Chapter 3: Goals, Objectives, and Action Items

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Previous chapters have provided an introduction to the project and an inventory of the watershed. This chapter focuses on the goals, objectives, and action items of the Clear Creek Watershed Planning and Technical Advisory Committee. We provide a cross-reference to indicate which action items address each goal and objective. Action items are Best Management Practices (BMPs) that can be used throughout the watershed. BMPs can be in the form of policy and regulation, planning and zoning, stormwater management, nutrient management, and soil retention tools. With respect to the agricultural and rural nature of this watershed and plans by county officials for it to stay rural and agricultural, emphasis for BMPs in this watershed is heavily placed on streambank stabilization, soil retention tools, stormwater management, and nutrient management. In Chapter 4, the action items identified here are used in a GIS modeling study of the watershed to determine their benefit to water quality and quantities needed.

Goals and Objectives

The goals and objectives for the Clear Creek watershed are provided below in Figure 3-1. It is intended that the reader use Figure 3-3 to cross-reference these goals and objectives with the action items listed in Figure 3-2.

Figure 3-1: Goals and objectives for the Clear Creek watershed.

Goals	Objectives
1. Minimize erosion and sedimentation.	a. Decrease streambank and shoreline erosion.
	b. Deter flashy hydrology and minimize stormwater runoff.
	c. Reduce soil loss from crop fields.
	d. Implement best management practices as pilot projects to use as examples and to test procedures.
	e. Trap sediment before it enters the stream or lake.
2. Minimize nutrient loading into surface waters and groundwater.	a. Reduce nutrient leaching into the groundwater.
	b. Reduce nutrient loading into the stream and lake from subsurface sources.
	c. Reduce nutrient loading into the stream and lake from surface runoff.
3. Protect "Class A" and other productive soils.	a. Prevent conversion of land use.
4. Protect, enhance, and manage wildlife and their habitats.	a. Protect existing wildlife habitat and high quality natural areas.
	b. Manage wildlife habitat and natural areas.
	c. Reduce fragmentation of wildlife habitat and natural areas.
	d. Manage overpopulated wildlife.
	e. Create new wildlife habitat.
5. Protect the rural lifestyle.	a. Maintain relative percentages of current land uses.
	b. Support opportunities for recreation, hunting, and fishing.
	c. Consider the economics involved for the individual producer in each conservation action.

Action Items

In order to satisfy the goals and objectives listed above, the Clear Creek Watershed Planning Committee and Technical Advisory Committee identified the following action items.

Figure 3-2: Action items that address the goals and objectives.

Priority	#	Action Item	Category
*	1	Stabilize streambank along permanent and intermittent streams, including the creation of check dams to slow water velocity.	Stream
*	2	Stabilize shoreline at Lost Lake.	Stream
*	3	Increase acreage of conservation farming and creation of grassed waterways on all farmland including highly erodible lands (HEL), using techniques such as no-till and strip till.	Rural
*	4	Create wetlands.	Rural
*	5	Construct rain gardens near homes.	Urban
*	6	Create filter strips.	Rural
*	7	Construct buffer strips with paths mowed at a diagonal along Lost Lake shoreline.	Urban
	8	Create stormwater holding ponds with dikes and berms to slow water velocity.	Stream
*	9	Construct a sediment control basin at the confluence of Babbling Brook and Lost Lake.	Stream
*	10	Expand the sediment control basin at the confluence of Clear Creek and Lost Lake.	Stream
	11	Limit the access of cattle to the stream.	Rural
	12	Provide shady areas and alternative water sources for cattle to decrease their time spent in the stream.	Rural
*	13	Manage fertilizer, herbicide, nutrient, and insecticide loss.	Rural
	14	Preserve prime farmland and farmland of statewide importance by activating agricultural easements.	Rural
*	15	Require homeowners to conduct inspections on their septic systems every 3 years.	Urban
*	16	Continue the campaign to use zero phosphorous fertilizers in residential areas.	Urban
*	17	Preserve priority natural areas, wildlife habitat, and open space with conservation easements and land aquisition.	Rural
	18	Create wildlife corridors between existing wildlife habitat and natural areas.	Rural
	19	Convert land around important, existing natural areas to wildlife habitat and natural area buffer.	Rural
	20	Manage important natural areas and wildlife habitat.	Rural
	21	Create recreation trails.	Urban
	22	Manage overpopulated wildlife by hunting deer with nuisance permits, addling eggs for goose control, and trapping beaver.	Rural/ Urban
	23	Continue to participate in long range planning efforts with the community.	Urban/ Rural
	24	Give presentations to landowners and farmers about runoff.	Rural
	25	Provide educational guidelines to landowners and farmers for management of runoff.	Rural
	26	Educate producers to make sure that they are aware of techniques and financial support to manage soils, residue, and contours.	Rural
	27	Use the Babbling Brook and Lost Lake Streambank Stabilization Project as a pilot project.	Stream
	28	Use projects as demonstrations, such as with The Nature Conservancy.	All
	29	Educate homeowners about best practices for home and yard.	Urban
	30	Partner with organizations that share similar missions.	All

