2011

Clear Creek Watershed Action Plan

Prepared for:

Lost Nation-New Landing

River Conservancy District of IL

Prepared by:

Olson Ecological Solutions, LLC

9/30/2011

Acknowledgements

This Clear Creek Watershed Action Plan was made possible by the dedication and support of the Clear Creek Watershed Planning and Technical Advisory Committee and other participants in the watershed planning process. Initiation of the planning effort was provided by the Lost Nation/New Landing River Conservancy District of Illinois (RCD) and USDA Natural Resources Conservation Service. Funding was provided by the RCD and Illinois Environmental Protection Agency through Section 319 of the Clean Water Act.

Many people generously gave their time and expertise. We would like to thank the following individuals:

Creek Watershed Planning Committee Members:

1. Joe Baker, Landowner
2. Marian Baker, Taylor Township
3. Ed Bettner (Chairperson), Taylor Township
4. Dan Boehle (Secretary), Landowner
5. Loran Brinkmeier, NRCS, Ogle Co.
6. Jim Brown, Homeowner
7. Bill Kleiman, The Nature Conservancy
8. Steve Larry, RCD
9. Steve Meiners, Landowner
10. Dave Meisenheimer, Soil Conservation Technician, NRCS, Ogle Co.
11. Dave Point, Landowner
12. Sherrie Taylor, Landowner

Clear Creek Technical Advisory Committee Members:

1. Bill Lindenmeier, University of Illinois Extension
2. Marty McManus (Chairperson), Illinois Dept. of Agriculture
3. Abby Merriman, NRCS, Ogle Co.
4. Frank Ostling, Wildlife Biologist, Illinois Dept. of Natural Resources
5. Dan Pierce, Soil Conservation Technician, NRCS, Ogle Co.
6. Mike Reibel, Ogle County Zoning and Planning Department
7. Karen Rivera, Fisheries Biologist, Illinois Dept. of Natural Resources
8. Joe Rush, JadEco Natural Resource Consulting
9. Aaron Seim, District Conservationist, NRCS, Lee Co.
10. Bob Vogl, Prairie Preserv. Soc. of Ogle Co. & Rock R. Resource Rich Area Ecosystem Partnership
11. Sonia Vogl, Prairie Preserv. Soc. of Ogle Co. & Rock R. Resource Rich Area Ecosystem Partnership
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8. Les Taylor
9. Bill Wurtz

Technical Assistants:

1. Gary Chase, Illinois Rural Water
2. Sharon Hartzold, Resource Conservationist, NRCS
3. Amy Kuhel, Illinois Dept. of Agriculture
4. Dave Larson, Illinois State Geological Survey
5. John Lesnak, Illinois Environmental Protection Agency
6. Jerry Paulson, Natural Land Institute
7. Marlyn Schafer, US Army Corps of Engineers
8. Sharron Santure, Natural Resources Conservation Service
9. Susan Steffens, Lost Lake Utility District.

Consultants and Staff:

1. Rebecca Breckenfelder, Administrative Manager, RCD
2. Angela Buesse, Olson Ecological Solutions
3. Nathan Hill, Olson Ecological Solutions
4. Rebecca Olson, Olson Ecological Solutions
5. Shannon Thruman, Olson Ecological Solutions

Executive Summary

Watershed Planning Effort

The Clear Creek Watershed Action Plan (Plan) was developed through a cooperative effort between the Lost Nation/New Landing River Conservancy District, Natural Resources Conservation Service, stakeholders of the watershed, and various federal, state, and local environmental and planning agencies. The interested parties formed the Clear Creek Watershed Planning and Technical Advisory Committee, and held 12 public meetings and one executive session over the course of two years.

The Plan was developed to provide suggestions for minimizing erosion and sedimentation; minimizing nutrient loading into surface waters and groundwater; protecting "Class A" and other productive soils; protecting, enhancing, and managing wildlife and their habitats; and protecting the rural lifestyle of the community. It is meant to be used by the local people on a voluntary basis, with assistance from local, state, and federal organizations with missions related to the goals of improving the watershed's environment, and it does not suggest any regulatory requirements. It provides cost-effective solutions to environmental issues while honoring the agricultural economy of the region.

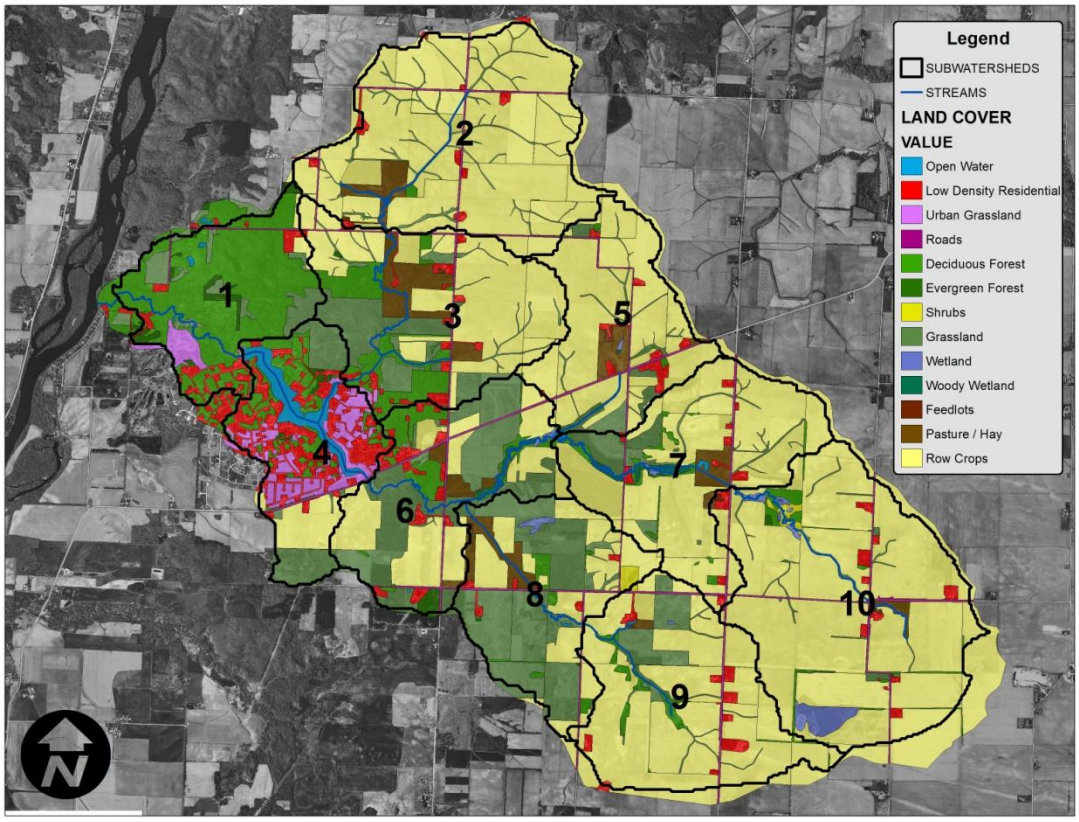
The Plan contains five chapters that provide the following: (1) an introduction; (2) an inventory of the watershed's natural resources and challenges; (3) goals, objectives, and action items to address environmental challenges and maintain or improve environmental quality; (4)modeling study to estimate pollutant load reduction potential; and (5) management recommendations, implementation plan, and monitoring plan. The Plan provides a basis to allow various agencies and individuals to collaborate on education and project implementation. It is an advisory document, and should be amended from time to time as needs change.

Watershed Description

The Clear Creek Watershed is a 7.22-mile basin that drains 11,130 acres (17.4 mi^3) in Ogle and Lee counties in north-central Illinois. Streams in the watershed flowed through mostly flat to rolling agricultural land, The Nature Conservancy's Nachusa Grasslands, and a subdivision situated around Lost Lake before it entered a former Biologically Significant Stream section of the Rock River. The land use of the watershed consists of about 56% row crops, 5% active pasture, 2.3% residential development, 2.4% wetlands, and the remainder in forest and grassland cover. No future land use changes are planned for the watershed by either county.

Natural area types present in the watershed include forest, rural grassland, prairie, and wetlands. The watershed contains 1,490 acres of high priority grasslands at Nachusa Grasslands and two Conservation Opportunity areas of high value to wildlife, the Rock River Conservation Opportunity Area and the Nachusa-Franklin Creek-Castle Rock-Lowden Miller Conservation Opportunity Area. It is within one of three Forest Legacy Areas in Illinois.

Figure A: Clear Creek Watershed Current Land Cover Map with Sub-Watershed Units .



Watershed Goals

The Clear Creek Watershed Planning and Technical Advisory Committee created the following goals to improve watershed conditions:

1. Minimize erosion and sedimentation.
2. Minimize nutrient loading into surface waters and groundwater.
3. Protect “Class A” and other productive soils.
4. Protect, enhance, and manage wildlife and their habitats.
5. Protect the rural lifestyle.

