

# Riparian Area Management

# A CITIZEN'S GUIDE

From the Lake County Stormwater Management Commission  
Prepared with funds authorized by section 104(6)(3) of the Clean Water Act

## Successful Stream Management Practices



*Taking care of your property*

Bull Creek, Beach Park, IL

The shoreline of a lake or stream and the immediate adjacent area is called the *riparian zone*. As a riparian landowner, you reap benefits daily from the lake or stream's natural attributes. Not only is your property value enhanced, but wildlife and fish habitat, recreation use and water quality, important to us all, are dependent upon this zone. Proper management of riparian areas can also enhance the economic, social, and cultural benefits for your community.

In Lake County, over 400 miles of streams drain into some 170 lakes and rivers throughout 480 square miles of the

county. But, nearly every stream and lake has been affected to some degree by shoreline erosion and water quality degradation, often the result of urbanization.

Urbanization creates the addition of hard, or *impervious*, surface including roads, rooftops and parking lots, causing greater stormwater runoff. As runoff velocity and volume increases, streambanks erode, water becomes turbid, and sensitive habitats are degraded.

Changes to the natural shape of the stream, or *channelization*, often accompanies urbanization further disrupting habitat and

increasing erosion. Adding to the problem is the removal of native stabilizing vegetation along banks and shorelines that are replaced with invasive, less protective species.

In addition, many riparian landowners are not aware that inappropriate landscaping,

### Inside...

■ Tips for stabilizing shorelines and streambanks.

# Successful stream management Continued from page 1

improper disposal of lawn materials, and uncontrolled burning and dumping can cause erosion and poor water quality, too.

The results are sedimentation in streams and lakes which degrades water quality; downcutting and widening stream beds that displace fish habitat; loss of shoreline and streambank property; and destabilization of structures such as bridges, piers, and foundations.

There are useful, easy steps riparian landowners can take to reduce some of the effects of urbanization. Preservation and

conservation of streambanks, shorelines, and water quality rely on two principles:

- Informing riparian landowners on the causes and affects of soil erosion and poor water quality.
- Utilizing "Best Management Practices" (BMPs) for effective stream and watershed management.

*A restored streambank along Buffalo Creek. Native vegetation mats on the left bank will fill in through the spring and provide bank stabilization.*



## The components of riparian management

### 1 *More is not better.*

One of the largest problems for Lake County streams and lakes is high amounts of nutrients which produce excessive growth of algae and other aquatic plants. Nutrients can come from different sources but mostly from the overuse and misapplication of lawn fertilizers. TIPS:

- Follow directions. More is not better. Base fertilizer type and application rates on a soil test.
- Do not fertilize plants near streambanks and lake shores.
- Avoid spillage and application on impervious areas where they are readily washed off.
- Do not dump excess fertilizer, or anything into storm sewers.
- Use a mulching lawn mower to reduce the need for fertilizer application.

### 2 *Clear the bank.*

Streambank erosion can be worsened by leaves, grass clippings, and other yard refuse placed along streambanks. Existing vegetation and stabilizing roots are killed.

When combined with an increase in runoff, the bank soils become unstable and begin to erode into the water. Loss of land will eventually occur as more of the bank erodes. Yard waste washed into streams and lakes also causes water quality problems related to excessive nutrient and organic loadings. TIPS:

- Properly dispose of yard refuse. Check with your municipality about pick up.
- Do not burn yard refuse on or near the streambank. It pollutes the water and destroys stabilizing vegetation.
- Encourage your community or homeowners association to adopt an anti-dumping ordinance if they don't already have one.
- Try composting, it's easy and you can find out more about it by calling the Solid Waste Agency of Lake County (see page 6 for SWALCO information).
- Stockpile firewood and other materials away from the streambank. Logs and floatable materials contribute to debris jams and possible flooding.

