

What is a Stream Setback Ordinance?

Stated simply, a Stream Setback ordinance is a regulation that creates a “buffer zone” between a river, creek, or stream, by specifying where construction of buildings and other infrastructure is or is not permitted.

Why is Lawrence, KS Considering Adopting a Stream Setback Ordinance?

A Stream Setback Ordinance will help avoid future liabilities by protecting new development and infrastructure from flood damage, while saving natural resources that provide multiple benefits. Limiting development near stream banks will also improve the City of Lawrence’s water quality, reduce erosion and sedimentation, prevent infrastructure damage, and protect riparian corridor habitat and greenways.

Benefits of a Stream Setback Ordinance

Reduce flood damage and loss of life - Keeping trees and plants along the stream and keeping buildings a safe distance away reduces the amount of stormwater entering streams and helps reduce flooding; protects buildings and occupants from flood hazards, and reduces long-term costs.

Stabilize stream banks and protect infrastructure – Root systems from trees and plants along a stream help the stream to function as nature intended, preserving the stream’s natural character. Buffers help prevent erosion that threatens infrastructure such as bridges and utilities, reducing future capital and maintenance costs.

Allow streams to meander or move as they would naturally – A stream will change course as it responds to impacts from natural and manmade forces; protecting riparian corridors allows streams to change naturally without damage to buildings and infrastructure.

Maintain and improve water quality – Vegetation along stream banks filters fertilizer, pesticides, herbicides, other chemicals, and sediment before they reach the stream where they can damage aquatic plants and wildlife.

Provide recreation and education – Riparian corridors are excellent places for walking, running, and biking trails. A connection with nature improves health, quality of life, and academic achievement.

Provide wildlife habitat – Vegetated stream buffers create a network of wildlife habitat corridors.

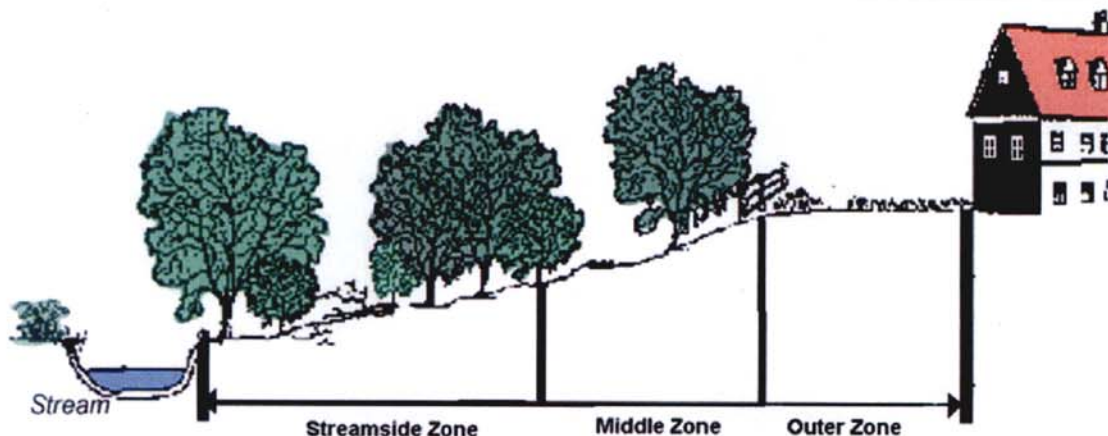
Increase property values – throughout the Kansas City region, the Midwest, and the nation, property values are higher adjacent to and near protected stream corridors and green spaces.

The purpose and objectives of the ordinance will be to establish acceptable minimum requirements to preserve and protect stream corridors within the City as follows.

- Beautification and aesthetic enhancement of the City
- Reduce flood damages by limiting streamside construction
- Reduce the impact of stormwater runoff by trapping sediment and sediment-bound pollutants;
- Encourage infiltration and recharge of groundwater
- Preservation of habitat
- Protection of water quality through infiltration, filtration, runoff velocity control and sediment retention
- Protection of adjacent properties from the natural lateral migration of stream channels
- Temporary storage and velocity reduction of flood waters
- Recreational and educational opportunities
- Effective visual and auditory screening between adjoining land uses
- Increased property values

The stream buffer will include three zones:

1. Streamside Zone – Closest to the stream, protecting the physical and ecological integrity of the stream.
2. Middle Zone – Protects key components of the stream with mature vegetation adapted to the region, providing distance between upland development and the streamside zone.
3. Outer Zone – A transition between the buffer and development that prevents encroachment into the stream buffer and filters runoff from residential and commercial development.



The location of the stream in the watershed dictates the setback width or "buffer width." Where the streams "begin" in the watershed is called the headwaters. These are first order streams. They flow into a second order stream and on to a third order, fourth order and so on. The first and second order streams drain about 80 to 85% of any watershed. These streams are the most important to protect. According to the Center for Watershed Protection, "as the headwaters go, so goes the watershed."



Some of the factors relating to stream buffer width include:

- Stream order
- Watershed area
- Channel slope
- Soil Type
- Floodplain locations

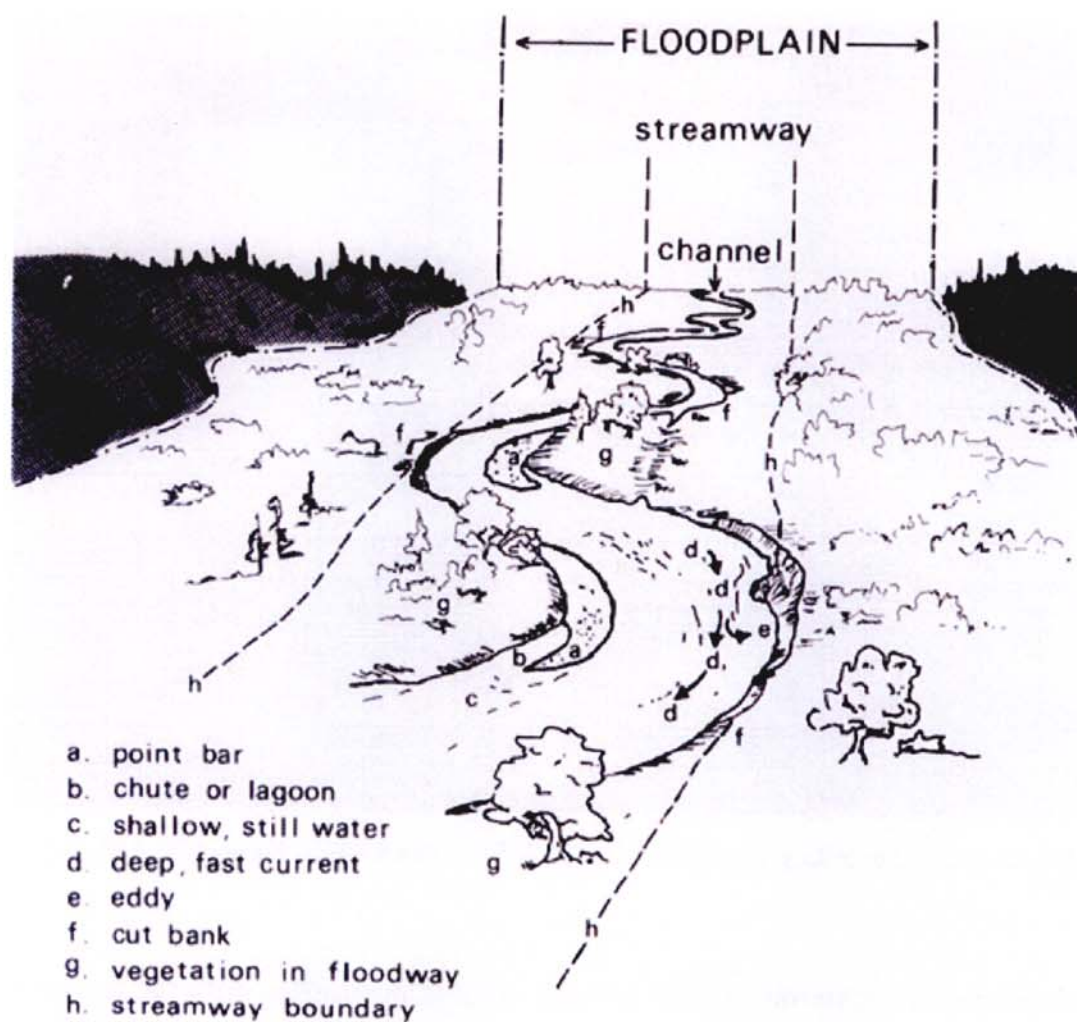


Illustration of a streamway
(source: Brookes, 1996 after Palmer, 1976).

