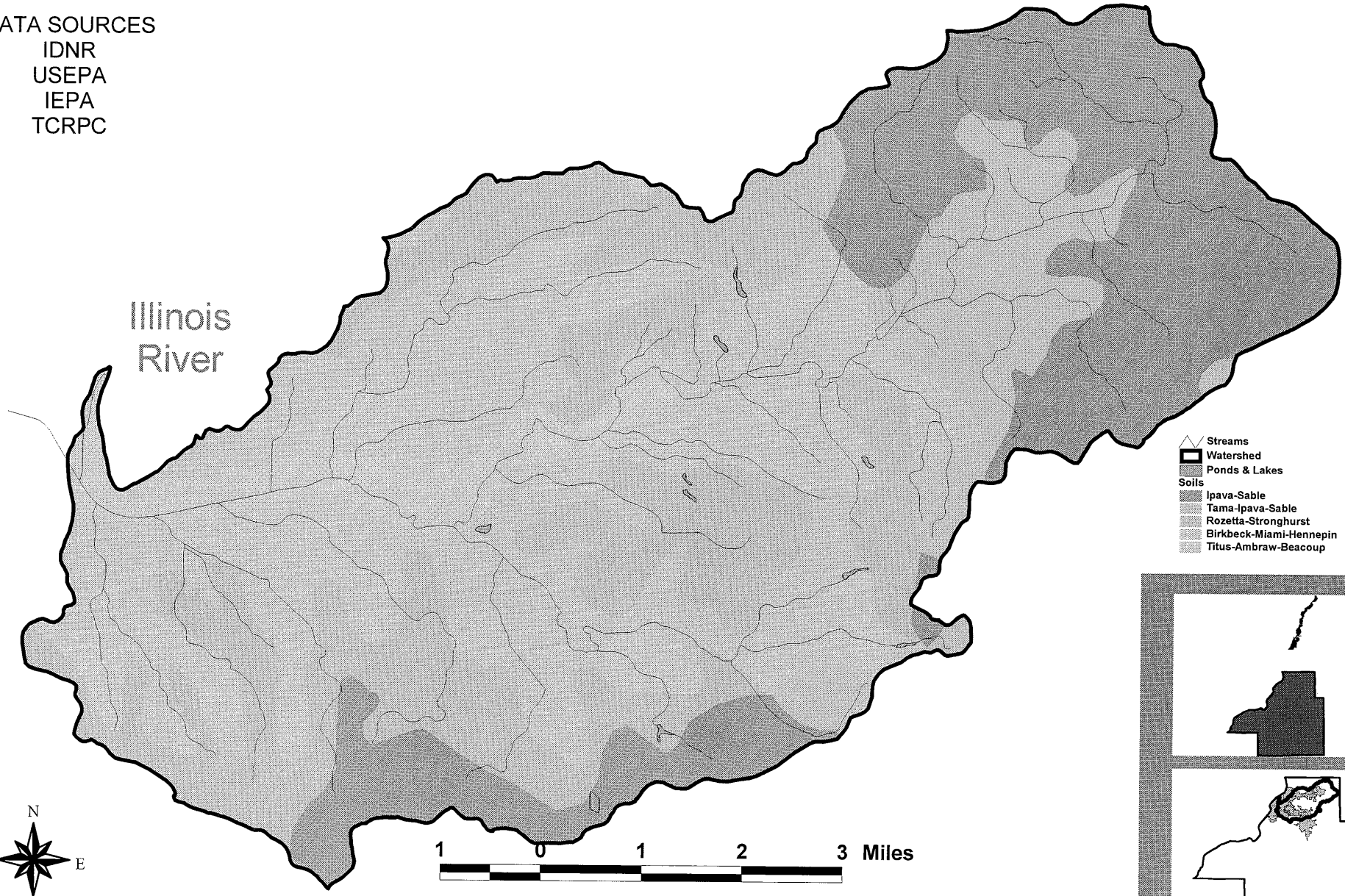
Soil Association	Acres	% of Watershed	% of County
Ipava-Sable	9532	24	20
Tama-Ipava-Sable	3186	8	20
Rozetta-Stronghurst	10151	26	11
Birkbeck-Miami-Hennepin	14105	36	17
Titus-Ambraw-Beaucoup	2090	5	4

Table 9 shows the general size and nature of the soils that can be found in the Farm Creek watershed. The number of acres was derived by taking the acreage of each soil association found in the watershed and multiplying it by the general percentages for each soil series found in the Soil Survey of Tazewell County, Illinois. Additional information concerning each soil type can be found in this publication along with detailed maps of the locations of these soils.

Soil Associations

Created by Tri-County Regional Planning Commission

DATA SOURCES
IDNR
USEPA
IEPA
TCRPC



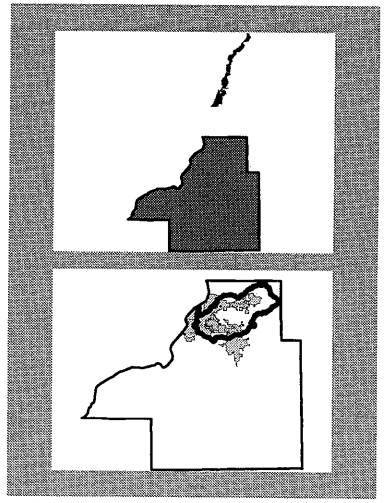


Table 9

Summary of Soils Found in the Farm Creek Watershed

Series	Soil Types	Acres in Watershed	Percent of Watershed	Prime Farmland
Ipava		5180	13	
	Ipava silt loam			x
	Ipava-Urban land complex			
Sable		4036	11	
	Sable silty clay laom			x
	Sable-Urban land complex			
Tama		1561	4	
	Tama silt loam, 1 to 5 percent slopes			x
	Tama silt loam. 5 to 10 percent slops, eroded			
Rozetta		4364	11	
	Rozetta silt loam, 1 to 5 percent slopes, eroded			x
Stronghurst		2842	7	
	Stronghurst silt loam			x
	Stronghurst-Urban land complex			
Birkbeck		5642	14	
	Birkbeck silt loam, 5 to 10 percent slopes, eroded			
	Birkbeck silt clay loam, 5 to 10 percent slopes, severelyeroded			
	Birkbeck silt loam, 10 to 15 percent slopes, eroded			
Miami		2821	7	
	Miami silt loam, 5 to 10 percent slopes, eroded			
	Miami silt loam, 10 to 15 percent slopes, eroded			
Hennepin		2115	5	
	Miami-Hennepin complex, 20 to 35 percent slopes			
	Miami-Hennepin complex, 30 to 60 percent slopes			
Titus		815	2	
	Titus silty clay, rarely flooded			x
Ambraw		585	2	
	Ambraw loam, rarely flooded			x
Beaucoup		188	1	
	Beaucoup silty clay loam, rarely flooded			x
Other Minor Extent		8626	24	
	Urban Land			

Soil Erosion

Erosion and the resulting sediment deliveries to the Lower Peoria Lake has been and will continue to be a major issue driving watershed planning in the Tri-County area. At this time, information concerning erosion and sediment deliveries to the lake is limited. Most of the research done have focused on the Peoria Lakes in order to learn generally where the sediment is

coming from. The major recommendations of these studies include additional studies to learn how much sediment is discharging from local tributaries such as Farm Creek. At this time, two studies have attempted to estimate the discharges from Farm Creek. Both were limited in the time spent taking samples. Other factors contribute to reliability of estimates about Farm Creek erosion and sedimentation. Sand and gravel mining attest to the hi levels of sediment being transported but also make accurate determination of discharge difficult (IDENR, 1993).

In Source Monitoring and Evaluation of Sediment Inputs for Peoria Lake, they estimated that 9,880 tons were discharge from Farm Creek in 1989. Nineteen eighty-nine (1989) was considered a drought year. In 1990, the estimate was 50,200 tons. 1990 precipitation and discharge were about average. While not a long term average, at least we have established a base number. This continued sediment deposition has resulted in a growth of the delta, at the mouth of the Farm Creek diversion channel in East Peoria, of about 68.46 acres from 1969 to 1994.

The Illinois Department of Agriculture has been promoting the T by 2000 soil loss prevention programs for nearly fifteen years. According to the USDA, 97% of the Upper Illinois River Watershed has reached a <or = to AT≅ soil loss level. Only two watersheds in the entire Illinois River valley are equal to this or greater. AT≅ is tolerable soil loss from an agronomic sustainability standpoint, but does not necessarily provide adequate protection for water quality purposes. With the increased success of efforts by the agricultural community to retain soil and implement soil conservation practices, an investigation to learn where erosion is occurring and in what volumes the sediment is making its way downstream to the Peoria Lake would be helpful in evaluating measures taken to reduce said erosion.

In 1995, Peoria, Tazewell and Woodford Counties adopted an Erosion, Sediment & Storm Water Control Ordinance. The intent of the ordinance is to help control soil erosion, sedimentation and storm water run-off caused by modifications to ground cover during land development. The ordinance includes provisions to reduce the soil leaving development sites, both during and after construction, and to reduce the amount and velocity of storm water runoff. The ordinance requires erosion control permits for all development sites meeting certain specifications. Controlling erosion and storm water is therefore a permit-driven process rather than voluntary. In each county, an Erosion Control Administrator oversees the implementation and enforcement of the ordinance. In addition, Peoria, Tazewell and Woodford counties have contracted with the USDA-Natural Resources Conservation Service, as well as with their respective Soil and Water Conservation Districts, to help with permit/plan review and site inspections. An NRCS civil engineer reviews erosion control permits requiring storm water plans, and the SWCD Resource Conservationists conduct inspections of all development sites having slopes greater than 10% and/or requiring storm water plans.

The Tri-County Regional Planning Commission is the agency responsible for coordinating the three counties= erosion control efforts. Beyond coordinating various issues surrounding the implementation and enforcement of the ordinance, these efforts include promoting the adoption of the ordinance to all municipalities in the Tri-County area, providing education to the

development community and increasing public awareness.

A more uniform set of erosion control ordinances combined with an effective enforcement mechanism within the watershed would go a long way in reducing the sediment entering the Peoria lake. In addition, any proposed study to monitor the amounts of sediment being delivered from the Farm Creek watershed should also look at the effectiveness of the ordinances in effect in the watershed on reducing amounts of sediment delivery.

Soil Erosion & Sediment Delivery Survey Results : USDA-NRCS

An erosion and sedimentation inventory was conducted for Farm Creek watershed in Tazewell County. The watershed totals approximately 39,417 acres or about 61.6 square miles. Sediment Delivery Rates (SDR) for each type of erosion occurring within the watershed and Sediment Transport Factors (STF) for the entire watershed and each of the subwatersheds were also calculated. The main goal was to estimate total sediment load to the mouth of Farm Creek at the Illinois River in East Peoria. An estimate was also made as to sediment delivery within the individual stream reaches below each of the two big sediment retarding structures already in place. Finally, an estimate was made as to quantity of sediment delivered to the northeast side of the City of Washington.

The entire watershed lies within the Till Plains Section of the Central Lowland Province physiographic area. Within the Till Plains Section, it is specifically located on the Bloomington Ridged Plain which is the unit that is more rolling and contains most of the Wisconsin glacial moraines located in Illinois. In most areas, Peoria Loess and Roxana Silt overlie diamictons (glacial till) of the Delavan Member of the Tiskilwa Formation of the Wedron Group that is generally loam or clay loam in texture. The loess ranges from 10 to 15 feet in thickness over the general area, but can be thicker along the major drainageways and thinner on the eroded side slopes. The Delavan Member is a brownish gray till that is calcareous and contains lenses of gravel, sand, silt and clay. The main Farm Creek channel cuts through deposits of Cahokia Alluvium which is less than 20 feet thick and is underlain by loamy and sandy outwash material of the Henry Formation. Stream and gully dissection has exposed the underlying Pennsylvanian-aged shale and limestone in a few areas along the major drainageways and the bluff areas bordering the Illinois River Valley. Sandy deposits of the Henry Formation are below the alluvium on the major valleys, but glacial till can be below the alluvium on the upper reaches of the streams or where smaller tributaries join the main drains as they exit from the surrounding uplands. Overall thickness of the loess and the thickness of the till over the bedrock does vary, and in a few areas, the loess directly overlies the shale. On the steeper slopes, the glacial till can be the surface unit, with the loess having been removed by erosion. The location of these surficial deposits has a significant effect on erosion and sedimentation that occurs within the watershed. The surface texture of the soils in greater than 80% of the watershed is a silt loam, reflecting the characteristics of the loess cover that blankets nearly the entire region. This material is quite erosive and is easily removed if exposed to running water. The alluvium in the streambanks can contain a variety of materials with a variety of textures and grain size content.

This is especially noticeable where the stream is running through the coarser, sandier deposits. Stability of the streambanks is greatly dependent on the shear characteristics of the material, and on a watershed scale, it is difficult to make "general" statements about overall conditions. Site specific determinations are essential for future streambank stabilization activities. Overall total relief in the watershed is about 360 feet, from a high of 800 feet in the upper reaches near the watershed divide to a low of about 440 feet near the mouth of Farm Creek in East Peoria.

The entire watershed was divided into "pieces" to analyze. To do this, three Geomorphic Units (GU) were set up. These Geomorphic Units are simply landscape units that are similar in geology, slope, soil, etc. and in anticipated response to erosion. These units are: **GU1**, Major floodplains and large wetlands (sinks); **GU2**, Upland flats and depressions with slopes generally 5% or less; and **GU3**, Upland, sloping areas, with slopes generally greater than 5%. Each GU produces differing sediment amounts depending on dominant erosion within it. Some, as in GU1, serve more as sediment "sinks" or deposition areas than they do as "sources" or eroding areas. Within GU2, there are a few areas that literally produce no sediment that will impact a surface water body. These areas are called Areas-of-No-Significant-Sediment (ANuSS). Generally they are flat or even depressional areas of less than 2 percent slope. They are not impacted directly by run-on water and are more than 2000 feet from a concentrated flow area (waterway, ditch, gully). These areas have a very low priority for watershed land treatment, in regards to affecting water quality at the outlet.
At least five different types of erosion can produce sediment: sheet, rill, ephemeral, gully, and streambank. In the Farm Creek watershed, sheet and rill erosion values were computed from data gathered during the Erosion and Sediment Inventory. In NRCS, we use a process referred to as the Rapid Assessment, Point Method (RAP-M) to statistically estimate erosion and sedimentation rates within any given watershed by sampling a portion and then expanding this data to fit the entire watershed. A Random-Stratified Sampling Procedure was used to select areas to be sampled. These units were 160 acres in size and were selected throughout the watershed, with an attempt to characterize all different land uses that are present. Inventory data collected in the field from these sites included all information necessary to compute sheet and rill erosion losses. Using this data, an **annual** soil loss rate for each type of major land use within the watershed was determined. If the total number of acres for each land use is multiplied times this rate, a gross amount of sheet and rill erosion occurring within the watershed can be estimated. From these same 160-acre sample units, gully reaches were also selected, again using a random procedure.

Ephemeral or "annual gully" erosion was evaluated in the field by either actual measurement of area voided or by applying a standard formula to estimate the total erosion produced on an average **annual** basis. The rates produced using these methods were then projected and expanded to fit the rest of the Farm Creek watershed.

Gully erosion ("classic gully" or "perennial gully") was measured in the field within the above mentioned sample units. A selected number of the gullies were walked and in-field measurements made on both the left and right banks in regard to severity of erosion or deposition. An erosion rate, called a "Lateral Recession Rate", was applied to each measured

section. These values were summarized and combined to produce an **annual** rate of erosion in tons or pounds of soil material removed per linear foot of gully. The estimated feet of gullies per sample unit was obtained by map wheel measurement from 7.5 minute quadrangle maps, with in-field checking and verification. This value was then expanded to fit the watershed, by first determining which GU unit is most affected by this type of erosion. In Farm Creek watershed, GU3 contains virtually all of the "classic" gullies. So, this unit will represent the entire watershed.

Streambank erosion was calculated in a manner very similar to that method used for the gullies. Selected segments of the main creek and the major tributaries were walked. In general, if the selected reach represents a perennial water body (solid blue line on quad map), it was called a "stream"; if it was intermittent (dashed blue line) with a flood plain, it was also called a "stream"; other concentrated flow areas were designated as "gullies". The *rate* of streambank erosion was calculated exactly as it was done for the gullies, using slightly different qualitative parameters and then summarized. Using the measured rates of streambank erosion and the map measured miles of streams that are currently eroding, an estimate of the quantity of erosion taking place was obtained.

In a dynamic environment that is constantly adjusting to man-made and geologic conditions, gullies and streams are in a perpetual state of shifting between downcutting and deposition. During field measurements, an attempt was made to verify the overall general percentage of gullies and streambanks eroding or, if possible, changes in these percentages based on landforms, soils, etc. If this field-verified value was significantly different from that percentage arrived at from the sample inventory, then a slight adjustment was made in the overall rate of gully erosion to account for this.

SHEET AND RILL EROSION in Farm Creek

Sheet and rill erosion occurs on all land whether it is cultivated or not. It is a very natural, unending process. It is more of a concern when it is accelerated by man's activities. In the Farm Creek watershed, sheet and rill erosion was estimated, on a per acre basis, for all the dominant land uses. For cropland, evaluations were made for the "A" and "B" slope areas (0 to 5%); for the "C" slope areas (5 to 10%); and for "D" slope and greater areas (10 to 15%+). These slope groups become quite significant from an erosion standpoint. Many different levels of land treatment are necessary to reduce the annual soil loss rate to an acceptable value. Average rate of soil loss for A/B slope cropland ranged from 3.1 to 3.8 T/A/year, depending on the soil type and length of slope. For C slope cropland, soil loss ranged from 8.1 to 8.3 T/A/year, again depending on soil type, length of slope, and degree of slope. Cropland on D slope and greater, had a soil loss of only 3.5 T/A/year. There are only 47 acres of D slope cropland and literally all of the acres are in a no-till farming system. In the years immediately following the implementation of the 1985 Farm Bill, efforts by the landowners and operators to remain eligible for future farm programs, prompted many of them to change their farming practices. Often times these changes included less tillage and leaving more residue on the surface. This helped to significantly reduce sheet and rill erosion on their fields. This trend is noticeable on all the slope classes of cropland.

Several land use categories of woodlands were also set up and evaluated. Areas of woodland that were ungrazed and relatively undisturbed, regardless of slope, had a soil loss rate of 1.8 T/A/year. Those that have had the understory disturbed by grazing, timber removal, etc. had a soil loss rate of 5.4 T/A/year. Pastures and other grasslands, which also includes land presently in the Conservation Reserve Program (CRP) program, were grouped together since soil loss is nearly the same regardless of slope. These grassed areas had a soil loss rate of less than 0.1 T/A/year. Residential or "urbanized" areas of the watershed that included the older subdivisions, towns, etc. had a soil loss rate of only 0.5 T/A/year. However, those acres of land that are "currently" being converted from an agricultural or wooded state to one of high-density urban use, have excessive amounts of sheet and rill erosion. These areas had an overall average soil loss rate of 61.5 T/A/year. For this watershed, it was estimated that approximately 150 acres, or roughly 0.3% of the total watershed, is taken out of cropland, grassland, or woodland use and converted to urban use each year. The "conversion process" of stripping the land of all vegetation and topsoil and then applying general land grading to construct facilities makes the land extremely vulnerable to excessive erosion.

