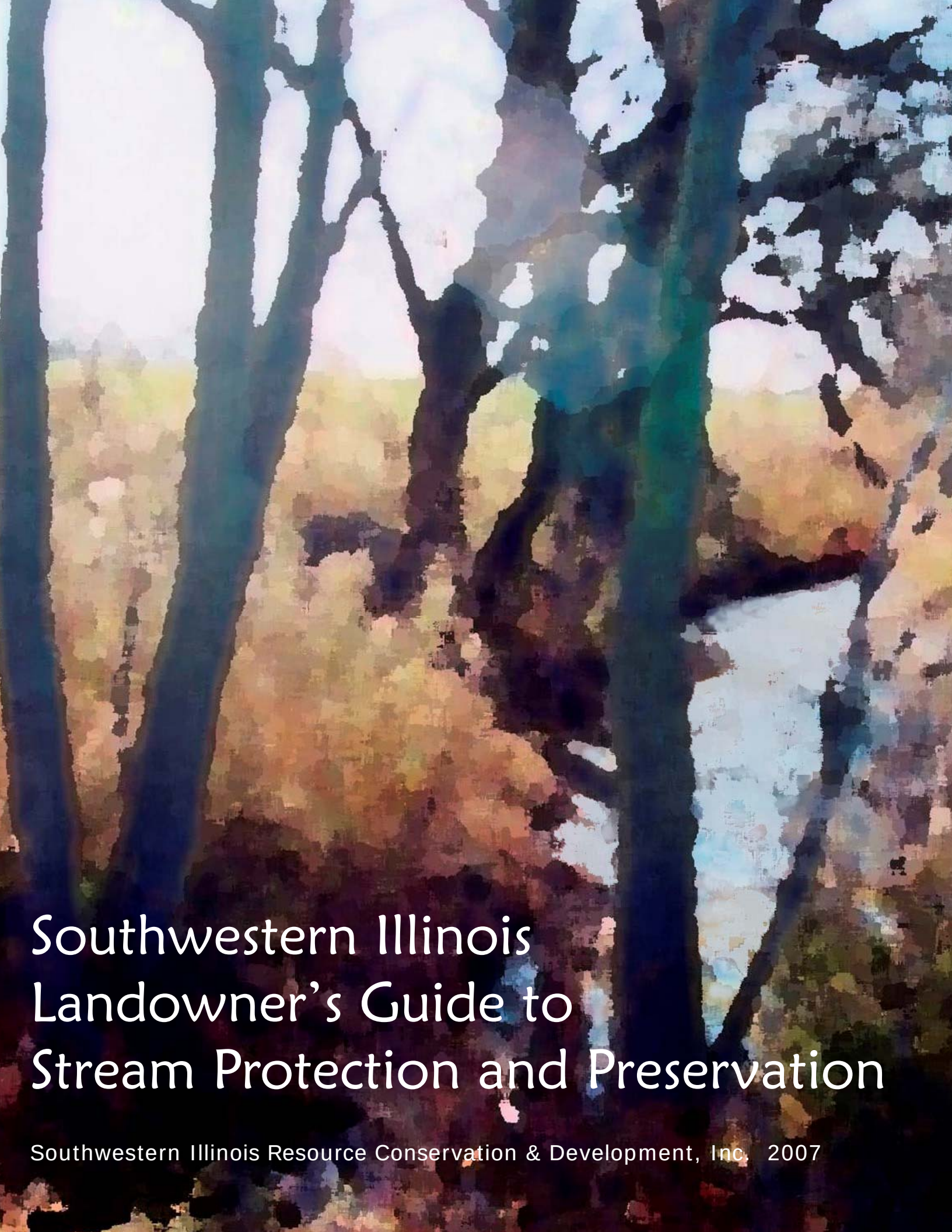

Southwestern Illinois Landowner's Guide to Stream Protection and Preservation

Southwestern Illinois Resource Conservation & Development, Inc. 2007

Southwestern Illinois Landowner's Guide to Stream Protection & Preservation

This landowner's guide for streambank protection and preservation has been produced by the Southwestern Illinois RC&D, Inc. with funding provided by the Illinois Department of Natural Resources C2000 Ecosystem Partnership Program. The Southwestern Illinois RC&D, Inc. serves Bond, Clinton, Madison, Monroe, Randolph, St. Clair and Washington counties in Illinois. All data presented in this publication pertains to these seven counties. However, the information provided is applicable and useful to the riparian habitats in our general region. We hope you will use this information to protect your valuable natural resources. If you have any questions or would like assistance protecting the streams on your land, please contact us at:

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Produced by the Southwestern Illinois RC&D, Inc. 2007
SWI RC&D is an equal opportunity provider and employer.

Funding provided by the Illinois Department of Natural Resources C2000 Ecosystem Partnership Program.

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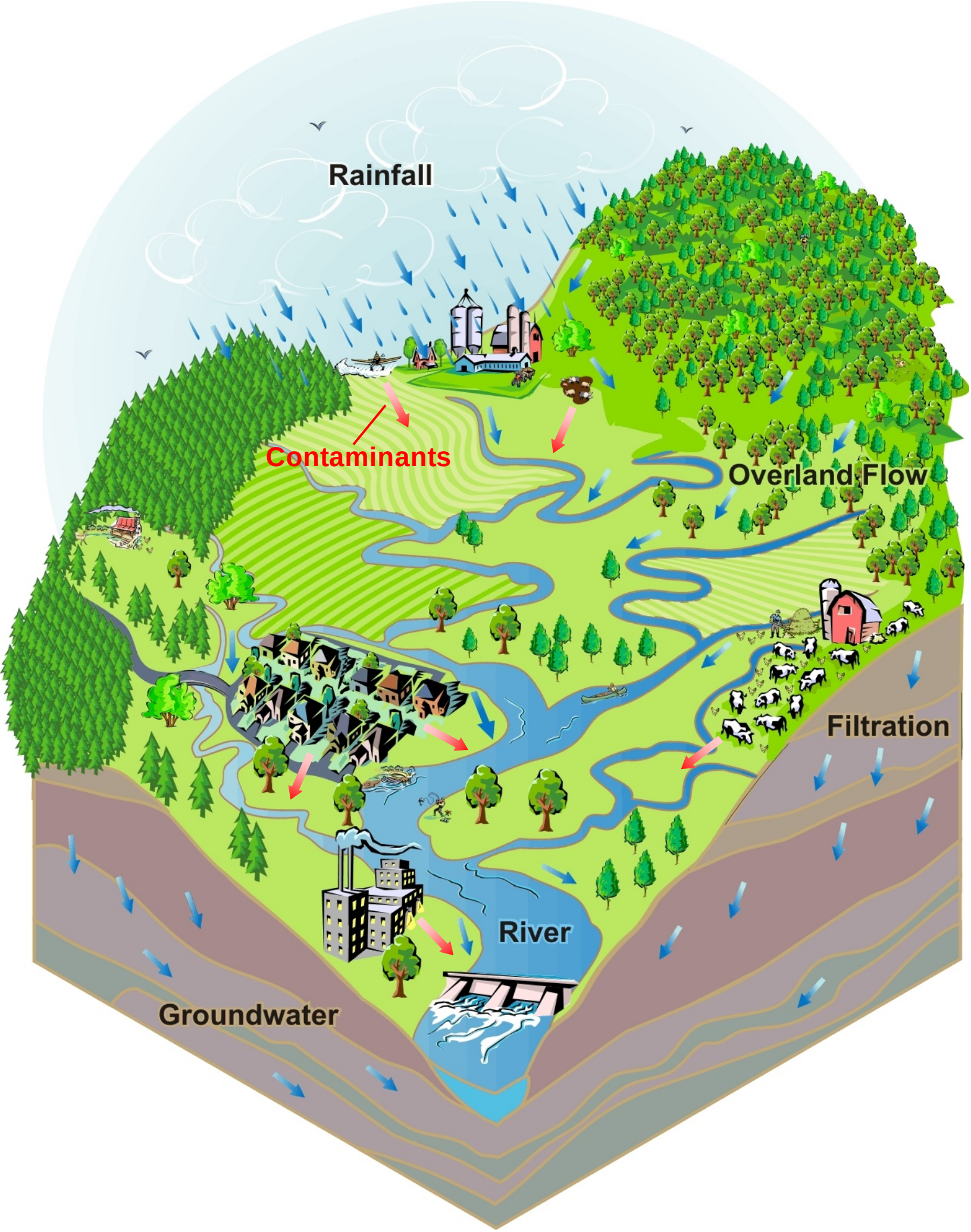
Rainfall
Contaminants
Overland Flow
Filtration
River
Groundwater