Douglas County Wetlands & Horizon 2020 Environmental Policy

The Environmental Protection Agency and the U.S. National Ramsar Committee, a Non-Governmental Organization our Save the Wakarusa Wetlands group has been affiliated with for years, can provide long lists of reasons wetlands, anywhere in the world, are crucial to the Earth's health and valuable to every community lucky enough to be located near these spaces between land and water.

I'm here to tell you that it would be a terrible injustice, an environmental injustice of enormous significance for future generations in this community, if you were to think of our Douglas County wetlands merely as EPA or NGOs like Ramsar do.

The most important way I can use my ten minutes before this sub-committee is to try to explain why these Wakarusa Wetlands matter, really have a place of priority in *defining who we are* as one among millions of spots on the globe.

In the long run the Wakarusa Wetlands can be as emblematic of our community as the Kansas Jayhawks. I realize that statement sounds absurd on first hearing. I'm including both the early Jayhawkers who nested here while hatching the Civil War, which has excited heritage tourism promoters lately, and the 20th & 21st century Jayhawks who hatched five national basketball championships, making this town famous in the world of college athletics.

How could less than one square mile of restored wetland play any significant role in transforming Lawrence's and Douglas County's geographical identity in the 21st century? The key to this is Haskell, including its diverse alumni, which represents virtually every recognized tribe in the nation. Although Baker University acquired the majority of the wetlands in 1968, KU obtained a 20 acre parcel in the 1950s, as did Kansas Parks & Wildlife. Haskell retained a small portion of their wetlands, which has grown in recent years to perhaps 60 acres or more, much of it restored by a local beaver colony. The fact that all three Douglas County universities have some stake in these wetlands is another important aspect of what makes this place especially valuable to our community.

This part of the Wakarusa Wetlands survived when most of the 18,000 acres of prairie wetlands stretching from Eudora to south of Topeka, was grabbed up by early settlers. It resisted being turned into farms as many Haskell students resisted being turned into farmers. Only after massive federal funds were provided did the "Lower Farm" emerge on the Haskell campus after decades of the frequently soggy bottoms providing refuge for those who needed a place to escape the gaze of authorities intent on wiping out indigenous languages, traditions and beliefs. The same folks who were determined to drain the "swamp" were even more dedicated to draining the "savages" of their cultures. "Kill the Indian, save the man."

Last Thursday evening I spoke at the Haskell Voices gathering. I talked about the Douglas County Poor Farm and the adjacent campground where the unwanted vagabonds and hobos were forced to stay beside the putrid, scary, smelly, disease ridden Wakarusa Bottoms, which was exactly how most of our parents and some of our neighbors STILL think of wetlands. That swamp-side location was intended to encourage all but the truly desperate to move on quickly.

When Indian parents brought their children to Haskell, or when they came back to beg officials to allow their kids to come home, even for a short vacation, or simply for a brief visit, they usually had to wait in that campground on the banks of the Wakarusa, sometimes for many weeks. Haskell officials tried to fend off this threat to their mission of exterminating all traces of the native cultures these students had carried with them to the boarding school. They saw tribal peoples as a threat, re-infection with old ways.

Few Native Americans shared white perceptions of this place as disease prone. This was where one found some of the most valuable medicinal herbs and plants. Virtually every native culture considered swamps, springs and other watery lands among their most significant **medicine cabinets**.

After my presentation the other night a middle aged Kickapoo woman came up to thank me for mentioning swamp milkweed. Her grandmother had taught her it was one of the most sacred medicines her people had known. The WPO students at Haskell recently produced a wonderful pamphlet picturing just a few of the plants in this wetlands that have been important to various tribes for ceremonies, foods, medicines, dyes, fibers for weaving, and many other ethno-botanical uses. Native educators understand how important those kinds of projects are in getting their students to appreciate that traditional knowledge and modern science are not polar opposites, as they have so often been told, but highly compatible areas of learning and research.

This small wetland is, in many respects, the soul of Haskell Indian Nations University. It came into Baker University's hands in 1968, but it is a place that will always have very special meanings, even be viewed as sacred, by many who have Haskell connections. It is an absolutely crucial part of Haskell's role in long neglected off-reservation boarding school history. It is important to Native Americans that their history be known to future generations. The early Haskell Institute property, including the wetlands, is by far the best place, probably the only place left in America, where that story can be made tangible, where people can walk it, smell it and be touched by what took place here. That history can be understood in a way that has an extremely positive outcome.

The Wakarusa Wetlands hold tremendous opportunities for Baker, Haskell, and KU to develop cooperative research projects. KU and Haskell students are already cooperating on a project to design and build a boardwalk from the medicine wheel out across the wetlands north of 31st to the current Baker Wetlands entrance. In the spring they have joint classes, hopefully Baker will accept an invitation to participate, looking for the elusive "snoring" crawfish frogs, which has not been documented in this wetlands for more than a decade.

The city has already located its new wastewater treatment plant just east of the wetlands, and the design includes a large constructed wetland buffer that extends west to within view of Baker Wetlands. The mitigation project taking form on the west side of Louisiana is very unlikely to be returned to farming, and most would not be suitable for commercial or residential development. Growing the Wakarusa Wetlands, even in non-contiguous parcels, has great value. Of course connectivity, providing real wildlife corridors, is much preferred, but the more we can think of the Wakarusa floodplain environs as a single related entity the better.

After World War II, when the Army Air Corps training facility in Salina no longer needed the wetland it had taken for bombing practice it was restored. It is now one of the most significant wetlands in North America, Cheyenne Bottoms. In Ohio an old drained section of the Olentangy River Bottoms was turned into what many call the nation's leading wetland research and education park adjacent to Ohio State University. It is younger, less biologically diverse, further from the major flyways, and has few of the advantages this wetland has to attract international students, yet they have already partnered with African, Asian and South American nations for reciprocal educational programs. The indigenous exchange programs Haskell has already initiated are indicative of the extraordinary possibilities our three universities would have in this wetland is expanded. One day it may join Cheyenne Bottoms and Quivira as a Ramsar site. Olentangy recently became the latest Ramsar wetland solely on the basis of its educational and research role, which included exchange programs with foreign countries. Imagine the indigenous peoples of the world who have really significant relations with their local wetlands. There are real opportunities for exchanges here that simply do not exist elsewhere if we imagine what the Wakarusa Wetlands can mean to our community.

Finally, we have a real chance to make 31st Street into the nation's most advanced "eco-road", where the technology of "toad tunnels" and other wildlife crossings and protection devices can be developed and tested. Road surface materials that reduce noise pollution, drainage design to protect water quality, all manner of research that can make this place the nation's foremost outdoor lab for wetland protection along roadways.

The many great possibilities associated with this wetland in the heart of our county and community require that we think outside the Crayola box where “green” space is good enough. We have in our midst an exceptional opportunity to bring into strong focus something incredibly important in defining who we are. If our environmental policy embraces the ideal of growing the wetlands as a major feature of our identity, with all three academic institutions invested in them, this place, the Wakarusa Wetlands, can be the signature by which we are known far and wide.

Save the Wakarusa Wetlands, Inc.

