

Davis Creek Watershed

A newsletter for residents of the Davis Creek Watershed; Sponsored by the Kalamazoo Conservation District, River Partners Program of The Forum for Kalamazoo County and the Michigan Department of Environmental Quality

Special Edition

The Davis Creek Watershed Management Plan

This is a special reproduction of the Forum Newsletter of October 1996. This reproduction is the Executive Summary of the Davis Creek Watershed Management Plan that was presented to the Kalamazoo area community on November 12, 1996.

Davis Creek Watershed Mission Statement

The mission of the Davis Creek Watershed Initiative is to improve the water quality and environmental health of Davis Creek and the Kalamazoo River by severely reducing the pollution and erosion from runoff within the watershed. Education, action and environmental cleanup are our goals by involving the diverse urban and rural land-owners in improving the quality of life for people, wildlife and the community.



East Lake in Pavilion Township (origin of Davis Creek)

Community Developed Clean Water Plan Includes Education, Remediation and Redevelopment

Scores of individuals have participated in the Davis Creek watershed planning process and have contributed to its success. These persons provided valued input, great depths of expertise and wide-ranging perspectives of the various water quality problems that were identified. As a consequence, many creative and fruitful ideas have come forward.

Forty-eight recommended action items are described in the full text of the Davis Creek Watershed Plan. The specific work task recommendations are designed to further the attainment of the stated water quality objectives. The recommendations are not considered all inclusive, nor should the recommended actions be construed as a universal deficiency throughout all communities in the watershed. Indeed, a fundamental recommendation of the plan is the *cooperative pursuit of coordinated watershed management practices* among the independent jurisdictions. This will increase the consistency of local land use, drainage practices and nonpoint source pollution management throughout the watershed.

A major component of the Davis Creek Watershed Plan is a detailed work proposal for a grant funded Implementation Project. The proposed three-year work program, funded by the Michigan Department of Environmental Quality (MDEQ), will implement specific actions for the remediation and control of nonpoint source pollution (NPS).

DAVIS CREEK WATERSHED STEERING COMMITTEE

CO-CHAIRS

Ralph Freed, Gove Associates, Inc.
Linda Matveia, Chateau Acres Mobile Home Park

CITIZENS

Bill and Barbara Aitken
Darlene Flachier
Marcia Harahus
Jan Livingston
Daryl Perkins
James Turek