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Executive Summary

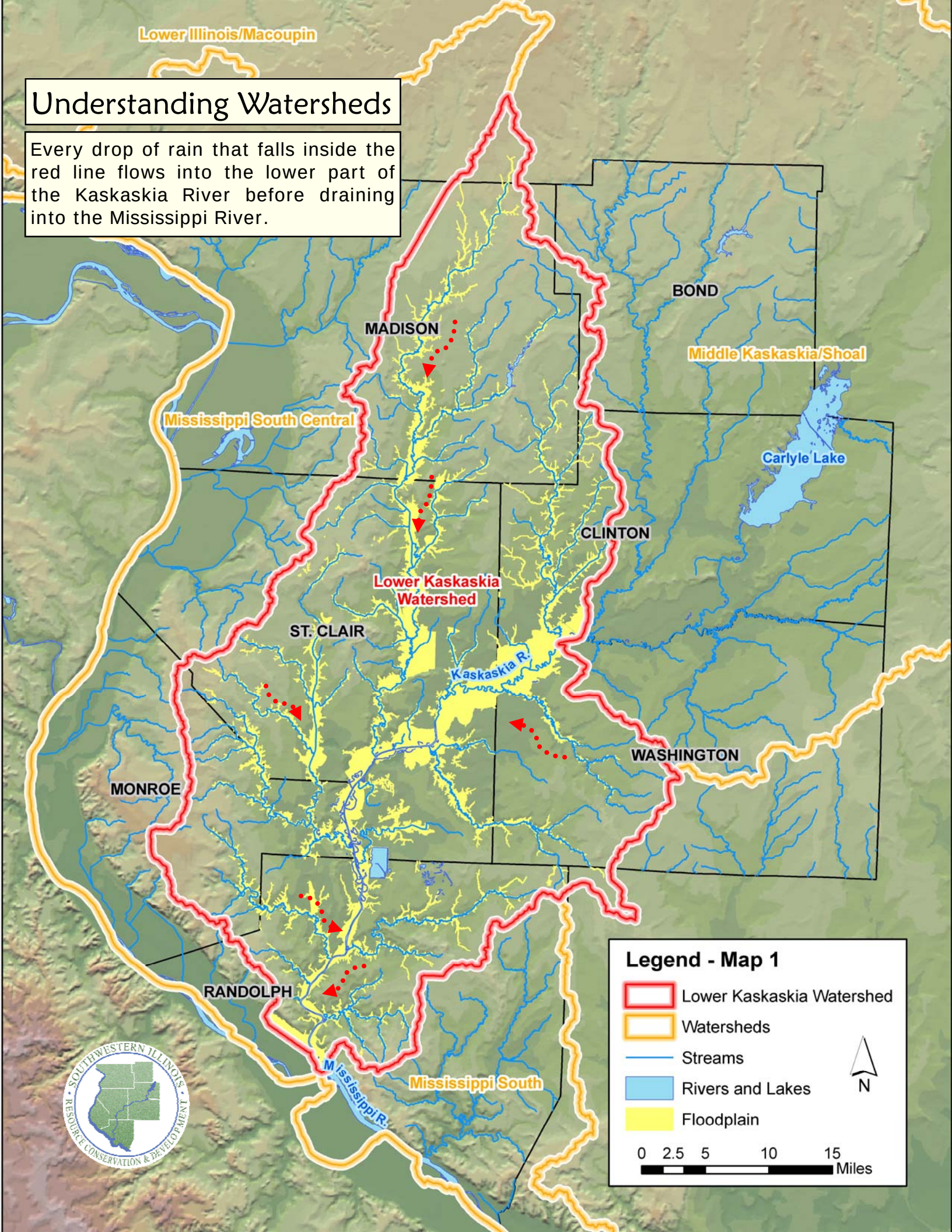
The streams of southwestern Illinois play a crucial role in the health of our watersheds, and our watersheds play a crucial role in the health of our streams. Healthy streams create critical habitat for fish and wildlife, water for recreational activities, and in many cases, drinking water for our communities. Many human-directed activities can have a negative impact on the health of our streams and stream systems. Channelization and culverts, urbanization, the removal of vegetative buffers, agricultural production, damming, and introducing and spreading invasive species are just a few examples of human activities that impact streams.

In a typical watershed, 80 percent of streams and rivers are first– ("headwater") or second-order streams. Headwater streams are especially vulnerable to the pollution, alteration, and general mismanagement of natural resources that human activity often brings. Because southwestern Illinois is experiencing rapid development in many areas, each and every landowner plays a role in the health (good or bad) of our streams. We all have a responsibility to positively impact our streams and watersheds. There are many ways we can alter our behavior or fix existing problems to improve the health of our surrounding environment. There are also times when we must rely on our local network of aquatic, hydrologic, and biological professionals to repair the damage that has already been done. The following guide explains in more detail why the health of streams in our area is so important, what the problems are, what we can do to fix them, how we can become involved, and when it is necessary to involve professional support.

Streams and their surrounding environment can be damaged very quickly, but it takes much time and effort to repair this damage. Please use the information provided here to act, and act quickly. Together, working with our neighbors both up and downstream, we can preserve, protect, and restore our waters and watersheds for future generations.

Understanding Watersheds

Every drop of rain that falls inside the red line flows into the lower part of the Kaskaskia River before draining into the Mississippi River.



Streams and Their Benefits

Southwestern Illinois has an abundance of rivers, streams, lakes, and wetlands. These waterways provide drinking water, recreational opportunities, and fish and wildlife habitat that all depend on a consistent supply of clean water, as well as support transportation (barge) industries. With minimal care and expense, these waterways produce maximum benefits. Ensuring that we retain the appropriate quantity and quality of water in our region is critical to all residents, businesses, and industries.

A watershed, also known as a drainage basin, is the area of land that drains to a particular body of water. A watershed is different from a floodplain. A floodplain is the area along streams and other water bodies that is susceptible to flooding after a rain event. As such, the floodplain is a very vulnerable area.