### 3 *Excess debris spells disaster.*

Healthy streams provide effective storm-water conveyance and fish habitat. Often however, debris blockages occur, reducing channel capacity to convey water causing elevated flood stages, and reduced aeration of the water. Debris can also deflect streamflows into banks causing increased erosion. TIPS:

- "Urban artifacts" such as tires and old equipment should be removed immediately.
- Routinely check stream channels for fallen branches, limbs and other debris. While natural accumulations of woody debris are good for habitat, excessive amounts of debris should be removed to avoid stream blockages.

## 4 *Plant some roots.*

When ground and banks are left bare, soil washes off into nearby streams. An eroding bank makes it difficult to support vegetation and doesn't buffer other pollutants from entering the stream. TIPS:

- Establish vegetation on all bare areas. Temporarily stabilize with mulch or geotextile fabric for protection to minimize erosion.

- Preserve a "buffer strip" of at least 10 feet of dense, preferably natural vegetation to grow along the water's edge and stream-bank. This allows pollutants to filter out and the bank to stabilize.

- Plant vegetation native to the Midwest for best results (see plant listing).

- Native vegetation, both woody and prairie species, is naturally deep-rooted and able to stabilize sensitive slopes.

- Many "natural" appearing banks are in trouble because invasive plants like buckthorn don't provide effective stabilization and readily shed limbs contributing to debris jams. Invasive plants should be removed and replaced by native vegetation.

- Stabilize tiles and storm sewer outlets or other sources of concentrated flows into streams.

- Contact NRCS regarding removal of inappropriate vegetation and planting of desirable species.

## 5 *Short grass doesn't cut it.*

Short grass may look nice but doesn't have a deep root system and is ineffective as a pollutant filter or wildlife habitat. TIPS:

- Consider native grasses rather than Kentucky bluegrass (see "Native Plants").

- Never mow to the edge of a stream bank or shoreline. Leave a buffer of at least several feet for root development. As indicated, native vegetation buffers are preferred.

- Never cut bluegrass shorter than 2.5" in height. The height allows larger and deeper root systems making stronger defense against weeds and droughts.

## 6 *Tune into your channels.*

Natural meandering channels are often modified to improve drainage. Straightening, artificial lining, and dredging are some of the modifying practices. But channelization results in the removal of natural buffer strips and aquatic habitat zones, increased downstream flooding and erosion, and increased sediments loads. TIPS:

- Manage land use along the entire length of a stream.

- Minimize or avoid channel reshaping and straightening. Before any stream modi-

fications, consult your municipality or the Lake County Stormwater Management Commission.

- Incorporate natural structures in the channel design to improve habitat. Techniques could include pools, meanders, and native vegetation; for more severe erosion problems, lunkers and a-jacks. "Hard" erosion practices such as rip rap, concrete rubble, gabion baskets, logs and seawalls are rarely appropriate and usually cause more erosion.

- Implement bank stabilizing measures. Native plantings, maintenance, and no dumping practices can secure your bank or shoreline.

- Follow the Lake Co. Watershed Development Ordinance and companion Technical Reference Manual for regulations and Best Management Practices for channel preservation and construction.



Underneath the lawn clippings is an exposed streambank. Invasive plants like the buckthorn shrub (near the pipe) and reed canary grass (in the water) offer no stabilizing roots to stabilize the bank. These invasive plants should be removed and replaced with native vegetation.

# Alternative bank stabilizing methods

Streambank erosion generally occurs as a result of the action of streamflow against the toe (base) of an unprotected slope. While placing stone rip-rap, railroad ties, or concrete on an eroding streambank appears to solve the problem, these practices are often prone to failure as they do not stabilize the toe properly.

Another problem with "hard" solutions is that they do not dissipate any of the excess stream energy that was causing the erosion problem; rather they transfer and sometimes amplify this energy to the next section of unprotected streambank, creating a new set of problems. Unless the entire stream is treated in this manner, a costly and unsightly option, the erosion problem is not solved, only transferred and usually causing increased erosion.

In contrast, the use of vegetation in stabilizing streambanks is a proven low-cost, highly effective solution. Native vegetation features extensive root systems which help bind the soil in the streambanks. The top growth serves to deflect erosive stream flows away from the bank, while dissipating the energy of the stream. This reduces the potential for erosion problems to be transferred to new locations.