Total sheet and rill erosion from **cropland** is estimated to be **65,791 tons** per year. This figures out to be about 4.2 T/A/year for all cropland. Most of the soils in this watershed have tolerable soil loss (T) values of 5.0 T/A/year. This means that if erosion rates are below the "T" value, long-term cropland sustainability is likely. This shows that the landowners have a commitment to protect the land from further damage by erosion. Sheet and rill erosion from **pasture and grassland** is about **262 tons** per year. Total **woodland** areas produce about **19,115 tons** per year or about 2.1 T/A/year for all woodland. Older **rural residential and urban areas** produce about **4,500 tons** of erosion per year, while those **currently under development** produce about **9,225 tons** per year. **Total sheet and rill erosion** in the Farm Creek watershed is estimated to be **98,893 tons** per year. This is roughly 2.5 T/A/year for each acre of land in the entire watershed.

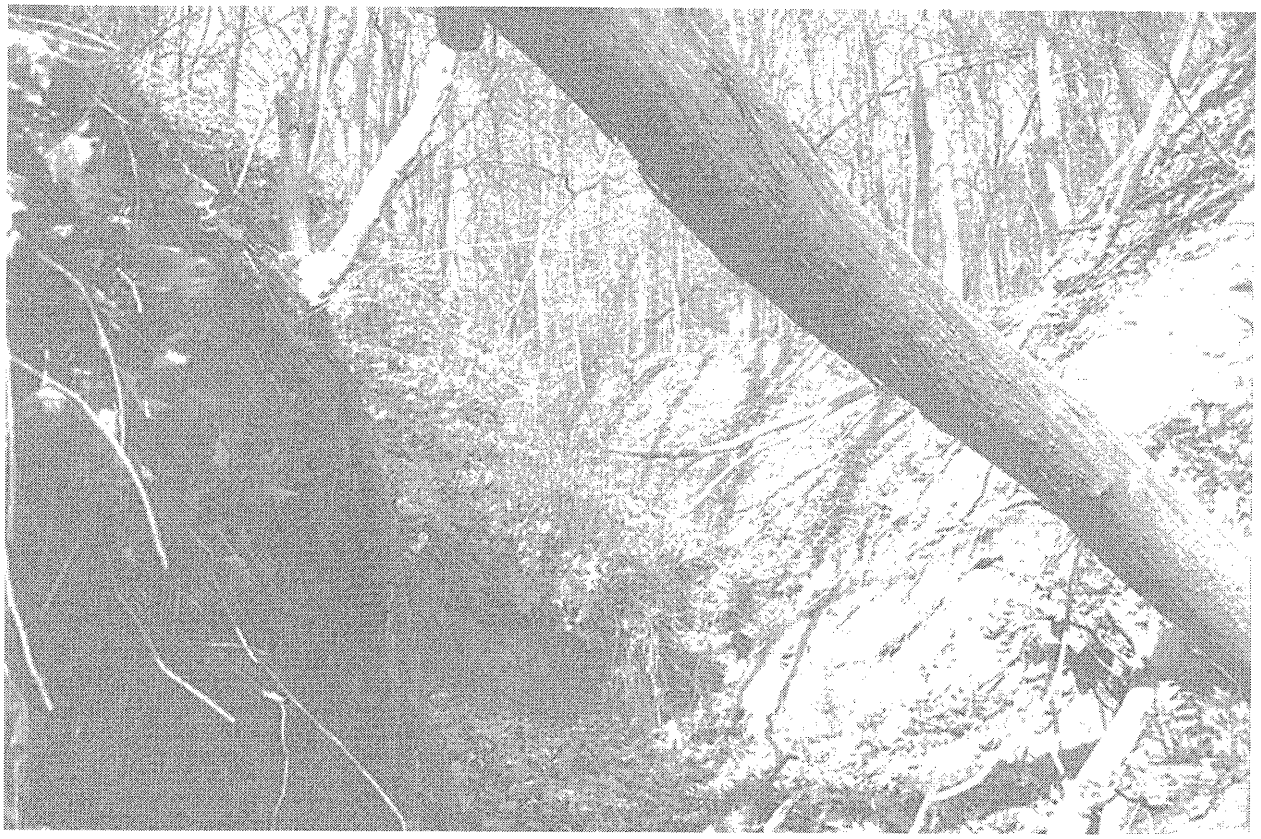
EPHEMERAL EROSION in Farm Creek

Ephemeral erosion occurs when tiny rills coalesce into small channels that tend to "funnel" water in a concentrated flow. These ephemeral or "annual" gullies are usually destroyed each year as the tillage for the year is completed. However, if the rate of erosion is great enough, the small channels will enlarge, even in a year's time, to concentrated flow areas that are too large to be crossed with normal tillage implements. This, then, becomes the beginning of the more "classic" perennial gully. These ephemerals generally begin to form where relatively flat or gently sloping soils "break" into steeper areas. Often times, they form on the edge of cultivated fields where the native vegetation is no longer in place to hold the soil during the high water flow times. In the past couple years, more emphasis has been placed on attempting to measure the amounts of erosion from these gullies. Studies have indicated that in some states, these contribute as much erosion, and thus sediment, as does sheet and rill erosion. For this field study, the length and grade of each ephemeral, and the type of tillage surrounding each of these was recorded. This information was then plugged-in to a predictive formula that has been developed to estimate tonnage of erosion, assuming one annual voiding. In this watershed, approximately **3,900 tons** of erosion can be contributed to the **ephemerals.**

The rate and total amount of erosion from ephemerals is somewhat lower than expected for this general type of watershed. This is probably due to the fact that there are not many sloping cropland fields present and where they do exist, the field have been enrolled in the CRP Farm Program and currently support grass vegetation. This perennial vegetation is very effective in reducing sheet, rill, and ephemeral erosion. Nearly 83 percent of the cropland present is in the A/B slope group, which is generally 5 percent slope or less. These areas don't generate significant amounts of ephemeral erosion.

GULLY EROSION in Farm Creek

Gully erosion was estimated in the entire watershed by selecting random "reaches", evaluating these "qualitatively" to obtain "quantitative" values, and then expanding this data to fit the remainder of the watershed. The premise for this is that if enough segments are sampled, areas that are only slightly eroding as well as those that are very severely eroding will be selected to evaluate. This percentage can then be used throughout the watershed with statistical validity. The "qualitative assessment" used to assign Lateral Recession Rates is one that bases observed physical features of the gullies with actual measured amounts from many Midwestern watersheds. In Farm Creek, many gullies contained "knickpoints", or small overfalls in the base of the channel. This can indicate recent downcutting and also indicate a difference in soil material. In areas where loess overlies glacial till, and this, in turn, overlies shale bedrock, a whole series of these knickpoints can be traced up many of the gullies. In regard to sediment production, each type of material produces different rates. The loess is most susceptible and will readily collapse into the gully and move off-site. The glacial till has more strength and is more difficult to erode, but can be eroded over time. Glacial till generally contains the large stones and much of the sand and gravel that is observed in the streambed farther downstream. The shale bedrock is even more resistant to erosion than the till. However, if it is exposed on a gully side wall or along a streambank, the drying and re-wetting will cause it to "weather " or begin to break off in small pieces. When this happens, it, too, can be eroded and moved downstream.



Many of these steeper watersheds contain more gullies than what it is normally "expected". There are approximately 440 miles of total gullies in the watershed, or in other words, about 7.1 miles of perennial gullies per square mile of watershed, with an even greater density near the river bluffs. With this degree of dissection, the erosion produced by eroding gullies can become significant quickly. In Farm Creek watershed, approximately **88,000 tons** of soil is eroded each year that can be attributed to **gullies.** Much of this comes from the gullies that lie immediately adjacent to the Illinois River Valley or along the main channel of Farm Creek.

STREAMBANK EROSION AND SEDIMENTATION in Farm Creek

Streambank erosion in any watershed is a rather complex and detailed process. As the stream meanders across its valley or floodplain, "new" sediment is being added continually as the stream cuts into its banks. However, sediment is also being deposited in perhaps another portion of the stream as energy levels of the stream rise and fall. If the "net effect" remains somewhat constant over a period of years, the stream is considered "stable" and the changes are considered to be part of a "dynamic equilibrium" condition that exists within the watershed. If, however, this ongoing process is skewed one way or the other and either severe downcutting and bank caving predominates or extreme rates of sedimentation within the stream are occurring, then it is considered to be "unstable". In truth, many streams experience all of this variation if all stream reaches from headlands to mouth are considered. To determine the magnitude of the dominant process occurring, the stream itself must be walked and evaluated. In most cases, no other "measured" streambank data

has been gathered in the past, so these **estimates** become the base for determining present sediment yield and future projections that would be modified by treatment measures in the watershed.

Streambanks in the lower part of Farm Creek and several of the major tributaries in particular have been stabilized using concrete aprons to line the slopes. This lining keeps the stream off the banks and thus nearly reduces all streambank erosion.

The field data collected by NRCS personnel conducting the Streambank Inventory on the "natural" areas of the streams, contained estimates of Lateral Recession Rates (erosion rates) that ranged from "slight" (0.03 of a foot per year) up to "severe" (1.0 foot per year) of actual annual bank recession. These qualitative estimates can underestimate the erosion amounts coming from the most severely eroding sites. Illinois State Water Survey (ISWS) data from similar watersheds has shown that on the most eroding sites, rates of lateral recession have been as high as 5 to 10 feet per year. It is assumed that on most stream reaches in Illinois the "slightly" and "moderately" eroding areas probably contribute very small amounts of sediment to the overall average annual yield. With this in mind, the rates that NRCS used were re-evaluated and "adjusted" where it was clear that a "more severe" rate should have been used. This helped to bring these more in line with actual measured values elsewhere.

Total mileage of streams in the watershed was taken from published hydrology data or map-measured from 7.5-minute quadrangle maps. Farm Creek (main channel) is approximately 19.8 miles long; Ackerman Creek 7.6 miles; Coal Creek 3.6 miles; Little Farm Creek 2.7 miles; Fondulac Creek 3.0 miles and the other perennial, but unnamed channels, 12.3 miles. This brings the total stream mileage in the watershed is about 49.0 miles.

In this inventory and using NRCS methods of "visual assessment," an overall rate of streambank erosion, on an **average annual basis**, was calculated for most of the major stream channels. An average rate of erosion was estimated to be 100 pounds per linear foot of streambank. **Total streambank erosion** in the Farm Creek watershed is estimated to be **12,850 tons**, which is considered to be an **average annual rate.**

SEDIMENT DELIVERY RATES (SDR) and SEDIMENT TRANSPORT FACTOR (STF)

Only a portion of the sediment produced reaches a concentrated water source. Then, the stream system itself transports only a portion of what actually enters it. To account for this, Sediment Delivery Rates (SDR) and Sediment Transport Factors (STF) are used. These factors are similar to the "Blue Book" value of a used car - for a car, you start out with a base value and then add or subtract from that, depending on the options and mileage on the car. For this watershed, you start out with a "standard" value and then adjust this number up or down based on landscape characteristics. The Farm Creek watershed is somewhat complex when it comes to overland flow of water and sediment. It is a "youthful" to "mature" watershed, geologically, with an abundance of short, steep slopes along the major drains and longer, more gentle slopes away from the drains. Stream dissection and downcutting is quite evident, extending nearly to the

uppermost reaches of the watershed. What this means is that some of the sediment moves just to the base of the slopes while other sediment may move entirely through the watershed.

SDR's vary for each type of erosion, as would be expected. Sheet and rill erosion and the sediment it produces varies dramatically across this watershed. In the sloping area surrounding the main stream channel and the other major tributaries, sheet and rill erosion ***potential*** is greatest. The land is more sloping and the slopes are often short and "choppy". Conversely, in the areas of the watershed where the slopes are longer and more gradual or the land is nearly level, the soils do not have high erosion potential. Along the path to a concentrated water flow area, many options are available for the sediment. Small sinks or traps are found within this watershed that include potholes, small ponds, wetlands, and even the flat parts of upland fields. In many cases, the wide floodplains can serve a very natural and useful purpose by also keeping sediment from entering the streams. Some of these "local" sinks effectively capture nearly 100% of the sediment produced above them in their subwatershed.

SEDIMENT DELIVERY RATES in Farm Creek

Sediment Delivery Rates (SDR) are used to predict the quantity of sediment that is moved "on-site" to be "available for transport". For example, sediment is produced on a sloping, cultivated field each year as the farmer chisel plows the field. The sediment moves down the slope, and here, some of it becomes immobilized as it imbeds itself within the grass or is deposited where there is a change in slope. Some of it, however, is in a position near a waterway, or ditch, or shallow field channel that makes it available to move farther with the next storm event. SDR's are developed for each type of erosion and often times, several are developed for sheet and rill erosion, based on where the slopes are within the watershed.

Sheet and rill erosion has the most complicated Sediment Delivery Rate, because it involves sheet or laminar flow, as opposed to channel flow. Some of the factors involved in determining this are land slope, distance from a concentrated flow area, slope configuration, NRCS runoff curve number, and a surface roughness coefficient. Usually a "base rate" is determined for the conditions in the watershed or subwatershed, and then adjustments are made to that rate based on subsidiary conditions. A strong attempt is made to apply these criteria in a uniform and consistent manner throughout. Since sheet and rill erosion from the cropland areas was so varied no single value of SDR seemed to suffice. For cropland areas, three different SDR's were used, determined solely by differences in slope. For pastureland and grassland, one SDR was used. Woodland was the major land use along the main stream tributaries and was comprised of those areas that were relatively undisturbed and those areas that have been grazed extensively. SDR's varied accordingly and two different ones were applied. Finally, residential areas within the wooded areas also had a separate SDR applied because the close-cut lawns and landscaping in the yards causes transport factors to be significantly different than cultivated fields. More "urbanized" areas and those areas currently being "developed" in East Peoria, Sunnyland, Washington, etc. had another SDR applied to reflect the runoff differences caused by high concentrations of roofs, driveways, parking lots, etc. The eight different SDR's used in this watershed for sheet and rill erosion ranged from 0.25 to 0.77.

Ephemeral, gully, and streambank erosion are all considered to be a form of "channel" erosion. Channels generally have larger SDR's because often times the erosion-produced sediment comes from the channel bottom and sides themselves, therefore naturally being more directly tied to delivery into the stream system. Ephemeral SDR's commonly are in the 0.75 to 0.85 range. In the Farm Creek watershed, a value of 0.75 was used for all the empheral erosion sediment routing purposes.

Gullies serve as almost the "perfect funnel" to move sediment directly into the entire stream system. Gullies that lie immediately adjacent to the main channel have SDR's of 0.90 to 1.0. Gullies that occur on the extreme upper reaches of the watershed may have a range of 0.70 to 0.90. In this watershed, rates of 0.80 were used for the gullies in the upper reaches and 0.95 for those gullies adjacent to the major tributaries.

Streambanks, of course, have an SDR of 0.95 to 1.0. Literally everything that is eroded from the streambanks falls in the stream and is immediately available for transport. This is one of the reasons that even though the quantities of sediment produced by streams is not as great as compared to some of the other sources, it is literally 100% "delivered". Sheet and rill produces large quantities of erosion and sediment, but only a fraction of it actually enters the system. Therefore, it is often times more important to treat the streambank areas because the sediment is much more "concentrated" and can often be considered a "point" source of pollution.

SEDIMENT TRANSPORT FACTOR for Farm Creek

Sediment Transport is the final step in our erosion/sediment cycle. Sediment Transport Factors (STF) attempt to rate the overall effectiveness of the entire stream system in moving sediment through. Stream systems that are relatively small, have high gradients, and have small tributaries that reach to the upper segments of the uplands move sediment through completely and rapidly. Watersheds that are quite large with numerous locations for sediment to drop out, have low stream gradients, and have numerous undrained upland areas are much less efficient in moving the total sediment load. The STF is based on drainage density, drainage texture, relief/length ratios, valley slope of 3rd order streams, size of the watershed, type of sediment that is predominant, percent of the watershed "controlled" by natural or man-made "sinks", stage of stream system development, etc. These factors are weighted and then applied to the stream system in as uniformly and consistent manner as is possible. The number produced by the rating system is simply multiplied times the total sediment "available for transport" and this number is then the total sediment, from all sources, delivered to the Illinois River. For the entire Farm Creek watershed and the subwatershed below the flood control structures (Lower Farm Creek), a STF of 0.45 was used.

Since an attempt was made to estimate suspended sediment load at several different outlets, several other STF's were used. The subwatershed above Fondulac Structure has different characteristics than that above Farmdale Structure. Also, the subwatershed above the City of Washington is much flatter than the rest of the area, so a fourth STF was used here. Fondulac STF was 0.65; Farmdale

was 0.35; and for the City of Washington subwatershed a STF of 0.30 was used.

From the quadrangle map it was noted that there are numerous small ponds in the Farm Creek watershed. These ranged in size from 0.5 to 5.0 acres of surface water. If we assume there are about 25 of these and that each has an average watershed of 25 acres, then this amounts to more than 625 acres of watershed that are "controlled" in regard to sediment deposition. These small ponds are very effective in trapping sediment, also, and serve to keep nearly 100% of the sediment generated above them from moving through the system. Most of the acres where this "control" exists would be those in the "sloping cropland" land use. These 625 acres were subtracted from the overall total of cropland that was C+ (>5% slope).

Two huge flood retarding structures are located within this watershed that have been in place for a number of years. Both Farmdale Structure and Fondulac Structure are very effective in reducing flooding and in trapping sediment within the overall Farm Creek drainage system. These dams control nearly all the sediment produced "above" them within the watershed. A certain amount of bedload is allowed to pass through, but significant reduction of total sediment is noted below each structure. Trapping efficiency, or the amount of sediment caught and held by each of these two big structures is important when considering the overall amount of sediment that is reaching the Illinois River on an annual basis. Trapping efficiency is calculated from a set of curves based on hydrologic characteristics such as runoff, storage capacity, inflow-outflow ratios, etc. Both these structures have estimated trap efficiencies near 85%. This means that 85 percent of the sediment produced above them in their watershed is retained within them and only 15 percent actually passes through and moves into the lower part of the Farm Creek system.

SUMMARY OF EROSION AND SEDIMENTATION IN FARM CREEK WATER SHED

In the total Farm Creek watershed, an estimated **203,650 tons of erosion** occurs on an annual basis from the five major types of soil erosion. If this number is divided by the number of acres in the watershed, a rate of about 5.1 tons per acre per year is obtained, when ALL sources of erosion are considered. As has been discussed earlier, the Farm Creek watershed was broken down into four separate subwatersheds to analyze for erosion and sedimentation. The Fondulac Creek subwatershed contributes approximately 2,200 tons of "delivered" sediment to the Illinois River. (Table 2) The Farmdale Creek subwatershed contributes about 2,300 tons (Table 3) and the City of Washington subwatershed only about 520 tons. (Table 4) The remainder of the sediment is generated in the lower section of the Farm Creek stream system "below" the large flood control structures. Sediment delivered from here totals 28,600 tons. Therefore, approximately **33,600 tons of sediment** is actually "delivered" to the outlet end of the watershed at the Illinois River. This gives an overall rate of 0.8 tons per acre per year or 512 tons of sediment per square mile of watershed when the entire watershed is considered. At 60 pounds per cubic foot, this also calculates to be 25.7 acre-feet of sediment deposition on an annual basis that is reaching the Illinois River in East Peoria.

Roughly 34% of the sediment comes from sheet and rill erosion and 2% from ephemeral erosion (channel). Gully erosion (channel) contributes about 55% and about 9% comes from streambank

erosion (channel). Remember, though, that sheet and rill sediment comes from all 39,417 acres of the watershed, while the streambank sediment comes from about 49 miles of perennial streams, of which less than one-third of the total mileage is producing nearly three-quarters of the total load. Likewise, there is still much discussion on SDR rates for slopes less than 5%. It is believed presently that SDR **base rates** of 0.10 to 0.15 may be more appropriate.