As illustrated in Map 1, the Lower Kaskaskia Watershed is defined by the elevations of the land. All water that falls on land contained by the red line drains into the lower Kaskaskia River, through the many streams in the area or through the ground water. The health of the streams in this area directly contribute to the health of the Kaskaskia River and, in turn, the Mississippi River, which is fed (in part) by the Kaskaskia River.

The business of water: a coal barge on the Kaskaskia River depends on the river for transportation. (Norma Hall)

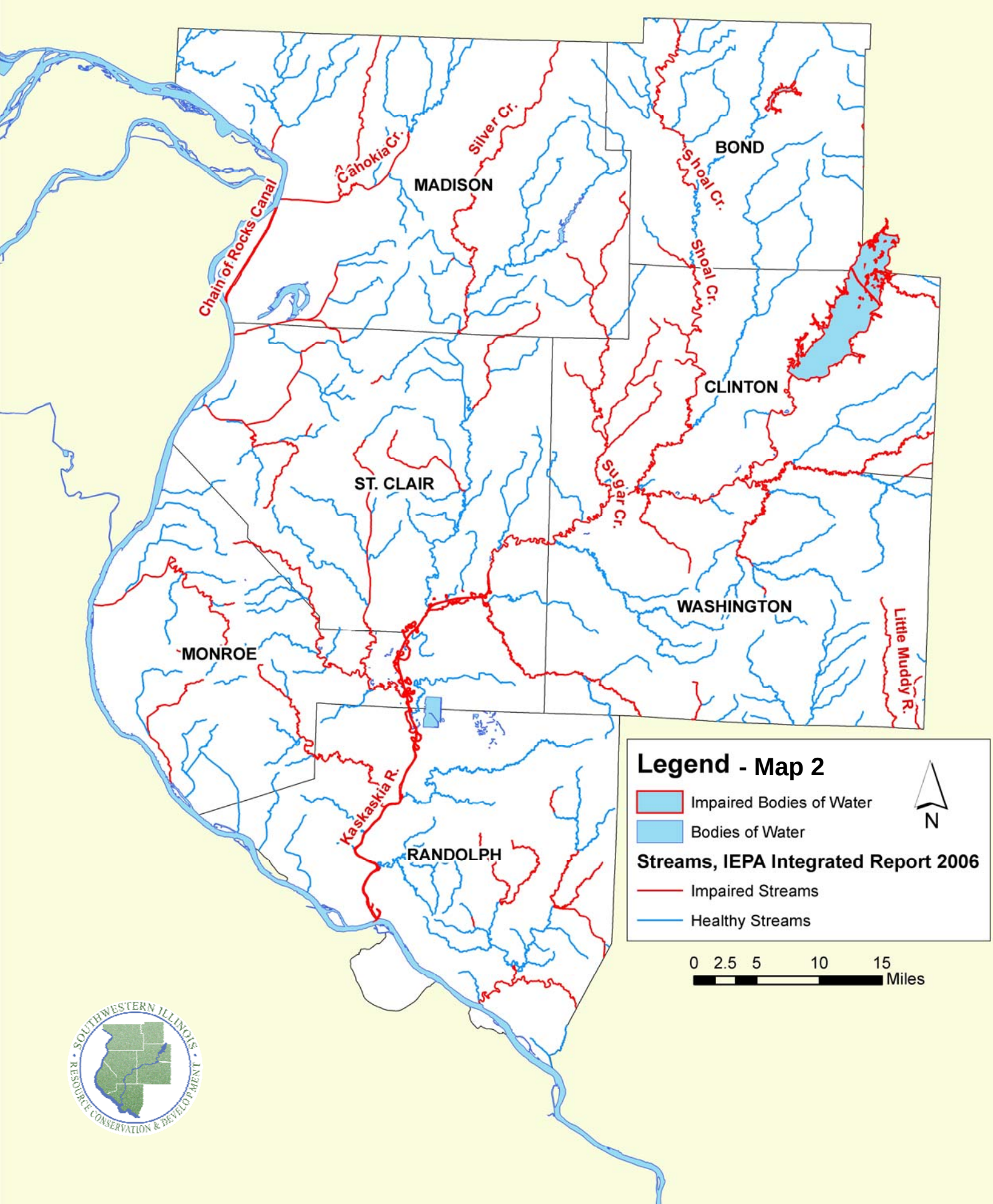
Nonpoint source (NPS) pollution. Dumping dirty mop water into a storm drain will pollute the stream that the storm drain dumps into. (keats.admin.virginia.edu)

Everything that happens in a stream's watershed has an effect on its health, either positive or negative. Most of the human-directed tasks in a watershed have a negative effect on its streams, and therefore the recovery of these streams has to be human-directed.

The streams in southwestern Illinois have been damaged in many ways: channelization and culverts, urbanization, removing vegetative buffers, agricultural production, damming and logjams, and introducing and spreading invasive species all cause impairment in streams. These actions can cause pollution, increased runoff, and/or the erosion of streambanks.

There are two types of pollution: point source and nonpoint source (NPS)

Impaired Streams—Illinois Environmental Protection Agency 2006



pollution. Permitted point source pollution is pollution that occurs at one specific point by dumping a damaging material into the stream's flow. Most point source pollution has been reduced as a result of the Clean Water Act.