A List of Wetland Functions & Values to the Community

➤ natural water quality improvement and biogeochemical cycling

- wetlands provide the conditions needed for the removal of both nitrogen and phosphorus from surface water
- improve water/drinking water quality by
 - intercepting surface runoff
 - removing or retaining inorganic nutrients
 - processing organic wastes
 - reducing suspended sediments
- wetlands also reduce environmental problems such as algal blooms, dead zones, and fish kills, that are generally associated with excess nutrients

➤ atmospheric maintenance

- wetlands world-wide help moderate global climatic conditions
- store carbon within their live and preserved (peat) plant biomass instead of releasing it to the atmosphere as a greenhouse gas-thus wetlands are major "carbon sinks"

➤ hydrologic cycle roles

- receive, store, and release water in numerous ways
- wetlands may maintain stream flow during dry periods
- wetlands replenish groundwater

➤ flood storage

- store and slowly release surface water, rain, snowmelt, groundwater and flood waters
- wetland vegetation also impedes the movement of flood waters and distributes them more slowly over floodplains
- counteract the greatly increased rate and volume of surface-water runoff from pavement and buildings

➤ shoreline erosion protection

- protect shorelines and stream banks against erosion
- hold the soil in place with their roots
- absorb the energy of waves

➤ fish, wildlife and plant habitats

- source of substantial biodiversity
- produce great quantities of food to maintain wildlife diversity

- development of organisms that form the base of the food web
- birds rely on wetlands for food, water, and shelter, especially while migrating and breeding
- mammals like beaver, mink, muskrats, and long tail weasels require wetlands, and many others are dependent on this habitat for food, shelter and breeding at least part of the time
- critical breeding and egg deposition areas (fish, amphibians and reptiles)
- wetlands serve as important fish nurseries
- 43% of the federally threatened and endangered species rely directly or indirectly on wetlands for their survival

➤ opportunities for recreation, education, research and aesthetic appreciation

- bird watching is a major component of nature-based tourism
- hiking, boating, canoeing and other recreational activities
- studied in conjunction with environmental programs from graduate research to kindergarten field trips
- major site for Monarch butterfly tagging
- some wetlands have historical, cultural and spiritual significance, especially among indigenous peoples
- ethnobotanical studies frequently point to wetland species as major components of traditional medicinal knowledge
- excellent research and teaching sites to learn about vegetation, ecological functions and processes, biodiversity, and plant-animal interactions
- artists and writers capture the beauty of wetlands on canvas and paper, or through cameras, and video and sound recorders

➤ economic benefits of natural services and products at little or no cost

- wetlands filtering function saves us a great deal of money
- wetlands supporting timber totals about 55 million acres
- blueberries, cranberries, mints, and wild rice, are produced in wetlands
- medicines from wetland soils and plants
- fishing and shellfishing industries harvest wetland-dependent species
- habitats for commercial fur-bearers like muskrat, beaver, otter, and mink, as well as reptiles such as alligators
- 3 million migratory bird hunters generated \$1.3 billion in retail sales

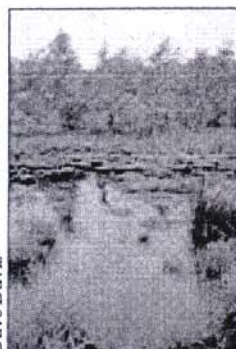
➤ reduce flood damage and protect our health and safety

- reduce the likelihood of flood damage to homes, businesses, and crops in agricultural areas
- lower flood heights and reduce erosion downstream and on adjacent lands
- reduce or prevent waterlogging of agricultural lands
- less monetary flood damage (and related insurance costs), as well as greater protection of human health, safety, and welfare.



Functions and Values of Wetlands

Dave Davis



Wetlands are considered valuable because they clean the water, recharge water supplies, reduce flood risks, and provide fish and wildlife habitat. In addition, wetlands provide recreational opportunities, aesthetic benefits, sites for research and education, and commercial fishery benefits.



Long regarded as wastelands, wetlands are now recognized as important features in the landscape that provide numerous beneficial services for people and for fish and wildlife. Some of these services, or functions, include protecting and improving water quality, providing fish and wildlife habitats, storing floodwaters, and maintaining surface water flow during dry periods. These beneficial services, considered valuable to societies worldwide, are the result of the inherent and unique natural characteristics of wetlands.

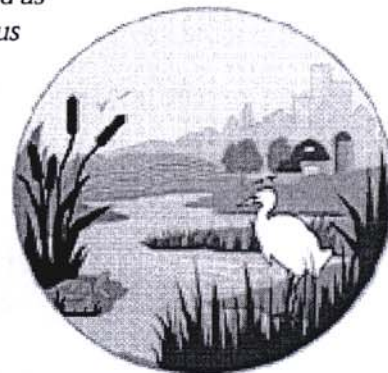
Functions Versus Values

Wetland functions include water quality improvement, floodwater storage, fish and wildlife habitat, aesthetics, and biological productivity. The value of a wetland is an estimate of the importance or worth of one or more of its functions to society. For example, a value can be determined by the revenue generated from the sale of fish that depend on the wetland, by the tourist dollars associated with the wetland, or by public support for protecting fish and wildlife.

Although large-scale benefits of functions can be valued, determining the value of individual wetlands is difficult because they differ widely and do not all perform the same functions or perform functions equally well. Decision-makers must understand that impacts on wetland functions can eliminate or diminish the values of wetlands.

Water storage. Wetlands function like natural tubs or sponges, storing water and slowly releasing it. This process slows the water's momentum and erosive potential, reduces flood heights, and allows for ground water recharge, which contributes to base flow to surface water systems during dry periods.

Although a small wetland might not store much water, a network of many small wetlands can store an enormous amount of water. The ability of wetlands to store floodwaters reduces the risk of costly



property damage and loss of life—benefits that have economic value to us. For example, the U.S. Army Corps of Engineers found that protecting wetlands along the Charles River in Boston, Massachusetts, saved \$17 million in potential flood damage.

Water filtration. After being slowed by a wetland, water moves around plants, allowing the suspended sediment to drop out and settle to the wetland floor. Nutrients from fertilizer application, manure, leaking septic tanks, and municipal sewage that are dissolved in the water are often absorbed by plant roots and microorganisms in the soil. Other pollutants stick to soil particles. In many cases, this filtration process removes much of the water's nutrient and pollutant load by the time it leaves a wetland. Some types of wetlands are so good at this filtration function that environmental managers construct similar artificial wetlands to treat storm water and wastewater.



Red-osier dogwood

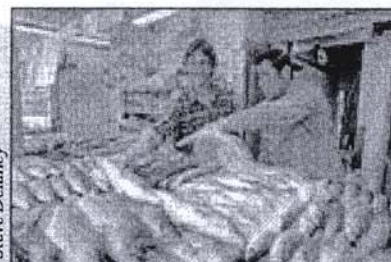
Biological productivity. Wetlands are some of the most biologically productive natural ecosystems in the world, comparable to tropical rain forests and coral reefs in their productivity and the diversity of species they support. Abundant vegetation and shallow water provide diverse habitats for fish and wildlife. Aquatic plant life flourishes in the nutrient-rich environment, and energy converted by the plants is passed up the food chain to fish, waterfowl, and other wildlife and to us as well. This function supports valuable commercial fish and shellfish industries.



The Great Flood of 1993 in the upper Mississippi River Basin caused billions of dollars in property damage and resulted in 38 deaths. Historically, 20 million acres of wetlands in this area had been drained or filled, mostly for agricultural purposes. If the wetlands had been preserved rather than drained, much property damage and crop loss could have been avoided.

DID YOU KNOW?

- In 1991 wetland-related ecotourism activities such as hunting, fishing, bird-watching, and photography added approximately \$59 billion to the national economy.
- According to the Pacific Coast Federation of Fishermen's Associations, almost \$79 billion per year is generated from wetland-dependent species, or about 71 percent of the nation's entire \$111 billion commercial and recreational fishing industry in 1997.
- An acre of wetland can store 1–1.5 million gallons of floodwater.
- Up to one-half of North American bird species nest or feed in wetlands.
- Although wetlands keep only about 5 percent of the land surface in the conterminous United States, they are home to 31 percent of our plant species.



Steve Delaney

Seventy-five percent of commercially harvested fish are wetland-dependent. Add shellfish species and that number jumps to 95 percent.

The Wetland Fact Sheet Series



Wetlands Overview

Types of Wetlands

Functions & Values of Wetlands

Threats to Wetlands

Wetland Restoration

Funding Wetland Projects

Wetland Monitoring & Assessment

Sustainable Communities

Volunteering for Wetlands

Teaching about Wetlands

For more information, visit www.epa.gov/owow/wetlands.

Wetland Resources

On the Internet

Ecosystem Valuation www.ecosystemvaluation.org

Economic Valuation of Wetlands www.ramsar.org/lib_val_e_index.htm

In Print

Restoration, Creation, and Recovery of Wetlands: Wetland Functions, Values, and Assessment, R.P. Novitzki, R.D. Smith, and J.D. Fretwell. United States Geological Survey Water Supply Paper 2425. Available on-line at <http://water.usgs.gov/nwsum/WSP2425/functions.html>.