Cross Referencing

Several of the action items address more than one goal and objective. Table 3-3 explains which goal and objective is addressed by each action item by tabulating a cross-reference. Numbers and letters for goals and objectives correspond to the numbering system used in Table 3-1. Action item numbers correspond with the system used to number Table 3-2.

Figure 3-3: Goals and objectives cross-referenced with corresponding action items.

Action Item #	Goals and Objectives																
	1					2			3	4					5		
	a	b	c	d	e	a	b	c	a	a	b	c	d	e	a	b	c
1	x	x		x	x			x									
2	x			x				x									
3	x	x	x	x	x	x	x	x						x		x	x
4		x		x	x	x	x	x			x	x		x		x	
5	x	x		x	x	x	x	x						x			
6	x	x	x	x	x			x				x		x		x	x
7	x			x				x					x	x			
8	x	x		x	x			x						x		x	
9				x	x			x									
10				x	x			x									
11	x			x				x									
12	x			x				x									
13				x		x	x	x									x
14									x						x		x
15				x		x	x										
16						x	x	x									
17	x	x		x		x	x	x	x	x		x			x	x	
18												x		x		x	
19										x	x	x		x		x	
20											x					x	x
21																x	
22													x			x	x
23									x	x		x		x	x	x	x
24	x	x	x	x		x	x	x									
25	x	x	x	x		x	x	x									
26	x	x	x	x	x	x	x	x									
27				x													
28				x													
29	x	x		x	x	x	x	x						x			
30																	

Definitions

This section defines and explains each action item. Since each action item relates directly to goals and objectives, the goals and objectives are not individually defined. Overall, the Best Management Practices (BMPs) that are suggested by the action items involve both structural and non-structural to reduce pollutant loads in watersheds. Although there is no universally accepted definition of a BMP, the Soil and Water Conservation Society provides a definition that fits with the intent of this project. It defines a BMP as "a practice or combination of practices that are determined by a state or designated area-wide planning agency to be the most effective and practicable (including technological, economic, and institutional considerations) means of controlling point and nonpoint source pollutants at levels compatible with environmental quality goals" (Evans and Corradini, 2001).

1. *Stabilize streambank along permanent and intermittent streams, including the creation of check dams to slow water velocity.*

   Streambank stabilization refers to the restoration and protection the banks of streams and excavated channels against scour and erosion using techniques using vegetative plantings, soil bioengineering, structural systems, or any combination thereof. These techniques provide two categories of protection:

   (1) Reduce the force of water against the bank and
   (2) Increase the resistance of a bank to erosive forces.

   To reduce the force of water against the streambank, techniques likely to be used along Clear Creek and Babbling Brook include stormwater reduction or retention methods; grade reduction; and designs that reduce flow velocity such as tree or brush revetments, jacks, stream jetties, barbs, increasing channel sinuosity, and log, rootwad, and boulder combinations. To increase the resistance of a bank to erosive forces, the techniques likely to be proposed for our watershed include concrete, rip rap, stone toe protection, gabions, interlock block, coir fiber logs with vegetated slope, thinning tree canopy, and native vegetation installation (NRCS, 1996).