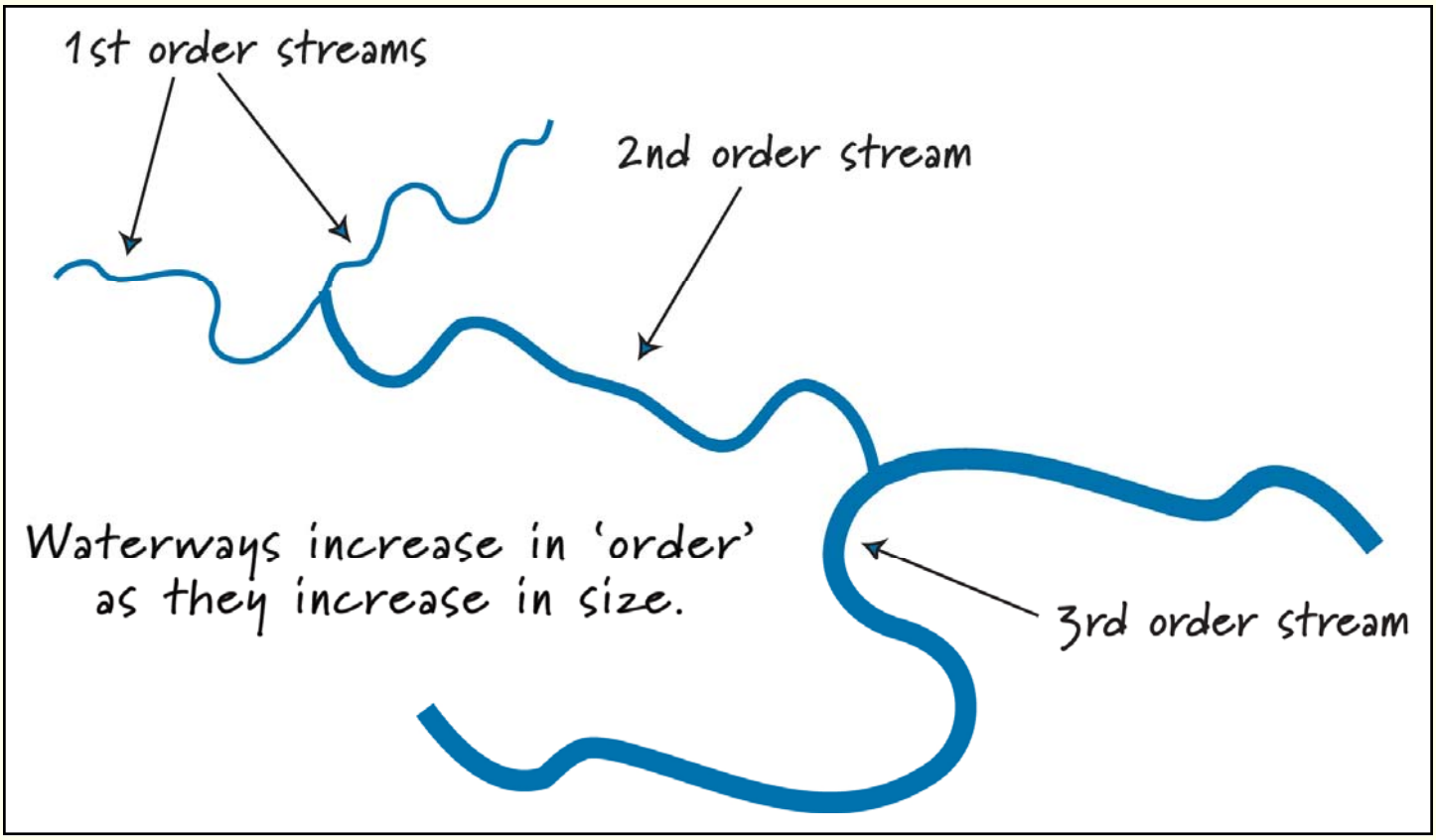
Due to this reduction in point source pollution, NPS pollution is a higher priority in today's world. NPS pollution is random and diverse – coming from a multitude of sources from within the watershed.

NPS pollution is defined as pollution that occurs when rainfall, snowmelt, or irrigation runs over land, picking up pollutants, and depositing them into streams, rivers, lakes, and wetlands, or introducing them into the ground water.

The 2006 Integrated Report by the Illinois Environmental Protection Agency (IEPA) states that there are 796 miles of impaired streams in southwestern Illinois. We can also estimate from this data that 60 percent of the impairments are caused exclusively by NPS pollution. The remaining 40 percent is a mixture of point source and NPS pollution (see Map 2).

In order to properly manage and protect streams, you must first understand the overall connection between streams, tributaries and rivers (see figure below). Headwater streams (first-order) are typically very small in size, generally seasonal and are the origin of larger streams and lakes. An example of a headwater stream in your community might be the ditch system that runs along the roadsides and transports stormwater and other urban runoff.

A second-order stream is formed when two first-order streams converge, and thus increases in size. The overall order of a stream will not change until it converges with a stream large enough to increase its overall size significantly.



Stream order depicted with first-, second-, and third-order steams. (www.pwconserve.org)

Approximately **80%** of all streams in southwestern Illinois are first- or second-order. Due to this high number, every landowner in our region is within a relatively short distance to a first-order stream. First-order streams are very vulnerable to NPS pollution and **if the water quality in a first- or second-order stream is poor, it is likely the water quality will be poor in the larger stream or lake to which the stream drains.**

We all have a responsibility to contribute to good water quality in our local streams and the larger streams and lakes they feed into. If a headwater stream has good water quality, this will contribute to good water quality within the larger stream system or lake.

Stream Impairments and Solutions

Streams are products of the lands they drain, and those waters reflect the land management practices of the region.

All human activities have an effect on our regional water quality. Those actions that are capable of degrading any stream, especially first-order streams, include: channelization and culverts, urbanization, removing vegetative buffers, agricultural production, damming and logjams, and the introduction of invasive species. These can all contribute to pollution, increased runoff, and/or the erosion of streambanks.

Ensuring the existence of a vegetated streamside buffer with a sign to prevent mowing or removal of plants is a good solution for the removal of vegetative buffers. (www.fish.state.pa.us)

A properly installed livestock stream crossing with a fence will reduce agricultural pressures by preventing streambank erosion from livestock hooves and the removal of necessary vegetative buffers from livestock grazing. (separcd.org/livestock_watering)

Read on to learn about these impairments and their solutions. You will learn how to identify them and how they were caused, and what you can do to prevent them. If they were previously existing, you will also learn how to mitigate them, and when it is appropriate to secure the assistance of a professional.

Mitigating Channelization and Culverts

The Problem:

Channelization of a stream consists of removing the natural bends and meanders of a stream. These bends have a purpose: they slow the flow of water. When they are removed, the channel becomes shorter and steeper, resulting in water flowing faster.

The flowing water then becomes more erosive and begins cutting the bottom and sides of the stream to flatten its slope and increase its length by "rebuilding" the natural meander bends. This results in erosion, loss of property, more intense flood peaks downstream, and loss of aquatic habitat.

Culverts create a conduit to enclose a stream, allowing water to pass under a road, railway, or embankment. Culverts disrupt the natural flow of the water. Fish, other aquatic animals and plants are sometimes prevented from traveling upstream and/or downstream and get trapped in one section of the stream.

The Problem Visualized:

Above: A channelized stream. (Mike Fruth)

Right: A culvert under a roadway. (www.uvm.edu)

What You Can Do:

If you own land that has a channelized stream, you can return it to its normal path **with proper permits**, or allow it to return on its own. If you have installed a culvert **with proper permits**, ensure it is the proper size for your stream.

Proper maintenance of your channelized stream and/or culvert is critical. Remove debris (trash) and silt from your **culvert** to outside the floodplain. **Only remove debris from a channelized stream if it is blocking normal water flow**. Removing debris from a channelized stream can increase erosion, so consult a professional before proceeding. Replace culverts that have been crushed, rusting, or otherwise damaged.

When To Call A Professional:

The restoration of stream meanders is a viable option on previously straightened streams. However, the number of meanders, distance between them, and where to start are all very technical issues and requires one or multiple permits. Contact your local office of the US Army Corps of Engineers (ACOE), IEPA and IDNR for guidance.

If it becomes necessary to install a culvert in your stream, understanding the proper size, material and design is complicated—contact a professional for assistance.

Other professionals to contact: your local (by county) Soil and Water Conservation District (SWCD), and your local office of the USDA Natural Resources Conservation Service (NRCS).

Reducing Urban Impact

The Problem:

Urban development in a watershed is one of the leading causes of stream degradation. Development produces significantly increased amounts of stormwater runoff due to increased impervious surfaces. Unfortunately, much of this runoff ends up in our stream system.