Technical Aspects of Wetlands: Wetland Hydrology, Water Quality, and Associated Functions, Virginia Carter. United States Geological Survey Water Supply Paper 2425. Available on-line at <http://water.usgs.gov/nwsum/WSP2425/hydrology.html>.

Wetlands Functions and Values. Visit the North Carolina State University Water Quality Group's on-line informational database, WATERSHEDSS, at <http://h2osparc.wq.ncsu.edu/info/wetlands/funval.html>.

Why Are Wetlands Important?

Wetlands are important for so many reasons:

The Role of Wetlands in an Ecosystem

Wetlands prevent flooding by holding water much like a sponge. By doing so, wetlands help keep river levels normal and filter and purify the surface water.

Wetlands accept water during storms and whenever water levels are high. When water levels are low, wetlands slowly release water.

Wetlands also release vegetative matter into rivers, which helps feed fish in the rivers. Wetlands help to counter balance the human effect on rivers by rejuvenating them and surrounding ecosystems.



Many animals that live in other habitats use wetlands for migration or reproduction. For example, herons nest in large old trees, but need shallow areas in order to wade for fish and aquatic life. Amphibians often forage in upland areas but return to the water to mate and reproduce.

While wetlands are truly unique, they must not be thought of as isolated and independent habitat. To the contrary, wetlands are vital to the health of all other biomes and to wildlife and humans everywhere.

Unlike most other habitats, wetlands directly improve other ecosystems. Because of its many cleansing benefits, wetlands have been compared to kidneys. The analogy is good one. Wetlands and kidneys both help control water flow and cleanse the system.

Erosion Control

Looking at pictures of deltas, one can tell that rivers deposit a lot of sediment into the ocean. The sediment is from top soil that has been

eroded and washed away.

Emergents (plants firmly rooted in the muddy bottom but with stalks that rise high above the water surface) are able to radically slow the flow of water. As a result, they counter the erosive forces of moving water along lakes and rivers, and in rolling agricultural landscapes. Erosion control efforts in aquatic areas often include the planting of wetlands plants.

Wetlands and Water Purification

Wetlands also clean the water by filtering out sedimentation, decomposing vegetative matter and converting chemicals into useable form.

The ability of wetlands to recycle nutrients makes them critical in the overall functioning of earth. No other ecosystem is as productive, nor as unique in this conversion process. In some places artificial wetlands were developed solely for the purpose of water purification.

Flood-Related Terminology

Floodplain - any land area susceptible to floodwaters.

100-Year Flood - a flood having a 1% chance of being equaled or exceeded in magnitude in any given year.

100-Year Floodplain - the area adjoining a river or watercourse covered by water during a 100-year flood.

Floodway - the channel of a river or watercourse & adjacent areas that discharge the 100-year flood without increasing the water surface elevation more than 1'.

Flood Fringe - that portion of the floodplain (outside the floodway) that may be inundated by flood waters.

Encroachment - a man-made obstruction in the floodplain which displaces the natural passage of flood waters.

Surcharge - an increase in flood elevation due to encroachment of the floodplain.

FEMA - Federal Emergency Management Agency

NFIP - National Flood Insurance Program

FIRM - Flood Insurance Rate Map

SFHA - Special Flood Hazard Area

Drainage Maintenance

The Public Works Department, Stormwater Engineering Division, has initiated a program of drainage system maintenance. Major drainage channels, ditches, & structures are periodically checked & maintained so that stoppage is minimized & the systems are allowed to flow freely. A clear drainage system can convey stormwater more efficiently & can minimize flood damage to surrounding buildings & property.

Citizens can greatly assist in this effort by keeping catch basins in front of their property free of debris.

By law, (Ordinance No. 7373) it is illegal to dump debris, grass clippings, & other waste materials into drainage ditches & catch basins. Please contact the Stormwater Engineering Division at 832.3143 to report illegal dumping into the City's drainage system or to obtain further information.

Property Protection

Preventive measures can be taken to minimize or eliminate the potential for flood damage to your existing home or business.

Temporary measures include:

Use of sandbags, plywood, plastic sheeting, & lumber to divert flood waters away from a building
Moving furniture or other possessions to upper floors, availability & time permitting.

Permanent measures (retrofitting*) include:

Elevating the structure &/or utility devices.
Building a floodwall or berm.

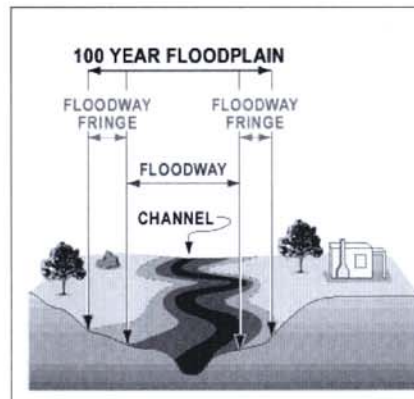
Installing sewer back flow prevention devices.

*Information on retrofitting is available at the main branch of the Lawrence Public Library, 707 Vermont Street.

Natural & Beneficial Functions

The City's Floodplains are a valuable resource for the community. Floodplains left in an undeveloped, natural state can provide storage for floodwaters, which in turn minimizes future flood damage. They also provide habitat for wildlife & recreational opportunities for community residents. The natural vegetation of floodplains also filters pollutants from stormwater, in turn improving local water quality.

Stormwater carries untreated water runoff directly into wetlands, creeks, & rivers & impacts our natural environment. Improper disposal of waste, such as oil, paint, fertilizer, & pesticides, will pollute stormwater runoff & destroy plants, endanger wildlife, & affect local drinking water sources. Please remember to properly store & dispose of oils, chemicals, antifreeze, & other toxic materials. Never dump waste materials into any storm drain or drainage canal.



The City of Lawrence participates in the Community Rating System (CRS), which enables residents to receive a discount on their flood insurance.

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Are You Ready for the Next Flood? (or even the next little one?)



A public service for the residents of the City of Lawrence.

Douglas County is a StormReady community. StormReady, a program started in 1999 in Tulsa, Oklahoma, helps communities establish the communication & safety skills needed to save lives & property before & during storm events. StormReady helps community leaders & emergency managers strengthen local safety programs making StormReady communities better prepared to save lives from the onslaught of severe weather through better planning, education, & awareness. While no community is storm proof, StormReady can help communities save lives.

Additional information is available from the following local departments & agencies:

General information: Lawrence/Douglas County Planning Office at 832.3150.

Structure-related: Development Services 832.7700.

Site drainage-related: Stormwater Engineering 832.3143.

Emergency response-related: Douglas County Emergency Management at 832.5259

Information is also available at the main branch of the Lawrence Public Library, 707 Vermont Street..

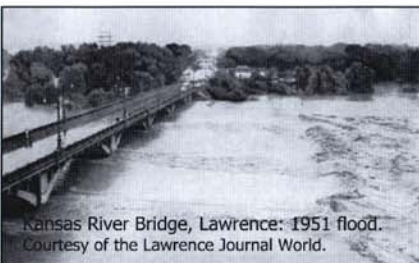


**City of Lawrence
Douglas County**
PLANNING & DEVELOPMENT SERVICES

Local Flood Hazards

The City of Lawrence will experience flooding sometime in the future. History has shown that the community has a number of local flood hazard areas. These areas can experience frequent or infrequent inundations of water from rain/storm events. The worst flood in Lawrence's history was the flood of 1951, causing damage to the City in excess of \$3 million. In 1993, Lawrence was faced with another major flood. The local system of levees & reservoir did their job & the City only experienced \$1.2 million in damage. However, damage for the area topped \$5.8 million as the majority of flooding in 1993 occurred in unprotected areas.

There are also numerous creeks & tributaries subject to frequent flooding with little warning after substantial rain events due to their small drainage areas & steep slopes. These include the Brook Creek, Belle Haven, Hidden Valley, & KLWN Tributaries. The Maple Grove Drainageway is also subject to quick flood rises with little warning. To find out about other specific localized areas subject to flooding, please contact the Stormwater Engineering Division at 832.3143.



Kansas River Bridge, Lawrence: 1951 flood.
Courtesy of the Lawrence Journal World.