2. *Stabilize shoreline at Lost Lake.*

   The definition of shoreline stabilization mirrors that of streambank stabilization, except in reference to lake shores. Techniques that are being used at Lost Lake thus far include rip rap, coir log breakwater with reconstructed emergent wetland, and concrete block wall.

3. *Increase acreage of conservation farming and creation of grassed waterways on all farmland including highly erodible lands (HEL), using techniques such as no-till and strip till.*

   Conservation farming, also called crop residue management, refers to any production system that leaves at least 30% of the soil surface covered with crop residue after planting to reduce soil erosion by water. Some such practices include conservation, strip, ridge, slit, and mulch tillage; no-till planting; and seasonal residue management (Ritter and Shirmohammadi, 2001 in Evans and Corradini, 2001). Strip, ridge, and slit tillage refer to methods used to minimize the disturbance of crop residue between the rows by tilling the field along rows. Seasonal residue management leaves the residue on the field between harvest and planting and tills the residue over immediately before planting (Evans and Corradini, 2001).

   Highly erodible lands (HEL) are lands sensitive to erosion as determined by the erodibility index. If the land is used for producing an agricultural commodity, HEL would have an excessive average annual rate of erosion in relation to the soil loss tolerance level, as determined through application factors from the universal soil loss equation and wind erosion equation. Factors of determination include climate, soil erodibility, and slope (US Legal, 2011). The local NRCS office houses maps denoting HEL locations in the watershed.

   Grassed waterways are natural or constructed channels lined with perennial grasses to provide a stable conveyance of excess runoff where flows are of a relatively short duration. They are designed to carry the amount of excess flow without causing damage to the waterway or its lining. For this watershed, we foresee their use mainly for conveying runoff from agricultural fields, but they can also be used for spillways, floodways, diversions, and waterways (NRCS, 2007*a*).

4. *Create wetlands.*

   For the purposes of the Clean Water Act and this Plan, wetlands are "those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (EPA, 2009). Wetlands are a significant factor in flood control and water retention. They reduce flow velocity, re-charge groundwater aquifers, trap sediment and control pollutants (Novitski et. al., 1997). Most of the wetlands in the watershed have been drained and their land use has been altered. Their hydric soil properties still identify their locations, mostly along the streams. The restoration of these wetlands would serve the functions listed above, ultimately deterring the flashy hydrology that threatens downstream banks from the erosive forces of water during storm events.

The potential for restoring wetlands is located within boundaries of hydric soils. Hydric soils are "soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (NRCS, 2011). Hydric soils, combined with wetland vegetation and hydrology, are used to define and identify wetlands.

5. *Construct rain gardens hear homes.*

   A rain garden is a depression in a yard planted to wildflowers and other native vegetation. It absorbs rain water originating from a nearby impervious surface like rooftops, streets, and driveways. The rain garden fills with a few inches of rain water after a storm. Typically, there is no outlet for the water from the rain garden. Therefore, all of the water entering it that would otherwise travel into a nearby storm drain slowly filters into the ground. Compared to a conventional patch of lawn, a rain garden allows about 30% more water to soak into the ground (Bannerman and Considine, 2003).

6. *Create filter strips.*

   Filter strips are areas of land maintained with some type of permanent vegetative cover, strategically placed on along the edge of a water body or drainage area, for the purpose of trapping pollutants contained in surface runoff from adjacent lands. The filter strips can be established on the edges urban lawns, cropland, confined animal facilities, steep slopes, and streams and lakes. Permanent vegetation can be herbaceous plants like grasses and forbs, shrubs, trees, or some combination thereof. Pollutants are removed by a variety of methods that occur when water is slowed, including filtration, infiltration, adsorption, absorption, uptake, volatilization, and deposition. The predominant processes are infiltration of dissolved pollutants and deposition of pollutants bound to sediment. Filter strips are also called vegetated buffer strips, conservation buffers, buffer zones, or buffer strips (Evans and Corradini, 2001).

7. *Construct buffer strips with paths mowed at a diagonal along Lost Lake shoreline.*

   Buffer strips are synonymous with filter strips, as defined above. A diagonally-mowed path through a stand of permanent vegetation will deter Canada geese, a known nuisance wildlife species at Lost Lake.