Impervious surfaces increase:

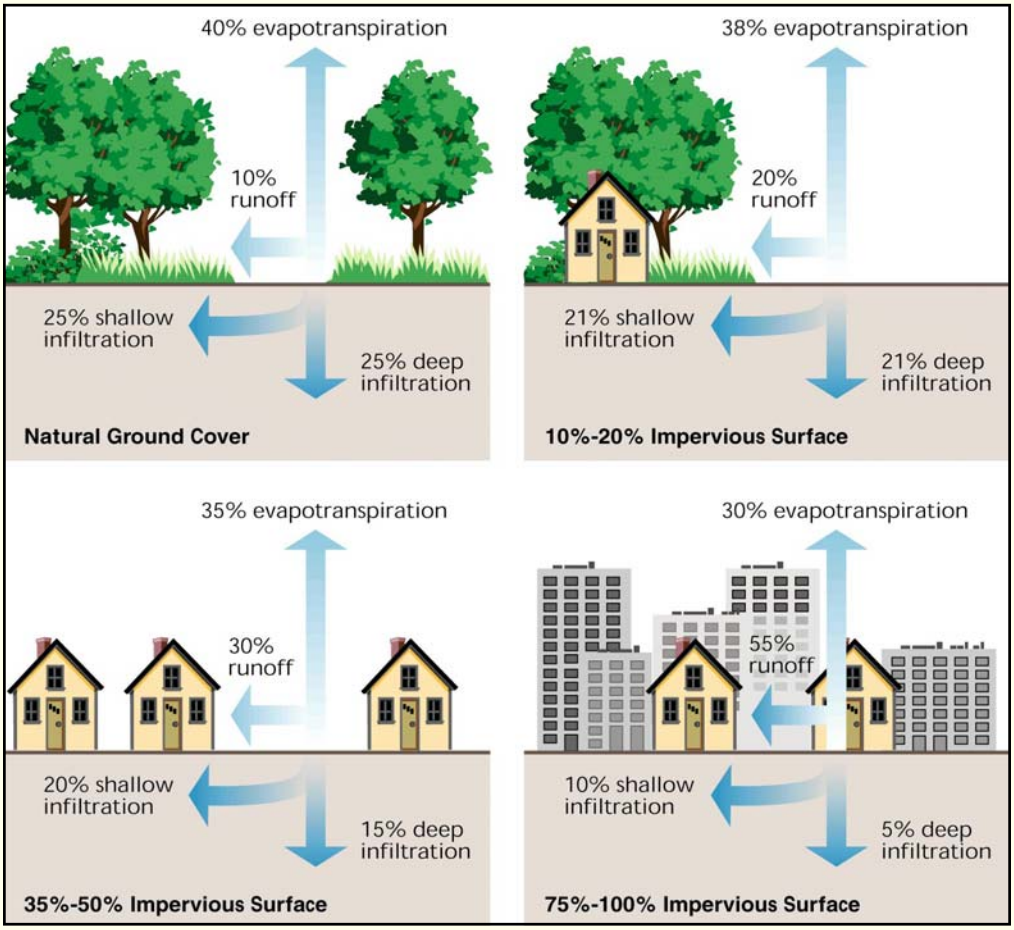
- Peak flood heights and flow velocities
- Streambed size—at 8-10% impervious surface, streams double in size of bed
- Pollutants
- Stream temperature
- Bacteria, often as a direct result of household pet density

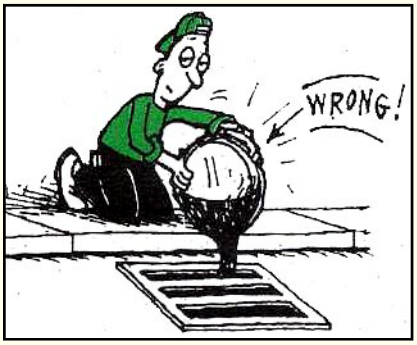
Development increases the amount of impervious surfaces, which decreases infiltration. Both shallow and deep infiltration of a rain event are critical to the health of our streams and the overall watershed. The image below illustrates how rapidly development can have an effect on stormwater load (most of the runoff will drain into the stormwater system of the community).

The chemicals we use for our landscaping, maintaining our cars and trucks, the waste our pets leave behind, and the paint and varnishes we use to care for our homes and businesses can all be picked up by stormwater runoff and end up in our local stream system, severely damaging this fragile ecosystem. Some people even dump these chemicals directly into nearby storm drains instead of disposing of this waste properly. **Contact your health department to find proper locations for disposal.**

The Problem Visualized:

Right: Relationship between impervious cover and surface runoff. As little as 10% impervious cover in a watershed can result in stream degredation. (Federal Interagency Stream Resotration Working Group. USDA)





Above: Chemicals, such as waste oil, dumped down a storm drain flow to streams untreated. (www.co.grays-harbor.wa.us)

Reducing Urban Impact

What **You** Can Do:

Organize or join a Stream Team (see page 19). You can help your community understand their impact on their streams and overall watershed. Many Stream Teams mark storm drains with stencils or decals to deter the dumping of waste materials into the storm water system (see example stencil bottom left).

Serve on a planning or zoning commission to influence zoning ordinances or building codes for riparian buffers, building set-backs, maintaining or restoring natural stream segments, and mandating silt fences and/or retention ponds during construction to limit pollution and erosion.

Other ways to help are: control invasive species in your area (see page 18), store animal pens or other pollutants away from the stream, keep ATV's away from the stream, use permeable pavement on your property, and build rain gardens.

Top: Children participating in storm drain stenciling project. (New Hampshire Estuaries Project)
Bottom: Example of a storm drain stencil. (www.co.grays-harbor.wa.us)

When To Call A Professional:

If you observe oily or suspiciously colored water flowing into a storm drain or in a stream, notify your local Health Department or your local office of the Illinois Environmental Protection Agency (IEPA) as soon as possible. Since many storm drains dump water directly into creeks, streams, and rivers without undergoing treatment for pollution, the quality of that water is very important and can be very dangerous to the health of the stream habitat and your community if it becomes contaminated.

It is illegal to dump pollutants, which include soil, sand, rocks, and vegetated material, into a stream without a permit. If you wish to conduct an activity on your property that will deposit dredged, excavated, or fill materials into or onto the banks of a stream, you will need one or more permits. Contact your local office of ACOE, IEPA and IDNR to determine what permit(s) you will need.

Left: An example of polluted stormwater. (www.midwestadvocates.org)
Top: A sign by a local health department in response to contaminated water. (rvcog.org)

Maintaining Vegetative Buffers

The Problem:

Removal of plant buffers along streams degrades the overall quality of the stream. Certain trees, low shrubs and native grasses have extensive deep root systems that filter out silt and pollution, slow down and hold water (preventing flooding), prevent the undercutting and collapse of streambanks (reducing erosion), offer shelter and food for wildlife species, and provide shade to cool the water.

Riparian buffers can be broken down into two categories: filter strips and streambank buffers. Filter strips occur along the top of the streambank and, as their name implies, filter out pollution, silt and debris from entering the stream. Streambank buffers are within the "active stream channel", meaning some experts consider them to be dynamic like the stream itself. Streambank buffers serve to stabilize the bank and prevent erosion. Both of these buffers work together and are crucial to the health of the stream.

The Problem Visualized:

A stream with the filter and streambank buffers removed.

Same stream with buffers restored. (www.ag.iastate.edu)

What You Can Do:

The easiest, most cost-effective way to protect your stream is to maintain a buffer of native plants. **Maintain a strip of native plants and trees on both sides of the stream of a minimum of 50 feet, with the recommended width of 200 feet**.