A further breakdown of erosion and sedimentation in the Farm Creek watershed reveals the following: Fondulac Subwatershed. Approximately 30,400 tons of erosion from all sources is produced above the structure. Of that total, approximately 14,300 tons of sediment reaches the structure and nearly 12,100 tons is trapped within, due to the designed trapping efficiency. That leaves only 2,200 tons that pass through and enter the Farm Creek system. The Farmdale Subwatershed can be evaluated in a similar manner. Approximately 67,400 tons of erosion is produced in the subwatershed and the accompanying sediment delivered is about 15,300 tons. Of that total, about 2,300 tons pass through and enter the Farm Creek system. Finally, in the small "City of Washington" subwatershed, approximately 22,300 tons of erosion actually occurs above the City, and much of this is from sheet, rill, and ephemeral sources. This is a reflection of the overall low relief of this subwatershed. Of this erosion, about 3,120 tons is actually reaching the "outlet" which was established on the north-northeast corner of the community. This represents abut 1.6 acre-feet of sediment (@90 pcf) that is available for deposition, especially if outlet-restrictions or flooding occurs.

Bedload material is very seldom measured as an output at the point of delivery, because of the cost and extensive sampling equipment that is necessary to complete this job. U.S. Geological Survey gauge stations do not routinely sample or measure this material. General estimates can be made, based on suspended sediment quantities. In Illinois, estimates of 5 to 10 percent of this total can be used. In this case, using NRCS methods, roughly 1,700 to 3,400 tons can be added to the total suspended load delivered from Farm Creek to the outlet at the Illinois River. This would bring the **total sediment load delivered to 35,300 to 37,000 tons**. In most cases, bedload type, composition, and grain size coming from the streambanks and streambeds, is used extensively in channel design and channel geomorphology studies but is not routinely reported. In this watershed, there are several gravel pits present, with at least two of significant size. It was noticed that there appeared to be an increase in bedload quantity and size of bedload material below these pits, but this difference was less noticeable farther downstream.

Assessing the overall "dynamic equilibrium" stage in a watershed is most difficult indeed! In other words, is the stream system still degrading or has the sediment production in the watershed reached a peak and now will begin to decline?! Several geomorphologists years ago developed a landscape model called the Channel Evolution Model (CEM). It was intended to be used to determine the relative differences between gullies/streambanks that were progressing from a "stable" condition, Stage 1, through a series of "unstable" steps to a new, but geologically and physically lower "stable" elevation called Stage 5. This process can take decades or several millennium. Farm Creek watershed definitely is undergoing incision or downcutting in many of its tributaries. (Stage 2) As long as downcutting is occurring, continual amounts of sediment will be produced. This rate of

sediment production will only begin to decrease when the streams reach a condition of bed stability that will allow, in turn, the streambanks to stabilize. (Stage 4) Watershed efforts can assist this progression, but total watershed stability is a long way in the future!

CONSIDERATIONS FOR EROSION AND SEDIMENT CONTROL

1. Concentrate any land treatment alternatives on the sloping (>5%) areas that lie immediately adjacent to the channels and streams themselves for the most effective land treatment control. In other words, the "flat" land doesn't really produce much sediment that reaches the Illinois River so lets not spend unproductive time and effort here.

2. If needed, select a "pilot" subwatershed and concentrate land treatment or structural control efforts here. From this "base" a better estimate as to effectiveness of these controls could be made for the remainder of the entire watershed. These smaller subwatersheds also give the local people a better visual example of how their control methods will work.

3. Select highly visible or locally "known" eroding sites for demonstration areas, particularly if streambank stabilization is included as part of the project. Easier to "point" at these to show how "effective" local efforts have been.

4. If structural measures are used in the Farm Creek watershed, it is important to remember they will "control" the **sediment** produced from **all types of erosion** above them in their own subwatershed. The surface water might be carrying sediment derived from sheet, rill, ephemeral, and gully erosion but much of the suspended and nearly all the bedload is trapped, regardless of the source. These structures can also reduce the peak runoff flows developed during rainfall events. The magnitude and timing of these peak flows can significantly affect channel erosion and overall movement of sediment within a given subwatershed. Therefore it is more efficient and effective, in general, to have these structures as "low" in the watershed as is possible.

5. Streambank stabilization projects "attack" localized sediment production directly. However, streambank projects don't deal with reducing sediment that is already in the stream system from other upland sources. Therefore, it is important to remember that, in general, the entire watershed must be "treated" to effectively reduce the overall sedimentation rate.

6. Taking in to account what was just said in 5.) above, it becomes less efficient and effective, FROM A SEDIMENT REDUCTION STANDPOINT ONLY, to "treat" subwatersheds that occur above the two big flood-control, sediment-control structures! Why? Because very little of the sediment is actually able to move through and eventually impact the outlet end at the Illinois River. If reduction of sediment in East Peoria is the PRIMARY goal, then more treatment would be accomplished by working "below" these two big structures.

7. In areas where significant land use change is anticipated, monitoring of increased erosion and sediment rates is recommended. This inventory has indicated that even relatively small areas can

significantly increase the sediment load on the stream system or subsystem.

8. Structural means of sediment control have been effective on smaller watersheds. Let's not overlook these but let's always be on the lookout for new, innovative ideas and methods that can be applied **in** the watershed. Streambank stabilization projects on the most severely eroding sites are encouraged. These not only reduce sediment load at the site, but tend to cause a "ripple effect" on downstream streambank and streambed stabilization.

9. One of the "new" (experimental??) methods referred to above would be the use of off-channel wetland diversions. These could allow for surface water from the creeks that exceeded a certain designated discharge to flow into a wetland area that was immediately adjacent and parallel to the stream. Water that has time to "slow down" will begin to drop a certain proportion of its sediment load. Even small amounts of deposition, say 20 to 40 percent of the total suspended load, could have a dramatic influence over the entire watershed.

10. Some recent efforts in the watershed to construct hydrology and eventually sediment models is very encouraging! Development of sound**, real-world, field-based**, database models will go far in allowing us to make viable predictions about future conditions in all of our watersheds!!

Erosion and Suspended Sediment Totals for Entire Farm Creek Watershed

Table 1

	Erosion (tons)	SDR	Sediment Produced (tons)	
Sheet/Rill				
Cropland				
A/B	43,400	0.25	10,800	
C	22,200	0.64	14,200	
D/D+	165	0.72	120	
Grassland	260	0.52	135	
Woodland				
Disturbed	4,900	0.77	3,700	
Undisturbed	14,200	0.73	10,300	
Urban				
Residential	4,500	0.45	2,000	
Developing	9,300	0.69	6,400	
Subtotal	**98,900**	**-----**	**47,655** (34%)	
Ephemeral	3,900	0.75	2,900	(2%)

Gully	88,000	0.80	42,200		
		0.95	33,400	(55%)	
Streambank	12,850	1.00	12,850		(9%)
TOTAL	**203,650**	**-----**	**139,000**		

SEDIMENT DELIVERED TO ILLINOIS RIVER BY FODULAC CREEK (Table 2)	**2,200**
SEDIMENT DELIVERED TO ILLINOIS RIVER BY FARMDALE CREEK (Table 3)	**2,300**
SEDIMENT DELIVERED TO ILLINOIS RIVER BY WASHINGTON SUBWS (Table 4)	**520**
SEDIMENT DELIVERED TO ILLINOIS RIVER BY LOWER FARM CREEK (Table 5)	**28,600**

TOTAL DELIVERED SEDIMENT FROM FARM CREEK *33,600 T*
ON AVERAGE ANNUAL BASIS

Erosion and Suspended Sediment Totals for Fondulac Creek Subwatershed

Table 2

		Erosion (tons)	SDR		Sediment Delivered (tons)
Sheet/Rill	A/B	2,200	0.25		550
	C	6,700	0.64		4,300
	Other	6,700	0.65		4,400
Ephemeral		390	0.75		300
Gully		13,200	0.80	(60%)	6,300
			0.95	(40%)	5,000
Streambank		1,200	1.00		1,200
TOTAL		**30,400**	------		**22,000**

Watershed Sediment Transport Factor X 0.65

14,300

Trapped in Fondulac Structure X 85% Trap Eff.

12,100

Moved into lower Farm Creek watershed **2,200 tons**

Erosion and Suspended Sediment Totals for Farmdale Creek Subwatershed
(w/o City of Washington subwatershed)

Table 3

		Erosion (tons)	SDR		Sediment Delivered (tons)	
Sheet/Rill	A/B	17,360	0.25		4,300	
	C	7,800	0.64		5,000	
	Other	8,300	0.65		5,400	
Ephemeral		1,170	0.75		900	
Gully		30,800	0.80	(65%)	16,000	
			0.95	(35%)	10,200	
Streambank		2,000	1.00		2,000	
TOTAL		**67,400**	------		**43,800**	**tons**

Watershed Sediment Transport Factor X 0.35

15,300

Trapped in Farmdale Structure X 85% Trap Eff.

13,000

Moved into lower Farm Creek watershed **2,300 tons**

Erosion and Suspended Sediment Totals for City of Washington Subwatershed

Table 4

		Erosion (tons)	SDR	Sediment Delivered (tons)
Sheet/Rill	A/B	13,000	0.25	3,300
	C	1,100	0.64	700
	Other	1,600	0.65	1,000
Ephemeral		1,560	0.75	1,200
Gully		4,400	0.80 (100%)	3,500
Streambank		650	1.00	650
TOTAL		**22,300**	**-------**	**10,400** **tons**

Watershed Sediment Transport Factor X 0.30

3,120

Trapped in Fondulac Structure X 85% Trap Eff.

2,600

Moved into lower Farm Creek watershed **520 tons**

Erosion and Suspended Sediment Totals for Lower Farm Creek Subwatershed

Table 5

		Erosion (tons)	SDR		Sediment Delivered (tons)
Sheet/Rill	A/B	10,800	0.25		2,700
	C	6,700	0.64		4,300
	Other	16,600	0.65		10,800
Ephemeral		780	0.75		600
Gully		39,600	0.80	(20%)	6,300
			0.95	(80%)	30,000
Streambank		9,000	1.00		9,000
TOTAL		**83,500**	------		**63,700**

Watershed Sediment Transport Factor X 0.45

28,600

Moved into lower Farm Creek watershed **28,600 tons**

Geology

Areas within the Farm Creek Watershed are some of the most studied in this region of the country dating back to 1899. A series of exposures reveals the most comprehensive stratigraphic record of late Ice Age events in the Midwest (USACE, 1998). The eastern portion of the Illinois River valley may be divided onto two parts. The upper portion, underlain by Wisconsin drift, and the lower portion south from East Peoria, underlain by Illinois drift. Glacial streams have cut all of the areas. The valley walls typically are very steep, and in most places wooded, while the upland plains of the watershed are for the most part grass and farmland (USACE, 1984).

In 1998, the USACE completed a Natural Resource Management Plan for the Farm Creek Flood Control Project, which encompasses large portions of the watershed. Due to the unique value of the geologic resources within the project area, they conducted a geology survey. The evidence suggests that the area was first covered by two Illinoisan ice advances. After the ice melted, a Sangamon soil developed. The onset of the Wisconsinan glacial period and the deposition of Roxanna silt began about 75,000 years ago. The end of this period was characterized by the formation of Farmdale soil on stable surfaces and Robein silt collecting in low lying areas. AThis period of soil formation and accretionary activity represents and important interstade that is widely recognized in the professional literature as the Farmdalian Substage (USACE, p.2-4, 1998).≅ This period ended about 25,000 years ago and was followed by the Woodfordian glacial advance.

The Woodfordian ice brought Delavan Till deposits. However, by 18,000 B.C.E. the ice had likely retreated out of the watershed. This retreat deposited sands and gravel onto the Delavan Till for a short time. After 12,500 B.C.E., the process characteristic of the watershed is that of erosion on the unstable surfaces and soil formation on the stable ones.

Farmdale Park contains within its borders, classic Pleistocene sections useful for future study and appreciation. The AFarmdale Section≅ was recognized in 1998, and placed on the National Register of Historic Places.

Topography

The topography of the watershed is characterized gently sloping uplands with steep slopes down to the river. At its maximum elevation of 810 feet, the watershed drains in a south westerly direction through East Peoria to its confluence with the Illinois River at an elevation of 440 feet. From its source to convergence with the Illinois River, Farm Creek drops an average of 19.1 feet per mile.

Land Use

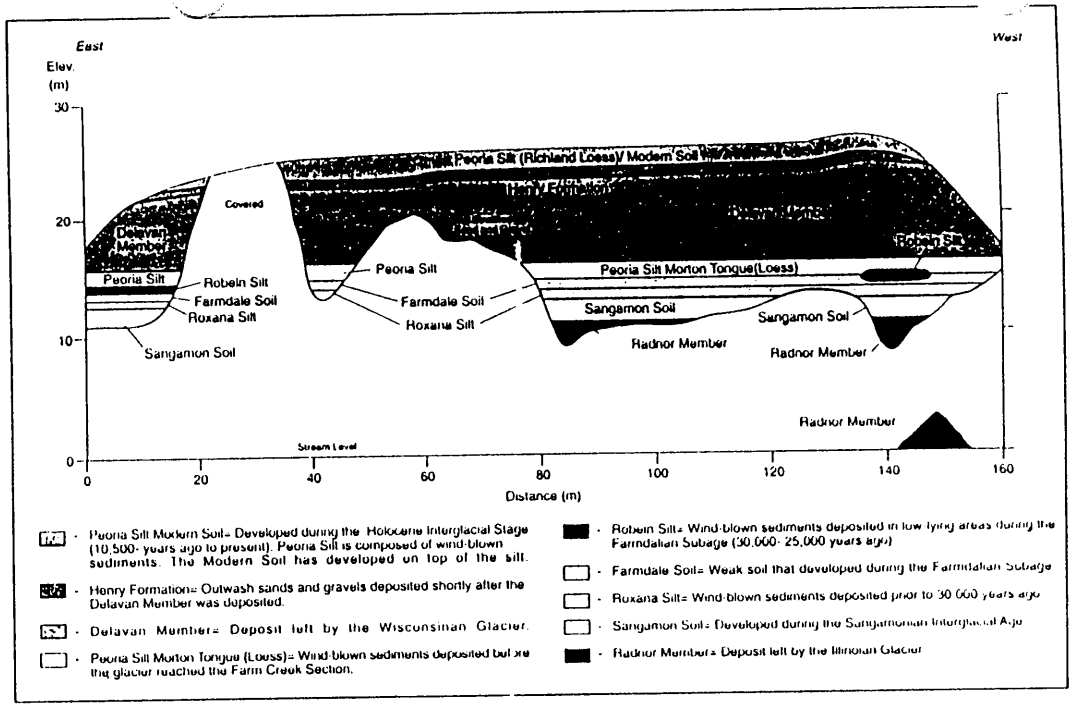
Land Use within the Farm Creek Watershed is as diverse as the landscape itself. Agriculture, heavy & light industry, commercial, medium & low density residential, forest, parkland, and reservoir area all reside within the watershed. In 1996 the Illinois Department of Natural

climate was similar to that of the present climate in parts of Canada.

The loess deposited early in the Wisconsinan up to about 30,000 years ago is known as the Roxana Silt. A weak soil (named the Farmdale Soil) then developed on stable surfaces, and the organic rich Robein Silt collected in low-lying areas. This period of soil formation, known as the Farmdalian Subage, ended about 25,000 years ago when the Farmdale Soil was buried by loess (known as the Morton Tongue of the Peoria Silt). The deposition of the loess meant that a glacier was again advancing into the Midwest. This glacier ultimately occupied a portion of central and northeastern Illinois, including the area of the Farm Creek Section. This was the last glacier to occupy Illinois. The sediment deposited by the glacier is known as the Delavan Member of the Tiskilwa Formation. The Farm Creek Section documents that sands and gravels (the Henry Formation), originating from meltwater, buried the Delavan Member as the glacier retreated. Loess, also part of the Peoria Silt, blankets the Henry Formation. Loess deposition ended in this part of Illinois about 10,500 years ago.

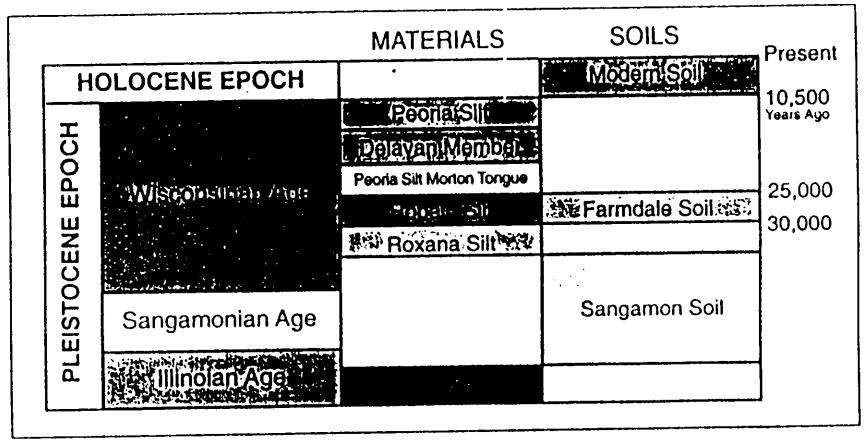
Currently, we are living in an interglacial time known as the Holocene Epoch. Plants and animals again reclaimed the area during this period and a modern soil developed on the ground. It was also during this period that humans spread into North America. The earliest Midwestern human occupation is known as the Paleoindian period (12000 to 8000 B.C.). These hunters entered the area in search of large mammals, such as mastodons.

The Farm Creek Section was listed on the National Register of Historic Places in 1992 and was designated a National Historic Landmark in 1997. The Farm Creek Section has changed little since Frank Leverett discovered it a hundred years ago. Since that time, numerous geologists have studied the exposure and refined Leverett's theories on Midwestern glacial geology. The terminology associated with soils and glacial deposits has been revised many times as a result. Geologists today are still studying the exposure, and as new advancements in technology are made, the exposure may provide more valuable information in the future.



Adapted from Holmes and McKay 1987

Stratigraphic Profile of the Farm Creek Section.



Courtesy of Steve Esling 1998

Stratigraphic Key to the Farm Creek Section.

Resources released a Land Cover Atlas of the state of Illinois. A satellite acquired the images. With the ability to detect objects as small as 0.2 acres in size, we have a tool for assessing the overall land cover, and in some cases, land use within the watershed. Table 10 shows the various types of land cover in the watershed and its approximate size relative to the watershed. The parameters for classification of a certain land cover are somewhat different from those used for other purposes. This is illustrated by the acreage of wetlands as land cover. The extent of these wetlands is far less than the ones previously identified by USF&W found in the wetlands section.

Table 10

Land Cover Type	Acres	% of Watershed
Woodlands	9006.78	22.85%
Grasslands	4820.81	12.23%
Wetlands	83.49	0.21%
Bottomland	495.35	1.26%
Water	240.25	0.61%
Urban	8993.53	22.82%
Agriculture	15777	40.03%
Total	39417.21	100.00%

As can be seen on the Land cover map on the following page, many different types of land cover buffers the streams in the watershed. From this Land cover we can also denote some of the uses. Agricultural activity that comes into direct contact with stream corridors dominates the peripheral areas of the watershed. This is especially true of the rural Washington area. As Farm Creek makes its way toward the Illinois River, it moves through the urban area of Washington and East Peoria. However, Woodlands or Grasslands buffer most of Farm Creek and her tributaries. The lower portions of the watershed in East Peoria that have been extensively modified for flood control and have virtually no vegetation or habitat corridor beside their course. A detailed assessment of the stream corridor has not been completed. To do so would provide information on areas that could be the focus of restoration efforts. Establishment of these buffers in the upland areas would increase sediment filtration and provide additional floodwater storage capacity upstream of the City of Washington.