Watershed Assessment

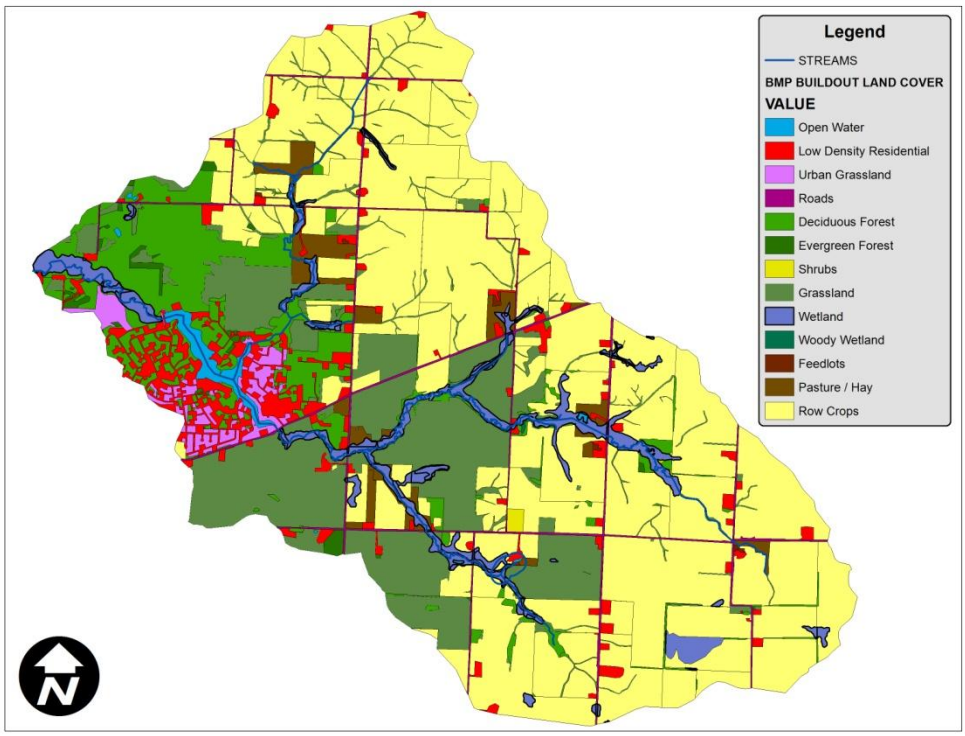
The watershed is an important agricultural area, as over 90% of its soils are designated as either prime or of statewide importance. The watershed offers very little natural filtering of pollutants from these land uses. It consists of only 0.22% floodplain, 2.4% wetlands, and 5.9% hydric soils, all predominantly located along the creek corridor. Studies suggest that Clear Creek and Lost Lake have moderate to good water quality. According to studies by the Environmental Protection Agency (2010), the Rock River has a fish consumption advisory, due to mercury and polychlorinated biphenyls from atmospheric deposition and other unknown sources, presumably not caused from uses in the Clear Creek Watershed. Lost Lake fully supports aquatic life, but it does not support aesthetic quality due to total suspended solids (TSS), total phosphorous, and aquatic algae stemming from nonpoint sources upstream and along the lake shore. Known upstream sources include agriculture and runoff from forest, grassland, and parkland, such as Highly Erodible Lands covering 31% of the watershed, channelization of about 10% of the open waterways, runoff and soil compaction of cropland affecting about 59% of the watershed, lack of vegetation along riparian zones, livestock on 350 acres with free access the stream, and worsening unstable stream banks. Sources within the lake community include impervious surfaces, residential home and lawn care, the dam, and eroding shoreline. The only known, potential point source of pollution in the watershed is a wastewater treatment plant for the subdivision, which has been recently reconstructed. No violations were reported from the new operation at the time of this Plan.

Watershed Management Recommendations

In order to prevent nonpoint source pollution, the Plan recommends treating the sources of pollutants by implementing good planning and coordination, stream and shore management, rural best management practices (BMP), and urban BMPs. Planning and coordination recommendations include hiring a watershed coordinator to be the “face” of the watershed planning effort and partnering with organizations that have similar missions. Stream and shore management recommendations include stabilizing severely eroding streambanks and shorelines, constructing and expanding sediment basins at the confluences of major tributaries and Lost Lake, and monitoring water quality related to storm events. Rural BMP recommendations focus on wetland restoration, restoration and management of prairie/wildlife upland habitat, conservation tillage, nutrient management, filter strip installation, and livestock exclusion from streams. These BMPs are especially important in sub-watersheds #2 and #10, which are dominated by row crop agriculture. Urban BMP recommendations focus on construction of rain gardens and filter strips, education for homeowners about proper lawn care, continuation of a campaign for a zero phosphorous community, restoration of wetlands and prairies/wildlife upland habitats, and septic system inspections. These efforts are concentrated in sub-watershed #4, which houses the Lost Lake Community.

Implementing these recommendations could reduce nonpoint source pollution by as much as 2,600 tons of sediment; 740,000 pounds of total suspended solids; 5,100 pounds of phosphorous; and 41,000 pounds of nitrogen each year. Full implementation is expected to cost approximately $6 million. The Committee has assigned high priority to BMPs estimated to reduce the highest quantity of pollutants. These BMPs are conservation tillage, agricultural nutrient management, sediment basin installation, wetland restoration, livestock exclusion, and wildlife upland habitat management. The Committee anticipates these recommendations to be carried out over a 10-year period or longer. The plan focuses on the first five years of implementation, and it foresees long term needs to be addressed after this five-year period.

Figure B: Clear Creek Watershed Land Cover Map with Recommendations Implemented.



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Chapter 3: Goals, Objectives, and Action Items

Written by: Rebecca Olson

Chapter 4: Watershed Modeling Study

Written by: Nathan Hill

Chapter 5: Management Recommendations, Implementation Plan, and Monitoring Plan

Written by: Nathan Hill and Rebecca Olson

Addendum A: Clear Creek Watershed Planning Committee and Technical Advisory Committee Meeting Agendas and Minutes

Agendas Created by: Rebecca Olson
Minutes Written by: Rebecca Breckenfelder and Dan Boehle

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Chapter 1: Introduction

This first chapter of the Clear Creek Watershed Action Plan (Plan) provides an introduction to the planning process, including the funding sources, purpose, success statement, scope and limitations, process overview and timeline, participants, and guidelines followed.

About the Planning Process

Funding

Initial watershed planning efforts were funded by the Lost Nation/New Landing River Conservancy District of Illinois (RCD). Funding for this 2011 Clear Creek Watershed Action Plan (Plan) was provided by the Illinois Environmental Protection Agency through Section 319 of the Clean Water Act and the RCD. Many organizations donated their time and staff resources, including the USDA Natural Resources Conservation District, Illinois Department of Natural Resources, The Nature Conservancy, Illinois Department of Agriculture, and Ogle County Zoning and Planning Department.

Project Purpose and Success Statement

The committee's success statement is:

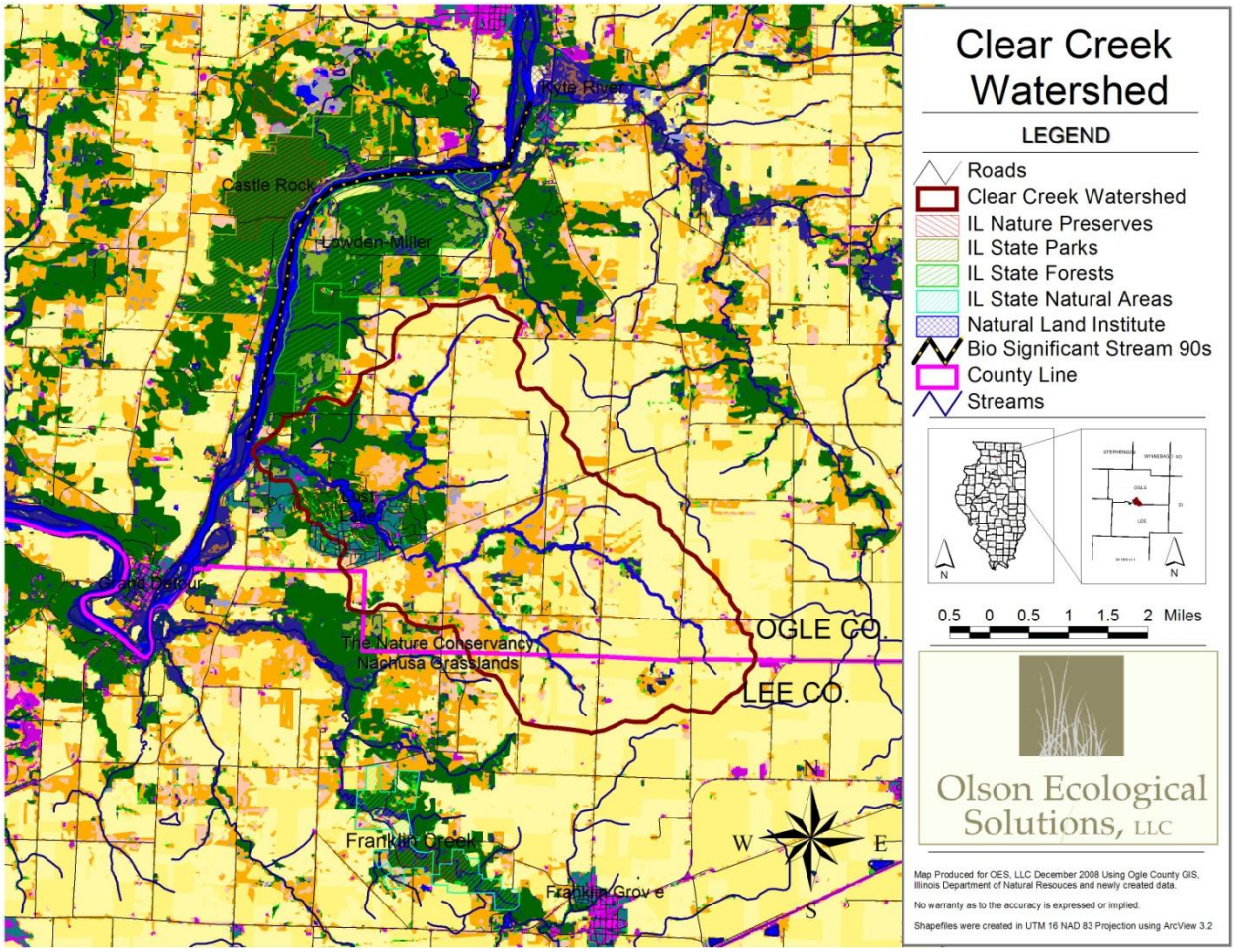
> "To minimize the amount of pollutants entering the watershed by recommending, instituting and maintaining environmentally sound practices that support the ecosystem and the productive use of the land that is inclusive of the Clear Creek watershed."