Bio-engineering techniques combine vegetation with structural practices. A-jacks (above) installed at the toe of the bank, and gabion baskets (below) installed on the slopes also help to slow water down. Different situations require different techniques so consult a professional for the best solution to your erosion problem.



Vegetation techniques typically involve conducting a minimum amount of exposed area, and implementing appropriate erosion control practices until the vegetation becomes fully established.

In areas where rapid streamflow occurs during rain events, a combination of vegetative and structural solutions may be more appropriate. A number of "bio-technical" practices are available, including Luncker Structures, A-Jack Structures, and Bio-Logs. In larger streams, these practices can also provide habitat for many types of fish.

Because problems result from poorly designed and constructed projects, land owners should seek professional assistance in determining the cause of their streambank erosion problem, as well as identifying possible alternatives and the need for permits. Depending on the scope and location of the project, federal, state, or local permits may be required.

For more on bio-engineering practices, see the "Streambank and Shoreline Protection Manual" available to download at [www.co.lake.il.us/smc/publications](http://www.co.lake.il.us/smc/publications).

## Go native with prairie plants

Consider establishing native plant prairies in your backyard. Native plant communities often contain dozens or hundreds of species. While many of the species are not commonly available in the retail landscape market, specialized native plant nurseries and landscapers can often obtain them. Also, check out soil and water conservation districts for annual tree, shrub and prairie plant sales, and suggested readings.

The plants listed here represent only a small portion of the native species potentially available for stream corridor landscaping.

However, as native plants often have more specialized requirements to become established and thrive, it is important that the proper plant material be selected. Some factors to consider include the soils present, amount of sunlight available, depth and velocity of stream flow during storm events, and competition from non-native species.

TIPS:

- Avoid canned wildflower mixes. They often contain non-native species or a high percentage of annuals that provide no long term stabilization benefits.

- Avoid seeding of native grasses or wildflowers in stream corridors as the seed can be washed away during high flows. Instead, use rooted plant material that can be firmly planted into the ground.

- Get a copy of NIPC's "Native Plant Guide" appropriate native plants for northeastern Illinois. To order, call the Lake County SWCD.

- Call the Chicago Botanic Garden, a local garden club, forest preserve district, arboretum, conservation group and others for information and courses on designing, installing, and maintaining native landscapes.

### Desirable Plant Species Trees \*

Common Name	Genus/species
Red Maple	Acer rubrum
Swamp White Oak	Quercus bicolor
Bur Oak	Quercus macrocarpa
Basswood	Tilia americana

### Shrubs \*

Common Name	Genus/species
Buttonbush	Cephalanthus occidentalis
Red-Osier Dogwood	Cornus stolonifera
Elderberry	Sambucus canadensis
Arrowwood	Viburnum dentatum

### Emergent Wetland Plants \*

Common Name	Genus/species
Sweet Flag	Acorus calamus
Water Plantain	Alisma subcordatum
River Bulrush	Scirpus fluviatus
Arrowhead	Sagittaria latifolia

### Shoreline Flowers \*

Common Name	Genus/species
Blue Flag Iris	Iris virginica
Yellow Coneflower	Ratibida pinnata
Black-Eyed Susan	Rudbeckia hirta

### Shoreline Grasses \*

Common Name	Genus/species
Big Bluestem	Andropogon gerardii
Bluejoint Grass	Calamagrostis canadensis
Switch Grass	Panicum virgatum
Prairie Cord Grass	Spartina pectinata

\*Many more desirables exist.