Agriculture: Agriculture and its related industries play a major role in the Tazewell County economy. With 909 farms and 328,289 acres in Tazewell County as of 1997 the dominant land use within the county is agriculture. The average net cash return on an average 361 acre farm was $51,950 in 1997. The table below contains some basic information about Tazewell county agriculture and some land use information.

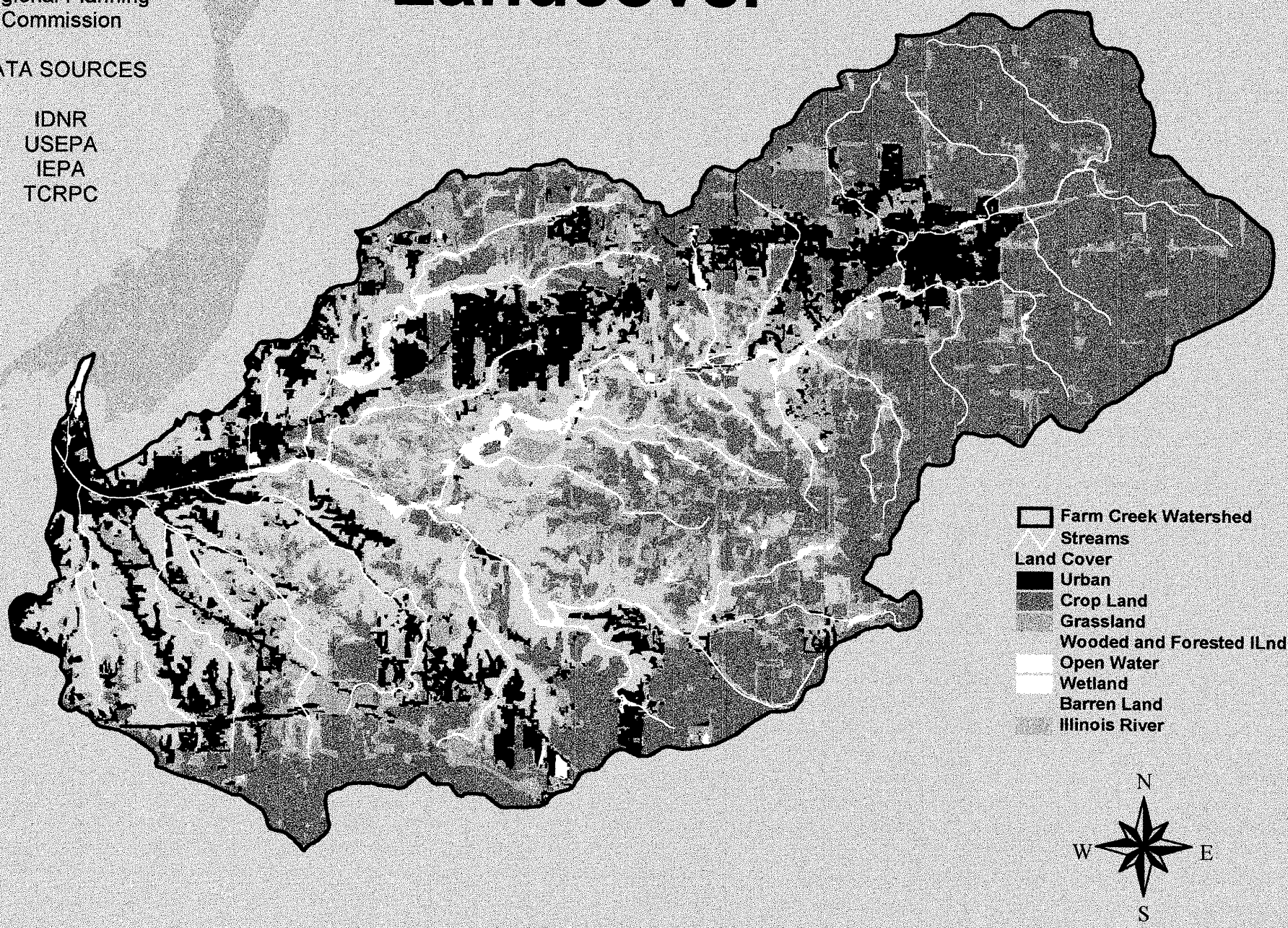
Table 11

Landcover

Created by Tri-County Regional Planning Commission

DATA SOURCES

IDNR
USEPA
IEPA
TCRPC



Agricultural Land Use
in Tazewell County*

1997	1992	1987	
909	1008	1182	Farms (number)
328289	336450	353326	Land in farms (acres)
361	334	299	Land in farms - average size of farm (acres)
176	(N)	(N)	Land in farms - median size of farm
80	89	107	Farms by size: 1 to 9 acres
158	183	209	Farms by size: 10 to 49 acres
219	216	263	Farms by size: 50 to 179 acres
207	277	348	Farms by size: 180 to 499 acres
164	173	207	Farms by size: 500 to 999 acres
81	70	48	Farms by size: 1,000 acres or more
854	941	1076	Total cropland (farms)
305386	313429	323850	Total cropland (acres)
815	906	1040	Total cropland, harvested cropland (farms)
294395	290548	259498	Total cropland, harvested cropland (acres)
107	93	84	Irrigated land (farms)
30487	22625	16390	Irrigated land (acres)
232	270	352	Livestock and poultry: Cattle and calves inventory (farms)
10186	9712	14218	Livestock and poultry: Cattle and calves inventory (number)
175	201	274	Beef cows (farms)
3373	4096	5001	Beef cows (number)
26	28	38	Milk cows (farms)
1070	854	1033	Milk cows (number)
220	252	336	Cattle and calves sold (farms)
5645	4760	8548	Cattle and calves sold (number)
102	146	200	Hogs and pigs inventory (farms)
111253	109534	121092	Hogs and pigs inventory (number)
109	159	209	Hogs and pigs sold (farms)
186840	188424	194687	Hogs and pigs sold (number)
27	65	63	Sheep and lambs inventory (farms)
679	1346	1847	Sheep and lambs inventory (number)
29	23	56	Layers and pullets 13 weeks old and older inventory (farms)
636	(D)	(D)	Layers and pullets 13 weeks old and older inventory (number)

3	1	4	Broilers and other meat-type chickens sold (farms)
175	(D)	640	Broilers and other meat-type chickens sold (number)
663	771	900	Corn for grain or seed (farms)
149125	153974	137203	Corn for grain or seed (acres)
19885880	23987451	18558097	Corn for grain or seed (bushels)
25	24	22	Corn for silage or green chop (farms)
894	641	647	Corn for silage or green chop (acres)
15001	10035	14921	Corn for silage or green chop (tons, green)
130	93	187	Wheat for grain (farms)
4485	2513	5507	Wheat for grain (acres)
234875	107951	282013	Wheat for grain (bushels)
653	736	835	Soybeans for beans (farms)
127670	121425	105867	Soybeans for beans (acres)
5834469	5513775	4412192	Soybeans for beans (bushels)
240	285	317	Hay-alfalfa, other tame, small grain, wild, grass silage, green chop, etc. (farms)
6178	6306	7071	Hay-alfalfa, other tame, small grain, wild, grass silage, green chop, etc. (acres)
19919	19776	20210	Hay-alf alfa, other tame, small grain, wild, grass silage, green chop, etc. (tons, dry)
69	70	45	Vegetables harvested for sale (farms)
6859	6655	3286	Vegetables harvested for sale (acres)
10	13	15	Land in orchards, total (farms)
27	81	47	Land in orchards, total (acres)
1	1	0	Land in orchards, irrigated (farms)
(D)	(D)	0	Land in orchards, irrigated (acres)
693	799	967	Commercial fertilizer (farms)
198334	220941	198664	Commercial fertilizer (acres on which used)
681	798	958	Commercial fertilizer, cropland fertilized, except pasture land (farms)
197676	220450	197821	Commercial fertilizer, cropland fertilized, except pasture land (acres on which used)
34	18	50	Commercial fertilizer, pasture land and rangeland fertilized (farms)
658	491	843	Commercial fertilizer, pasture land and rangeland fertilized (acres on which used)
383	435	645	Sprays, dusts, granules, fumigants, etc., to control--insects on hay and other crops (fm)
62710	70222	93975	Sprays, dusts, granules, fumigants, etc, to

			control--insects on hay/other crops (acres used)
39	2	111	Sprays, dusts, granules, fumigants, etc., to control--nematodes in crops (farms)
2782	(D)	7816	Sprays, dusts, granules, fumigants, etc., to control--nematodes in crops (acres used)
18	30	46	Sprays, dusts, granules, fumigants, etc., to control-diseases in crops/orchards (farms)
1830	3358	2041	Sprays, dusts, granules, fumigants, etc., to control-diseases crops/orchards (acres used)
605	646	784	Spray, dusts, granules, fumigants, etc. to control-weeds, grass/brush in crops/pasture(fm)
222516	231498	192186	Spray, dust, granules, fumigants, etc., to control-weed, grass/brush in crops/pasture (acres used)
7	21	31	Chemicals used on crops to control growth, thin fruit, or defoliate (farms)
6567	1718	5270	Chemicals used on crops to control growth, thin fruit, or defoliate (acres used)

*1997 Census of Agriculture

Landfills: Thirty-seven landfills totaling approximately 428 acres are known to exist within the Farm Creek Watershed. Most are small privately owned landfills that have been closed for some time. The largest facility, operated by Waste Management of Illinois is still in operation and serves as one of two such large scale facilities in Tazewell County. This landfill is scheduled to close by 2005. It is found between the Farmdale and Fondulac Reservoir areas. An opportunity may exist to develop this property in some manner as to enhance the greenway and open space amenities of the two reservoir areas. The table and map on the following page show relevant information concerning these facilities.

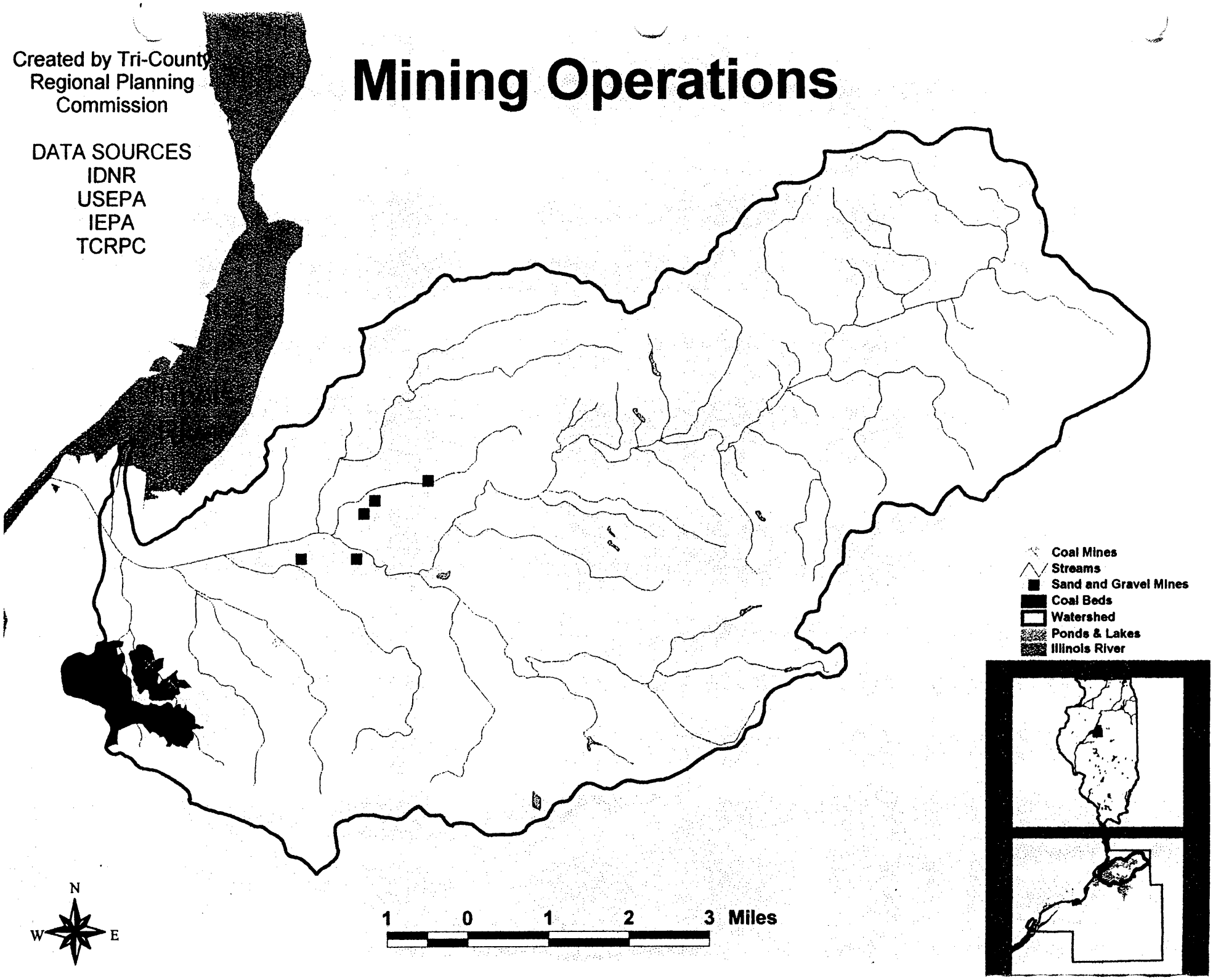
Mining: Coal, clay, sand and gravel mining have been and will continue to be a part of the land use mixture within the Farm Creek Watershed. Four coal mining operations were in place from 1900-1940 in the south western portion of the watershed. Current use of the land above the coalbeds is a mixture of residential and forested bluff areas. Clay, sand and gravel operations continue to thrive in the watershed. Five such facilities are currently in operation in East Peoria. The map on the following page suggests the coalbeds, types, and locations of past and ongoing mining operations within the watershed.

Commercial: Commercial operations within Tazewell County and particularly the Farm Creek Watersheds have been experiencing growth in sales and expansion overall. The table below shows growth rates by major sector in the County and the communities that are part of the Farm

Mining Operations

Created by Tri-County Regional Planning Commission

DATA SOURCES
IDNR
USEPA
IEPA
TCRPC



Creek Watershed from 1990 through 1995. The general trend toward economic expansion and low unemployment in the region would suggest that these numbers are likely to show continued growth from 1995-2000. An update of this study will be available in 2002.

Table 12

Retail Sales Growth by Sector 1990-95*

Sector	Tazewell	Creve Coeur	East Peoria	Morton	Washington
Total	4%	-12%	11%	5%	-9%
General Merchandise	5%	36%	9%	28%	1%
Food	-17%	21%	-25%	-8%	-6%
Eating	8%	-17%	4%	24%	9%
Apparel	-48%	108%	-34%	-75%	-7%
Furniture Household	19%	43%	2%	121%	1%
Lumber	55%	-49%	4%	109%	37%
Auto	5%	7%	61%	-12%	-27%
Other	-11%	26%	-38%	-15%	-4%
Agriculture	-25%	-90%	-36%	-26%	33%
Manufacturing	89%	34%	209%	43%	42%

* Retail Trade Analysis: Tazewell County. 6/11/97 Rural Economic Technical Assistance Center

Development & Growth: Population growth within Tazewell County is projection to increase by 8%, resulting in a 2020 population of around 133, 791. The table below shows the estimated current population of all jurisdictions in the watershed. Growth rates range from three to seven percent. Growth in terms of land use is expected to occur primarily along the US 24 bypass north of Washington (TCRPC, 1995). Infrastructure is currently being upgraded to facilitate this commercial and residential development. For the most part growth within the watershed has

remained adjacent to existing municipalities and services. However, as demand outstrips infrastructure capacity, we may see development occurring in undesirable areas.

Table 13

Population Estimates
1995-98*

Area	1990	1995	1996	1997	1998
Tazewell Co.	123692	127020	127372	127509	127958
Fondulac Twp.	12821	13212	13250	13269	13338
Groveland Twp.	19608	20051	20092	20082	20145
Washington Twp.	18907	19746	19827	19873	20011
Morton Twp.	14975	15738	18897	15936	16020
East Peoria	21378	21960	22004	22016	22117
Creve Coeur	5938	5936	5921	5889	5877
Washington	10136	10550	10557	10549	10611
Morton	13799	14497	14644	14672	14742

* Population estimates Program, Population Division, U.S. Census Bureau

Riparian Corridor

A riparian or stream corridor is a unique plant community consisting of the vegetation growing near a river, stream, lake, lagoon or other natural body of water. It serves a variety of functions important to people and the environment as a whole by:

-Preserving water quality by filtering sediment from runoff before it enters rivers and streams.
-Protecting stream banks from erosion.
-Providing a storage area for flood waters.
-Providing food and habitat for fish and wildlife.
-Preserving open space and aesthetic surroundings.
(http://www.cruzio.com/~countysc/pln/riparian.htm)

The streams within Farm Creek Watershed have a variety of vegetation and land uses adjacent to the stream corridor. The table below shows the types of cover adjacent to three streams in the watershed and the predominant land use within a 300 meter corridor around the stream.

Table 14*

	Farm Creek	Ackerman Creek	Fondulac Creek
Streambank Land Cover			
Forest	56.18%	76.28%	72.41%
Mixed	0%	0%	0%
Grass	40.97%	21.15%	1.72%
Agriculture	0%	0%	0%
Urban	0%	0%	0%
Disturbed	0%	0%	0%
Water Adjacent	0%	2.56%	0%
Reservoir	0%	0%	25.86%
Predominant Land Use			
Forest	15.45%	28.21%	12.93%
Mixed	7.30%	7.69%	0%
Grass	12.94%	11.54%	17.24%
Agriculture	35.67%	44.23%	31.03%
Urban	25.79%	8.33%	12.93%
Disturbed	0%	0%	0%
Water Adjacent	0%	0%	0%
Reservoir	0%	0%	25.86%

* IDNR Illinois Stream Information System, 1995

Cultural Resources and Watershed Planning: USDA-NRCS

Federal and state assistance requires that proposed land-disturbing activities take into consideration any effects on historic properties (significant cultural resources). The National Historic Preservation Act of 1966, as amended, requires federal agencies to consider historic properties during planning. In Illinois, the Illinois State Agency Historic Resources Preservation Act requires any state agency that provides assistance or licenses a potentially land-disturbing activity to also take into account the effect their activities may have on historic properties.

In addition, unmarked mortuary sites over 100 years old are protected by the 1989 Illinois Human Skeletal Remains Protection Act, which prohibits any disturbance of grave markers (including earthen mounds), burial remains, and grave offerings both on private and public lands, by all individuals. If disturbed graves are recognized they must be reported to the County Coroner within 48 hours of discovery.

The Natural Resources Conservation Service's Cultural Resources Specialist can provide an inventory of formally recorded cultural sites on file with the Illinois State Museum to assist with watershed resource inventory and planning.

When structural conservation practices are chosen to address resource needs, archaeological surveys will need to be conducted in each project location to identify any cultural sites present and determine the effects of the project activities on them. State and federal policies require that significant cultural resources (historic properties) be avoided or mitigated.

Site Locations and Cultural Periods

Prehistoric human settlement frequently focused on water resources. These early cultural sites are often located adjacent to large rivers, lakes and wetlands, usually on terraces and floodplain land slightly elevated above the frequently flooded bottomlands. Any stream and wetland restoration projects and construction or rehabilitation of stormwater detention structures have the potential for disturbing these types of sites. Other favorite locations for prehistoric settlement are the bluffcrests overlooking wide floodplains. The construction of upland water retention basins, diversions and terraces may potentially affect sites in these locations.