To meet this success statement, goals, objectives, and action items form the crux of this Plan. They address mainly the remedial needs to alleviate negative impacts of current land uses on water quality and other environmental concerns through the use of best management practices (BMP). They also provide some preventative measures in the form of agricultural and natural land preservation. The agricultural economy and rural lifestyle of the area are respected throughout the Plan. The Plan will serve as a guide for implementation, and shall be updated from time to time.

Watershed Action Plan Scope and Limitations

The scope of this project is defined to meet the needs of the people of the Clear Creek watershed in addition to the needs of the land. The geographic area considered for this Plan is the Clear Creek Watershed, as delineated in Figure 1-1. This watershed is situated mostly in Ogle County, Illinois, with its southernmost tip extending into Lee County. It empties into the Rock River near Grand Detour, Illinois. It consists of over 11,000 acres, over half of which is farmland. The rest contains Nachusa Grasslands, which is owned and operated by The Nature Conservancy, privately owned forest lands, and a residential subdivision situated around Lost Lake. The watershed features are described in detail in Chapter 2.

Figure 1-1: Watershed boundaries of Clear Creek.



The people of the watershed have various interests that need to continue to be met under this Plan, some of which might interfere with what is the most ecologically sound approach to land management. This plan is designed to suggest reasonable options that result in a compromise that will achieve improvement to water quality and other environmental factors while allowing other interests to persist, mainly sustaining the agricultural economy of the watershed. Therefore, the Plan suggests very little land use change.

The majority of pollutant load reductions into surface waters and groundwater are often achieved by stabilizing streambanks and Highly Erodible Lands (HEL), restoring hydric soils to wetlands, and improving agricultural and residential land management practices. The changes suggested in this Plan are concentrated on stabilizing streambanks and restoring hydric soils to wetlands closest to the streams, with a few exceptions. The Plan recognizes that stabilizing HELs by changing the land use from agricultural production to permanent vegetative cover would likely interfere with the livelihood of the landowners. Therefore, it is instead suggested to use conservation farming practices on HELs. The Plan also recognizes that known areas of channelization are likely not to be reverted to meandering streams, again because this would likely unacceptably interfere with the income potential of the surrounding farmland. Other best management practices are recommended for the remainder of agricultural and residential lands.

Watershed Planning Process Overview and Timeline

The process of creating a watershed-based action plan began largely in 2006, when the RCD formed the Lake Management Committee to preserve and protect the Clear Creek watershed by promoting understanding and comprehensive management plans for the land and watershed ecosystems. The RCD initially was concerned about the declining water quality of Lost Lake and their contribution to water quality degradation downstream from the lake to the Rock River. They recognized that this was not just a lake community issue, but a whole watershed issue. The RCD hired the firm JadEco of Shannon, Illinois to help them improve the water quality of the lake. They adopted standard operating procedures for shoreline re-vegetation prepared by Kaskaskia Engineering Group (2008), implemented a rebate program for homeowners to stabilize their shorelines, and introduced a zero phosphorus lawn fertilizer program in May 2009, which is an educational tool for homeowners (Breckenfelder, Pers. Comm.). In April of 2008, they hired Olson Ecological Solutions, LLC of Rockford, Illinois as a grant writer and facilitator of a watershed planning committee and a technical advisory committee. They soon gained support from local organizations, including the Ogle County Soil and Water Conservation District, who authorized the USDA Natural Resources Conservation Service to become a partner in the watershed planning effort.

On April 1, 2009, the first Clear Creek Watershed Planning Committee meeting was held, and individual stakeholders of the watershed volunteered to serve as committee members. On June 8, 2009, the first Clear Creek Technical Advisory Committee meeting was held, and representatives from federal, state,

and local environmental and planning organizations joined the effort. In September of 2009, the committees decided to merge into one Clear Creek Watershed Planning and Technical Advisory Committee. Separate meetings were to be held if any one meeting was going to lean specifically toward planning or technical advice, but this did not occur.

In December of 2008, a funding request was submitted by the RCD to the Illinois Environmental Protection Agency (EPA) for assistance through Section 319 of the Clean Water Act, who provided partial funding for watershed planning to the RCD through grant number 3190816 in May 2009.

During initial meetings, committee members found common ground in their concerns for improving water quality for all surface waters in the watershed. As the planning process moved forward, the committee members identified goals and objectives related to improving the environment within the watershed while maintaining the rural lifestyle of the community. The current conditions of the watershed were inventoried using readily available data. In May 2010, the EPA approved the Clear Creek Watershed Resource Inventory, which reflected the outcome of this study. The committee used this information to refine their goals and objectives and create a list of action items, which were more specific tasks to address the goals and objectives. Field work was conducted to satisfy gaps in the data, which were recognized as the action items unfolded. Nathan Hill, GIS Analyst for Olson Ecological Solutions, created a land cover data file to reflect information that was more current than what was readily available, and ran a computer model using this land cover data file to estimate current pollutant loading into the streams and lake. He then changed the land cover map to reflect the hypothetical situation of a complete build-out scenario using the measurable best management practices (BMP) recommended in the action items. He re-ran the model to estimate the pollutant loading once the BMPs were implemented. The differences in these values were the pollutant load reduction estimates. With this information, the committee quantified the work to be accomplished and created a schedule and budget to the extent possible. They chose to limit this Plan to 5 years and included the perceived long-term needs that would extend beyond the life of the Plan. They intended to update the Plan annually. In June 2011, the committees agreed to continue their structure and commitment, changing their focus from planning to education and facilitation.

Watershed Planning Participants

Many people participated in the watershed planning effort, including landowners and stakeholders of the watershed; representatives from federal, state, and local environmental and planning organizations; and staff and consultants of the RCD. Participants represented a wide range of interests and expertise. Below participants are listed by their role in the process.

Creek Watershed Planning Committee Members:

1. Joe Baker, Landowner
2. Marian Baker, Taylor Township

3. Ed Bettner (Chairperson), Taylor Township
4. Dan Boehle (Secretary), Landowner
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3. Nathan Hill, Olson Ecological Solutions
4. Rebecca Olson, Olson Ecological Solutions
5. Shannon Thruman, Olson Ecological Solutions

Figure 1-2: Part of the Clear Creek Watershed Planning & Technical Advisory Committee.

From left to right: (Back row) Abby Merriman, Steve Larry, Rebecca Olson, Becky Breckenfelder, Jim Brown, and Joe Rush. (Front row) Joe Baker, Marian Baker, and Ed Bettner.

Watershed Action Plan Guidelines Met

The Plan was based on the Inventory and the input of the committee. The Plan was consistent with USEPA watershed based plan guidance dated August 26, 2003 (as revised), Chicago Metropolitan Agency for Planning's "Guidance for Developing Watershed Action Plans in Illinois" dated June 2007, and current watershed planning principles. The Handbook for Developing Watershed Plans to Restore and Protect Our Waters (USEPA, 2008) was especially helpful. Total maximum daily load (TMDL) implementation plan requirements were not applicable to this watershed and therefore not considered. The draft of this plan was submitted in June of 2011.