ORGANIZATIONS

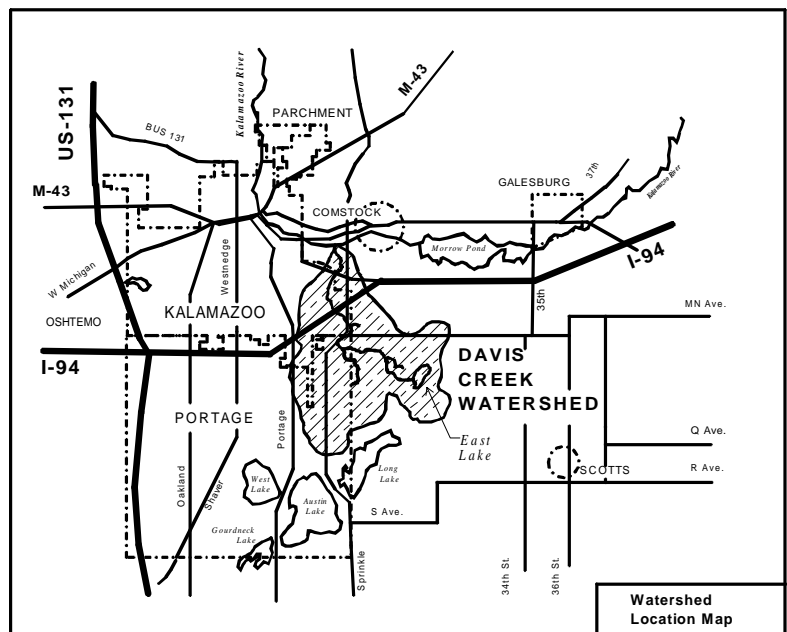
Mike Brundage, Chateau Acres Mobile Home Park
Keeley Taylor-Lore, Bruce Merchant, City of Kalamazoo
Joseph Van Bruggen, Comstock Township
Dr. Robert L. Greene, CYTEC Industries, Inc.
Robert Houtman, Lorence Wenke, Davis-Olmsted Drain Board
Pat Adams, The Forum for Kalamazoo County
Dan Cummins, Georgia-Pacific Corporation
Barry Boaz, GM Kalamazoo Metal Center
Ken Potts, Kalamazoo-Battle Creek Int'l Airport
Dean Holub, Kalamazoo County Dept. of Economic & Community Development
Richard Kleiman, Kal. County Drain Commission
Patrick Krause, Deb Wemer, Kalamazoo County Human Services Dept.
John Byrnes, Kalamazoo County Road Commission
Bonnie Christenson, Phyllis Cleveland, Kalamazoo Township
Dave Heinicke, Kalamazoo Water Reclamation Plant
Doris McClish, Kalamazoo Soil Conservation District
Dean Solomon, MSU Cooperative Extension
Mark Kieser, Kieser & Associates
Mary Goznell, Lakewood Association
Stan Burland, Lexington-Green Neighborhood
Ben Zimont, Michigan Dept. of Environmental Quality
Don Brown and Orlin Loen, Nonpoint Source Pollution Advisory Committee
Karen Ruthven, Pavilion Township
Jim Coury, Potawatomi RC&D Council
Marc Elliott, River Partners Program
Kenneth L. Hargie, Rod & Gun Club of Kalamazoo
George Heffner, USDA Natural Resources Conservation Service
Randall Sellbrede, Sauk Trails RC&D Council
Ed LaForge, State Representative
Robert Snell, Wilkins & Wheaton, Inc.

Economic Growth, Quality Of Life Concerns Draw Community Focus

Davis Creek and the Davis Creek watershed are located in the urban and urbanizing core of Kalamazoo County, Michigan. Within this urbanizing core, the Kalamazoo River and its major tributaries (including Davis Creek) have recently received tremendous public attention as valuable, shared resources for community economic growth and quality of life enhancements.

The Davis Creek watershed came into public focus when the Nonpoint Source Pollution Advisory Committee of the River Partners Program identified this creek as one of the most polluted tributaries in Kalamazoo County. It quickly became clear that the degraded water quality of Davis Creek was due to nonpoint source pollution. Nonpoint source pollution (NPS) is the contamination of surface water and groundwater by sediments, nutrients, organic compounds, pathogens and heavy metals which originate from a variety of diffuse sources. Another common term for NPS pollution is contaminated storm water.

Davis Creek, also sometimes referred to as Allen Creek or the Olmsted-Davis Drain, is a highly modified, predominately urban drainage corridor. The watershed encompasses portions of five local jurisdictions: the cities of Kalamazoo and Portage, and Comstock, Kalamazoo and Pavilion Townships. The watershed has been urbanizing generally in a northwest to southeast direction which is roughly the inverse of the overall flow of Davis Creek. The lower (downstream) reaches are largely urbanized and contain large industrial/commercial tracts that include Wings Stadium, the former Cork Street landfill and Lakeside Oil Refinery. The upper reaches (Pavilion Township) are currently rural, agricultural lands with occasional, dense residential developments. It is anticipated that this urbanizing trend will continue moving toward the origin of Davis Creek at East Lake.



Davis Creek Watershed Location Map

What is a Watershed?

A watershed is the area of land from which runoff (from rain snow and springs) drains to a stream, river, lake or other body water. Its boundaries can be identified by locating the highest points of land around the water body. Streams and rivers function as the “arteries” of the watershed. They drain water from the land as they flow from higher to lower elevations.

What is the Water Cycle?