Buck Thorn

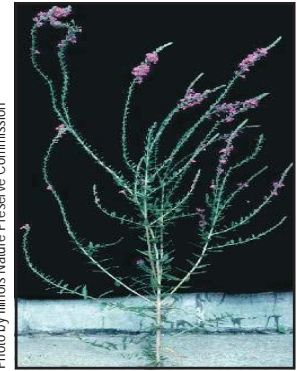


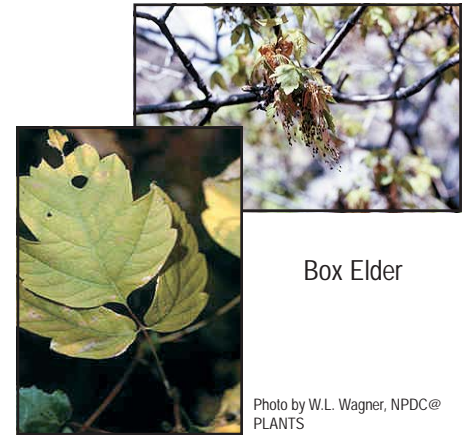
Photo by Illinois Nature Preserve Commission

Purple Loose Strife



Photo by Kenneth R. Roberts, INHS

Garlic Mustard



Box Elder

Photo by W.L. Wagner, NPDC@ PLANTS

### Undesirable Plant Species

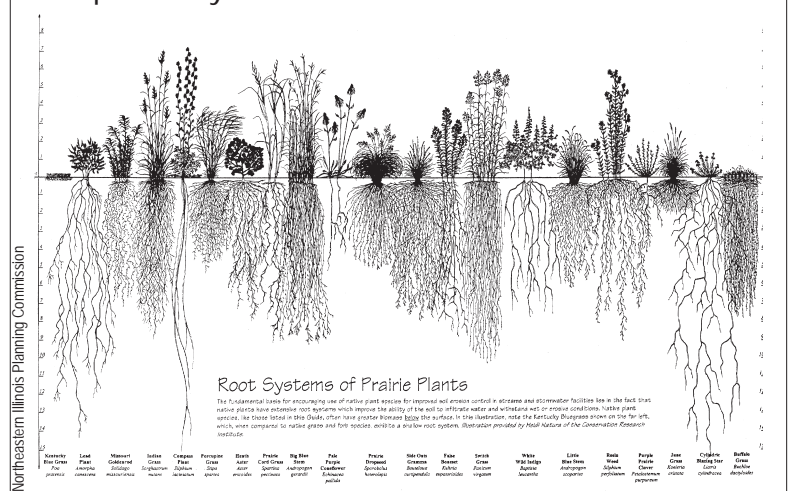
Common Name	Genus/species	Growth Form
Box Elder	Acer negundo	Tree
Garlic Mustard	Alliaria officinalis	Groundcover
Tartarian Honeysuckle	Lonicera tatarica	Shrub
Reed Canary Grass	Phalaris arundinacea	Grass
Common Buckthorn	Rhamnus cathartica	Shrub
Glossy Buckthorn	Rhamnus frangula	Shrub
Multiflora Rose	Rosa multiflora	Shrub
Purple Loosestrife	Lythrum Salicaria	Plant

### Rain Gardens and Rain Barrels



Rain gardens are just what they sound like - gardens that soak up rain water, mainly from your roof, but also from your driveway and lawn. They are landscaped areas planted to wild flowers and other native vegetation to replace areas of lawn. The gardens fill with a few inches of water and allow the water to slowly filter into the ground rather than running off to storm drains. Compared to a patch of conventional lawn, a rain garden allows about 30 percent more water to soak into the ground. Try rain barrels, too, to filter rain water and to water your plants.

### Deep Root Systems Can Stabilize Banks and Shores



# Where to go for more information (updated 2014)

## Stream/shoreline Best Management Practices

Lake Co. Stormwater Management Commission (SMC)  
500 W. Winchester, Suite 201  
Libertyville, IL 60048  
(847) 377-7700  
[www.lakecountyil.gov/stormwater](http://www.lakecountyil.gov/stormwater)

## Bank stabilizing methods, bioengineering techniques

SMC

## Channel modification methods, permits

Your municipality, SMC

## Lakes management, pollutants, water quality

Lake Co. Health Department  
Lakes Management Unit (LCHD)  
500 W. Winchester Rd.  
Libertyville, IL 60048  
(847) 377-8000  
<http://health.lakecountyil.gov/Population/Pages/Lakes-Management.aspx>