About the Watershed

The Clear Creek Watershed was a 7.22-mile basin that drained 11,130 acres (17.4 mi^3) in Ogle and Lee counties in north-central Illinois (Hill, Pers. Comm. and USGS, 2009). Clear Creek and Lost Lake were the major waterbodies referenced by the EPA as HUC 0709000506 (IEPA, 2010). The nature of this watershed was generally explained by its physical and natural features, land use and population characteristics, watershed and waterbody conditions, pollutant sources, and waterbody monitoring data. Streams in the watershed flowed through mostly flat to rolling agricultural land, The Nature Conservancy's Nachusa Grasslands, and a subdivision situated around Lost Lake before it entered a former Biologically Significant Stream section of the Rock River. The watershed was an important agricultural area, as over 90% of the soils were designated as either prime or of statewide importance. About 56% of the watershed was in row crops and 5% was grazed. Only about 2.3% was developed. The watershed consisted of only 0.22% floodplain, 2.4% wetlands on the National Wetlands Inventory, and 5.9% hydric soils, all predominantly located along the creek corridor. Bedrock in the watershed varied, with a depth of 75 feet at the Lost Lake dam (Finch, 1973). There were five reported archaeological sites in the western portion of the watershed (Santure, Pers. Comm.). Local ordinances regarding land management practices in the watershed originated from Ogle and Lee Counties and the RCD. No future land use changes were planned for the watershed by either county (Ogle County Planning & Zoning Dept., 2008 and Vandewalle and Associates, 2010). The designated uses for Lost Lake were Aquatic Life, Fish Consumption, Primary Contact, Secondary Contact, and Aesthetic Quality. In 2010, the Environmental Protection Agency assessed that the lake fully supported Aquatic Life, but did not support Aesthetic Quality. Reasons stated were excess of total suspended solids (TSS), total phosphorous, and aquatic algae stemming from nonpoint sources, namely residential districts, the dam, yard maintenance, agriculture, and runoff from forest, grassland, and parkland (IEPA, 2010). No TMDL reports applied to the watershed.

The Clear Creek Watershed was of great importance to many wildlife species classified as Species in Greatest Need of Conservation and housed several threatened and endangered species (IDNR, 2005). The watershed contained high priority grasslands at Nachusa Grasslands and two Conservation

Opportunity areas of high value to wildlife, the Rock River Conservation Opportunity Area and the Nachusa-Franklin Creek-Castle Rock-Lowden Miller Conservation Opportunity Area (Renn, Pers. Comm.). It was within one of three Forest Legacy Areas in Illinois (Gillespie, Pers. Comm.). Habitat types present in the watershed included forest, rural grassland, prairie, and wetlands. The Nature Conservancy was the only agency permanently protecting land within the watershed. They owned 1,490 acres and have conservation easements on 400 acres. Other critical habitat was provided by over 5,500 acres of state-protected lands within the vicinity. The Illinois Department of Natural Resources sampled fish at Nachusa Grasslands in 2006 and ranked the site as a Moderate Aquatic Resource with an Index of Biotic Integrity (IBI) of 35 (Rivera, 2006 unpublished). Further studies of macroinvertebrates in Clear Creek and Lost Lake suggested moderate to good water quality (DeWalt, Pers. Comm.).

Limited data provided by the Environmental Protection Agency's sampling of Lost Lake in 2007 supported that excessive amounts of suspended solids, nitrogen, and phosphorus contributed to the decline of water quality in the surface waters of the watershed (Carruso, 2008 unpublished). Likely sources of sedimentation and pollution were identified, and some measures were installed to mitigate and prevent these threats. Known major contributors to sedimentation in the watershed included Highly Erodible Lands covering 31% of the watershed, channelization of about 10% of the open waterways, runoff and soil compaction of cropland affecting about 59% of the watershed, lack of vegetation along riparian zones, livestock on 550 acres with free access to 17,330 linear feet of stream, and worsening unstable stream banks. The likely nonpoint sources of pollution and erosion to surface and ground waters included livestock and runoff from agricultural fields and residential lawns. Impervious surfaces account for considerably less than 10% of the watershed and were therefore not assessed as sources of pollution. The only known point source of pollution in the watershed was a wastewater treatment plant for the subdivision, which incurred multiple violations by the Environmental Protection Agency prior to its reconstruction in the summer of 2010. After the reconstruction, no violations were reported at the time of this Plan. The entire Clear Creek watershed fell into the "excessive" category of Keefer's mapping of aquifer sensitivity to contamination by pesticide leaching (Keefer, 1995). Technical and financial assistance were being utilized by stakeholders for implementation projects to combat sedimentation and pollution. The Lost Lake Utility District reduced some pollutants by reconstructing the wastewater treatment plant to meet stricter requirements recently implemented by the Environmental Protection Agency. Support for reducing nonpoint source pollution came from the Natural Resources Conservation Service, Soil and Water Conservation District, and RCD. At the time of this Plan, one Section 319 nonpoint source project was in progress for the watershed, to stabilize 1,575 feet of streambank along Babbling Brook and 1,981 feet of shoreline at Lost Lake (Grant No. 3191003). Construction was scheduled to be completed in June 2012.

Some information about the watershed was not readily available, including fish consumption advisories, Source Water Assessment; annual drinking water report; septic system number, locations, or failures; drain tile locations; or livestock population, management, or land application of manure. Wells were located, but information about well contamination was not available. Septic systems outside the subdivision were not considered a significant source of nonpoint pollution due to low density.

Literature Cited for Chapter 1

Chicago Metropolitan Agency for Planning. 2007. Guidelines for Developing Watershed Action Plans in Illinois. Springfield, IL: Illinois Environmental Protection Agency.

U.S. Environmental Protection Agency (U.S. EPA). 2008. Handbook for Developing Watershed Plans to Restore and Protect Our Waters. Washington, D.C.: USEPA Office of Water, Nonpoint Source Control Branch.

*See the Literature Cited section of Chapter 2 for all other references.

Chapter 2: Clear Creek Watershed Inventory

Edited by: Rebecca Olson
Written by: Rebecca Olson, Shannon Thruman, Angie Akers, Marlyn Schafer, Dan Pierce, Karen Rivera, Sharron Santure, Joe Rush, and Nathan Hill
Maps by: Nathan Hill and Sherrie Taylor
Data gathering coordination by: Shannon Thruman

Chapter 1 provided an introduction to the project and the watershed, with an abstract of the information found in this Chapter. This Chapter referenced readily available data at the time this Plan was produced, including information published in the *Clear Creek Watershed Inventory* (Olson Ecological Solutions, 2010) and a search for pertinent updates. Information in this Chapter was used to create the goals, objectives, and action items listed in Chapter 3.

Physical and Natural Features

Watershed Boundaries

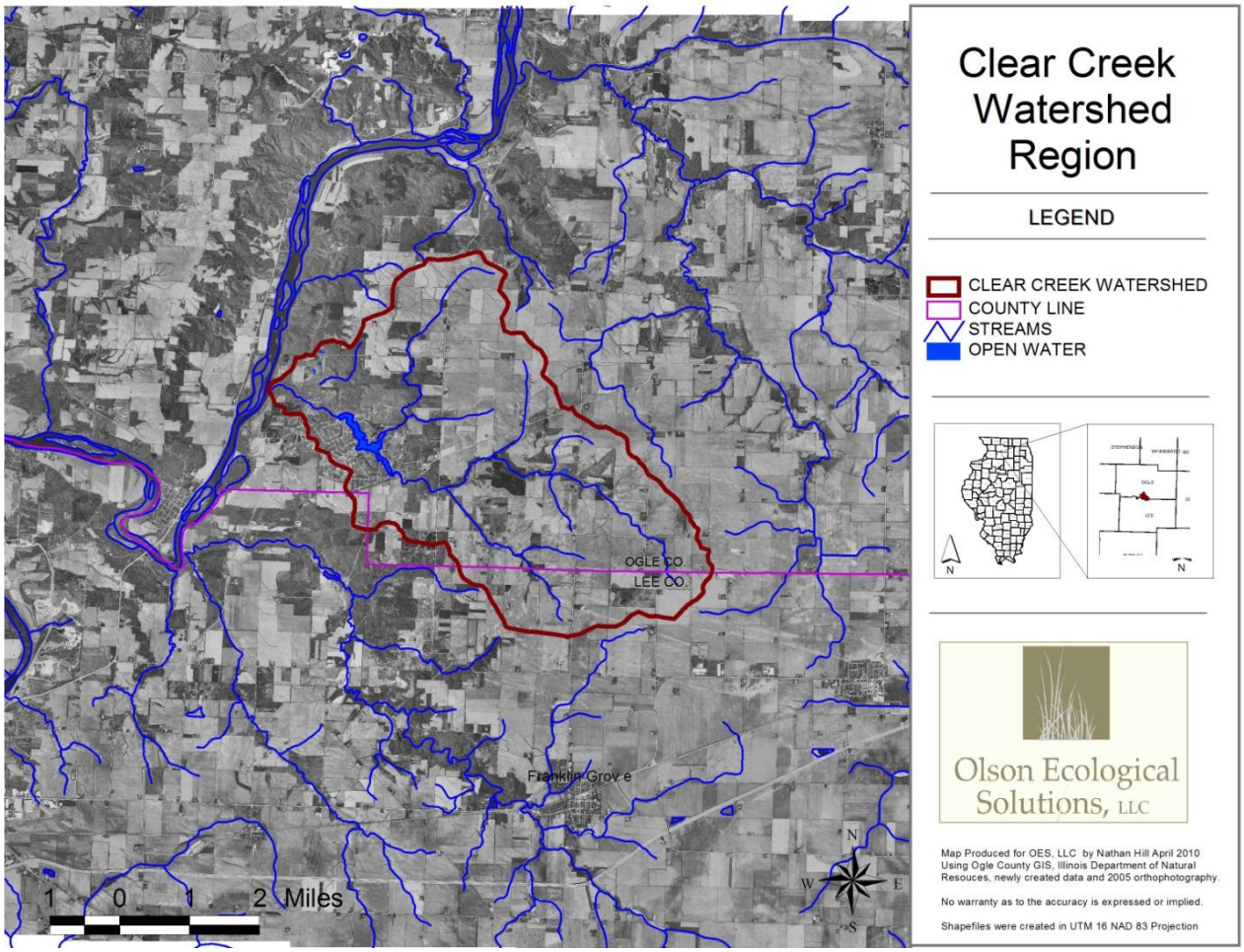
The Clear Creek Watershed lies within the Upper Rock River Watershed Environmental Protection Agency Basin 6, and Rock River Hill Country Natural Area Division in north-central Illinois (IDNR, 2005). The Clear Creek Watershed lies largely within Taylor Township in Ogle County, and it extends into adjacent townships and Lee County. The Clear Creek flows into the Rock River, which empties into the Mississippi River and then into the Gulf of Mexico (IDNR, 2001). It contains 11,130 acres (17.78 sq. mi.), based Watershed Boundary Dataset GIS database of watersheds at a scale of 1:24,000 (Hill, Pers. Comm.).