Flood Hazard Maps

The Federal Emergency Management Agency (FEMA) publishes maps indicating flood hazard areas in the community & the degree of risk in those areas. These maps are referred to as Flood Insurance Rate Maps, or FIRMs. Copies of these maps are available for viewing at the Lawrence Public Library & at the Lawrence/Douglas County Metropolitan Planning Office at City Hall. Floodplain maps are also available online at the Planning Office webpage: www.lawrenceplanning.org & the FEMA webpage: www.fema.gov. The Planning Office also maintains a GIS mapping system that incorporates information found on FIRMs. If you have questions about whether or not a property or building is located in a SFHA, please contact the Planning Office at 832.3150.

Flood Insurance

All community property owners & renters are eligible for flood insurance, not just those that live in flood prone areas. Flood insurance is available to all residents because the City of Lawrence participates in the NFIP which is administered by FEMA. Don't assume your homeowner's policy will protect you from property damage as a result of flooding or rising waters. The majority of homeowner insurance policies do not cover losses from flood related events.

If a property is located within a SFHA, insurance is required by law to obtain federally secured financing to buy, build, or improve a structure on that property.

An insurance agent can assist in determining the amount of coverage required and can sell a separate flood insurance policy under rules set by the Federal government. All agents must charge the same rate. Rates for flood insurance will not change just because you file a damage claim since they are set on a national basis. A flood insurance policy can take 30 days to become effective.

Permit Requirements

Any development in the SFHA requires a floodplain development permit per requirements of City Ordinance No. 7597. This ordinance establishes flood protection standards (located in Article 20-12 of the City's Land Development Code). These regulations mean you must obtain a floodplain development permit before you build, alter, regrade, or fill if your property is located in the SFHA as identified on the City's Flood Hazard Map.

Substantial Improvements

Buildings that are substantially improved or repaired due to substantial damage must meet the requirements of new construction specified in the City's Flood Protection Standards (Ordinance No. 7597), Article 20-12 of the City's Land Development Code.

A substantial improvement is defined as "any reconstruction, rehabilitation, addition or other improvement to a building, the cost of which equals or exceeds 50% of the market value of the building before the start of the improvement."

Substantial damage refers to damage to a building by any origin (not just flood), whereby the cost of restoring the building to its pre-damage condition would equal or exceed 50% of the value of the building before the damage occurred.

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Flood Safety

Before & During a Flood

Stay alert to weather conditions & forecasts for flood or flash flooding in your area.

If you need to evacuate your home or business, **stay calm & don't panic.**

Time permitting, turn off all utilities at the main switch & **don't touch anything electrical.**

Report downed power lines immediately. REMEMBER: Any source of electricity should be considered dangerous during & after a flood event.

Don't walk or drive through moving water!! Drowning is the number one cause of flood deaths.

If you **smell gas or suspect a leak**, contact the Utility company immediately. Use flashlights for light & avoid open flames (candles, matches, etc.)

After a Flood

Clean everything that got wet!! Floodwaters pick up contaminants from roads, farms, & buildings turning everyday household items into health hazards. When in doubt, throw them out!

Flood Warning System

You should become familiar with these terms: Flood watches, warnings, & forecast services are issued by the National Weather Service.

Listen to local radio stations for up-to-date information & instructions in floodlike conditions. Use a bat-

Flood Watch	Flooding is possible.
Flash Flood Watch	Flooding is possible with little or no warning.
Flood Warning	Flooding is imminent (it may take several hours/days to occur).
Flash Flood Warning	Flash flooding is imminent & precautions should be taken.

tery powered radio in the event of a power outage. In the event of a flood, the Douglas County Emergency Management Department will utilize additional methods of providing information to the community, such as the Emergency Alert System & local public safety agencies (police, fire, medical personnel).

www.lawrenceks.org/pds



We all live in a watershed.

Everything we do in our watershed affects the soil, water, air, plants, and animals.

Let's work together to keep our watersheds healthy. Here are some things you can do.



On the farm

Keep plant residue on the surface of sloping cropland. This reduces runoff and prevents sediment, fertilizers, and pesticides from entering streams, rivers, lakes, and ponds.



At home

Landscape your yard with plants that need a minimum of water and fertilizer. Use only the amount of fertilizers and pesticides that plants need.



In your community

Protect wetlands that serve as natural buffers against pollution, soil erosion, and flooding.

Helping People Help the Land

*USDA is an equal opportunity
provider and employer*



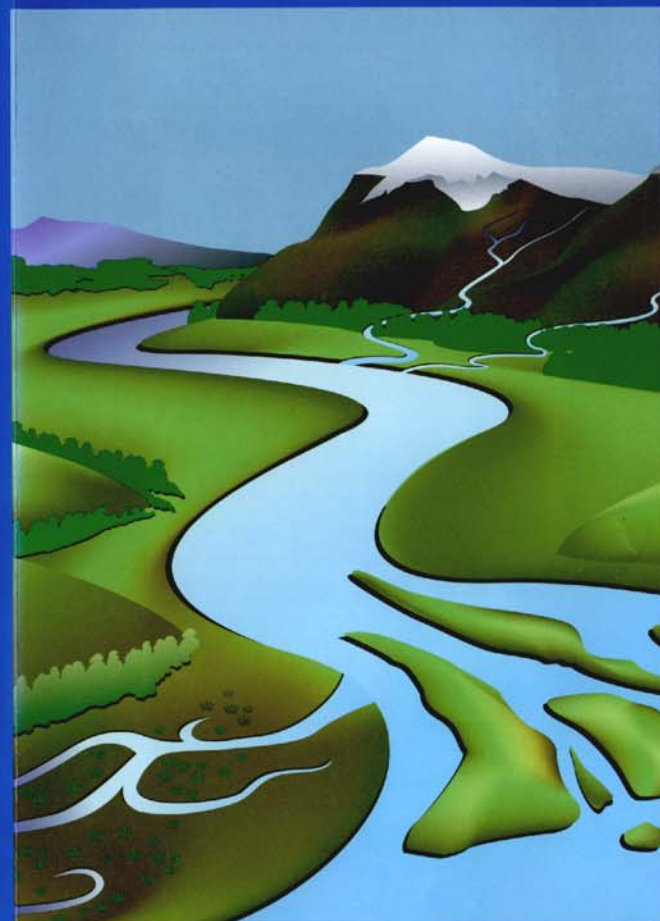
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United States Department of Agriculture
Natural Resources Conservation Service

PA-420 • December 2005

What is a Watershed?





What is a watershed?

It's the land that water flows across or under on its way to a stream, river, or lake.

How do watersheds work?

The landscape is made up of many interconnected basins, or watersheds. Within each watershed, all water runs to the lowest point—a stream, river, or lake. On its way, water travels over the surface and across the farm fields, forest land, suburban lawns, and city streets, or its seeps into the soil and travels as ground water. Large watersheds like the ones for the Mississippi River, Columbia River, and Chesapeake Bay are made up of many smaller watersheds across several states.

Are all watersheds the same?

Not at all. Watersheds come in many different shapes and sizes and have many different features. Watersheds can have hills or mountains or be nearly flat. They can have farmland, rangeland, small towns, and big cities. Parts of your watershed may be so rough, rocky, or marshy that they're suited only for certain trees, plants, and wildlife.

Your watershed community.

Everyone lives in a watershed. You and everyone in your watershed are part of the watershed community. The animals, birds, and fish are, too. You influence what happens in your watershed, good or bad, by how you treat the natural resources—the soil, water, air, plants, and animals. What happens in your small watershed also affects the larger watershed downstream.

There are many things you and your community can do to keep your watershed healthy and productive. To learn what you can do to take care of your watershed, call 1-888-LANDCARE or your local Natural Resources Conservation Service office. It's listed in the telephone book under U.S. Government, Department of Agriculture. Visit us online at www.nrcs.usda.gov.





MULCH

Apply 2 to 3 inches of organic mulch. Organic mulch – such as shredded bark and pine needles – is decomposable and improves the soil as it breaks down.

Mulch maintains moisture, decreases watering and inhibits weed growth.

Place four to five sheets of newspaper underneath the mulch layer to enhance performance.

Add mulch as needed to maintain a 2- to 3-inch layer.

Avoid mounding a “volcano” of mulch around the trunks of trees.