If the filter strip or streambank buffer is gone, here is a good list of native species to plant: common water plantain, fox sedge, hackberry, common buttonbush, gray and red osier dogwood, blunt and creeping spike rush, nodding and Virginia wild rye, green ash, fowl manna grass, switch grass, peachleaf and black willow, chairmaker's rush, late goldenrod, prairie cordgrass, blue vervain, and nannyberry.

When To Call A Professional:

Filter buffers are fairly easy to plant and maintain as a landowner. Your local SWCD has rates for the number of plants per acre for your buffers. Streambank buffers are a different story. Odds are you will do more damage than good if you try to repair degrading banks and bank buffers, so if your streambank is damaged, please contact a professional for assistance.

A great resource for buffer issues are the technical guides by the USDA NRCS. They discuss the many ways to fine-tune your buffer so that it is optimally productive. For example, if you have an animal waste problem, there are specific plant species that can help remove these impurities before they enter the stream. The Illinois NRCS technical website is: www.il.nrcd.usda.gov/technical

Managing Agricultural Pressures

The Problem:

Agricultural activities can negatively affect the water quality of a nearby stream. Natural buffers along a stream bank are often lost to grazing livestock or planting crops. Without buffers, herbicides and pesticides sprayed on the crops and livestock waste can flow into the stream during irrigation or a rain event.

One consequence is algal blooms. Algal blooms form when there is too much fertilizer in the water, specifically phosphorous and nitrogen, and the algae that is naturally present in the water experience a boom in population growth. The mass quantity of algae can choke out other aquatic species, including other plants and fish.

If the stream is used for livestock drinking water, or the stream banks for grazing, trampling can destroy the banks of the stream, increasing erosion and the amount of siltation in the water.

The Problem Visualized:

Above: Livestock crossing a stream with severely eroded banks. (www.dnr.wisconsin.gov/ag/waterquality)

Right: An algal bloom. (www.csir.co.za)

What You Can Do:

Apply chemicals carefully: apply the correct amount in the correct location, don't dump sprayer contents into the stream, and implement a "no-spray" zone near streams.

Construct livestock crossings across streams to reduce the animals' impact on riparian buffers and streambanks, and stabilize additional erosion wherever possible.

Spread manure on non-frozen ground—this prevents excessive nutrient runoff. Avoid driving equipment and trucks through streams or on streambanks whenever possible.

When To Call A Professional:

To ensure you are using the right amount of fertilizers and pesticides, consult with your chemical supplier for help developing a "nutrient management plan" (NMP). This will avoid stream degradation and could even save you money.

If an algal bloom appears in a stream on your property, contact your local IDNR or NRCS office for professional assistance in controlling the bloom.

Plant a filter buffer along streambanks to help remove excess chemicals before they can enter the stream. Consult with NRCS, IEPA, IDNR, your SWCD, or a botanical professional for the appropriate trees and plants—also, see "Maintaining Vegetative Buffers" on page 13.

Controlling Dams and Logjams

The Problem:

Dams are known as "stream killers". They obstruct the water flow, ruining miles of free-flowing streams. They eliminate native fish populations. They create stagnant, warm, and weed-choked water.

A stream's energy will always attempt to create a new path around any and all obstructions. This results in eroding stream banks and flooding.

Logjams are an obstruction in the stream created by woody vegetation, and act the same as a dam. Logjams usually occur naturally, the result of a large object (such as a tree) falling into the stream and blocking the flow of the stream.

People contribute to the formation of logjams, both directly and indirectly. Dumping tree trimmings, appliances and other litter into the stream can initiate a logjam. Channelization and vegetation removal can lead to channel instability and bank erosion, which indirectly causes trees and shrubs along the bank to fall in at a faster rate.

Some logjams are engineered or created on purpose. If enough water can get through the jam, it is beneficial, creating structure and cover for fish and other aquatic organisms, stabilizing streambanks, and reducing erosion. If a logjam has been created to improve stream function, it is critical that it be properly maintained (see images below). The more tightly packed the jam becomes, the more of a barrier it is to natural stream flow and function. It is a delicate balance.

The Problem Visualized:

A Damaging Logjam

A logjam that has dammed the stream. A large amount of debris has been captured by the jam, reducing water flow and creating poor water quality in the trapped water. (Mike Fruth)

A Beneficial Logjam

A logjam and a log weir that have been constructed to facilitate habitat, spawning environment and easy transportation for fish species. This was purposefully created and is maintained on a regular basis to ensure its positive functionality. (www.cityoffederalway.com)

Controlling Dams and Logjams

What **You** Can Do:

Most natural dams (logjams and beaver dams) are short-lived and eventually collapse, threatening life and property downstream. You may be liable if a dam on your property negatively affects someone downstream.

If a dam has been illegally created in a stream on your property, or if a natural dam occurs on your property, it should removed as soon as possible to alleviate extensive damage. However, it is recommended that you have some assistance with the removal (ACOE, IDNR, IEPA, NRCS or SWCD).

Logjams or illegal dams are not the best way to create a pond on your property, and have a negative domino affect down the length of the stream.

A crew removing a beaver dam. (www.pinelakeslid.org)

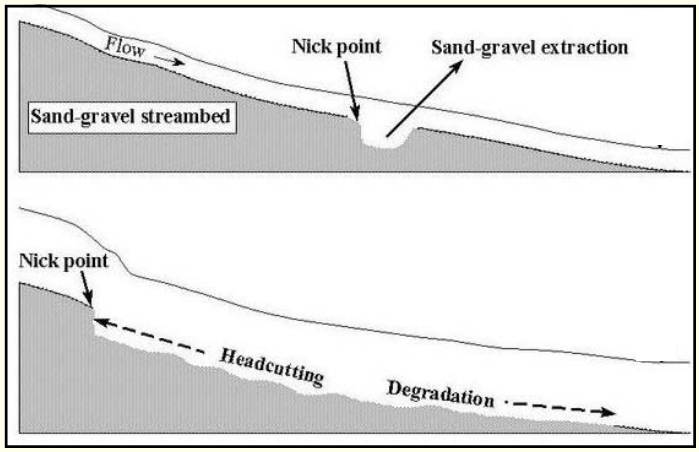
The most important thing you can do for the health of your stream and the surrounding watershed is regular maintenance to control logjams. It is critical to preventing extensive, expensive restoration at a later date.

When To Call A Professional:

Creating a dam on your property is illegal, under both state and federal law. Your must obtain a permit (see bottom of page 11).

If you are going to remove a dam, get professional advice or assistance to remove it, and it is required that all of the dam materials be removed outside the floodplain **and** that you do not alter the stream banks. If debris remains in the floodplain, it will end up back in the stream after a significant rain event.

Logjams are sometimes the result of headcutting in the stream channel. Headcutting is the stream's response to channelization or dredging. When the stream's depth or slope is changed, the stream attempts to level out between the depth of the dredge and the un-dredged area (see image above). This backward flow erosion results in failing streambanks causing trees to fall into the stream.



A depiction of headcutting as a result of streambed removal.
(http://ponce.sdsu.edu/three_issues_sandminingfacts01.html)

In this instance, you will need professional assistance because constructed "grade control structures" will be needed to stabilize the stream channel. If you notice headcutting and the resultant tree fall occurring in your area, contact a professional.