A total of 111 cultural sites have been recorded in the Farm Creek Watershed. A detailed inventory is at the end of this report. At these 111 sites, there are 139 cultural occupations present.

Recorded sites include information about the type of site present and the time period or cultural affiliation. Site types in this watershed include habitation (where people lived), mortuary (where burial activities took place), commercial (business location), and a dump (refuse disposal). Time periods are usually divided into prehistoric and historic periods. The prehistoric period predates European exploration and settlement of this area. Designation of an archaeological site as "prehistoric" normally indicates that the archaeologist who recorded the site did not find any diagnostic artifacts that could date the site to a specific time period or cultural affiliation.

The earliest time period in Illinois is the Paleoindian (10,000 B.C.). Sites from this era are rare, and none were recorded in the Farm Creek Watershed.

The next time period is identified as Archaic (8,000-600 B.C). The Archaic period is divided into Early Archaic (8,000-6,000 B.C), Middle Archaic (6,000-3,000 B.C.) and Late Archaic (3,000-1,000 B.C.) The Paleoindian and Archaic periods are dominated by hunting and gathering nomadic people.

Towards the end of the Archaic period, habitation sites become larger and more permanently occupied, burial mounds start to be built, and plant domestication is present.

When pottery-making begins in 600 B.C. we enter the Woodland Period. The Woodland period is also divided in Early Woodland (600-200 B.C.), Middle Woodland (200 B.C.-A.D. 400) and Late Woodland (A.D. 400-900) periods.

The Woodland Period is followed by the Mississippian Period in central Illinois and lasts from A.D. 900-1450. This is followed by the occurrence of proto-historic tribes during the next two hundred years.

The historic period in Illinois begins in 1673 with the arrival of Marquette and Joliet. In Illinois, archaeologists and historians have divided historic sites into the following episodes: Historic (generic); Native American Historic (1673-present); Colonial (1673-1780); Pioneer (1781-1840); Frontier (1841-1870); Early Industrial (1871-1900); Urban Industrial (1901-1945); and Post-War (1946- present).

Farm Creek Watershed Cultural Sites

Several archaeological surveys have been conducted in the study area that contributed to the majority of recorded cultural sites in the watershed. The Peoria Bypass Survey, conducted in 1996 and 1997 by the Center for American Archaeology archaeologists, found 47 sites located in three areas (T26N R3W Sections 16, T26N R3W Sections 31-32, and T25N R4W Sections 1-2-11). The Farmdale Reservoir Survey, that identified 25 archaeological sites, was conducted in 1986, 1987 and 1996 by Western Illinois University, with follow-up site testing done by the American Resources Group, Ltd. in 1993, 1994 and 1998. Seven sites were found during the 1999 Blye/Kiel Survey, located in T26N R3W Section 18 and T26N R4W Section 13, and conducted by Archaeological and Architectural Surveys. The Austin-E. Peoria Survey, conducted by the University of Illinois-Urbana in 1996, and located in T26N R3W Section 20, found five sites. Two sites were discovered during the development of the Washington Meijer store.

A total of 75 sites were recorded as "prehistoric," with the majority being situated on the bluffcrests (37), upland ridges (23), and other upland (11) settings. While there were no sites identified from the Paleoindian period, eighteen sites were from the Archaic period, with six listed as generically "Archaic," one as Early Archaic, two from the Middle Archaic, and nine from the Late Archaic period. Archaic sites showed a greater variety of distribution across the landscape: one floodplain Late Archaic site, one terrace Middle Archaic Site, one bluffslope Archaic site, eleven bluffcrest sites throughout the Archaic, with the rest being in the upland ridges or other upland areas.

Three sites were labeled as Woodland, with one listed generically, and one each representing the Early and Late Woodland periods. There was neither Mississippian nor proto-historic Native American sites recorded in the watershed. These were situated on the bluffcrest, upland ridge and upland.

Historic sites totaled 43. Seven were listed as generic historic, and the remainder was designated as follows: Pioneer (1), Frontier (6), Early Industrial (13), Urban Industrial (13), and Post-War (3). Thirty-nine of these sites were located in upland settings, with only four found in the floodplains.

Most sites were designated as either, habitation, isolated find (meaning only one object was found), or unknown. There was one instance each of a commercial property, a refuse dump, and a cave. There is one recorded prehistoric mortuary site in the watershed, a burial mound overlooking the Illinois River, and numerous registered cemeteries mapped on the topographic quadrangle maps.

Cultural Resources Inventory
Farm Creek Watershed - Tazewell County, Illinois

An inventory of the 111 recorded sites includes the township and section in which each site is located, the site number within the county, its landscape position, site type, its cultural affiliation, who reported the site and when, and the institution of the reporting individual. (Some sites include a "Not Eligible" designation that indicates the archaeologist recording the site evaluated it for significance and eligibility for listing on the National Register of Historic Places, and found the site to be lacking in criteria for significance.)

Township 26 North, Range 3 West

Sec. 10	Site 396	Upland	Tributary Cr.	Habitation	Not Eligible
	Prehistoric, Frontier, Early Industrial				Cross, 1998, CAA
Sec. 11	Site 392	Upland	Tributary Cr.	Habitation	Not Eligible
	Prehistoric, Early Industrial, Urban Industrial				Cross, 1998, CAA
Sec. 11	Site 391	Upland	Tributary Cr.	Habitation	Not Eligible
	Frontier, Early Industrial				Cross, 1998, CAA
Sec. 13	Site 334	Upland Ridge	Intermittent St.	Dump	Not Eligible
	Urban Industrial				Conrad, 1999, WIU
Sec. 14	Site 390	Upland	Tributary Cr.	Habitation	Not Eligible
	Pioneer, Frontier, Early Industrial, Urban Industrial				Cross, 1998, CAA
Sec. 15	Site 389	Upland	Tributary Cr.	Habitation	Not Eligible
	Prehistoric, Early Industrial				Cross, 1998, CAA
Sec. 16	Site 357	Upland Ridge	Spring Cr.	Habitation	
	Prehistoric				1997, CAA
Sec. 16	Site 356	Upland Ridge	Spring Cr.	Habitation	
	Prehistoric				1997, CAA
Sec. 16	Site 380	Upland Ridge	Spring Cr.	Isolated Find	
	Prehistoric				1997, CAA

Sec. 16	Site381	Upland Ridge	Farm Cr.	Isolated Find	
Prehistoric				1997, CAA	
Sec. 16	Site 355	Upland Ridge	Farm Cr.	Habitation	
Early Industrial, Urban Industrial				1997, CAA	
Sec. 17	Site 406	Upland	Unnamed Trib.	Habitation	Not Eligible
Prehistoric				Ullman, 1989, CAA	
Sec. 17	Site 405	Upland	Unnamed Trib.	Habitation	Not Eligible
Prehistoric				Ullman, 1989, CAA	
Sec. 18	Site 401	Upland	Intermittent St.	Unknown	
Archaic				Barr, 1999, AAS	
Sec. 18	Site 402	Upland	Intermittent St.	Habitation	
Early Woodland, Early Industrial, Urban Industrial				Barr, 1999, AAS	
Sec. 18	Site 403	Upland	Intermittent St.	Habitation	
Prehistoric, Early and Urban Industrial, Postwar				Barr, 1999, AAS	
Sec. 18	Site 398	Upland	Intermittent St.	Unknown	
Late Archaic				Barr, 1999, AAS	
Sec. 18	Site 400	Upland	Intermittent St.	Unknown	
Archaic				Barr, 1999, AAS	
Sec. 18	Site 404	Upland	Intermittent St.	Habitation	
Frontier, Early and Urban Industrial, Postwar				Barr, 1999, AAS	
Sec. 20	Site 307	Upland Ridge	Unnamed Cr.	Habitation	Not Eligible
Prehistoric				Kreisa, 1996, UIU	
Sec. 20	Site 311	Upland Ridge	Unnamed Cr.	Habitation	Not Eligible
Prehistoric				Kreisa, 1996, UIU	
Sec. 20	Site 308	Upland Ridge	Unnamed Cr.	Habitation	Not Eligible
Early Archaic				Kreisa, 1996, UIU	
Sec. 20	Site 309	Upland Ridge	Unnamed Cr.	Habitation	Not Eligible
Prehistoric				Kreisa, 1996, UIU	

Sec. 20 Site 310 Upland Ridge Unnamed Cr. Habitation Not Eligible
Prehistoric Kreisa, 1996, UIU

Sec. 21 Site 331 Upland Farm Cr. Habitation, Commercial Not Eligible
Early Industrial, Urban Industrial, Postwar Phillippe, 1997, FRR

Sec. 21 Site 332 Upland Farm Cr. Habitation, Commercial Not Eligible
Frontier, Early Industrial Phillippe, 1997, FRR

Sec. 30 Site 207 Floodplain Farm Cr. Habitation
Late Archaic Conrad, 1986, WIU

Sec. 30 Site 239 Bluffcrest Farm Cr. Habitation Not Eligible
Prehistoric Titus, 1994, ARG

Sec. 30 Site 232 Terrace Farm Cr. Unknown
Prehistoric Conrad, 1987, WIU

Sec. 30 Site 240 Terrace Farm Cr. Unknown
Prehistoric Conrad, 1987, WIU

Sec. 31 Site 243 Terrace Farm Cr. Unknown
Prehistoric Conrad, 1987, WIU

Sec. 31 Site 205 Terrace Farm Cr. Habitation
Middle Archaic Conrad, 1986, WIU

Sec. 31 Site 215 Bluffcrest Intermittent St. Habitation
Archaic Titus, 1998, ARG

Sec. 31 Site 208 Bluffcrest Farm Cr. Habitation
Archaic Conrad, 1986, WIU

Sec. 31 Site 209 Bluffcrest Farm Cr. Habitation
Prehistoric Conrad, 1986, WIU

Sec. 31 Site 210 Bluffcrest Farm Cr. Habitation Not Eligible
Middle Archaic, Late Archaic Titus, 1998, ARG

Sec. 31 Site 212 Bluffcrest Farm Cr. Habitation
Prehistoric Conrad, 1996, WIU

Sec. 31 Site 213	Bluffcrest	Farm Cr.	Habitation		
	Prehistoric			Conrad, 1986, WIU	
Sec. 31 Site 211	Bluffcrest	Farm Cr.	Habitation		
	Late Archaic			Titus, 1998, ARG	
Sec. 31 Site 214	Upland Ridge	Intermittent St.	Habitation		
	Prehistoric			Titus, 1993, ARG	
Sec. 31 Site 216	Bluffcrest	Intermittent St.	Habitation	Not Eligible	
	Archaic			Titus, 1993, ARG	
Sec. 31 Site 219	Bluffcrest	Intermittent St.	Habitation		
	Prehistoric			Conrad, 1986, WIU	
Sec. 31 Site 233	Bluffcrest	Intermittent St.	Habitation	Not Eligible	
	Prehistoric			Titus, 1994, ARG	
Sec. 31 Site 206	Bluffcrest	Farm Cr.	Unknown		
	Prehistoric			Conrad, 1987, WIU	
Sec. 31 Site 234	Bluffcrest	Farm Cr.	Unknown		
	Prehistoric			Conrad, 1987, WIU	
Sec. 31 Site 237	Bluffcrest	Intermittent St.	Habitation	Not Eligible	
	Prehistoric			Titus, 1994, ARG	
Sec. 31 Site 236	Bluffcrest	Farm Cr.	Unknown		
	Prehistoric			Conrad, 1987, WIU	
Sec. 31 Site 235	Bluffcrest	Intermittent St.	Habitation	Not Eligible	
	Late Archaic			Titus, 1994, ARG	
Sec. 31 Site 241	Bluffcrest	Intermittent St.	Habitation		
	Prehistoric			Rose, 1988, WIU	
Sec. 31 Site 242	Upland Ridge	Intermittent St.	Habitation	Not Eligible	
	Late Woodland			Titus, 1994, ARG	
Sec. 31 Site 238	Upland Ridge	Intermittent St.	Habitation		
	Late Archaic			Titus, 1994, ARG	

Sec. 31	Site 372	Bluffcrest	Farm Cr.	Isolated Find
		Prehistoric		1996, CAA
Sec. 31	Site 368	Bluffcrest	Farm Cr.	Isolated Find
		Prehistoric		1996, CAA
Sec. 31	Site 369	Bluffcrest	Farm Cr.	Isolated Find
		Late Archaic		1996, CAA
Sec. 31	Site 363	Bluffcrest	Ackerman Cr.	Isolated Find
		Prehistoric		1996, CAA
Sec. 31	Site 361	Bluffcrest	Ackerman Cr.	Isolated Find
		Late Archaic		1996, CAA
Sec. 31	Site 362	Bluffcrest	Ackerman Cr.	Isolated Find
		Late Archaic		1996, CAA
Sec. 31	Site 360	Bluffcrest	Ackerman Cr.	Isolated Find
		Prehistoric		1996, CAA
Sec. 31	Site 385	Bluffcrest	Ackerman Cr.	Isolated Find
		Prehistoric		1996, CAA
Sec. 31	Site 366	Bluffcrest	Ackerman Cr.	Isolated Find
		Prehistoric		1996, CAA
Sec. 31	Site 367	Bluffcrest	Ackerman Cr.	Isolated Find
		Prehistoric		1996, CAA
Sec. 31	Site 359	Bluffcrest	Ackerman Cr.	Isolated Find
		Prehistoric		1996, CAA
Sec. 31	Site 335	Upland Ridge	Ackerman Cr.	Habitation
		Early Industrial, Urban Industrial		1996, CAA
Sec. 31	Site 340	Bluffcrest	Ackerman Cr.	Habitation
		Prehistoric		1996, CAA
Sec. 31	Site 341	Bluffcrest	Ackerman Cr.	Habitation
		Prehistoric		1996, CAA
Sec. 31	Site 339	Bluffcrest	Ackerman Cr.	Habitation

		Prehistoric			1996, CAA
Sec. 31	Site 338	Bluffcrest	Ackerman Cr.	Habitation	
		Prehistoric			1996, CAA
Sec. 31	Site 337	Bluffcrest	Ackerman Cr.	Habitation	
		Prehistoric			1996, CAA
Sec. 31	Site 345	Bluffcrest	Ackerman Cr.	Habitation	
		Prehistoric			1996, CAA
Sec. 31	Site 344	Bluffcrest	Ackerman Cr.	Habitation	
		Prehistoric			1996, CAA
Sec. 31	Site 365	Bluffcrest	Ackerman Cr.	Isolated Find	
		Prehistoric			1996, CAA
Sec. 31	Site 364	Bluffcrest	Ackerman Cr.	Isolated Find	
		Prehistoric			1996, CAA
Sec. 32	Site 370	Bluffcrest	Farm Cr.	Isolated Find	
		Prehistoric			1996, CAA
Sec. 32	Site 371	Bluffcrest	Farm Cr.	Unknown	
		Prehistoric			1996, CAA
Sec. 32	Site 342	Upland Ridge	Farm Cr.	Habitation	
		Prehistoric			1996, CAA
Sec. 32	Site 343	Upland Ridge	Farm Cr.	Habitation	
		Prehistoric			1996, CAA
Sec. 32	Site 373	Bluffcrest	Farm Cr.	Isolated Find	
		Prehistoric			1996, CAA
Sec. 32	Site 374	Bluffcrest	Farm Cr.	Isolated Find	
		Prehistoric			1996, CAA
Sec. 32	Site 376	Bluffcrest	Farm Cr.	Isolated Find	
		Prehistoric			1996, CAA
Sec. 32	Site 375	Bluffcrest	Farm Cr.	Isolated Find	
		Prehistoric			1996, CAA

Township 25 North, Range 4 West

Sec. 1	Site 336	Bluffcrest	Ackerman Cr.	Habitation	
		Prehistoric			1996, CAA
Sec. 2	Site 354	Upland Ridge	Farm Cr.	Habitation	
		Prehistoric			1997, CAA
Sec. 2	Site 353	Upland Ridge	Farm Cr.	Habitation	
		Prehistoric			1997, CAA
Sec. 2	Site 379	Upland Ridge	Unnamed Cr.	Isolated Find	
		Prehistoric			1997, CAA
Sec. 2	Site 378	Upland Ridge	Unnamed Cr.	Isolated Find	
		Prehistoric			1997, CAA
Sec. 2	Site 347	Upland Ridge	Unnamed Cr.	Habitation	
		Prehistoric			1997, CAA
Sec. 2	Site 346	Upland Ridge	Unnamed Cr.	Habitation	
		Prehistoric			1997, CAA
Sec. 3	Site 44	Bluffcrest	Mackinaw R.	Unknown	
		Prehistoric			Lauf, 1982, UIU
Sec. 10	Site 273	Floodplain	Kerfoot Cr.		
		Historic			Babson, 1991
Sec. 11	Site 348	Upland Ridge	Unnamed Cr.	Habitation	
		Prehistoric, Urban Industrial			1997, CAA
Sec. 11	Site 352	Upland Ridge	Unnamed Cr.	Habitation	
		Prehistoric			1997, CAA
Sec. 11	Site 350	Upland Ridge	Unnamed Cr.	Habitation	
		Prehistoric			1997, CAA
Sec. 11	Site 351	Upland Ridge	Unnamed Cr.	Habitation	
		Prehistoric			1997, CAA
Sec. 11	Site 349	Upland Ridge	Unnamed Cr.	Habitation	

	Prehistoric, Urban Industrial			1997, CAA
Sec. 11	Site 377	Upland Ridge	Unnamed Cr.	Unknown
	Prehistoric			1997, CAA
Sec. 14	Site 229	Upland	Intermittent St.	
	Prehistoric			Morin, 1987
Sec. 14	Site 225	Upland	Intermittent St.	
	Historic			Morin, 1988
Sec. 14	Site 224	Upland	Intermittent St.	
	Historic			Morin, 1987
Sec. 14	Site 228	Upland	Intermittent St.	
	Prehistoric			Morin, 1987
Sec. 14	Site 230	Upland	Intermittent St.	
	Prehistoric			Morin, 1987
Sec. 14	Site 222	Upland	Intermittent St.	
	Historic			Morin, 1987
Sec. 14	Site 223	Upland	Intermittent St.	
	Historic			Morin, 1987
Sec. 14	Site 231	Bluffcrest	Intermittent St.	
	Historic			Morin, 1987
Sec. 14	Site 226	Upland	Intermittent St.	
	Historic			Morin, 1987
Sec. 15	Site 221	Upland	Intermittent St.	
	Prehistoric			Morin, 1987

Township 26 North, Range 4 West

Sec. 13	Site 399	Upland	Intermittent St.	Unknown
	Prehistoric			Barr, 1999, AAS
Sec. 23	Site 172	Bluffslope	Illinois R.	
	Archaic			Unsicker, 1987, ISU

Sec. 23	Site 32	Floodplain Prehistoric	Illinois R.	Cave Bluhm, 1971, UIU
Sec. 26	Site 306	Floodplain Frontier, Early Industrial, Urban Industrial	Farm Cr.	Habitation Eckberg, 1995, CAA
Sec. 27	Site 8	Bluffcrest Woodland	Illinois R.	Habitation Bargola, 1971, ISM
Sec. 33	Site 5	Bluffcrest Prehistoric	Illinois R.	Mound Bluhm, 1957, UIU