The water cycle is the movement of water through the environment (fig. 1). It is through this movement that water in river system is replenished. When precipitation falls to earth in a natural (undeveloped) watershed, 40 percent will be returned to the atmosphere by evaporation or transpiration (loss of water vapor by plants). About 50 percent will percolate into the soil (fig. 2). The remaining 10 percent of the precipitate moves across the land as runoff and drains into streams, wetlands and other bodies of water.

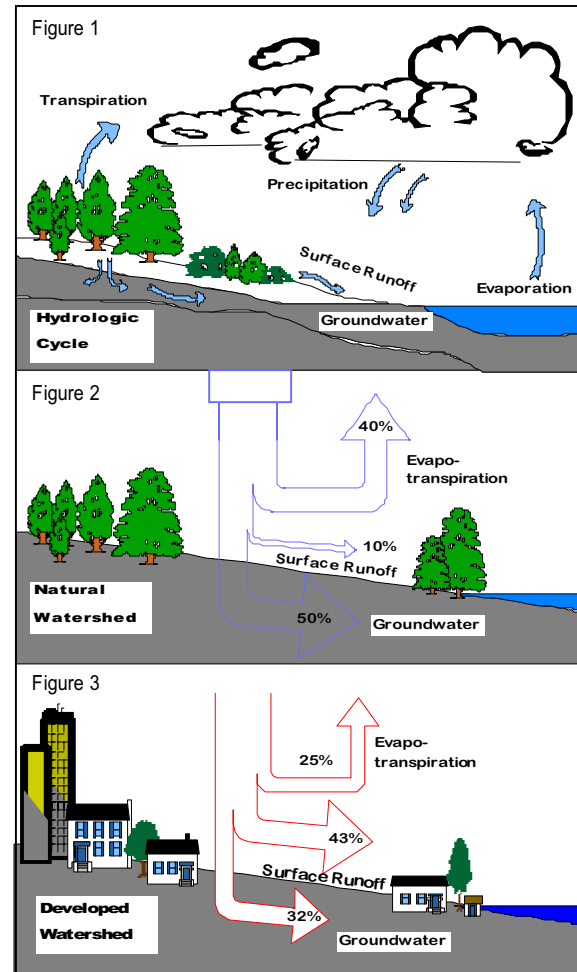
The water that soaks into the ground is important for maintaining stream flow during dry weather. Percolating water slowly moves downward through the soil until it drains into an area where all the pores and cracks in the rock are saturated with water. The top of this zone is known as the water table.

Water in this saturated zone moves laterally, following the pull of gravity and/or water pressure from above. If the path of the moving ground water intercepts a stream channel, the ground water is discharged into the stream as a spring. This discharge is defined as its base flow. At times when there is no surface runoff, the entire flow of a stream might be base flow from ground water.

Why Does Development Change Streams?

Developed land is more impervious than natural land. Rain hits the hard surfaces of buildings, pavement and compacted ground and runs off into a storm drain instead of percolating into the ground (fig. 3). These man-made structures are designed to move water quickly away from developed areas and into a natural watercourse. This practice drastically changes the fate of precipitation in the water cycle:

- Water is transported rapidly away from developed areas via storm drains and is not allowed to stand in pools,
- Stream flow becomes more intense during and immediately after storms;
- Less precipitation percolates through the soil to become ground water. This can result in a lower water table and can affect base flow;
- Less precipitation is transpired back to the atmosphere from plants. Natural vegetation is replaced by buildings, pavement, etc.
- Rapid runoff carries high concentrations of NPS pollutants from streets, yards and parking lots into streams.



The Hydrologic Cycle

How Can NPS Pollution Be Controlled?

The most obvious way to prevent nonpoint source pollution from entering a creek is to have new development retain storm water runoff on-site. This is one recommendation of the Davis Creek Watershed Plan. Another, less restrictive, recommendation is that developed lands should capture the first one-half inch of rainfall. The first runoff from a rain storm can be highly polluted because it contains the accumulated pollutants washed from roads and parking lots.