Eradicating Invasive Species

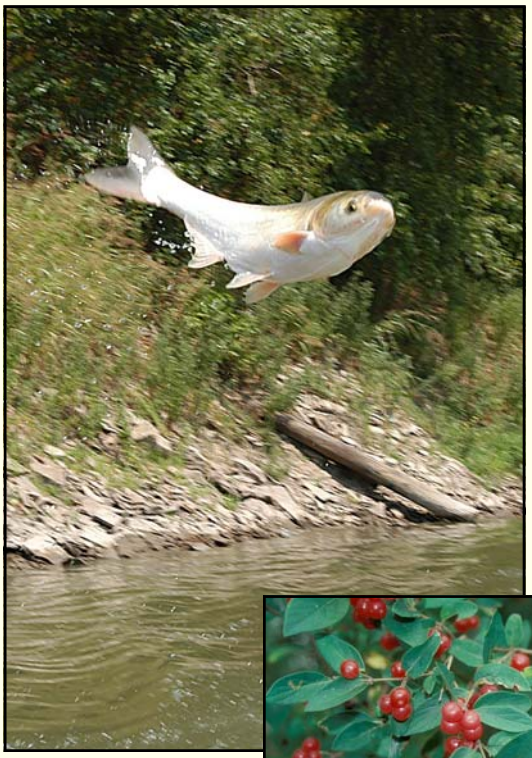
The Problem:

Invasive species are exotic (non-native) species that, when introduced into our environment, dominate their ecosystem and compete with native species for resources.

Not all exotic species are invasive. A species usually becomes invasive when there is an absence of natural control in the new environment, such as a predator. When this natural balance is unchecked, exotic species' populations can explode out of control, dominating and severely damaging our native ecosystems.

Some examples of invasive species in southwestern Illinois streams are Asian clams, Asian carp, purple loosestrife, and bush honeysuckle. These pests severely damage the habitat and may reduce or eliminate populations of many of our native species. In order to keep bird-watching, sport fishing and water-centered activities alive and well, these species must be controlled or eradicated.

The Problem Visualized:



Left: An invasive Asian carp jumps high out of a stream. (agebb.missouri.edu)

Right: Bush honeysuckle fruits. (John Randall, TNC)

What You Can Do:

Learn to identify invasive plants and animals: on your property, in plant catalogs, and at your local nursery. Once you have learned what they look like, you can remove these species from your property or avoid introducing them.

Educate your neighbors, both up and down stream from you, and local nursery owners, about invasive species. They spread quickly and could spread back to your property even after you remove them.

Do not dump your aquatic pets into a stream, even if they are dead, and if you move your boat between water bodies, wash it to prevent species transfers.

When To Call A Professional:

Identifying invasive species, especially distinguishing them from native relatives, can be difficult. The SWI RC&D has put together an educational brochure on this topic. Please contact us if you would like to receive a copy.

Other good resources for exotic species identification and eradication guidance are IDNR and NRCS. Contact a professional if there is a heavy infestation on your property and you need help with removal, or if you are unsure of the species or the proper time of year to remove it—you may do more damage than good.

Fire has been a successful eradication method for many invasive plants, but **you need professional assistance, and possibly approval, to conduct a prescribed burn**.

Stream Teams

A Stream Team is an organization of concerned citizens that works to address stream and water quality problems in their local area. These community-based organizations bring together both public and private funding to address problems stemming from pollution, alteration, and the mismanagement of natural resources. They also provide much-needed community education, spurring their neighbors and coworkers into positive action.

A Stream Team's activities can be extremely varied, based on the needs of the area. From clean-up events to routine technical monitoring of stream health and water quality issues, landowners, students, and local businesses can bond together to make a positive impact on the health of their local water system.

Currently, the only Stream Team program in Illinois is the Prairie Rivers Network Stream Team based out of Champaign, Illinois (www.prairierivers.org). They concentrate their efforts on water quality monitoring. A good example of how to start a Stream Team clean-up program in your area is the Stream Team organization in Missouri, www.mostreamteam.org.

Adopt-A-Stream Program sign. (www.pwswcd.org)

Many communities also have "Adopt-A-Stream" programs, similar to the "Adopt-A-Highway" program that has been so successful in community clean-up efforts.

However you choose to become involved, use this guide booklet to start determining the needs of your local stream system and how to correct those problems.

Stream Clean-Up

Before & After

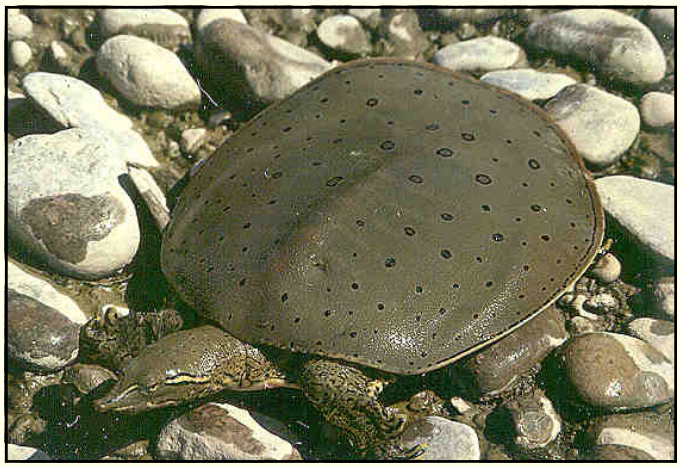
An example of the trash present in an Illinois stream. (Mike Fruth)

The product of a stream clean-up. (river.communitycrossings.net)

Wildlife of Southwestern Illinois Streams

The largemouth bass enjoys the quiet, deep pools that some streams contain. The cool water is prime mating habitat for the bass. Their diet consists of fish, worms, snakes, frogs, crawfish and insects, which they swallow whole and then digest. They are a very popular target for sport fishermen.
(www.duiops.net)

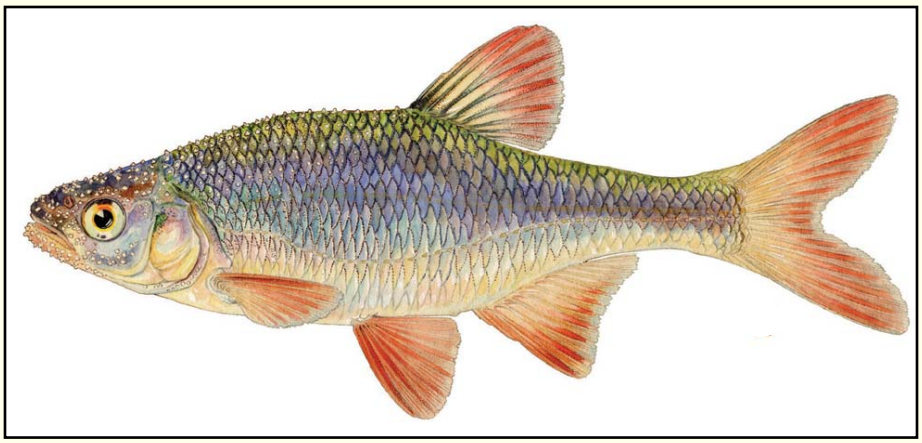
The eastern tiger swallowtail butterfly, along with many other butterfly species, relies on the water from the stream as drinking water and can often be seen on the sandbars along and in the streams, drinking from the damp sand.
(www.pbase.com)