Too much mulch hurts plants by reducing the amount of oxygen and water available to the roots.

Mulch can be purchased from local garden centers, local tree care companies, or through the City of Lawrence. For more information about purchasing mulch produced by the City of Lawrence, contact the Forestry Division at (785) 832-7979.

PEST MANAGEMENT

Check plants early and often for pests.

Use bio-friendly products for treatments.

Environmental damage from wind or hail can look like pest damage. Confirm the source of the problem before trying to remedy it.

Trim damaged areas and remove insects when possible.

Low levels of pests are normal and to be expected in the landscape. Most insects are beneficial.

Spot-treat by applying pesticides only to the affected areas. Avoid whole-lawn, blanket applications.



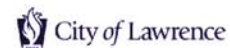
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FOR MORE INFORMATION:

**K-State Research and Extension
Douglas County**
Douglas County Fairgrounds
2110 Harper St • Lawrence, KS
(785) 843-7058

www.kansasgreenyards.org

SUPPORT PROVIDED BY:



The Kansas Department of Health and Environment has provided financial assistance to this project through EPA Section 319 Nonpoint Source Pollution Control Grant #C9007405 12.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended, Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Fred A. Choleick, Director.

published 4/2008



LAWRENCE / DOUGLAS COUNTY

GREEN YARDS AND COMMUNITIES
BUILDING A GREENER COMMUNITY
ONE YARD AT A TIME.

GREEN YARDS AND COMMUNITIES

RIGHT PLANT RIGHT PLACE

Consider the mature size of plants. • Choose plants that thrive in hot, dry locations for sunny, low-water areas. Plant shade-loving plants in shady areas. • Selecting the right plant for the site reduces need for water, fertilizer and maintenance. • Plan lawn areas to be functional. • Grass can serve as a filter for stormwater runoff.

ATTRACT WILDLIFE

Provide a water source such as a pond or birdbath. • Select plants that produce flowers, fruit or seeds that provide food wildlife depend on. • Plant trees or shrubs that provide natural shelter or hang a birdhouse.

GRASSCYCLE

Leave grass clippings on your lawn. • Clippings are a natural source of nitrogen; leaving them on the lawn will reduce the amount of fertilizer needed. • Start a compost pile or bin. The City of Lawrence sells compost bins at a reduced rate to Lawrence residents. • Call the Waste Reduction and Recycling Division at (785) 832-3030 for more information.

WATER EFFICIENTLY

Group plants based on water needs.

Choose plants that require little water after they are established.

Use low-volume or drip irrigation in beds.

Overwatering causes shallow root growth. This makes it harder for plants to survive drought or disease and pest infestations.

Use a rain sensor that will turn off the irrigation timer when water is not necessary, or set the timer for manual operation.

Learn how your irrigation system works and adjust it accordingly so plants get the proper amount of water.

Check your irrigation system while it is on to make sure you are not watering the driveway or the street. Check for leaks or missing heads.

REDUCE STORMWATER RUNOFF AND POLLUTION

Water flowing into storm drains enters the river untreated. To reduce the amount of runoff, use porous surfaces such as brick or rock instead of concrete for walkways and patios.

Sweep grass clippings, yard waste or fertilizers into the lawn or dispose of properly.

Use downspouts to water flowerbeds or fill rain barrels.

Pick up pet waste. Pet waste contains bacteria and other pollutants. Flush pet waste down the toilet or put in solid waste receptacles.

Trash and yard waste can clog storm drains. Remove them from streets and gutters.

Identify weeds before you apply herbicides.

Don't use products that contain both herbicides and fertilizers in one application. Instead, target pesticide applications to affected areas.

FERTILIZE APPROPRIATELY

Soil testing determines how much and what kind of fertilizer is needed. Submit soil samples to K-State Research and Extension - Douglas County, or for more information about soil testing, visit the Douglas County Extension Web site at www.douglas.ksu.edu.

Determine and apply the correct amount of fertilizer.

Fertilize lawns, trees and plants only when necessary.

Too much fertilizer can lead to pest problems and excessive growth. Underfertilizing can cause thin grass or weeds.

Overuse of fertilizers contributes to pollution and runoff into the Kansas and Wakarusa rivers, Clinton Lake and the Baker Wetlands.

	Grassed Waterways are constructed so they can carry large quantities of water without causing soil erosion. They are built to stop an existing erosion problem or may be built to provide a safe outlet for terraces. Grassed waterways are also excellent for filtering soil, nutrients and pesticides. If native grasses are used as part or all of the grass mix a waterway can provide additional habitat for wildlife.
	Range/Pasture Grazing and Hayland Management have several keys to success. Know the grass you are managing. Native grass, a warm season grass grows in the summer and needs a periodic burn to remain productive. Brome and fescue, a cool season grass, grows in spring and fall. Fertilization and proper soil pH are a must to remain productive. Both require correct stocking rates to prevent overgrazing. Each has its' correct haying dates. Continuous attention to noxious weed and general brush control is important.
	Range/Pasture/Critical Area Seeding require good planning to insure years of productivity. Cool season grasses such as brome and fescue are best planted in the fall with a nurse crop of oats or wheat. It is a must that nutrient and pH levels in the soil be put into proper balance before seeding. Failure to do so will lead to years of disappointing yields. Native grass, a warm season grass, is planted in the spring. No-till plant it into sorghum or soybean stubble. Native grass should not have fertilizer applied.
	Tree and Shrub Plantings provide years of function and beauty. They are planted for windbreaks, reestablishment of riparian areas, firewood, timber and christmas tree production, esthetics and wildlife habitat. It is very important to refer to a soil survey and plant species adapted to the site and planned use. Plant a variety of species when possible to reduce insect or disease problems that might kill the whole planting. Several advances in tree establishment techniques have made success easier.
	Ponds are built for several purposes. They are used for livestock water, recreation, stopping gullies and to benefit wildlife. Ponds can benefit downstream water quality by trapping sediment, nutrients and pesticides. They also can provide some limited flood control. The quality of the water in the pond itself can be protected. Fence livestock out and water from a tank below. Maintain a good grass cover in the watershed above the pond. Limit fertilizer application to reduce growth of moss.
	Illegal Dumping / Improper Disposal of Oil, Paint, Unwanted Pesticides and Other Toxins are a problem. Old couches, appliances and trash show up in county ditches. Farm debris and old pesticide containers in the back gully. People pour used oil, anti-freeze, paint and other toxins into storm drains. All of these individual pollution sources drain to our water supply and contribute to water quality problems. Counties have a place for these items to be taken for proper disposal. Many have programs to clean up problem sites.
	Wildlife Habitat Management can involve special conservation practices that specifically benefit wildlife. However, there are numerous conservation practices that benefits wildlife just by the adoption of the practice. Basically, wildlife needs food, water and cover to survive. Common crops are a good source of food. Ponds and streams provide a good water source. Native vegetation of trees and grass provide the best cover. Maintaining crop stubble and properly stocking pastures also benefit wildlife.

Credit for many of the images and concept for this page goes to the USDA - Natural Resources Conservation Service Iowa publication "Conservation Catalog" and the Kansas publication "Conservation Choices".



The Many Facets of Conservation

**A Guide To Key Conservation
Practices Of The Natural
Resource Conservation
Service (NRCS) In A Region
Of Northeast Kansas**

USDA UNITED STATES DEPARTMENT OF
AGRICULTURE

There are more than 100 conservation practices in the Natural Resources Conservation Service (NRCS) Technical Guide in Kansas. A set of priority practices that target major natural resource concerns in the counties of Douglas, Osage, Shawnee and Wabaunsee are highlighted in this publication.

The natural resource concerns of the area are:

- Soil** – Erosion, Quality
- Water** – Quality, Quantity
- Air** – Particle, Odor
- Plant** – Productivity of Desired, Invasion of Undesirable
- Animal** – Domestic, Wildlife



Contact your county offices for a **NO COST** onsite visit to your property. Cost-share grants are also available to reduce your cost of applying certain practices.

(785)843-4288 Douglas County
 (785)828-3831 Osage County
 (785)267-5721 Shawnee County
www.sccdistrict.com
 (785)765-3836 Wabaunsee County



Crop Rotation could be the most important cropland practice there is. A tremendous amount of tillage and chemicals is used each year trying to battle weeds, insects and disease. Just simply alternating two or more crops like corn, sorghum, soybeans and wheat, never planting the same crop twice in a row reduces weed, insect and disease problems. A crop rotation should include at least one legume (a nitrogen fixing plant) such as soybeans, alfalfa or red clover to gain maximum benefits.