Total = 111 Sites with 139 cultural periods represented

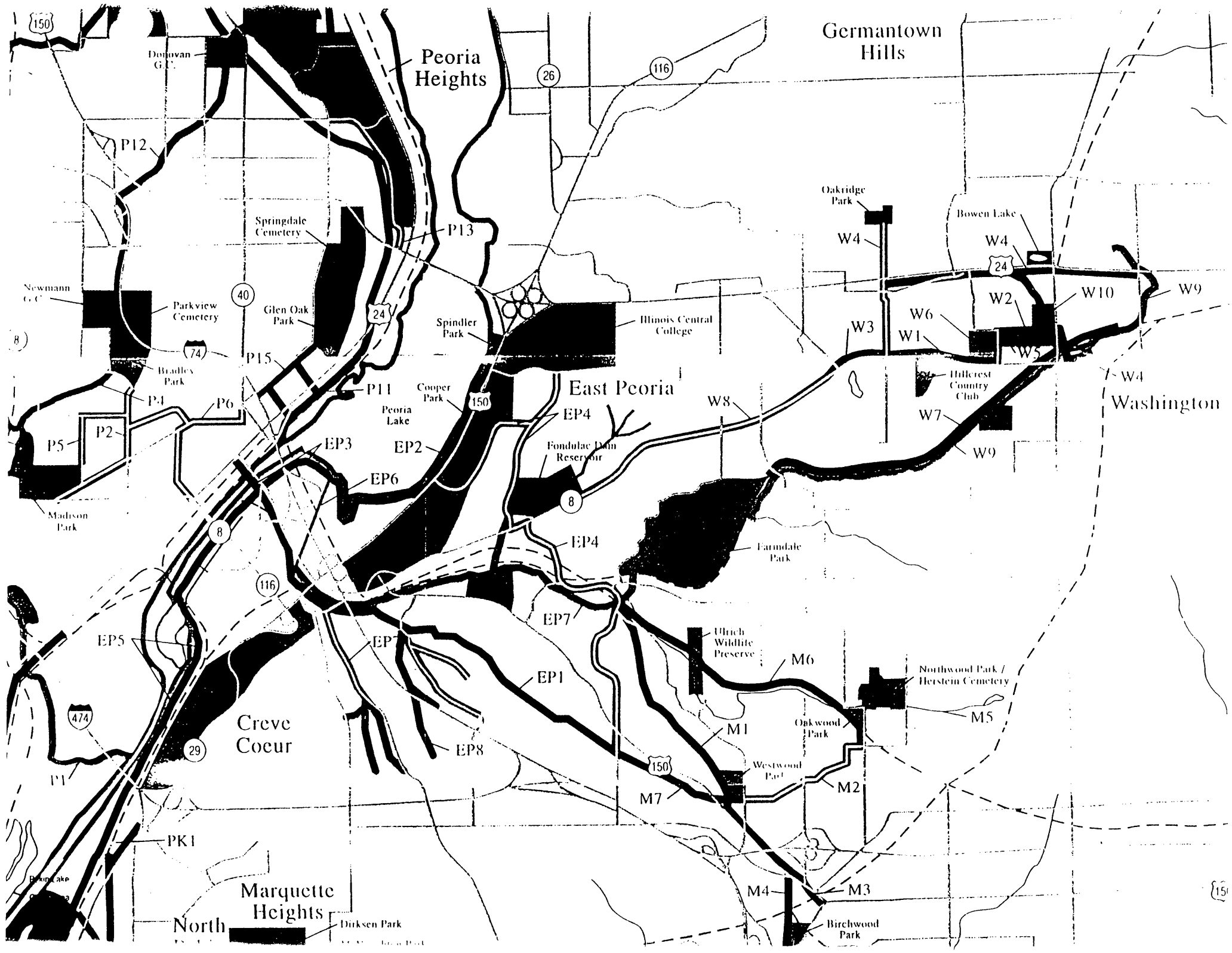
AAS = Archaeological & Architectural Surveys; ARG = American Resources Group, Ltd.; CAA = Center for American Archeology; FRR = Fever River Research; ISM - Illinois State Museum;
ISU = Illinois State University; UIU = University of Illinois-Urbana; WIU = Western Illinois University

Greenways

AA Greenway is a linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridge line, or overland along a railroad right-of-way converted to recreational use, a canal, a scenic road, or other route. It is any natural or landscaped course for pedestrian and bicycle passage. A Greenway is an open-spaced connector linking parks, nature preserves, cultural features, or historic sites with each other and with populated areas (TCRPC, 1997).≅

In 1997, Tri-County Planning Commission published Peoria Metro Area Greenways and Trails Plan. This plan was developed in cooperation with the Regional Greeways Task Force consisting of representatives from the municipalities in the urbanized area and other interested parties and citizens within the study area. Virtually the entire watershed lies within the scope of this plan. The intent was to develop a plan that facilitates coordination among various interests within the region. The environmental benefits of Greeways include habitats for plants and animals, migration conduits, sediment filters, and buffers reducing sediment delivery to streams. Economically, Greenways can improve property values of adjacent parcels, in cooperation with flood control measures reduce damages from flooding, and increase overall quality of life for residents by making available additional recreational opportunities.

In the Farm Creek watershed, several Greeways projects are underway. The list below corresponds to the map on the following page and is taken from the Metro Plan. As work on these various projects moves forward, we should identify opportunities to cost share the


Germantown Hills
Peoria Heights
Donovan G.C.
Springdale Cemetery
Newmann G.C.
Parkview Cemetery
Glen Oak Park
Bradley Park
Spindler Park
Illinois Central College
Cooper Park
Peoria Lake
East Peoria
Fondulac Dam Reservoir
Madison Park
Farmdale Park
Oakridge Park
Bowen Lake
Hillcrest Country Club
Washington
Ulrich Wildlife Preserve
Northwood Park / Herstein Cemetery
Oakwood Park
Westwood Park
Birchwood Park
Creve Coeur
Marquette Heights
North
Dirksen Park
P1
P2
P4
P5
P6
P11
P12
P13
P15
PK1
EP1
EP2
EP3
EP4
EP5
EP6
EP7
EP8
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10
M1
M2
M3
M4
M5
M6
M7
150
26
116
24
40
74
8
474
29

expenses. Incorporating Best Management Practices that reduce erosion can maximize benefits to improved water quality and promote streambank stability in these areas. Also, in areas where flooding is a problem, use these corridors as floodplain.

MORTON

The Morton area is highlighted by the **Morton Bike Trail** (M7) This trail will connect with the River Trail of Illinois through East Peoria

Westwood Park Extension (M1) - This extension would serve Westwood Park following the Penn Central abandoned Railroad right-of-way. It would eventually connect to Ackerman Creek.

Lakeland Road (M2)- This road serves as a connection between the parks in the northeast section of Morton and Westwood Park. A pedestrian /bicycle facility could be built within the existing right-of-way.

Ackerman Creek (M5) - This creek is part of the Farm Creek watershed and is located North of Morton. It would serve as a natural link to the Farmdale Recreation area.

Norfolk and Western Rail ROW- Although this rail line is still active, it would be an ideal candidate for railbanking if given the opportunity. Its location is within the natural area of Ackerman Creek and would serve as a good candidate for a rails-to-trails project.

EAST PEORIA

East Peoria is notable for the existing trail system and spectacular bluffs that bisect the community. East Peoria serves as a hub for the communities east of the Illinois River. It is the location of the only pedestrian bicycle crossing over the Illinois River.

The River Trail of Illinois Phase I (EP1)-This phase runs southeast through the community and will provide the connection to the Morton Trail.

River Trail of Illinois Phase III (EP3) - Phase III uses the Farm Creek levee to connect to the Bob Michael Bridge over the Illinois River.

East Peoria Bike Route System (EP3) - This system involves roadways that either have scenic value such as on a bluff or serve to connect trails with macro sites. They include portions of Fondulac Drive, Highview Road, Pleasant Hill Road, School Street, Farmdale Road, and Oakwood Road.

Diversion Channel (EP6) -The Diversion Channel is a channelized stream off of Farm Creek in the Camp Street area. It provides habitat for wildlife and the movement of

wildlife in the urban area.

Cole Street Creek (EP7) - A natural greenway that runs from Farm Creek to Muller Road in southern East Peoria.

Fahey Hollow (EP8) - A natural greenway which encompasses roughly 2/3 of Phase 1 of the River Trail of Illinois. This greenway extends from Farm Creek to Interstate 74, just east of Pinecrest Drive.

WASHINGTON

The Washington area is in the development stages of a trail system that would primarily serve the residents of Washington.

Washington Recreation Trail Phase I (W1) - This trail was the initial phase in the Washington Recreation trail system. It essentially links Washington Park to the McDonald=s on US Business 24. McDonald=s underwrote a portion of the trail.

Washington Recreation Trail Phase II (W2)- This phase was completed in 1996, and funded in part by a Bike Trail Grant from the Illinois Department of Natural Resources. This section of trail connects Phase I and runs from Washington High School through Washington Park to a trail head located at Lincoln Grade School.

Washington Recreation Trail Phase III (W3) - This section of trail will connect to the trail head at Lincoln Grade School and runs along an abandoned road right of way to Jefferson street.

Washington Recreation Trail Phase IV (W4)- Development of future phases of the Washington Recreational Trail will take the trail North along Cummings Lane to Oak Ridge Park and east to Weaver Park and Lawndale Avenue.

T.P.&W Rail ROW (W7) - This connection provides an excellent connection to Meadow Valley Parks, and ultimately could be used as a link to the East Peoria trail system.

ILL 8 Bike Lanes (W8)- Discussions with IDOT have already taken place concerning the provision of eight foot pedestrian/bicycle facilities within the proposed improvements to IL Route 8 between Washington and East Peoria.

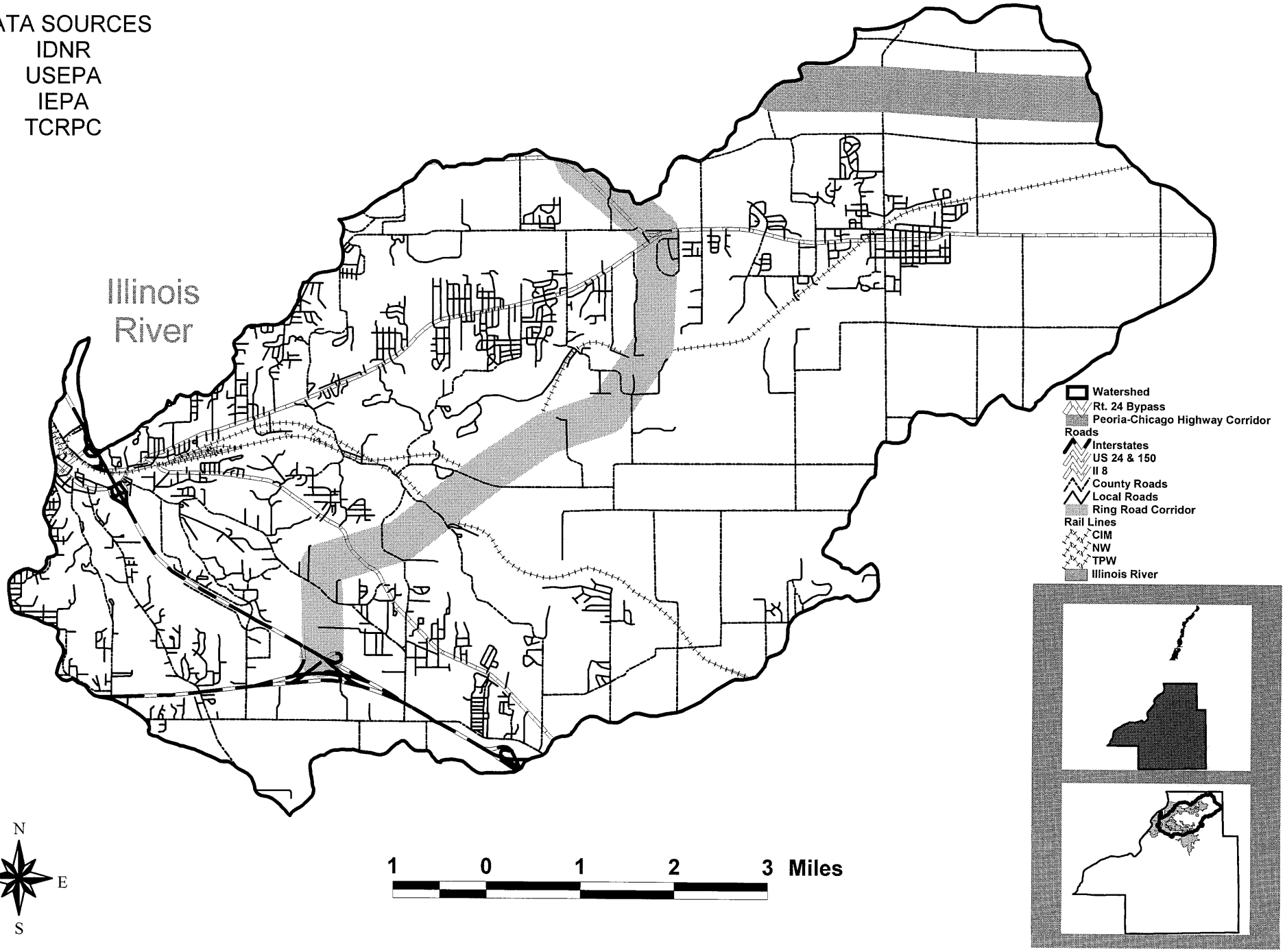
Farm Creek (W9) - This stream has a significant impact in storm events. Farm Creek should be preserved in its natural state where possible to help mitigate impacts of erosion.

In August of 1999, Tri-County Regional Planning Commission received grants from the Illinois

Created by Tri-County Regional Planning Commission

Transportation Network

DATA SOURCES
IDNR
USEPA
IEPA
TCRPC



Department of Natural Resources to conduct a rural Greeways planning process for Peoria-Tazewell and Woodford-McLean counties.

Transportation

The Transportation network within the Farm Creek Watershed is both extensive and dynamic. In addition to the local and county roads within the watershed, two Illinois state routes (8 & 116), two US routes (24 & 150), and two interstates (I-74 & I-474) bisect the watershed. Railroads also play an important role in the Farm Creek watershed transportation system. Approximately 35.5 miles of rail line are present in the watershed. The lines generally run from the industrial areas of East Peoria through the Toledo-Pekin & Western rail yard near US 150 in East Peoria. They then proceed east through Washington and Morton until they leave the watershed. Four projects of major significance to the region and to the watershed need to be addressed in this resource inventory.

Illinois Rt.. 8 through East Peoria has been slated for an increase in capacity. The final design will be a five lane facility, two lanes in each direction with a center turn lane. Various portions have already been completed. The schedule for final completion is between 3-7 years.

Within the next five years Interstate 74 through Peoria-East Peoria area will be subject to a complete upgrade. The reasons for this include safety and capacity issues. This project will include the replacement and realignment of ramps and overpasses within the East Peoria region of the Farm Creek Watershed. The extent of the construction within the watershed will be from the Murray-Baker bridge through the Camp street interchange in East Peoria. This will coincide with a closure of the Murray-Baker bridge for a period of around six months. The potential effects of this project on the watershed have not been determined. The Environmental Impact Statement has yet to be released. This project is scheduled to begin within the next 3-5 years.

In the spring of 1999 the Illinois Department of Transportation District 4 (IDOT) announced the corridor for a proposed ARing Road≅ on the west side of the Illinois River. This will be an interstate type facility completing a northern bypass of the metropolitan area. It will connect the north part of Peoria with the Washington-East Peoria-Morton area. The corridor bisects the Farm Creek Watershed between Washington and East Peoria and then moves in a south westerly direction until it intersects with the I-74/I-474 interchange (please see map on following page). It is expected that the alignment of the proposed facility will be announced within the next year. No funds have been allocated for engineering or construction at this time. While the expected construction of this facility is in the 15-30 year time period, the potential impacts on the watershed are immense. The growth that will follow the construction of such a facility will increase the conversion of farmland to residential and commercial uses. Efforts must be made during this interim period, before serious engineering begins, to work with IDOT to understand these impacts and to manage them accordingly.

At this time, three potential corridors exist for a Peoria to Chicago interstate facility. This

facility will serve to connect the Peoria Urbanized area with the Chicago area. Currently traffic must go south to Bloomington-Normal in order to access I-55 to Chicago. One of the proposed corridors extends directly north of Peoria up the West side of the Illinois River. The other two corridors extend directly west of the City of Washington and connect to I-55 at either Chenoa or Pontiac. Both corridors on the East side of the Illinois River originate within the Farm Creek Watershed. They would run East on US Highway 24 until they leave the county. This type of facility located in the upper reaches of the watershed will likely increase commercial and residential development. At this time no announcement on a specific corridor is imminent and no funds have been allocated for engineering or construction.

Air Quality

With the exception of one accedence of Sulfur Dioxide levels in the air in 1994, the air quality of the Tri-County region is good. Additional information on air quality can be found at http://www.epa.gov/airsdata/montrnd.htm.

Fish

In 1984, a fish kill was reported along Ackerman Creek adjacent to the Village of Morton Sewage Treatment Plant. The Illinois Stream Information System Database contained no other information for this event, and it appears to be the only such kill in the watershed. The following tables have been extracted from the Illinois State Natural History Survey Database. The Mollusks and Fish are those found in Farm Creek itself and the mammals are those found in Tazewell County. As can be seen, many common species are not found in the database. A more accurate accounting of the fish species in Farm Creek is currently being researched by the District Natural Heritage Biologist.

Table 15

Fish in Farm Creek

Catalogue #	Genus species	Name	Year
15036	Carpets cyprinus	Quillback	1966
15037	Campostoma anomalum		1966
15038	Notropis dorsalis		1966
15039	Cyprinella lutrensis	Red shiner	1966
15040	Notropis ludibundus	Sand shiner	1966
15041	Pimephales notatus	Bluntnose minnow	1966
15042	Pimephales promelas	Flathead minnow	1966
15043	Rhinichthys atratulus	Blacknose dace	1966
15044	Semotilus atromaculatus	Creek chub	1966
42545	Campostoma anomalum		1997
42546	Notropis dorsalis		1997
42547	Pimephales promelas	Flathead minnow	1997
42548	Rhinichthys atratulus	Blacknose dace	1997
42549	Semotilus atromaculatus	Creek Chub	1997
42550	Catostomus commersoni	White sucker	1997

Table 15

Mollusk in Farm Creek

Catalogue #	Genus species	Name	Stream	Drainage	Year
INHS 19844	Pyganodon grandis	Giant Floater	Farm Creek	Illinois River	1997
INHS 19845	Toxolasma parvus	Lilliput	Farm Creek	Illinois River	1997
INHS 19846	Venustaconcha ellipsiformis	Ellipse	Farm Creek	Illinois River	1997

Wildlife

Tazewell County and the Farm Creek watershed are home to many types of plants and animals. Eight hundred and ninety-one (891) plant species and thirty-five (35) species of Amphibians and Reptiles are found in Tazewell County. Below are the threatened species in Tazewell County. It is assumed that these species can be found within the boundaries of the Farm Creek watershed. A more complete inventory of flora and fauna of the watershed would assist with determining problems. Also, identification of areas where native plants can be used to reduce erosion and increase streambank stability should be undertaken.