The eastern spiny softshell turtle is the Illinois turtle most adapted to aquatic life. It feeds on fish, burying itself up to its head in the sand and waiting for its prey to swim by. It can remain underwater for long periods, absorbing oxygen through its skin. Its spotty shell helps it blend in with the stream bed.
(www.marshall.edu)

The longear sunfish builds conspicuous nests by creating a shallow depression and removing silt, leaving a clean gravel surface on which to lay its eggs. It then vigorously defends its nest from other fish that try to eat its eggs.
(www.cnr.vt.edu)

Wildlife of Southwestern Illinois Streams



The redfin shiner relies on the presence of the spawning sunfish in the stream. It lays its eggs in the sunfish's nest and lets the sunfish protect its eggs as if they were its own. (fish.dnr.cornell.edu)

The belted kingfisher is a predatory bird in the stream ecosystem. Its diet consists exclusively of fish. It is often seen hovering before it plunges headfirst into the water to catch a fish. It usually announces its presence with a large, rattling cry. Female birds, like the one shown here, have a blue breast band, a red chest band and flanks, and males just have the blue breast band. (www.alanmurphyphotography.com)

The northern crayfish lives in areas of the stream that have a swift current. They rely on rocks, logs or thick vegetation for shelter, which they use to hide from their predators. They have a high tolerance for low levels of oxygen and can leave the stream to forage for food along the bank, or to travel to another body of water. (wri.sdstate.edu)

The cricket frog is one of the many animals that lives part of its life in an aquatic habitat. It lays its eggs in the water and has a totally aquatic tadpole stage. They require permanent or flowing water and enjoy streambanks with low vegetation. They hibernate in winter in the muddy stream bottom. (departments.ozarks.edu)

Resources & References

Federal Agencies

- US Army Corps of Engineers—St. Louis District
  www.mvs.usace.army.mil/permits/illinois.htm

- US Fish and Wildlife Service
  www.fws.gov

- USDA Natural Resources Conservation Service—Illinois
  www.il.nrcs.usda.gov

State Agencies

- Illinois Department of Natural Resources
  www.dnr.state.il.us & (618) 594-3627

- Illinois Department of Transportation
  www.dot.state.il.us

- Illinois Environmental Protection Agency
  www.epa.state.il.us
  Bureau of Water: (217) 782-3362
  - IEPA has also produced a series of publications called "Lake Notes" about issues confronting Illinois' water resources. The following are some available titles in this series. For more information and to request copies, please contact the Bureau of Water (see above):
    - Aquatic Exotics (October 96)
    - Aquatic Plant Management Options (November 97)
    - Artificial Structures for Fish Cover (January 04)
    - Beavers and Muskrats (February 01)
    - Common Lake Water Quality Parameters (December 98)
    - Fertilizers and Pesticides (October 96)
    - Home and Yard (January 97)
    - Illinois Clean Lakes Program (January 97)
    - Illinois Volunteer Lake Monitoring Program (VLMP) (January 98)
    - Lake Aeration and Circulation (November 97)
    - Lake Dredging (June 98)
    - Lake Stratification and Mixing (November 97)
    - Monitoring Lake Quality (December 98)
    - Pressure-Treated Wood (February 01)
    - Septic Systems (August 95)
    - Shoreline Buffer Strips (October 96)
    - Shoreline Stabilization—Bioengineering Alternatives (October 96)
    - Stormwater Detention Ponds (June 98)
    - The Milfoil Weevil (November 01)
    - Waterborne Pathogens (October 04)
    - Zebra Mussels (January 04)

Resources & References

- Ohio Department of Natural Resources Stream Management Guides
  www.dnr.state.oh.us/water/pubs/fs_st/streamfs.htm

- Tennessee Department of Environment and Conservation—A Landowner's Guide to Streambank Protection and Stabilization
  www.state.tn.us/environment/wpc/publications/Streambank/strmbank.shtml

Local Agencies

- Soil & Water Conservation Districts—Illinois counties (www.aiswcd.org)
  - Bond County: (618) 644-0555
  - Clinton County: (618) 526-7919 & www.geocities.com/clintoncountyswcd
  - Madison County: (618) 656-7300 & www.madisonilswcd.org
  - Monroe County: (618) 939-6181
  - Randolph County: (618) 443-4381
  - St. Clair County: (618) 233-5583
  - Washington County: (618) 327-3078

Non-Profit and Community Organizations

- Greenway Network, Inc.—St. Charles, Missouri
  www.greenwaynetwork.org

- Missouri Stream Team
  www.mostreamteam.org

- Prairie Rivers Network—Illinois Stream Team
  (217) 344-2371 & www.prairierivers.org & info@prairierivers.org

- Prince William Conservation Alliance
  www.pwconserve.org

- Southwestern Illinois Resource Conservation & Development, Inc.
  www.swircd.org

- University of Virginia—A Stream Corridor Protection Strategy for Local Governments
  www.virginia.edu/ien/docs/streamguide.final.pdf

- Virginia Cooperative Extension—Landowner's Guide to Managing Streams in the Eastern United States
  www.ext.vt.edu/pubs/forestry/420-141/420-141.html

Southwestern Illinois Resource Conservation & Development, Inc.

The Southwestern Illinois RC&D, Inc. is a not-for-profit corporation formed in 1989 to address regional natural resource concerns. The Southwestern Illinois RC&D, Inc. will develop and support partnerships, create programs and implement projects that are responsive to the needs of the people within the region, that strengthen local economies, and that encourage the conservation of our environmental resources. Technical assistance is provided to the Southwestern Illinois RC&D, Inc. through USDA-NRCS.

The Southwestern Illinois GIS Resource Center

A division of Southwestern Illinois RC&D, Inc., provides GIS services, which include the collection, creation, analysis and display of geographic data. The Resource Center combines a comprehensive, regional data library with innovative technology and experienced staff to provide solutions and support to civic leaders, communities, agencies and other not for profit organizations. A geographic information system (GIS) is a digital tool used to store geographic locations of features such as natural resources, transportation routes, utilities, and parcel boundaries. GIS technology integrates powerful database capabilities with the visual perspective of a map. GIS has become a common tool for providing a new level of analytical capability in diverse disciplines such as land use, transportation or natural resource planning, utility management and environmental assessment.

The Land Conservancy (TLC)

A division of Southwestern Illinois RC&D, Inc., was formed in 2003 in response to community need for voluntary tools for land conservation. TLC is a land trust, which offers permanent protection of land and its resources for the public benefit. TLC meets the requirements of a qualified 501(c) (3) non-profit conservation organization that can legally hold conservation easements. TLC is active in the counties of Bond, Clinton, Madison, Monroe, Randolph, St. Clair and Washington Counties in Illinois, but can hold conservation easements anywhere in the state.

Stewardship of Environmental Resources through Volunteer Efforts (SERVE)

SERVE, the volunteer program of the Southwestern Illinois RC&D, Inc., utilizes volunteer staff to provide technical assistance, outreach, and administrative support in a manner which strengthens the capacity and effectiveness of the overall organization. Volunteer positions are diverse, including office support, marketing, graphic design, web design, photography as well as many opportunities to provide outreach. Available positions, as well as an application form can be viewed on-line at: www.swircd.org/serve.htm

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