The boundaries of the Clear Creek Watershed are roughly as follows: The boundary begins about one half mile north of Lighthouse Road just east of Highway 27, then runs southeast to a point one mile east of Hoosier Road on the Ogle County line. The boundary then turns mostly west and a little south. This boundary line goes west and the other corner ends a mile north of Naylor Road and west of Daysville Road at the south end of the watershed. The boundary line then runs northwest, roughly parallel with the east side of the watershed, and ends a mile or so west of the Lost Lake dam, where it then runs northeast back up to Lighthouse Road.

Hydrology

Hydrology of the watershed is defined by stream reaches, floodplain, peak flow, and water bodies including Lost Lake, ponds, and wetlands.

Figure 2-1: Clear Creek Watershed boundaries.



Stream Reaches

The Clear Creek Watershed is named for the main stream running through it, Clear Creek (Assessment Unit IL_PZU, HUC 0709000506). It has one large tributary, Babbling Brook, which begins at the northern section of the watershed and flows south. Babbling Brook has two main branches that merge and drain into Lost Lake separately from the main Clear Creek stem. The main channel of Clear Creek generally flows east and north (IDOC, 1968). It starts as six "branches" that merge into one stem of Clear Creek, which empties into Lost Lake. From Lost Lake the creek continues as Clear Creek over the dam for another mile to the Rock River.

Clear Creek flows into a stream segment of the Rock River that was considered a Biologically Significant Stream Segment prior to the 2008 update, extending from the confluence of Clear Creek upstream to the confluence of Honey Creek (IDNR, 2008 *a;* Szafoni, pers. comm.; and Ogle County Zoning and Planning Department, 2004).

The basin length of Clear Creek is about 7.22 to 7.3 miles, according to ortho-photography, GIS analysis, and the ArcHydro method (Hill, Pers. Comm. and USGS, 2009). A GIS analysis measured all perennial and intermittent streams in the watershed as summarized in Table 1. "Clear Creek Upstream" refers to the segment upstream of Lost Lake. Intermittent streams and grassed waterways only flow during and shortly after rain events.

Figure 2-2: Stream Length in Clear Creek Watershed			
Stream Section	**Type**	**Length (lf)**	**Length (miles)**
Clear Creek - Upstream	Perennial	28,900	5.47
Clear Creek - Below Dam	Perennial	9,200	1.74
Babbling Brook	Perennial	23,400	4.43
Subtotal		*61,500*	*11.65*
Clear Creek - Upstream	Intermittent	82,200	15.57
Clear Creek - Below Dam	Intermittent	12,800	2.42
Babbling Brook	Intermittent	82300	15.59
Subtotal		*177,300*	*33.58*
Total		**238,800**	**45.23**
Source: National GIS Database at a scale of 1:24,000 (Hill, Pers. Comm.)			

Floodplain

Floodplain is an important component of stream ecology and serves to moderate flow rates and stream energy during high flow runoff conditions. However, the floodplain area of the Clear Creek watershed is a scant 24 acres (0.22% of the watershed), as identified by the Federal Emergency Management Agency (FEMA). Of this acreage, 23.7 acres are considered as the "Special Flood Hazard Areas Inundated by 100-Year Flood" and 0.3 acres are considered 500-year floodplain (Figure 2-3). This floodplain extends for about one mile along Clear Creek to its confluence with the Rock River. Flood stages on the Rock River can rise rapidly and remain high for considerable lengths of time (FEMA, 2009).

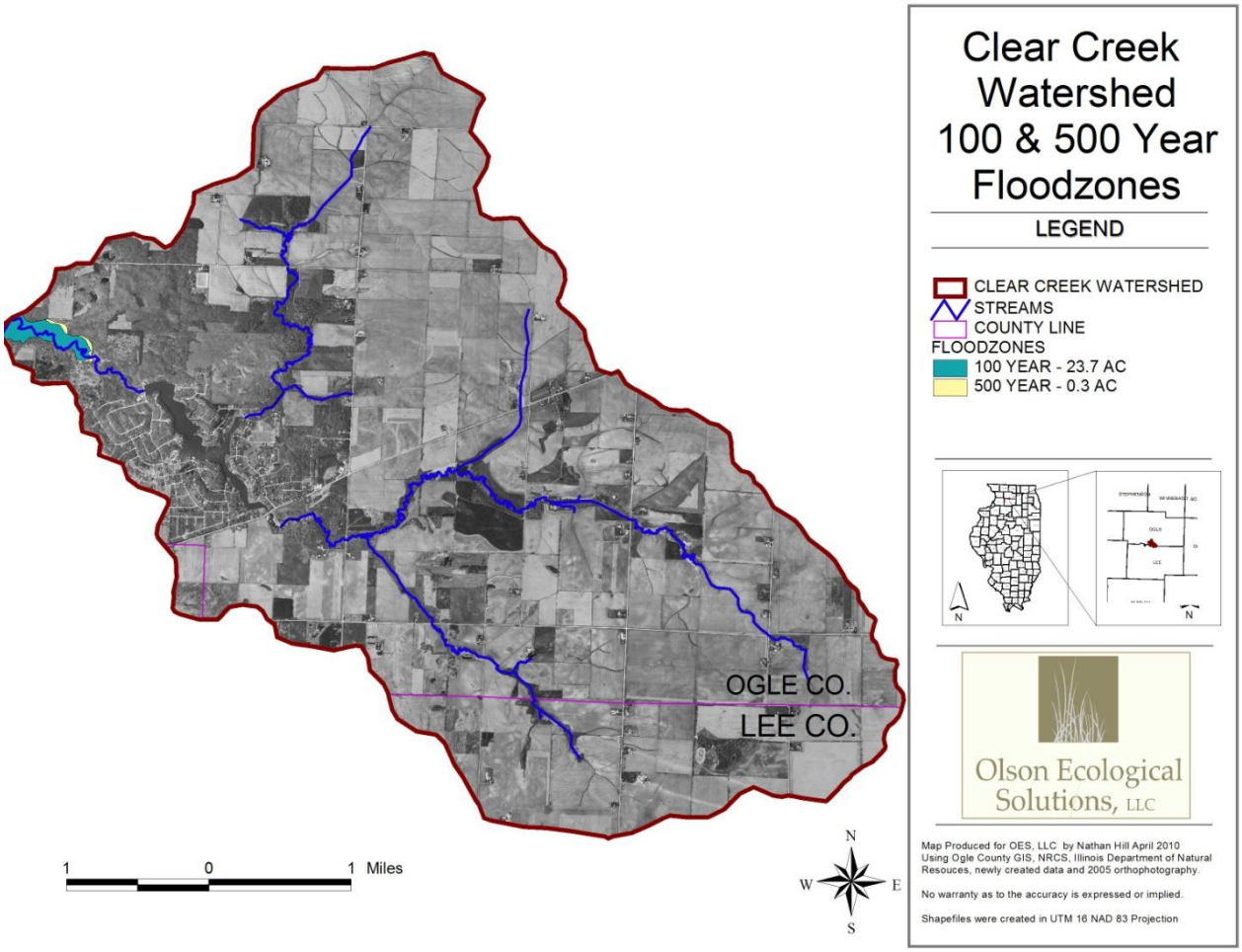
Stream Flow

During a downpour event in the Clear Creek Watershed, stormwater has relatively few places to go. Factors such as lack of floodplain, high base flow, runoff typical of the area, variable peak and average flow levels, and increases in average stream flow over historic levels help to explain changes in lake levels and flash flooding occurrences. Problems associated with flash flooding are being addressed by local planning groups.