8. *Create stormwater holding ponds with dikes and berms to slow water velocity.*

   A stormwater holding pond is a ponding area to provide for peak flow attenuation and water quality improvement. It is typically applicable to areas where the downstream capabilities of conveying water are limited by a culvert or storm drain associated with road projects (Mn/DOT, 2003). In our watershed, it might be used to deter flashy hydrology associated with storm events, especially upstream from channelized sections of the stream.

9. *Construct a sediment control basin at the confluence of Babbling Brook and Lost Lake.*

   A water and sediment control basin is "an earth embankment or a combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin." It can be effective in reducing the sedimentation of the downstream water body, and is usually used in areas where preventative measures upstream are not practical, or will not be realized (NRCS, 2007*b*). It is recommended to construct a sediment control basin at the confluence of Babbling Brook and Lost Lake to prevent sediment and associated pollutants from Babbling Brook from entering Lost Lake. Although preventative measures are recommended for Babbling Brook, it is not guaranteed that all of the recommended BMPs will be implemented. It is also estimated that the recommended BMPs will reduce pollutant loading into the stream, but not eliminate it.

10. *Expand the sediment control basin at the confluence of Clear Creek and Lost Lake.*

    A sediment control basin, as defined in Action Item 9, exists at the confluence of Clear Creek and Lost Lake. We recognize that the basin needs to be expanded in order to capture more sediment travelling down Clear Creek to prevent it from entering Lost Lake.

11. *Limit the access of cattle to the stream.*

    Access of cattle to the stream can be limited by fencing, providing designated crossings, and limiting the time that cattle have access to the stream. These measures will mitigate the effects of cattle trampling streambanks, destroying protective vegetation, stirring sediment in the stream bed, and defecating and urinating in the stream (Evans and Corradini, 2001).

12. *Provide shady areas and alternative water sources for cattle to decrease their time spent in the stream.*

    Cattle need water and shade sources to prevent heat stress, but utilizing a stream to provide these resources can be detrimental to the health of both the cattle and the stream. Cattle are at risk of heat stress when temperatures exceed 77 degrees Fahrenheit. Other environmental factors play a role in heat stress, including access to water, shade, diet, relative humidity, wind speed, solar radiation, ground cover, and nighttime temperatures. Characteristics of the cattle will also affect an individual's susceptibility, including hide color, breed, and health. When cattle are stressed, they stand in ponds, gather in shade, increase water consumption, decrease grazing activity, and pant (Southwest Farm Press, 2009). By relying on the stream for their water and shade, cattle contribute to the pollutant loading of the stream, as measured in Chapter 4. If the water quality is poor in the stream, this arrangement can also take its toll on the health of the cattle. Some suggestions include fencing the cattle out of the stream and

providing an Alternative Watering System, such as traditional, nose, ram, and solar pumps (Missouri Dept. of Conservation, 2011*a*). Shade can be provided using either natural materials, such as trees, or man-made materials, such as cloth and metal structures. It may be beneficial to construct a portable shade cloth structure, as permanent shade locations may concentrate manure and moisture, leading to other problems (Garcia, 2006). Cost-share assistance is sometimes made available through the USDA Natural Resources Conservation Service.

13. *Manage fertilizer, herbicide, nutrient, and insecticide loss.*

    Managing fertilizer, herbicide, nutrient, and insecticide loss refers to developing farm-wide management plans that optimize forage and crop yields while minimizing the loss of nutrients and other pollutants to surface and groundwater resources (Evans and Corradini, 2001).

14. *Preserve prime farmland and farmland of statewide importance by activating agricultural easements.*

    An agricultural easement is a deed restriction used by landowners (grantors) to authorize a qualified conservation organization (grantee) to monitor and enforce the restrictions set forth in the agreement. They are flexible documents that can be tailored each property and the specific needs of the landowners, and are crafted jointly by the grantors and grantee. The easement can either cover the entire parcel or just a portion (American Farmland Trust, 2008).

    Prime farmland is defined as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops" (NRCS, 2011). Farmland of statewide importance is land other than prime or unique farmland that is also highly productive (NRCS, 2011).