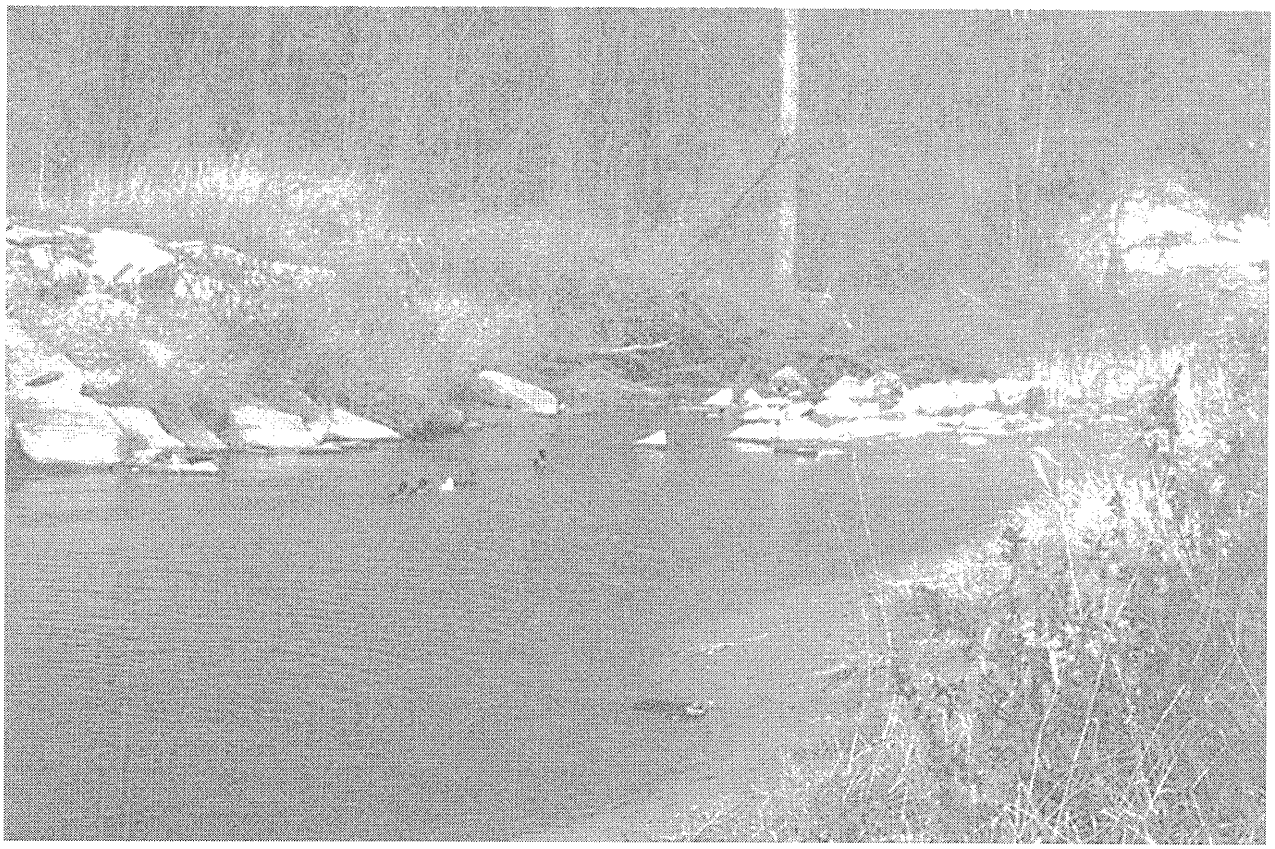


Table 17

Threatened Species
in Tazewell County

Bald eagle (Haliaeetus leucocephalus)

Decurrent false aster (Boltonia decurrens)

Lakeside daisy (Hymenoxis herbacea)

The following tables have been extracted from the Illinois State Natural History Survey Database. It does not contain some commonly found species. A more accurate accounting is being researched by the District Natural Heritage Biologist.

Table 18

Mammals Found in Tazewell County

Catalogue #	Family	Genus species	Name	Year
UIMNH 1677	Geomyidae	Geomys bursarius	Plains Pocket Gopher	1950
UIMNH 3347	Muridae	Microtus ochrogaster	Prarie Vole	1948
UIMNH 26700	Mustelidae	Mustela vison	Mink	1961
UIMNH 26742	Muridae	Microtus ochrogaster	Prarie Vole	1961
UIMNH 33096	Muridae	Peromyscus leucopus	White Footed Mouse	1965
UIMNH 36863	Muridae	Ondatra zibethicus	Muskrat	1958
UIMNH 38602	Vespertilionidae	Lasiurus borealis	Red Bat	1967
UIMNH 40684	Soricidae	Blarina brevicauda	Norhern Short Tailed Shrew	1968
UIMNH 40735	Muridae	Peromyscus leucopus	White Footed Mouse	1968
UIMNH 40751	Muridae	Microtus ochrogaster	Prarie Vole	1968

Socio-Economic/Human Resources

The economy of the watershed is lead by manufacturing, retail, and agricultural industries. The table below shows the breakdown of employment by major types in the communities located in the watershed. The Peoria-Pekin Metropolitan Area suffered a severe economic downturn in the 1980's. This resulted in large numbers of manufacturing and retail jobs being lost. The 1990's has been one of growth, however much of that growth has been to make up the ground lost a decade ago. The AG sector is currently in the midst of a crisis brought on by high levels of production and low commodity prices. This has made volunteer incentive based programs for soil conservation more attractive than in past years.

Table 19

Employment 1995*

Type	Tazewell Co.	Creve Coeur	East Peoria	Morton	Washington
Total	34,001	104	11,223	7,129	3,354
Mfg.	5,203	-	2,799	1,196	334
Retail	9,561	33	2,022	1,645	1,562
Finace Insurance Real Estate	1,733	-	161	229	135
Services	8,159	2	2,376	1,465	815
White Collar	22,209	7	6,242	3,968	2,520

Blue Collar	11,578	2	4,732	2,924	990

* Retail Trade Analysis: Tazewell County. 6/11/97 Rural Economic Technical Assistance Center

Ponds and Marshes

System P = Palustrine: Area dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. Areas lacking such vegetation are also included if they have all of the following characteristics:

1. Area less than 20 acres (8 hectares).
2. No active wave formed or bedrock shoreline.
3. Water depth in deepest part of basin less than 6.6 feet (2 meters) at low water. May be situated at the edge of a lake or river or in river floodplain.

There are no subsystems under this system, but several classes are recognized. A few examples follow:

Class SS = Scrub-Shrub - Woody Vegetation less than 20 feet (6.0 meters) tall.
Subclasses 1-5 = Broad leaved deciduous, needle leaved deciduous, etc.

Evergreen versus deciduous, and needle-leaved versus broad-leaved are determined on the basis of which subclass represents more than 75% areal canopy coverage during the leaf bearing seasons.

Class UB = Unconsolidated Bottom - Vegetation is absent over the majority (70%) of the area. Bottom consists of mud, sand, cobble, gravel, or organic matter.
Class EM = Emergent - Vegetation includes erect, rooted herbaceous hydrophytes representing more than 30% of the areal cover.
Subclass 1 = Persistent - Vegetation remains upright and visible throughout the year.
Subclass 2 = Nonpersistent - Vegetation dies back and is not visible during the non-growing season.

Examples of the common codes found in Illinois:

(1) PEMA - describes an area with water present for only brief periods during the growing season.
P - palustrine EM - emergent vegetation A - temporarily wet.

(2) PEMAf - same as PEMA, but showing evidence of farming -f.

(3) PEMAd - same as PEMA, but partly drained -d.

(4) PEM1C - an area with surface water present for extended periods during growing season.
P - palustrine EM - emergent vegetation 1 - persistent C - seasonally flooded.

(5) PFO1A - forested area with brief periods of flooding during the growing season.
P - palustrine FO - forested 1 - broad-leaved deciduous A - temporarily flooded.

(6) PUBG - describes a pond, borrow pit, or other small open water area.
P - palustrine UB - unconsolidated bottom G - intermittently exposed.

Lakes and Reservoirs

System L = Lacustrine: Deepwater habitats with all of the following characteristics:

1. Situated in a topographic depression or dammed river channel.
2. Lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with greater than 30% areal coverage.
3. Total area exceeds 20 acres. Areas less than 20 acres may be included in the lacustrine System if an active wave formed or bedrock shoreline makes up all or part of the boundary, or if the water is greater than 6.6 feet in the deepest part of the basin at low water. Lakes can be divided into two subsystems:

Subsystem 1 = Limnetic; deep water (greater than 6.6 feet).
Subsystem 2 = Littoral; from shore to a depth of 6.6 feet.

Several classes are associated with the lacustrine system. The class describes the substrate or vegetation type. An example follows:

Class AB = Aquatic Bed - area dominated by plants that grow principally on or below the surface for most of the growing season in most years (algae, duckweed, etc).

Examples of the most common codes found in Illinois.

(1) L1UBH or L1OWH - describes a large deep lake or reservoir. L - lacustrine 1 - limnetic OW - open water (or UB - unconsolidated bottom) H - permanently flooded.

(2) L2ABG - describes a shallow, vegetated area of a lake.
L - lacustrine 2 - littoral AB - aquatic bed G - intermittently exposed.

River and Streams

System R = Riverine: Wetlands and deepwater habitats contained within a channel with periodically or continuously moving water. Divided into 4 subsystems:

Subsystem 2 = Lower Perennial - Water velocity slow, but some water flows throughout the year. Gradient is low. The substrate consists of sand and mud. Oxygen deficits may occur.

Subsystem 3 = Upper Perennial - Gradient high, water velocity fast. Water flows throughout the year. Substrate consists of rock, cobble, gravel, and sand. Dissolved oxygen content high.

Subsystem 4 = Intermittent - Flowing water present only part of the year. When water is not flowing, it may remain in isolated pools or surface water may be present.

This system includes many of the same classes as the palustrine and lacustrine systems. A few common examples follow:

(1) R2UBH - slow moving perennial river or stream.
R - Riverine 2 - lower perennial UB - unconsolidated bottom H - permanent.

(2) R2UBH - perennial river or stream that has been modified by man.

R - riverine 2 - lower perennial UB - unconsolidated bottom H - permanent
X - excavated

(3) R4SBF - intermittent stream.

R - riverine 4 - intermittent SB - stream bed F - semipermanently flooded.

For additional information about the National Wetlands Inventory classification system or the Illinois Wetlands Management Program contact:

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600 N. Grand Avenue
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References

Burch, Stephen L. And Douglas J. Kelly. Peoria-Pekin Regional Groundwater Quality Assessment. Illinois State Water Survey, Champaign, Research Report 124, 1993.

Daily and Associates, Engineers, Inc. Preliminary Storm Water Management Study for Detention Basin Feasibility: City of Washington, Illinois. 1990.

Demissie, Misganaw and Nani G. Bhowmik. Peoria Lake Sediment Investigation. Illinois State Water Survey, Champaign, 1986.

Bhowmik, Nani G. et al. Source Monitoring and Evaluation of Sediment Inputs for Peoria Lake. Illinois State Water Survey. Champaign, 1993.

Illinois Department of Natural Resources, 1996. Illinois Land Cover, An Atlas.

Illinois Department of Energy and Natural Resources 1993. Source Monitoring and Evaluation of Sediment Inputs for Peoria Lake. Office of Hydraulics and River Mechanics. Champaign, IL

Illinois Environmental Protection Agency 1994. Illinois Water Quality Report 1992-1993. Bureau of Water. Springfield, IL

* Updated information for 1997-1998 was obtained through contact with a Bureau of Water representative.

Illinois, State of, Integrated Management Plan for the Illinois River Watershed 1997.

Suloway, Liane and Marvin Hubbell. Wetland Resources of Illinois: An Analysis and Atlas. Illinois Department of Energy and Natural Resources. 1994.

United States Corp of Engineers. Reconnaissance study: Peoria Lake, Illinois River Basin, Illinois, Rock Island 1987.

United States Corp of Engineers. Project Study Plan: Illinois River, Riverfront Development at Peoria, Illinois Environmental Restoration Feasibility Study. 1998.

United States Army Corp of Engineers. Environmental Assessment Section 205 Flood Damage Reduction study Illinois River Miles 160-162 East Peoria, IL Planning Division. Rock Island, IL 1996.

United States Army Corp of Engineers. Periodic Inspection Report No. 7 Farm Creek Reservoirs Farmdale and Fondulac Dams. Engineering Division. Rock Island, IL, 1998

United States Army Corp of Engineers. Final Report, Farmdale and Fondulac Reservoirs, Historic Properties Management Plan, January 1999

United States Army Corp of Engineers. Natural Resources Management, Operational Management Plan I & II, Farm Creek, updated yearly.

United States Army Corp of Engineers. The Geological and Regional Cultural Heritage of the Farmdale and Fondulac Reservoirs, prepared by MVR 1998 .

United States Army Corp of Engineers. Inventory and Analysis of Urban Water Damage Problems-City of Washington, Tazewell County, Illinois (Prepared for: The State of Illinois), August 1987.

United States Army Corp of Engineers. Definite Project Report, East Peoria Local Flood Protection Project, February 1996 & Updated April 1998, CWIS No. 091606.

United States Army Corp of Engineers. Rock Island District, Farm Creek Reservoirs, East Peoria, Illinois, Farmdale and Fondulac Dams, Outlet Works and Spillways, Periodic Inspection and Continuing Evaluation, Periodic Inspection Report No. 5, September 1988.

United States Army Corp of Engineers. Rock Island District, Farm Creek Reservoirs, East Peoria, Illinois, Farmdale and Fondulac Dams, Outlet Works and Spillways, Periodic Inspection and Continuing Evaluation, Periodic Inspection Report No. 6, September 1993.

United States Army Corp of Engineers. Rock Island District, Farm Creek Reservoirs, East Peoria, Illinois, Farmdale and Fondulac Dams, Outlet Works and Spillways, Periodic Inspection and Continuing Evaluation, Periodic Inspection Report No. 7, July 1998.

United States Army Corp of Engineers. Farm Creek Information Pamphlet, June 1949.

United States Army Corp of Engineers. Farm Creek Interim Report - Deposition Studies, November 1951.

United States Army Corp of Engineers. Farm Creek Flood Control - Reservoir Regulation Manual, - November 1976.

United States Army Corp of Engineers. Farm Creek Emergency Plan, October 1985.

United States Army Corp of Engineers. Farm Creek Reservoirs, Operations & Maintenance Responsibilities.

United States Army Corp of Engineers. Farm Creek Reservoirs, Hydrologic & Hydraulic Data.

United States Army Corp of Engineers. Channel Improvements, Farm Creek, Illinois Hydrologic Model Investigation, 1953

United States Department of Agriculture. 1997 Census of Agriculture.

United States Department of Agriculture. Soil Survey of Tazewell County, Illinois. 1996

Wilson, S.D., G.S. Roadcap, B.L Herzog, D.R. Larson, and D. Winstanley. *Hydro-geology and ground-Water Availability in Southwestern McLean and Southeast Tazewell Counties, Part 2: aquifer Modeling and Final Report.* Illinois State Water Survey and Illinois State Geological Survey Cooperative Ground-Water Report 19, Champaign, IL, 1998.

Problem Statements

Resource Concerns in the Farm Creek Watershed are centered around the general issue areas of flooding, erosion and sedimentation, habitat loss and declining water quality. In addition, public facilities and infrastructure issues have come up throughout the planning process. Below is a list of specific concerns identified to date. Asterisks show the same concern in another issue area.

Flooding
-Need for Storm water detention*
-Negative economic impacts of flooding
-Channel obstructions and debris as possible causes
-Benefits of flooding to habitat/bio-diversity*
-The loss of wetlands and the potential for restoration*
-Excess amounts of runoff*
-Control of headwater runoff*

Problem Statement: Flooding from increased and uncontrolled urban, agricultural, and construction runoff is causing damage to property, risk to life, and streambank instability.

Erosion & Sedimentation
-Sedimentation in stream beds and the Peoria Lake
-Economic impacts of erosion
-Streambank stability
-Loss of most productive farmland to sheet and rill erosion
-Excess amounts of runoff*
-Control of headwater runoff*
-Storm water & sediment detention*
-The loss of wetlands and the potential for restoration*

Problem Statement: Streambank, sheet, rill, gully, and ephemeral erosion occurring in the Farm Creek Watershed is damaging public and private property while reducing the amount of productive farmland in the watershed.

Problem Statement: Sediment entering Farm Creek and its tributaries are decreasing water quality and reducing habitat areas within the watershed. Lower Peoria Lake, as the receiving water body, is also experiencing declining habitat areas and water quality due to sedimentation. Finally, Lower Peoria Lake is seeing reduced recreational opportunities and increased public expenditures to maintain the Illinois River as an economic asset resulting from sediment delivery.

Ecology, Habitat, & Water Quality
-The loss of wetlands and the potential for restoration*
-Declining bio-diversity

-Benefits of flooding to habitat/bio-diversity
-Economic impacts of poor water quality

Problem Statement: Water quality in the Farm Creek watershed is impaired due to slight nutrient and moderate siltation problems. Municipal point sources, urban stormwater runoff, hydrologic and habitat modification in the watershed, and stream flow regulation cause these problems.

Problem Statement: Wildlife habitats within the Farm Creek watershed have decreased due to the drainage of wetlands, and removal of stream corridor vegetation by erosion and urbanization.

Public Facilities & Infrastructure
-Is current Infrastructure capacity being utilized?
-Lack of infrastructure information
-Inadequacy of existing infrastructure
-Potential expansion of current facilities

Problem Statement: Lack of up to date and coordinated infrastructure information at the watershed level has caused underutilization and untimely upgrades to public facilities and infrastructure.

Land Use
-Loss of most productive farmland to development

Problem Statement: Loss of prime farmland to erosion and development have weakened the agricultural sector of the Farm Creek watershed and damaged the rural character of outlying areas.

Other Considerations
-Funding sources for data and implementation
-Education of stakeholders about inter-connectivity and impacts
-Coordination of efforts (or lack of)
-Changes in regulations such as National Pollutant Discharge Elimination System (NPDES education)
-Potential for a Watershed Protection District

Problem Statement: The lack of education efforts concerning watershed issues and activities will be a barrier to successful implementation of the Farm Creek Watershed Management Plan.

Goals/Objectives

Problem Statement: Flooding from increased and uncontrolled urban, agricultural, and construction runoff is causing damage to property, risk to life, and streambank instability.

Goal: A reduction of flooding, as soon as possible, by means of detention facilities and conservation buffers.

Objective #1: Identify appropriate areas for stormwater detention and conservation buffers throughout the watershed.

Objective #2: Work with Morton, Washington, East Peoria, Creve Coeur and Tazewell County to develop consistent and logical stormwater control ordinances throughout the watershed.

Objective #3: Construct appropriate facilities on the AGregory,≅ ATarvin,≅ and Blumenshine≅ tracts that reduce flood damages, increase plant and wildlife habitats, reduces sediment delivery to nearby streams, and improve discharged water quality from the sites.

Problem Statement: Streambank, sheet, rill, gully, and ephemeral erosion occurring in the Farm Creek Watershed is damaging public and private property while reducing the amount of productive farmland in the watershed.

Goal: A reduction, through appropriate Best Management Practices, of the delivery of sediment to Farm Creek and its tributaries from the various types of erosion occurring in the watershed.

Objective #1: Conduct an Erosion and Sediment Delivery Survey of the watershed to learn the types and quantities of erosion taking place within the watershed.

Objective #2: Conduct a needs= assessment of the watershed to identify areas appropriate for BMP=s.

Objective #3: Begin one-on-one dialog with landowners concerning the issues in the watershed and how they can become involved in the process.

Objective #4: Work with landowners to implement BMP=s through voluntary, incentive based programs.

Problem Statement: Sediment entering Farm Creek and its tributaries are decreasing water quality and reducing habitat areas within the watershed. Lower Peoria Lake, as the receiving

water body, is also experiencing declining habitat areas and water quality due to sedimentation. Finally, Lower Peoria Lake is seeing reduced recreational opportunities and increased public expenditures to maintain the Illinois River as an economic asset resulting from sediment delivery.