Simple common sense, good housekeeping and wise choices are also critically important for preventing surface water damage from storm water related nonpoint source pollution. Rain can leach pollutants onto the ground whenever trash bins are left uncovered. Erosion from stream banks, road crossings, construction sites and agriculture fields are all major sources of pollution. Other controllable sources of pollution include: excessive use of lawn fertilizers and pesticides, leaves and limbs placed near a drain, grass clippings dumped into streams, dumpster spillage, people hosing dirt or paint waste into the street, oil and fuel spillage from poorly maintained vehicles, and pet wastes from our lawns.

Water Quality Impairs Public, Private Uses of Davis Creek

The degraded water quality of Davis Creek results in the creek's failure to fully support uses for (1) partial body contact recreation, (2) indigenous aquatic life, (3) a warm water fishery, and (4) stream corridor wildlife habitat. The Creek's ground water recharge function is also important since the City of Kalamazoo has several water supply wells located adjacent to the creek.

Achieving long-term water quality improvements may also identify a potential to restore Davis Creek as a cold water fishery. The creek was once known as a trout stream and had in earlier decades been stocked with trout by the Michigan Department of Natural Resources.

What Water Quality Concerns Need Restoration Actions?

The lower, highly urbanized watershed area is known to contribute sediment and nutrient loadings from channel erosion, railroad and roadway crossings, and storm sewer discharges. Urban storm sewer discharges contribute organic material, trash, and hazardous and toxic components such as oil and petroleum products from motor vehicles, parking lots, de-icing chemicals, and lawn care products (fertilizers, pesticides and herbicides).

Intensive industrial land usage located along the lower reaches of Davis Creek is also a concern due to past releases of polluting chemicals and the potential for further adverse water quality impacts. This segment runs adjacent to sites with known releases of toxic contaminants to the environment. These Michigan Act 307 sites and other abandoned industrial properties include chemical manufacturing, petroleum refining

and distribution, paper products manufacturing, municipal solid waste disposal, and the maintenance and storage of transportation equipment. Particularly noteworthy is an EPA Superfund Site situated at the mouth of Davis Creek where the creek joins with the Kalamazoo River.

In a densely populated residential section upstream of Kilgore Road, citizens have reported offensive odors and occurrences of skin rashes or irritating bumps among both children and adults who have come into contact with waters of the Creek. Excess sediment, urban trash and the loss of natural riparian vegetation to residential turf grass are particularly evident throughout this stretch. The watershed is largely rural upstream, with agricultural activities being the dominant land use. These areas have potential to contribute nonpoint source water quality problems through agricultural and residential landscaping practices which cause

excess sediment, nutrient and pesticide loadings to the Creek.

What Water Quality Concerns Require Pollution Prevention?

The effective prevention of current and future adverse nonpoint source impacts requires **an educated, active and involved citizenry**. Citizen involvement is necessary for effective implementation of changes in private owner land use practices, community-based river clean-up programs, and changes in personal behavior and attitudes which promote creek corridor conservation, stewardship and water quality protection. *Citizen involvement is also critical in developing effective and applicable revisions to local government planning, zoning and drainage control ordinances.*

Water Quality Problems

Water quality tests and biological assessments have shown that the creek is stressed from development and land use impacts associated with the continued urbanization of the watershed. The creek suffers from the following known types of NPS pollution:

- Suspended Solids and Sediments
- Bacteria - including fecal coliform bacteria
- Chemicals - including nutrients, metals and petroleum products
- Trash and Litter



Urban corridor w/lost: habitat, natural vegetation & protective buffer

Prevent Pollution

To report creek pollution or other incidents of misuse, call the River Partners Program at (616) 337-7382



Mature forested flood-plain



Sediment Deposits & Trash

THE GOOD, THE BAD..... AND THE UGLY

Poorly maintained urban drain with obstructions, eroding banks & human trash



Community Input Creates the Plan's Goal & Objectives

Numerous public meetings and the input from five citizen focus groups were used to reveal the general public's perception of the water quality impairments of Davis Creek.