As illustrated above, the watershed has very little floodplain located only within its last mile. Sustained base flow levels during dry periods are very high compared to the rest of the state, along with the Rock River Assessment Area (IDNR, 2001). Runoff accounts for roughly 25% (8.7 inches) of the average annual precipitation (34 inches) in the watershed, which is similar per unit of drainage area to other watersheds within the Upper Rock River Assessment Area (IDNR, 2002*a).* Peak flow rates vary greatly, and can often reach over 1,000 ft^3/s of maximum instantaneous flow (Table 2) (USGS, 2009*b*).

Historically, the average magnitude of these peak flow discharges has remained similar over the past 100 years. Average stream flow rates also vary greatly. Historically, the highest averages on record have occurred over the past 30 years. There have been significant increases over the past 60 years, which level out to only slight increases when viewed over the past 100 years (IDNR, 2001).

Figure 2-3: Flood zones within the Clear Creek Watershed.



Due to these factors, stormwater causes water level changes at Lost Lake and flash floods throughout the watershed. Lost Lake is poorly equipped to handle surges in flow rates because of the large watershed to lake-ratio. Lost Lake can rise very quickly and does not drop to a low-water condition. However, it will return to pool quickly. During times when the rainfall is heavy and significant, the lake rises quickly and significant damage can occur (Rush, Pers. Comm.). Stakeholders confirmed that the watershed is prone flash flooding. They identified two significant flash flood events in December 2008 and on June 21, 2009 as examples. On June 21, 2009, about four to six inches fell in three to four hours on already saturated ground over the entire watershed. Examples of damage include wash outs of bridges, livestock fences, roads, gabion baskets, and property (Figure 2-5). During these floods, the Lost Nation/New Landing River Conservancy District (RCD) sustained $33,000 of damage and lost gabion basket erosion control structures within the Clear Creek silt containment area. The Property Owner's Association lost a bridge. Homeowners on Lost Lake lost docks and boats and sustained damage to their

individual property (Clear Creek Watershed Planning Committee, Pers. Comm.). Upstream, bridge repair work on Daysville Road included shot rock installation along ditches entering the stream, straightening of the stream, and cement reinforcement of the streambanks. Many other examples were given, including destruction of fences and roads (Baker, Pers. Comm.).

Figure 2-4: Streamflow statistics for Clear Creek Watershed.

Statistic	Flow (ft3/s)	Prediction Error (%)	Equiv. Yrs. of Record	90% Prediction Interval Min.	Max.
PK2	536	40	2.6	283	1010
PK5	900	41	3.1	474	1710
PK10	1160	42	3.8	598	2240
PK25	1480	45	4.6	734	2970
PK50	1720	47	5.2	831	3570
PK100	1950	49	5.6	909	4170
PK500	2490	55	6.2	1070	5780

Key:

PK# =	maximum instantaneous flow that occurs on avg. once in every # years (USGS, April 12, 2010a).
Equiv. Yrs. of Record =	# of years a station should be in operation to predict reliable flow stats.
90% Prediction Interval =	There is a 90% probability that the actual flow rate falls within the range of the given values.

Source: USGS, 2009*b.*

Figure 2-5: Examples of damage to Babbling Brook banks after June 21, 2009 storm event.

Source: Rush, Pers. Comm.

Several goals of the Clear Creek Watershed Planning Committee, Ogle County Comprehensive Plan, and Draft Lee County Comprehensive Plan reflect the need to address flash-flooding issues. The Planning Committee would like to minimize stormwater run-off, flashy hydrology, and related sedimentation and pollutant loading into the streams (Clear Creek Watershed Planning Committee, Pers. Comm.). Both the Ogle County Comprehensive Plan and the Draft Lee County Comprehensive Plan contain goals and objectives to discourage development within the floodplain; protect wetlands near or adjacent to streams; and preserve natural areas as water retention areas, groundwater recharge areas, and habitats for plants and animals (Ogle County Planning & Zoning Dept., 2008 and Vandewalle and Associates, 2010). Both County Boards require the Soil and Water Conservation District (SWCD) in each county to complete a Land Use Site Assessment Report (LESA) to aid in the consideration of value of on-site resources prior to land use change decisions.

Water Bodies

Water bodies in the watershed include Lost Lake, ponds, and wetlands.

Lost Lake

The 88-acre Lost Lake (Assessment Unit IL_RPZF, HUC 0709000506) was formed by damming Clear Creek (IDOC, 1968). The original dam created a 32.5-acre lake in 1963 by the Lost Nation Development Company as a recreation feature for residents of their subdivision six miles south and two miles west of Oregon (IDOC, 1968). The lake was increased to its current size of 88-acres in 1972 by constructing a separate dam (Finch, 1973.). The Lost Nation/New Landing subdivision now has 820 lots, 351 or which are built on and 469 that are not (Steffens, Pers. Comm.).

When the lake was enlarged to its current size in 1973, engineers provided information regarding the lake's hydrology to the Illinois State Water Survey. According to this report, the average annual evaporation of Lost Lake at that time was 26.4 inches with a four-hour time of concentration. Estimated seepage losses were 165 acre-feet. Average annual runoff was 10.2 inches, or 9,620 acre-feet. The net

yield considering evaporation, runoff, and seepage was 2,998 M.G. The engineers designed the discharge rates of the lake based on a peak rate of inflow of 3,500 cfs to be a maximum discharge of 3,050 cfs and a maximum discharge volume of 252 acre-feet, or 0.28 inches, per hour (Finch, 1973).

Ponds

There were ten ponds, mostly man-made, that accounted for a total of ten acres. Three ponds located off of Hay Road in the northwest corner of the watershed were part of National Wetlands Inventory sites and had native vegetation present (discussed in further detail in the "Habitat" section of this chapter). Information regarding the other seven ponds was not known.

Wetlands

The watershed had a total of 273 acres of various National Wetland Inventory wetland types, representing 2.5% of the watershed and located mostly along the creek corridors (Figure 2-6). There were 109 acres of shallow marsh/wet meadow, 62 acres of bottomland forest, 19 acres of scrub-shrub wetlands, 7 acres of open water wetlands, and 76 acres of limnetic lake (Hill, Pers. Comm.).

Topography

The topography of the Clear Creek Watershed was mostly flat to rolling (Figure 2-7), the result of both erosion processes and irregularities in the bedrock surface that influenced total drift thickness (Ogle County Planning & Zoning Dept., 2008). It was glaciated but had a relatively thin glacial deposition (IDNR, 2002*a*). The two glacial ages of particular importance to the physiographic development of Ogle County were the Illinois Episode and the more recent Wisconsin Episode, which ended approximately 10,000 years ago (Ogle County Planning & Zoning Dept., 2008). From the upstream water course to Lost Lake, the difference in elevation was 180 feet (Finch, 1973). The average normal pool elevation at Lost Lake was 687 feet above mean sea level (Rysso et. al., 2008). The lowest point in Ogle County was 650 feet above mean sea level on the Rock River at the county line between Ogle and Lee Counties near the watershed (FEMA, 2009).

Soils

Soils in the watershed were defined by predominant soil associations, hydric soils, and hydric soil groups.

Predominant Soil Associations

The Clear Creek Watershed was made up of predominantly three soil associations: Plano-Catlin-Saybrook, Lawson-Comfrey-Jasper, and Boone-Eleva-Chelsea. All three associations shared erosion as a major management concern. All were used for pasture, beef livestock, and hogs. The first two associations were primarily used for corn, soybeans, small grain, and hay. The latter was often used for woodlot and was moderately suited for dwellings. Most of the soil in the Clear Creek watershed was Plano-Catlin-Saybrook. This soil association covered the majority of the east part of the watershed, the

northern reaches of Babbling brook, and south to the northern Taylor township line. It was level to sloping, moderately well drained, found on ridge tops and side slopes of uplands, and formed in loess over outwash or in loess over glacial till. Lawson-Comfrey-Jasper was found where the mouth of Clear Creek ran into the Rock River and to the north and south. This was the smallest section of soil association in the watershed. It was nearly level to sloping, somewhat poorly drained, poorly drained, and well-drained soils that formed in silty and loamy alluvium or in loamy material over outwash. It was found on terraces and bottom lands. Boone-Eleva-Chelsea was a somewhat even band of soil that ran north and south over the portion of the watershed that contained Lost Lake and Nachusa Grasslands. It abruptly tapered off at the north, and then veered west. It consisted of gently sloping to very steep, excessively drained to well-drained soils that formed in sandy or loamy material over sandstone bedrock or sandy material found on ridge tops, valley slopes, and strong side slopes (Ogle Co. Planning & Zoning Dept., 2008).