Crop Residue Management aims to manage crop residue in a way that best benefits crop and soil needs. For effective soil erosion reduction at least 30% of the soil must be protected with crop residue at planting. No-till farming provides maximum protection. Soil tilth is also influenced greatly by crop residue. Less tillage allows more residue to stay on and in the soil. The result is higher soil organic matter levels, better soil tilth and crop productivity.



Nutrient Management manages the amount, form, timing and placement of nutrients based on crop need, economy and water quality concerns. Step one is to obtain a current soil test to determine nutrient levels of the soil. With this information, other elements such as realistic yield, crop removal rates, nutrient credits from legumes and applied manure are used to determine the proper nutrient application needs. The highest level of nutrient management is found with the use of GPS precision application.



Pest Management uses a combination of chemical, biological and cultural methods to control pests. These pests could be weeds, insects, fungus or bacteria. Rotating crops would be a cultural pest control method that reduces pest levels. A biological method would be the use of pest resistant varieties or beneficial insects that attack pests. When chemicals are used label recommendations must be followed carefully to avoid crop damage and off sight movement through drift, leaching or in runoff.



Filter Strips are permanent strips of grass, legumes and/or trees designed to trap and filter a portion of the sediment, nutrients, pesticides and pathogens carried by water passing through them. These strips can take on several forms. Contour grass buffer strips are used as an alternative to terraces in cropland. Riparian buffers preferably of native grasses and/or trees provide a barrier between cropping activities and streams. Field borders provide a space between farming activities and your neighbor.



Animal Waste Management is critical to safeguarding water quality. Concentrated livestock feeding areas in or near a stream provide a direct avenue for fecal coliform and nutrients from the animal waste to enter the water. Establishing a buffer zone between feeding areas and streams is a good practice. Stockpiled livestock waste is a good source of nutrients for crop production, particularly, P and K. A nutrient management plan should be developed to insure correct application rates.



Terraces are earthen structures built along a slope to slow water runoff. Each terrace is built with a designed height, grade and spacing to match the need of the land. Many times terraces are used in conjunction with grassed waterways. Other use an underground pipe network to carry the water off the field. Terraces are an effective conservation practice to stop major erosive events. At least 30% crop residue must be kept on the cropland surface or they are prone to filling with sediment and failure.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410, or call (202) 720-6964 (voice and TDD). USDA is an equal opportunity provider and employer.

Conservation district board of supervisors meet the first Wednesday of each month for regular monthly board meetings. They establish local priorities, set policy and administer non-regulatory conservation programs during monthly board meetings. The supervisors are not paid a salary, they all volunteer their time and dedication to the protection of our natural resources.

The non-regulatory conservation programs which are administered through the Douglas County Conservation district include the Non-Point Source Pollution Control Program, Water Resource Cost-Share Program, Conservation Buffer Program and WRAPS program. All programs are available with regard to race, color, religion, sex national origin, marital status, age or handicap.

An annual meeting is held each February to report district activities and accomplishments since the last annual meeting and to advertise district programs. An election is also conducted to fill a three year term for position of supervisor.

The Kansas Banker Association Awards program is presented at the annual meeting. Each summer, the key banker, extension agent, NRCS District Conservationist, chair of the conservation district board, FSA county committee chair, and Farm Bureau board chair tour farms who have been nominated to receive recognition. In addition to the banker awards the conservation district honors landowners for wildlife conservation, grassland and conservation buffers.



Douglas County Conservation District

1217 Biltmore Drive, Suite 100
Lawrence, Kansas 66049

Phone: 785-843-4260 ext. 3

WHO ARE WE....

**Douglas County
Conservation
District**



Our Mission.....

Is to make available technical, financial, and educational resources and administer programs designed to encourage individual responsibility to conserve, improve, and sustain our soil and water resources for future generations.

Douglas County Conservation District is a subdivision of Kansas state government. The Conservation District develops and implements local programs to protect and conserve soil, water, farmland, rangeland, woodland, wildlife, energy and riparian and wetland resources. The district works closely with the Natural Resources Conservation Service (NRCS) and other agencies to assist in this effort. The local district is further supported by the National Association of Conservation Districts (NACD) in Washington D.C.

In an effort to meet both urban and rural residence needs the Douglas County Conservation District and Natural Resources Conservation Service is involved in a variety of information and educational activities. All programs and services are available to anyone, without regards to race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status.

The board has used a wide variety of methods to reach the citizens in the county:

Field Days and Tours

Farm and Urban Meetings

School and Public Meetings

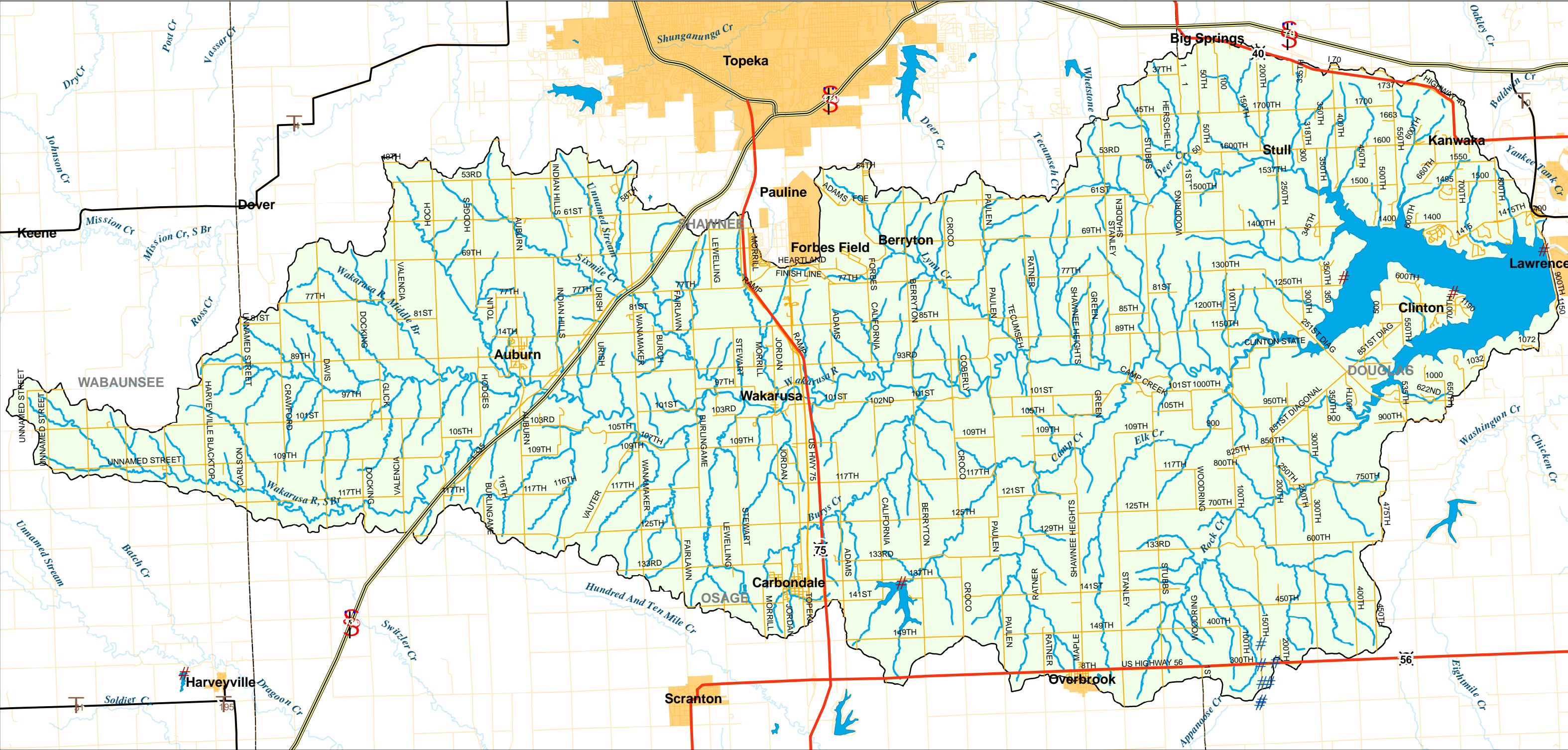
Small Group Meetings

Mass Information

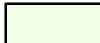













Information and assistance in conservation practices

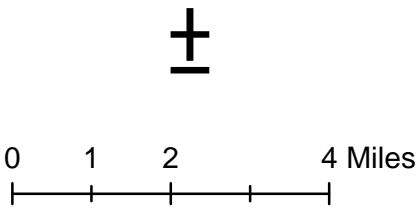


Upper Wakarusa Stream Network

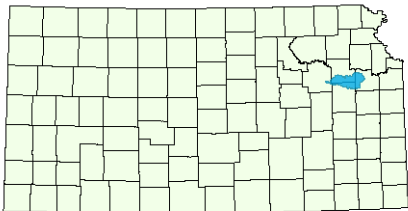


Map Key

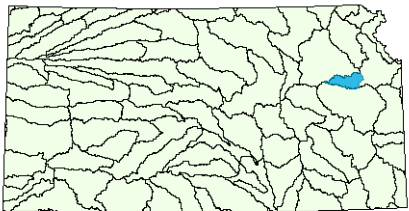
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|---|---|--|
|  Upper Wakarusa Watershed | Roads Classification | Public Water Supply Sources |
|  River or Stream |  Interstate |  Well |
|  Lake |  US |  Intake |
|  City or Developed Area |  State |  Reservoir |
|  County Boundary |  Local Roads |  Spring |
| | |  Infiltration Gallery |



Political - Counties



Physical - HUC 8 Watersheds



Map area shown in blue.



Map produced by
Kansas Department of Health & Environment
September 2008



Kansas Alliance for Wetlands and Streams

UPPER WAKARUSA WATERSHED RESTORATION AND PROTECTION STRATEGY

(WRAPS)

The WRAPS Program

Non point sources of contaminants have resulted in water quality impairments to streams and lakes. The Watershed Restoration and Protection Strategy is an opportunity for landowners, residents, municipalities, and other interests in a watershed to influence the way water quality challenges are met that will protect water supplies, human health, and aquatic life.

Water Quality Challenges in the Watershed

Sediment and attached nutrients are:

- filling Clinton Lake decreasing capacity
- increasing algae blooms that cause taste and odor which shuts down water supply
- detrimental to aquatic species like fish

Bacteria in Wakarusa River and Clinton Lake:

- is a health risk for water contact recreational uses and consumptive water supply
- contributes to nutrients in the River and Lake

Problems occur during runoff events

Primary Sources of Sediment are:

- washoff from fields, pasture, construction sites and barren areas during storm events
- erosion of streambed and banks from excessive runoff caused by destruction of native vegetation

Primary Sources of Bacteria are:

- livestock and wildlife in or very near the stream
- confined livestock and household effluent

Program Outreach and Coordination

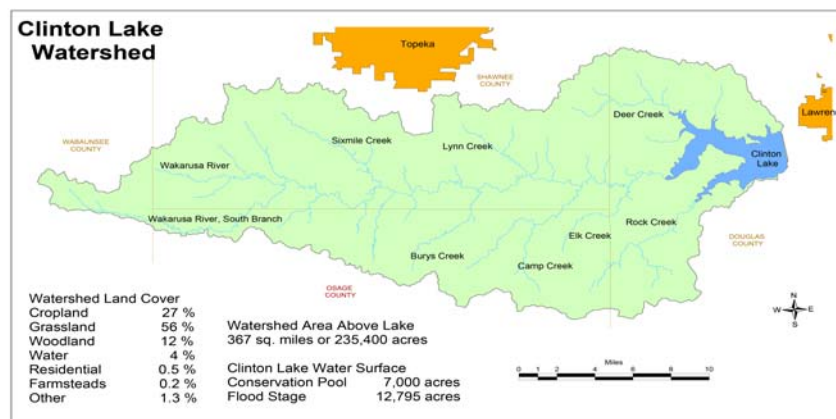
- Public Input – several public meetings have been held to discuss priorities and ideas for improving water quality with landowners and other interests in the watershed
- Education – technical materials and workshops are available to learn about water and land management practices that will decrease sediment, nutrients, and bacteria from entering streams and lakes
- Demonstration Projects – funding is available to implement land and water management practices that decrease sediment, nutrients, and bacteria from entering streams and lakes
- Other programs – the WRAPS program is committed to coordination of funding with NRCS, SCC, Wildlife Initiatives, Urban Planning and other state and federal cost share programs for conservation and water quality management

Funds Are Available

For assistance in applying for the WRAPS program funds for these practices contact:

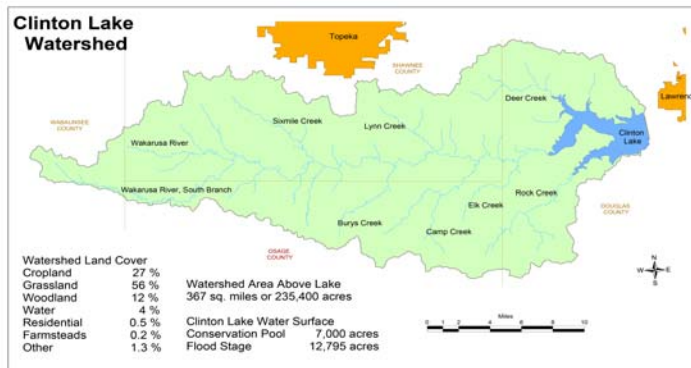
Tom Huntzinger, WRAPS Coordinator
785-766-6717

Will Boyer, KSU Ext. Specialist
785-587-7828





Stamp



Leadership Team

Patti Adams
Wayne Lukert
Bruce Smith
Keith Whealy
Robert Bierly
Richard Runnebaum
Judy Boltman
SanDe Fishburn
Lori Griffith
John Bond

UPCOMING ACTIVITIES



**Kansas Alliance For Wetlands and Streams
UPPER WAKARUSA WRAPS**

Tom Huntzinger

3000 Oxford Road, Lawrence, KS 66049

Phone: 785-766-6717

Email: tomhuntzinger@sunflower.com

MEMORANDUM

DATE: December 8, 2008

TO: Amy Brown, Lawrence-Douglas County Planning

FROM: Tom Huntzinger, Upper Wakarusa WRAPS Coordinator

CC: Draft Outline and Overview

SUBJECT: Presentation to the Comprehensive Plans Committee (CPC)

The Upper Wakarusa Watershed Restoration and Protection Strategy (WRAPS) program appreciates the invitation to discuss its mission and activities and to explain why the Environmental Chapter of the Comprehensive Plan is important. The WRAPS in the Upper Wakarusa watershed is an opportunity for land owners and communities to substantially influence the way the state of Kansas responds to water quality challenges in Clinton Lake which is water supply for over 120,000 people.

Land use directly influences storm runoff which supports riparian habitat and transports contaminants from the land into the streams and lakes. Planned land use changes are part of development. It is important to acknowledge the connection between land use and runoff in order to protect stream corridors and prevent water quality degradation.

Stream corridors are a continuum of green space essential to the hydrologic process that allows life sustaining water and nutrients to move through the landscape. Urban development and other land management decisions typically are site specific. A general plan based on hydrologic principles that maintain continuity of the stream corridors is essential to a sustainable landscape that maintains healthy habitat and clean water. It is understood that green space adds value to property and is sought by homeowners and communities as a part of an enjoyable and healthy lifestyle.

It is the role of WRAPS to encourage land use and water management policies that apply the principles of hydrology and water quality to ensure clean water and healthy and sustainable natural habitat. A focus on protecting stream corridors in concert with sound

urban development guidelines that prevent excess storm runoff and accumulation of contaminants will be a priority for the WRAPS program in its participation in preparing the Environmental Chapter. We believe these principles are achievable in the context of successful urban development.

WRAPS has provided comments and submitted associated documents before the public hearing on November 19. We appreciate the decision of the Planning Commission to prepare the Environmental Chapter of the comprehensive plan. We also appreciate the opportunity to meet with the Committee and to be included in this important activity. The Upper Wakarusa WRAPS Leadership Team is committed to support and assistance to the Planning Commission and the Planning Department in any way appropriate.