15. *Require homeowners to conduct inspections on their septic systems every 3 years.*

    Septic systems are used when sewage treatment plants are not accessible. They treat and dispose of waste water originating from household uses. They consist of the septic tank, drainfield, and soil beneath the drainfield. The tank is a water-tight, concrete box buried into the ground. A pipe connects the tank to a drainfield, which consists of two to five trenches excavated into the subsoil with the purpose of delivering wastewater to the soil. The soil purifies the water before it reaches the groundwater or nearby streams, lakes, or ponds. This system needs regular maintenance, including periodically having the solids pumped out of the system, maintaining adequate vegetative cover over the drainfield, and monitoring the system on a regular schedule. Preventatively, the owner should not put anything detrimental to the system down the drain, including oil, grease, chemicals, sanitary products, or other materials (Tyler et. al., 1977).

16. *Continue the campaign to use zero phosphorous fertilizers in residential areas.*

    Phosphorous is found in common household products like laundry and dish detergent, and it is also found in many fertilizers. When phosphorous enters the lake from these sources, either by runoff or through a septic system, it feeds algae and other lake vegetation. An excess of phosphorous in the water can lead to algal blooms.

    A campaign has been initiated for the Lost Lake Community to be a "zero phosphorous community." In other words, the community is committed to using products that are phosphorous-free.

17. *Preserve priority natural areas, wildlife habitat, and open space with conservation easements and land acquisition.*

    There are 3222 acres in natural vegetation, such as forest, prairie and wetland. These areas provide many environmental functions, such as reducing runoff, providing habitat, and filtering NPS pollutants from the stream and groundwater. There are various land protection tools available for landowners that wish to voluntarily protect properties with significant natural features, like wildlife habitat, open space, and scenic quality. Local land trusts are good resources to determine the land preservation option that is right for particular landowners and their land. One such tool is a conservation easement, which is a deed restriction like that described above for agricultural easements, except for properties with significant natural value (American Farmland Trust, 2008).

18. *Create wildlife corridors between existing wildlife habitat and natural areas.*

    Wildlife corridors are narrow strips of land that connect isolated patches of wild habitat, where the surrounding landscape serves as a barrier. Barrier landscapes include human development such as residential subdivisions and crop fields, which are relatively void of habitat quality. Corridors increase biodiversity by allowing wildlife and plants access to a broader range of habitat (Roach, 2006). They have been proposed as a means to mitigate some of the effects of habitat fragmentation caused by encroaching development. When designing a corridor, attention should be given to habitat patch size, edge-to-area ratios, corridor length and width, and population size of the targeted wildlife or plant species. A corridor should be as wide as possible, with a minimum width of 1,000 feet when possible, and the corridor should be maintained with permanent, native vegetative cover (Bond, 2003).

19. *Convert land around important, existing natural areas to wildlife habitat and natural area buffer.*

    A natural area buffer is a vegetated area that protects a natural area from a non-compatible use, like residential development. Protection can be needed from pollutants, agricultural herbicides,

or edge habitat, which can house predators for wildlife specific to the interior portions of a habitat block.

20. *Manage important natural areas and wildlife habitat.*

    Natural areas and wildlife habitat, if left unchecked, will likely suffer from invasion of weedy, non-native plant species. These species usually cause degradation of natural area and wildlife habitat quality. It is important to manage the target areas according to a management plan that fits the specific needs of the site and landowners.

21. *Create recreation trails.*

    The *Ogle County Regional Greenways and Trails Plan* creates a vision for a county-wide system of recreation paths. Some such paths are recommended within the boundaries of the watershed (Scheaffer Landscape Architects, 2000).