Figure 2-6: National Wetlands Inventory sites in the Clear Creek Watershed.

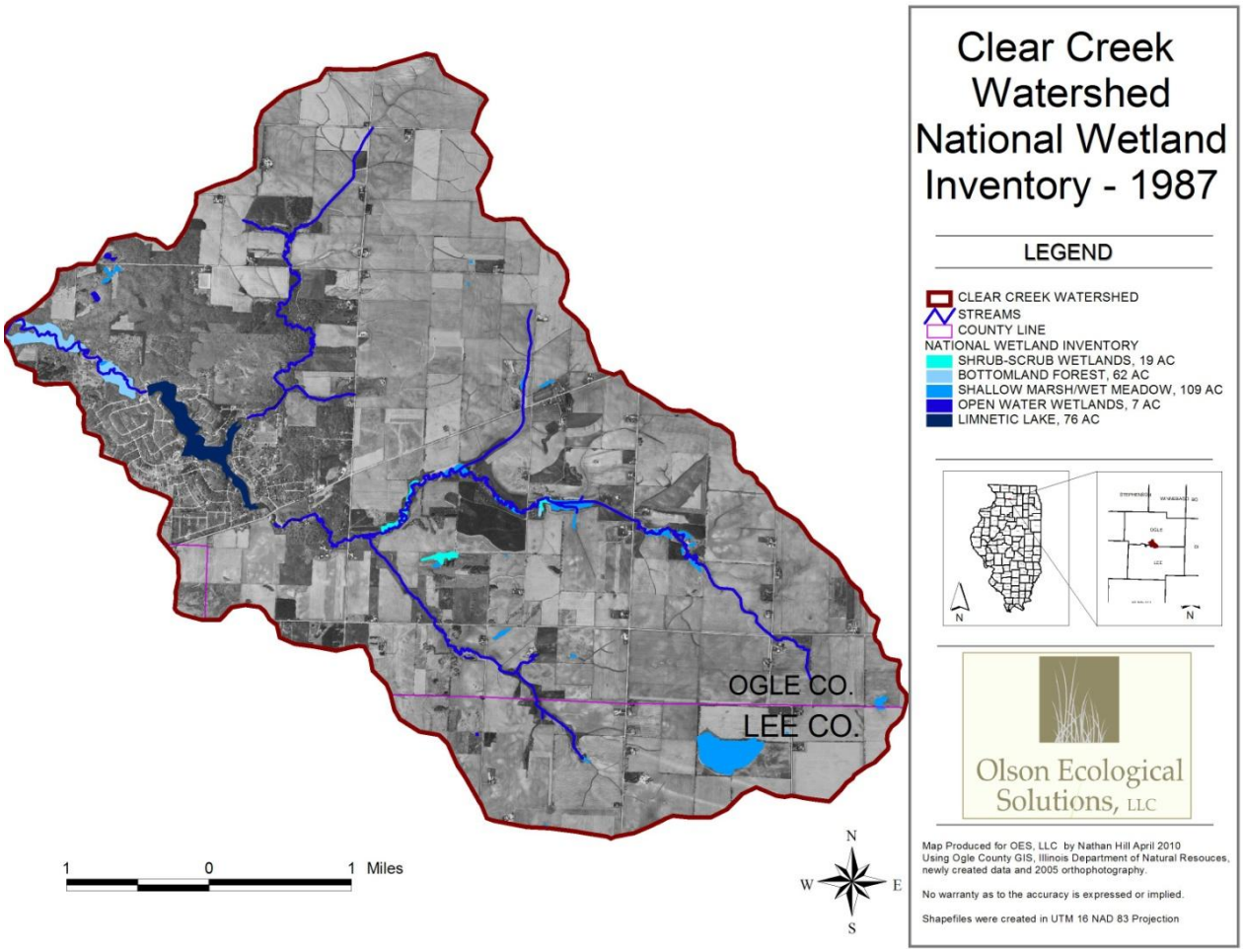
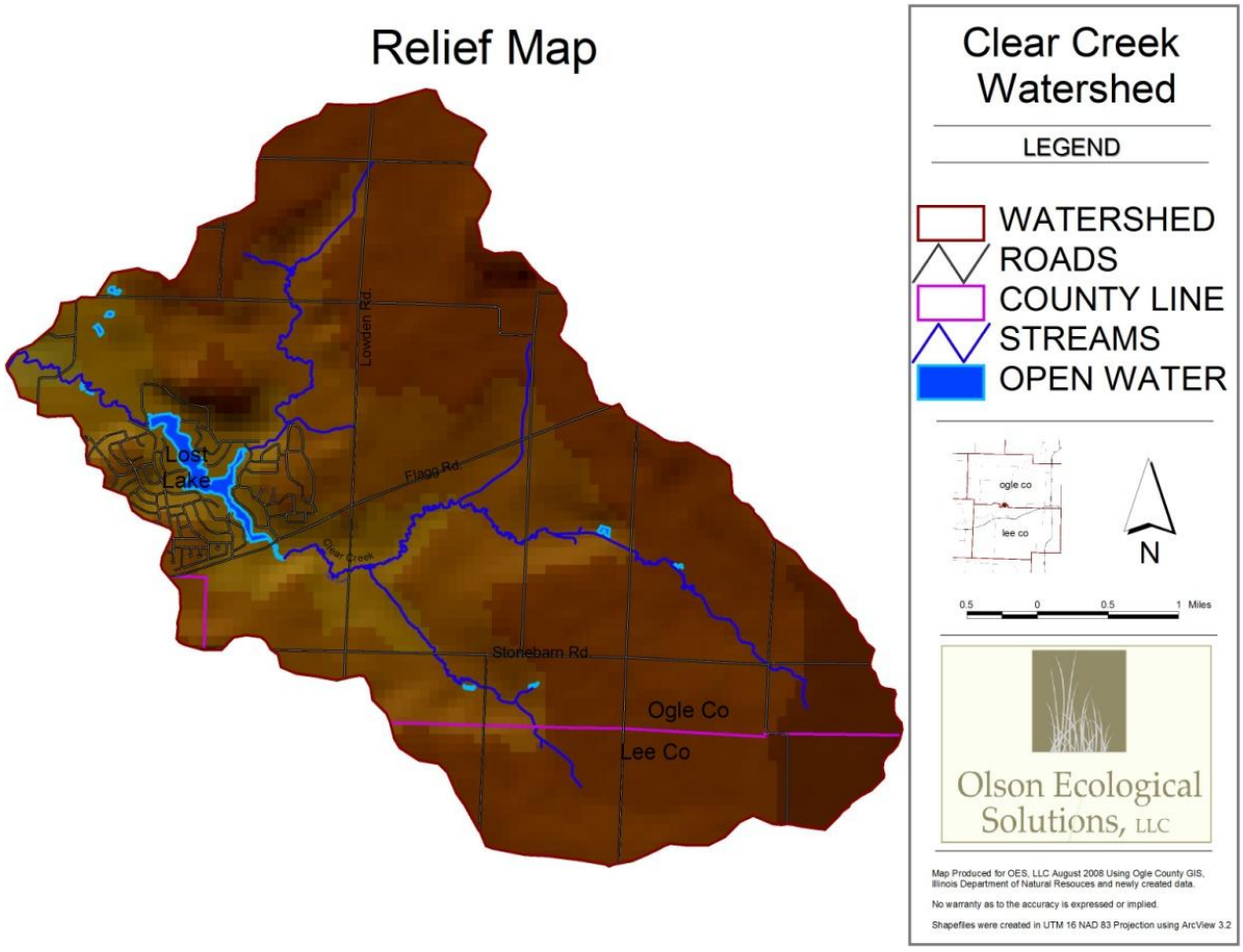


Figure 2-7: Clear Creek Watershed topographic relief.



Hydric soils

Hydric soils were poorly drained soils associated with wet prairies, forested floodplains, and wetlands and were prone to flooding or wet conditions if they were not drained (NRCS, 2010). In the watershed, hydric soils comprised 5.9% of the soils (Kuhel, Pers. Comm.), or 661 of the 11,132 acres (Figure 2-8). They were predominately on the floodplains and major drainage areas, although there were a few isolated areas in shallow depressions on terraces.

Hydrologic soil group (HSG)

Hydrologic soil groups (HSG) helped to define the runoff potential of soils. They were categorized into A, B, C, and D soils based on texture, permeability, and level of drainage. The ranking applied to hydric soils in their drained state. HSG A has the least runoff potential while HSG D has the greatest runoff potential. If the soils were not drained, they were assumed to have a runoff potential of HSG D soils. The Clear Creek Watershed had the following percentages of HSG (Kuhel, Pers. Comm.):

Figure 2-8: Hydric Soils in the Clear Creek Watershed.