Goal: Reduce the deposit of sediment to the Lower Peoria Lake from Farm Creek Watershed.

> **Objective #1: Conduct an Erosion and Sediment Delivery Survey of the watershed to learn the types and quantities of erosion taking place within the watershed.**
>
> **Objective #2: Begin a process of integrating the Farm Creek Management Plan into the Peoria Lakes Feasibility and Illinois River Basin Restoration Studies.**
>
> **Objective #3: Conduct a needs= assessment of the watershed to identify areas appropriate for BMP=s.**
>
> **Objective #4: Begin one-on-one dialog with landowners concerning the issues in the watershed and how they can become involved in the process.**

Problem Statement: Water quality in the Farm Creek watershed is impaired due to slight nutrient and moderate siltation problems. Municipal point sources, urban stormwater runoff, hydrologic and habitat modification in the watershed, and stream flow regulation cause these problems.

Goal: Improvement of water quality in the watershed by reducing sediment being delivered to streams and Waterbodies.

> **Objective #1: Remove trash and debris from the streams in the watershed.**
>
> **Objective #2: Reduce the sediment delivered to waterways from construction sites.**
>
> **Objective #3: Reduce the sediment delivered to waterways from agricultural areas through voluntary, incentive base programs.**
>
> **Objective #4: Reduce the sediment delivered to waterways from bluff and ravine areas resulting from increased stormwater runoff velocity/volumes and improper forest management.**
>
> **Objective #5: Reduce the sediment delivered to waterways from streambank and stream bed erosion through grade control, bioengineering and reduced stormwater velocities/volumes.**

Problem Statement: Wildlife habitats within the Farm Creek watershed have decreased due to the

drainage of wetlands, and removal of stream corridor vegetation by erosion and urbanization.

Goal: Protect, enhance, and add to the areas and types of habitat necessary to increase native wildlife populations throughout the watershed.

Objective #1: Inventory areas critical to wildlife habitats in the watershed.

Objective #2: Work with landowners to develop management strategies to protect these areas.

Objective #3: Educate the landowners and developers on the value of these areas to in terms of land value, esthetics, decreased maintenance costs and open space.

Objective #4: Develop a local incentive program to establish functional wildlife habitat areas in new developments.

Problem Statement: Lack of up to date and coordinated infrastructure information at the watershed level has caused underutilization and untimely upgrades to public facilities and infrastructure.

Goal: Information about the Farm Creek Watershed should be kept current and up to date at a local repository with availability to all interested parties.

Objective #1: Develop a resource inventory for the Farm Creek Watershed containing information on the natural, human, and manmade resources.

Objective #2: Update and included new information in the resource inventory annually.

Objective #3: Distribute the resource inventory to all affected stakeholders, agencies and organizations throughout the watershed.

Problem Statement: Loss of prime farmland to erosion and development have weakened the agricultural sector of the Farm Creek watershed and damaged the rural character of outlying areas.

Goal: Maintain agriculture as a viable enterprise and a valuable social component of the watershed community.

Objective #1: Work with landowners to develop sustainable agricultural practices that enhance the value of their products and conserve the land resources on which they rely.
Objective #2: Work with landowners to protect prime agricultural lands through

voluntary and incentive based easements permanently.

Objective #3: Work with developers, local zoning officials and landowners to incorporate agriculture into developments through clustered development.

Problem Statement: The lack of education efforts concerning watershed issues and activities will be a barrier to successful implementation of the Farm Creek Watershed Management Plan.

Goal: Develop an education and outreach program that will inform and involve those in the watershed about the ongoing planning process and how they can participate.

Objective #1: Distribute AWatermarks≅ CD-ROM of watershed information to local schools and organizations.

Objective #2: Develop and present information on Farm Creek and the management plan to local officials, schools and service organizations.

Objective #3: Develop training opportunities for developers and contractors that highlight proper instalation and maintenance of BMP's in the region.

Alternative Implementation Strategies, Costs & Selected Implementation Strategies

Throughout the planning process, the Planning & Technical Committees have worked to identify and evaluate feasible alternatives to addressing the problems identified in the watershed. Below are all alternatives that have been considered. A description, discussion, ranking, costs, and maintenance section follows each project heading. The Committees believe that all alternatives should be considered and none eliminated by the ranking procedure. Therefore all are included. The projects are listed in no particular order. The ranking score is on a five point scale and was derived using a variety of factors related to water quality, habitat, flood reduction, consistency with the plans goals & objectives and so on.

A. Streambank, Streambed stabilization and grade control.

1. *Description:* After several field investigations by members of the watershed committees and TCRPC staff in 1999 and 2001 we identified the need for large scale stabilization projects throughout the watersheds' major tributaries. Further, the NRCS Survey confirmed this and identified these measures as having the most potential beneficial impact on sediment delivery to surface waters in the watershed and the Illinois River.

   - Little Farm (Dempsey) Creek
   - Kerfoot Creek
   - Cole Creek
   - Ackerman Creek
   - Fondulac Creek
   - Farm Creek

2. *Limitations/Opportunities:* Interested landowners are certainly the most restrictive factor. However, the widespread interest and support by landowners, especially in the upland region of the watershed, are a good indication that we can successfully carry out projects. Funding alternatives are strong. Many existing Farm Bill programs are available plus EPA 319, and Illinois Rivers 2020 sources.

3. *Ranking:* 4.13

4. *Costs:* $50 per ft. X 5280 ft. (1 mile) = $264,000
   $264,000 x 5 tributaries = $1,320,000

5. *Maintenance:* Landowners. Most funding sources for this require a ten year easement agreement.

B. Refit of existing subdivision throughout the watershed to equip with storm water retention and infiltration BMP's

1. *Description:* Identification, design, and construction of appropriate storm water retention, detention and infiltration BMP's in existing subdivisions. Several areas along Farm Creek are experiencing gully erosion due to uncontrolled storm water outlets from residential subdivisions. The NRCS study identified this type of erosion from these areas as the most significant source of sediment in the surface waters of the watershed.

2. *Limitations/Opportunities:* This strategy will most likely result in the highest benefit of sediment retention for the cost. However, working within the confines of subdivision covenants and existing land use regulations can prove difficult. As property owners are experiencing damage to structures and property from this type of erosion, it is likely that private property owners will be interested. An education effort focused on landowners who are not experiencing problems but are non the less discharging large quantities of storm water can generate additional interest.

3. *Ranking:* 3.8

4. *Costs:* $1,000,000

5. *Maintenance:* Landowners, municipalities and neighborhood associations as relevant. Most funding sources for this require a ten year easement agreement. Routine maintenance will be needed to keep outlets clear.

C. City of Washington detention and habitat areas.

1. *Description:* The City of Washington has purchased three tracts of property upstream of the City along Farm Creek. We envision the areas to be storm water detention areas that incorporate habitat areas and recreational opportunities. The US Army Corps is currently assessing the three properties for feasibility in benefiting habitat and reducing sediment delivery to the Peoria Lakes.

2. *Limitations/Opportunities:* As all three properties are in public ownership and have an interest by State and Federal agencies for restoration work, the likelihood that these areas will benefit Farm Creek water quality is great. The Gregory tract is most restrictive in terms of low-cost storm water and habitat benefits. This is due to topography and parcel size. However, it is suitable for a constructed detention and wetland area. The Tarvin tract provides excellent opportunity for marginal storm water control and habitat benefits. We can achieve these through conservation pools, emergent wetland planting and native

prairie restoration. The Blumenshine tract offers the most alternatives due to its size. Storm water detention is possible in many ways along with large conservation pools for aquatic and emergent habitats. Prairie restoration of up to one hundred acres is possible on the site. Funding alternatives are excellent due to the Federal and State interest in the project areas.

- Gregory tract 17 acres
- Tarvin tract 67 acres
- Blumenshine tract 135 acres

3. *Ranking:* 4.13

4. *Costs:*

Gregory	$650,000
Tarvin	$1,500,000
Blumenshine	$1,500,000
Total Cost	$3,650,000

5. *Maintenance:* City of Washington per terms of Federal & State cost share agreements. Maintenance will include prescribed burns, mowing and keeping outlet structures clear.

D. Agricultural Dry dams.

1. *Description:* These structures are standard NRCS dry dams built to detain a 10-year storm event. The purpose is to slow sheet flow and prevent gully erosion on agricultural fields. These structures can currently be found on many farms in the watershed.

2. *Limitations/Opportunities:* The interest in the planning project by landowners over the past three years has resulted in increased requests for cost share assistance for these types of structures. The NRCS is currently analyzing 2-foot contour data for the watershed to learn suitable locations throughout the watershed. We will conduct a targeted mailing and workshop to provide landowners with information on these and other types of conservation practices. We would accomplish the funding of such measures through existing cost share programs offered by the department of Agriculture.

3. *Ranking:* 3.72

4. *Costs:* 100 structures = $150,000

5. *Maintenance:* Landowners per terms of cost share agreements. Sediment buildup needs to be periodically removed.

E. Bluff/Gully stabilization.

1. *Description:* Several areas within the watershed are experiencing large quantity erosion from forested bluffs due to heavy forest cover with no ground cover to prevent sheet flows. This sheet flow then concentrated to form gullies. Forested areas would be thinned to reduce invasive species and allow for sunlight to reach the forest floor. Additionally, prescribed controlled burns would be initiated to limit invasive species and open the forest floor to new growth. Finally, existing down cutting in gullies would be stabilized using a combination of check dams and under drains.

2. *Limitations/Opportunities:* Due to the fragmented nature of land ownership in the watershed, conducting projects on multiple properties will be difficult. However, several larger tracts of forest areas are present in the watershed that are suitable for this type of restoration activity. We have identified these landowners and would focus educational efforts on the benefits of forest management and the use of fire as a tool. Several prescribed burns take place annually around the region therefore training and technical assistance is available.

3. *Ranking:* 3.53

4. *Costs:* $900,000

5. *Maintenance:* As this is a management strategy rather than a structural solution, maintenance is not an issue. Continuing to follow the practices will be the responsibility of the landowner, the structures should not require maintenance once installed and vegetation established.

F. Filter strips (non CRP/CREP).

1. *Description:* Filters strips are used to convey water from agricultural areas while dropping sediment and nutrients from the surface waters. These are an established practice and would be done in coordination with dry dams and other ag related BMP's.

2. *Limitations/Opportunities:* The interest in the planning project by landowners over the past three years has resulted in an increase in request for cost share assistance for these types of practices. The NRCS is currently analyzing 2-foot contour data for the watershed to determine suitable locations throughout the watershed. We will conduct a targeted mailing and workshop to provide landowners with information on these and other types of conservation practices. We would accomplish the funding of such measures through existing cost share programs offered by the department of Agriculture.

3. *Ranking:* 3.83

4. *Costs:* 100 acre's = $20,000

5. *Maintenance:* Landowner per requirements of funding agreement.

G. Water management areas along Farm Creek and tributaries.

1. *Description:* We would identify several areas within the watershed for use as water management areas. These areas, along the main channels, would be used as side channel areas for habitats and for sediment deposition during high flows.

2. *Limitations/Opportunities:* The combination of topography and landowner interest will be the most challenging element to overcome. Maintenance would also be a consideration. However, we identified several areas during tours that would be suitable for such restoration activity. Landowner interest will largely depend on education and availability of funding. We assume that we would integrate these areas into larger streambank/streambed stabilization projects that are eligible for funding under existing programs.

3. *Ranking:* 3.97

4. *Costs:* $1,000,000

5. *Maintenance:* Landowners per requirements of the funding agreement. These project are most susceptible to hydraulic and hydro logic change over time. Therefore, they may require routine maintenance and routine sediment removal.

H. Ackerman Creek; Village of Morton Water Treatment Plant.

1. *Description:* This project has two components.

A. The first is the need for the protection and stabilization of a sanitary sewer line crossing the Creek. An approximate ten foot head cut has undermined the sewer twice before, one of which resulted in waste discharge to the stream. The Corps of Engineers under Section 206 has the resources to design and construct this project.

B. The second portion of the project will fall under the Feasibility Study. The Village of Morton owns an approximately 2000 ft. reach of Ackerman Creek. The area will be used for a pool and riffle sequence to provide additional in stream habitat.

2. *Limitations/Opportunities:*

A. The sewer line is difficult to access for large equipment, however easements are in place to allow for it. The USACOE is interested in assisting with the

project and it is currently moving forward through the Section 206 process. It is likely that the project will be completed in the short term (<5 years).

B. The project is being evaluated as part of the USACOE and IDNR Feasibility studies on the Illinois River Basin. The project is in public ownership with a willing partner and easy access. The habitat benefits would be significant due to the severe degradation that exists. Stabilizing this portion of Ackerman Creek will result in the elimination of head cuts that are endangering the sewer line and resulting in disproportionate sediment loads being delivered to Farm Creek and the Illinois River.

3. *Ranking:*

A. 3.79

B. 4.24

4. *Costs:*

A. $500,000

B. $100,000

5. *Maintenance:* Village of Morton per requirements of federal & state cost share agreements. Maintenance will include routine clearing of channel obstructions and trash.

J. East Peoria Sanitary District Channel Maintenance.

1. *Description:* The East Peoria Sanitary District is responsible for maintenance of the Farm Creek Flood Control Project in East Peoria. A complete description of its duties and operations can be found in the resource inventory. Its tax authority is a relatively small portion of East Peoria adjacent to the structures. However, the sediment load from Farm Creek is on average 33,000 to 35,000 tons per year. A large portion of this sediment drops out into the flood control channel and builds up over time. The rate of deposition is faster than the current maintenance budget allowance under the tax levy. This has the potential to place East Peoria at risk for flooding. An effort would be undertaken to secure funding to allow for the annual maintenance requirements of the sediment deposition in the channel. While the ultimate solution is the reduction of the sediment load from upstream, the reality of the current situation demands a more short term practical solution.

2. *Limitations/Opportunities:* Funding is really the only limitation to this project. Sources include the Federal government and expanded taxing district.

3. *Ranking*: 3.02

4. *Costs:* $50,000 per year

5. *Maintenance:* East Peoria Sanitary District.

K. Education, Outreach, & Watershed Coordination.

1. *Description:* Ongoing professional staff coordination of the planning effort. This will include outreach to all watershed stakeholder, educational materials development and distribution, workshops to inform and educate landowners on options available to them, coordination of the ongoing State and Federal programs that affect the watershed.

2. *Limitations/Opportunities:* The need is clear so that this planning effort is ongoing and a part of the way things are done in this area. Funding is the only limitation. However, the realization by funding sources that the strategies identified and implemented are feasible should give credibility to the need for ongoing coordination efforts.

3. *Ranking:* 3.86

4. *Costs:* $150,000 over five years

5. *Maintenance:* TCRPC.

L. Wetland restoration & Stream re-meander demonstration project at one location.

1. *Description:* Identification of a modified segment of stream with strong potential for restoration and enhancement. The project would be used to highlight the benefit of such watershed activities to the larger public and establish the feasibility of restoration projects in this watershed.

2. *Limitations/Opportunities*: Several sites are suitable for such a project. One on one discussions with landowners are necessary to move such a project forward. Further, funding sources need to be identified and initiated before discussions take place. Many programs at the Federal and State level would be suitable for such a project.

3. *Ranking:* 4.45

4. *Costs:* $100,000

5. *Maintenance:* Landowner per requirements of the funding agreements.

The Future & Our Success

Implementation of the Plan will be carried out through the agencies present on the Technical Committee. Tri-County Regional Planning Commission staff at the direction of the Planning Committee will conduct coordination of these efforts. The successful implementation of the strategies above is to be assessed in terms of overall achievement of goals and objectives identified in the Plan. The implementation strategies are general in nature, due to the complexity and size of the watershed. Therefore, specific measures of success for individual practices will be developed as selected practices are designed, funded and constructed. These specific measures will be formulated based on the ability of a given practice to address the goals and objectives of the Plan.

Implementation strategies, however, can be assessed in terms of watershed wide problems. The identification of problem statements during the planning process resulted in five general resource areas. Below are measures that can be applied to overall plan implementation in the context of each resource area

Flooding:

1. A flood damage assessment was conducted by the Army Corps of Engineers at various location in the watershed. An update of the annual damage figures is an effective in measuring overall reduction in flooding.

2. FEMA Flood Insurance claims over a period of time will be used to assess the effectiveness in reducing damages over time.

3. Two USGS gages exist along the lower portions of Farm Creek. The flow data collected for storm events can indicate trends in stormwater discharge over time. Further, the hydraulic & hydrologic baseline assessment currently underway can be updated at regular intervals to track changes in base flow and peek flows over time.

Relevant Strategies

- B. Refit of existing subdivision throughout the watershed to equip with storm water retention and infiltration BMP's
- C. City of Washington detention and habitat areas.
- D. Agricultural Dry dams.
- J. East Peoria Sanitary District Channel Maintenance.
- L. Wetland restoration & Stream re-meander demonstration project at one location.

Erosion & Sediment Delivery:

Water Quality:

1. The primary means of assessing overall water quality will continue to be the Illinois Water Quality Report. Full Use attainment would be the most desirable condition.

2. Removal of Farm Creek from the Clean Water Act Section 303(d) List before Total Maximum Daily Load requirements are imposed.

3. Semi-annual stream assessment using similar methods as those used in 2001 and at the same locations.

Relevant Strategies

- A. Streambank, Streambed stabilization and grade control.
- B. Refit of existing subdivision throughout the watershed to equip with storm water retention and infiltration BMP's
- C. City of Washington detention and habitat areas.
- D. Agricultural Dry dams.
- E. Bluff/Gully stabilization.
- F. Filter strips (non CRP/CREP).
- G. Water management areas along Farm Creek and tributaries.
- H. Ackerman Creek; Village of Morton Water Treatment Plant.
- J. East Peoria Sanitary District Channel Maintenance.
- K. Education, Outreach, & Watershed Coordination.
- L. Wetland restoration & Stream re-meander demonstration project at one location.

Habitat:

1. The Land Cover Database for Illinois is scheduled to be updated on a five year rotation. Comparing future data sets to 1995 & 1999 information can show changes in habitat areas such as forest, grassland, and wetland areas within the watershed.

2. Semi-annual stream assessment using similar methods as those used in 2001 and at the same locations.

Relevant Strategies

- C. City of Washington detention and habitat areas.
- E. Bluff/Gully stabilization.
- F. Filter strips (non CRP/CREP).
- G. Water management areas along Farm Creek and tributaries.
- L. Wetland restoration & Stream re-meander demonstration project at one location.

Erosion & Sedimentation:

1. On a five year basis, update the soil erosion & sediment delivery survey completed in

2000. Implemented BMP's can be factored into the assessment in similar ways as the existing structures in the watershed.

2. Four USGS gage stations exist in the watershed at this time. At least one could be outfitted to monitor sediment on a regular basis. The preference would be the lowest station in the watershed. This data could then be used to measure successful watershed wide reductions of sediment delivery to Farm Creek and the Illinois River.

Relevant Strategies

- A. Streambank, Streambed stabilization and grade control.
- B. Refit of existing subdivision throughout the watershed to equip with storm water retention and infiltration BMP's
- C. City of Washington detention and habitat areas.
- D. Agricultural Dry dams.
- E. Bluff/Gully stabilization.
- F. Filter strips (non CRP/CREP).
- G. Water management areas along Farm Creek and tributaries.
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Education & Outreach:

1. The only real measure of success for education & outreach efforts is a continued understanding and support of this plan by the public over the long term.

Relevant Strategies

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