Water quality impairments were easily evident in the creek's failure to fully support partial body contact recreation, indigenous aquatic life, a warm water fishery and wildlife habitat. The creek was well known as a magnet to children living nearby, and their safety and welfare were a particular concern.

Examination of these impairments led the Steering Committee to establish five principle water quality goals for the Davis Creek Watershed Project:

- Keeping the Creek Safe for Children
- Clean Water
- Improved Habitat
- Restored Bio-diversity
- Viable Fisheries

Community work sessions were also used to gather data on current and future desired uses for the creek as a shared public/private resource.

These public meetings were used to define various long and short-term planning objectives which might be used to meet the water quality goals for Davis Creek.

These ideas and others were reviewed by the Davis Creek Watershed Steering Committee, and distilled into twelve program objectives. These objectives (see side bar) represent the essential elements of the **Davis Creek Watershed Plan**.

Objectives of the Watershed Management Plan

- Promote citizen awareness of stream corridor functions
- Promote use of best management practices to control NPS pollution throughout the watershed
- Encourage creation of self-enforcing stream buffers
- Restore lost or damaged in-stream habitat and provide an unbroken corridor
- Control current and future flooding risk
- Moderate extreme fluctuations of stream flow
- Stabilize the stream bank and channel
- Restore and maintain up- and downstream passage of fish
- Minimize the number of stream crossings
- Eliminate direct discharge from storm water conveyance systems
- Develop model designs for roadways and bridges which can reduce NPS pollution
- Monitor and evaluate water quality improvement indicators

State, Local Contributions Fund Plan

The Davis Creek Watershed Implementation Project is proposed to be initiated in the spring of 1997. Up to \$100,000 in annual grant funds over three years may be available from MDEQ with the requirement that there be a minimum 30 percent match in local funding.

The Implementation Project will focus on NPS pollution prevention through education of landowners along Davis Creek and within the Davis Creek watershed. Site specific remediation projects will be partnership-based, involving landowners, community leaders and affected public agencies.

A MDEQ water quality planning grant of \$49,980 provided the major source of funding needed to develop the Davis Creek Watershed Plan. An additional \$16,200 in local funding was obtained through participating agency contributions. Project administration has been the responsibility of the Kalamazoo Conservation District, with substantial programmatic assistance provided by the River Partners Program of The Forum for Kalamazoo County.

Local funding used to prepare the plan included services from the following organizations: River Partners Program of The Forum for Kalamazoo County, KAR Laboratories, Inc., Kieser and Associates, Inc., the Cities of Kalamazoo and Portage, and Kalamazoo County.

Additional local assistance included the extremely valuable time contributed by the many individuals and organizations who served on the Davis Creek Watershed Steering Committee and participated in various public work sessions. We gratefully acknowledge these contributions toward improving the waters of Davis Creek and to the quality of life within the Kalamazoo River basin.

Recommended Actions

The Watershed Management Plan contains eight "issue areas" which are listed below. For each of these issues, a minimum of 5 and as many as 10 specifically recommended actions are presented in the Plan. These actions are the programmatic work tasks which the Steering Committee has recommended be pursued to address the various issue areas. A total of 48 recommended actions are contained in the Watershed Management Plan.

Issue Areas Addressed by the Plan:

- Public Education and Awareness
- Community Involvement; Effective Citizen Stewardship
- Watershed Master Planning and Public Stewardship
- Municipal Storm Water Management for NPS control
- Earth Movement, Soil Erosion and Sedimentation Control
- Site Development Design Standards
- Land Use Planning
- Intergovernmental Cooperation

Note: A supplemental summary that lists the specific recommendations of the Watershed Management Plan is available through The Forum Offices. Since the recommendations are often complex and are supported with discussions of issues, persons interested to learn more are encourage to refer the complete Plan.



Naturally Vegetated Creek Corridor



217 MONROE STREET
KALAMAZOO, MI 49006-4434

A Catalyst for Community Improvement



Nonprofit Org.
U.S. Postage
PAID
Kalamazoo, MI
Permit No.
515