22. *Manage overpopulated wildlife by hunting deer with nuisance permits, addling eggs for goose control, and trapping beaver.*

    Management for overpopulated, nuisance wildlife varies by species. Depending on the time of year, species of nuisance wildlife, and location in a rural or urban area, one might need a special permit to manage the animals. The Illinois Department of Natural Resources can issue permits to remove deer in areas where hunting is not allowed or outside of the hunting season or destroy Canada geese eggs or nests in certain situations. In rural areas, the IDNR encourages the removal of beaver whenever possible, during open hunting and trapping seasons and according to applicable laws (Univ. of IL Extension, 2011). Addling eggs refers to treating and removing eggs from incubation so that they do not hatch (Humane Society of the U.S., 2011). Addling and oiling eggs involves applying oil to Canada goose eggs in development stages one through four (between 0-18 days gestation) to stop the gas exchange, causing the embryo to die of asphyxiation (Missouri Dept. of Conservation, 2011*b*). Other techniques that have been used to deter geese at Lost Lake include silt fencing along shorelines and low grass areas, owl decoys, Mylar tape, and educational mailings to owners.

23. *Continue to participate in long range planning efforts with the community.*

    Stakeholders of the watershed are already involved in long range planning efforts of the community. Some such efforts include the *Ogle County Amendatory Comprehensive Plan "2K8 Update,"* last amended in 2008 (Ogle County Planning and Zoning Dept., 2008), and the Ogle County Long Range Planning Committee (2002).

24. *Give presentations to landowners and farmers about runoff.*

    The term runoff describes "the water from rain, snowmelt or irrigation that flows over the land surface and is not absorbed into the ground, instead flowing into streams or other surface waters or land depressions" (NRI, 2011). Pollutants are carried in the runoff, and both volume of water and pollutant loading can be problematic for surface waters.

25. *Provide educational guidelines to landowners and farmers for management of runoff.*

    In addition to presentations, landowners shall be provided with educational guidelines that they will be able to implement on their properties.

26. *Educate producers to make sure that they are aware of techniques and financial support to manage soils, residue, and contours.*

    Managing soils refers to keeping soils healthy and productive. A main component is organic matter, which is the part of soil derived of decomposing plant and animal matter. It is important for soil structure, and improves water filtration by decreasing compaction and providing open pores through which water can travel (SDACD, 2005*a*).

    Residue management refers to managing the amount, orientation, and distribution of crop and other plant residues on the soil surface. Managing residue on croplands can reduce erosion from wind and water, improve soil organic matter, provide food and cover for wildlife, and trap snow to increase available moisture levels for plants. This is especially important on HELs (SDACD, 2005*b*).

27. *Use the Babbling Brook and Lost Lake Streambank Stabilization Project as a pilot project.*

    A pilot project is a test, or trial, project to demonstrate the effectiveness of a full program. In this case, the project demonstrates techniques that can be used in the larger geographic area of the watershed. The Babbling Brook and Lost Lake Streambank Stabilization Project will demonstrate a variety of engineering and bioengineering techniques that can be used throughout the watershed and beyond to stabilize banks to lakes and streams. Watershed residents will be invited to at least two public meetings or tours, one before and one after construction of this project, which will be accompanied with photographic and videographic educational tools. The meetings or tours will show landowners examples of different shoreline stabilization techniques used on Babbling Brook and how they have improved conditions since they were implemented, and they will provide costs, implementation efforts, and sources of technical and financial support for review.

28. *Use projects as demonstrations, such as with The Nature Conservancy.*

    The initial projects that occur in the watershed would ideally be used as demonstrations, like the pilot streambank stabilization project. This educational process would hopefully lead to more projects in the watershed.

29. *Educate homeowners about best practices for home and yard.*

    There are practices for home and yard that can improve the condition of the environment, especially of Lost Lake. Some of these practices are referenced above, such as rain gardens, zero phosphorous campaign, buffer strips along the lake shore, and controlling nuisance Canada geese.

30. *Partner with organizations that share similar missions.*

    Several partners have been identified, many of whom serve on the Clear Creek Watershed Planning and Technical Advisory Committee. It is important to cooperate and collaborate with other groups that share similar missions. An effort will be stronger and more efficient when working together. Local agencies that have similar missions and may be interested in partnering on various projects include The Nature Conservancy, Natural Land Institute, Kickapoo/Mud Creek Nature Conservancy, and local chapters of Pheasants Forever, Turkey Federation, and Ducks Unlimited. Potential partnering state agencies include the Illinois Department of Natural Resources and the Illinois Environmental Protection Agency. Federal agency partners may include the U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, Natural Resources Conservation Service, and Soil and Water Conservation District.

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