## Soil erosion, plant species, pesticides/ fertilizer uses

SMC, LCHD

## Native Plant Information

Native Plant Guide available for purchase at SWCD or download from the Natural Resources Conservation Service:  
[www.nrcs.usda.gov/wps/portal/nrcs/main/il/plantsanimals/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/il/plantsanimals/)

## Additional publications on Best Management Practices:

[www.lakecountyil.gov/stormwater/publications/bestmanagementpractices.htm](http://www.lakecountyil.gov/stormwater/publications/bestmanagementpractices.htm)

**Specific BMPs for homeowners, businesses, municipalities, agricultural and development, and stream/lake property owners:** [www.lakecountyil.gov/Stormwater/LakeCountyWatersheds/BMPs/Default.htm](http://www.lakecountyil.gov/Stormwater/LakeCountyWatersheds/BMPs/Default.htm)

## Wetlands, habitat, endangered species

U.S. Fish and Wildlife Service  
1250 S. Grove, Ste. 103  
Barrington, IL 60010  
(847) 381-2253  
[www.fws.gov/midwest/Chicago/](http://www.fws.gov/midwest/Chicago/)

Volo Bog State Natural Area  
28478 W. Brandenburg Road  
Ingleside, IL 60041  
(815) 344-1294  
<http://dnr.state.il.us/lands/landmgt/PARKS/R2/Volobog.htm>

Illinois Department of Natural Resources/  
Endangered Species Protection Board  
<http://www.dnr.illinois.gov/esp/Pages/default.aspx>

SMC, LCHD

## To report stream pollution

Illinois Environmental Protection Agency  
Citizen Pollution Complaint  
(800) 782-7860 (for environmental emergencies only)  
[www.epa.state.il.us/pollution-complaint/](http://www.epa.state.il.us/pollution-complaint/)

## To report wetland violations

SMC or  
U.S. Army Corps of Engineers -  
Regulatory Branch - Wetland Permits  
(312) 846-5530  
[www.lrc.usace.army.mil/Portals/36/docs/regulatory/forms/UAR.pdf](http://www.lrc.usace.army.mil/Portals/36/docs/regulatory/forms/UAR.pdf)

## Composting, yard waste disposal

Your municipality,  
Solid Waste Agency of Lake County (SWALCO)  
1311 N. Estes  
Gurnee, IL 60031  
(847) 336-9340  
[www.swalco.org](http://www.swalco.org)

## Other household guidelines

- Recycle used motor oil. Do not pour on the ground, in a stream or down a stormdrain. Stormdrains flow into nearby streams and lakes, contaminating water and sediments, and creating oil slicks. Rather, put your oil in a plastic container and take to the nearest oil recycling center (gas stations).
- Direct roof downspouts to grassed areas, not to driveways or other surfaces that don't allow the water to soak in. Install a rain garden or a rain barrel to capture runoff and pollutants. For more on rain gardens, see University of Wisconsin-Extension's brochure, "Rain Gardens - A Household Way to Improve Water Quality in Your Community" at: [www.lakecountyil.gov/stormwater/publications/bestmanagementpractices.htm](http://www.lakecountyil.gov/stormwater/publications/bestmanagementpractices.htm)
- Use small amounts of low-phosphorous detergents to wash your car to reduce the

amount of phosphorus getting to the stream or lake. Wash the suds into the grass not down your driveway.

- Limit your use of pesticides, fertilizers, and other substances that have serious impacts on aquatic life if discharged into streams or lakes. To dispose of latex paint, let the can dry out, then scrape what's left into the garbage. For unused oil-based paints and other solvents, pesticides, fertilizers, and spray cans, watch for local "household hazardous waste days" in your community or call SWALCO.
- Maintain septic tank systems properly. Regular inspections and licensed pumping should be done every two to three years. Call the Lake County Health Department for more on septic tank maintenance.