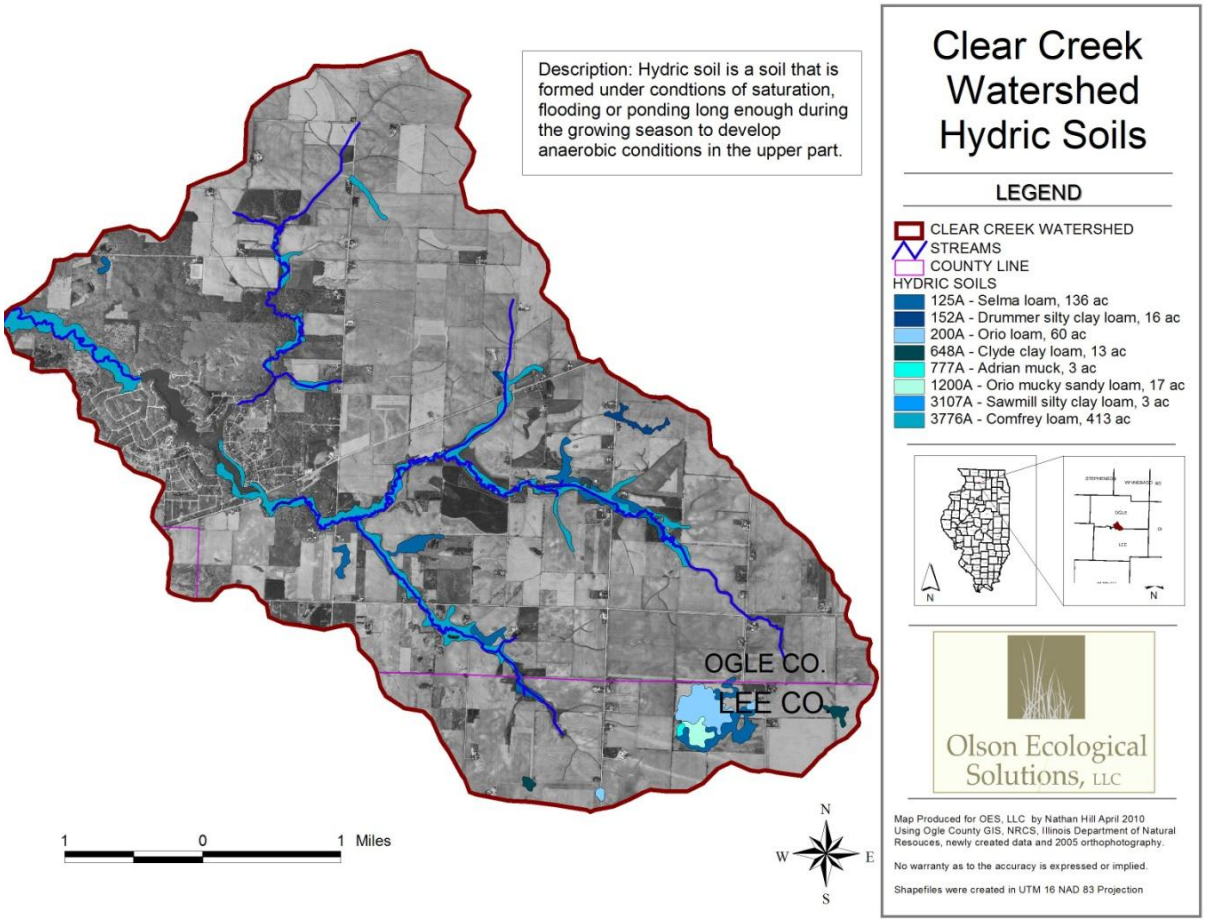


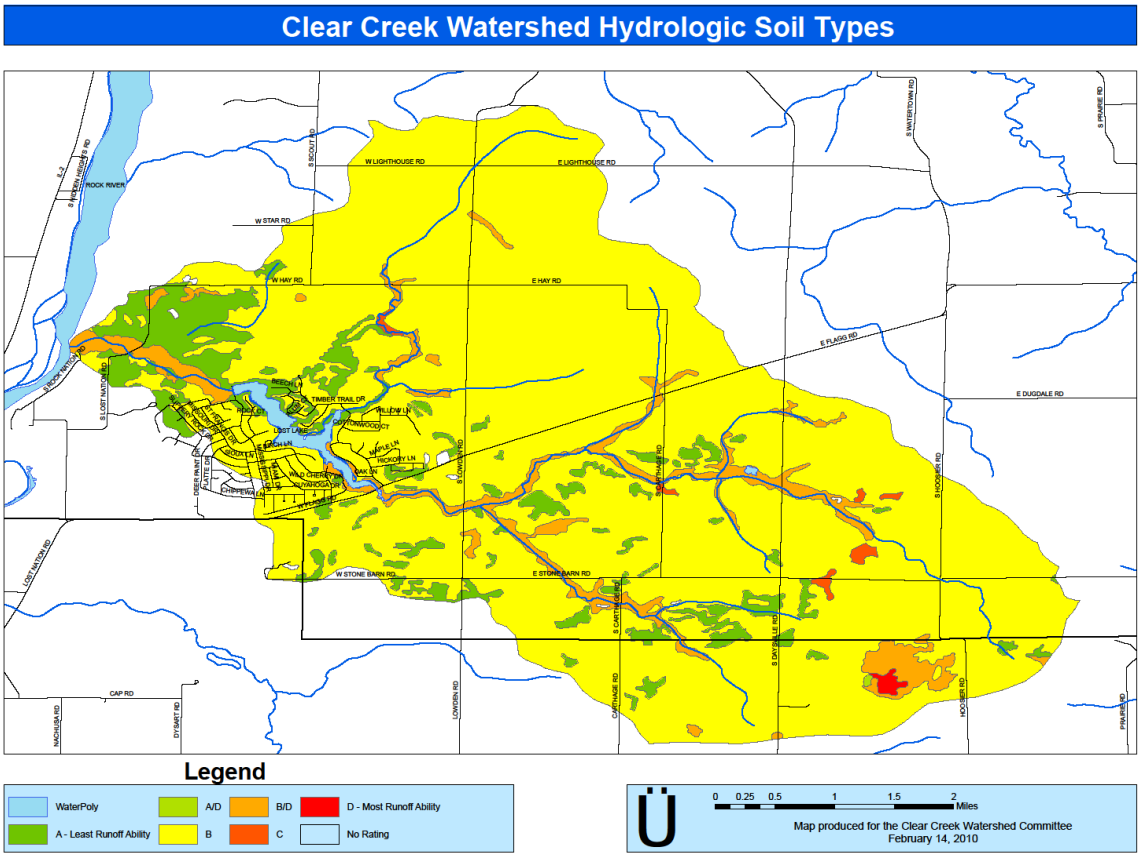
Figure 2-9: Percent Hydrologic Soil Group (HSG) in Clear Creek Watershed

HSG	% in Watershed
A	7.9
B	84.8
B/D	5.9
C	0.4
D	0.2
Source: Kuehl, Pers. Comm.	

The vast majority of the watershed was HSG B (84.8%). HSG A (7.9%) was found in a large patch near the mouth of the Rock River around the small floodplain and scattered throughout the watershed, mostly near streams. HSG B/D (5.9%) followed the streams and covered most of the largest wetland

complex within the southeast corner of the watershed. Smaller wetlands throughout the watershed overlapped with HSG A, B, or B/D. The small amounts of HSG C (0.4%) and D (0.2%) were found in small portions within the southeast corner of the watershed, some occurring within a wetland complex (Figures 2-9 and 2-10).

Figure 2-10: Hydrologic Soil Groups in the Clear Creek Watershed.



Soil Erodibility

Soil in the watershed was usually eroded by water. Wind was not a strong factor of erosion in north-central Illinois. Highly Erodible Land (HEL) percentages and soil erosivity (Kw) values provided insight to soil erodibility in the watershed. HEL was based on the erodibility index of a soil map unit and was determined by dividing the potential erodibility for each soil by the soil loss tolerance (T) value for each soil. A soil map unit with an erodibility index greater than 8 was an HEL (Hill, Pers. Comm.). Soil erosivity (Kw) measured how easily soil detached and was transported by rainfall (tons per acre). Soil with a higher Kw factor, on a scale of 0.02 to 0.69, was more susceptible to sheet and rill erosion by water. There were 3,415 acres (30.7% of the watershed) of soils that were considered HEL with slopes ranging from 5% to 35% (Map 7) (Meisenheimer, Pers. Comm.). The highest Kw factors in the watershed

were 0.43 and 0.49, which accounted for 5.1% of the soils (Kuhel, Pers. Comm.). Typically, soil erosion of cropland and CRP land by water was approximately three to five tons/acre/year in north-central Illinois (Muckel, 2004). In 21% of the watershed, or 2,373 acres, the soils were already considered to be eroded (Meisenheimer, Pers. Comm.).

There were three land covers in the watershed that were likely sources of intensified erosion: cropland, streambanks, and construction sites. In order to obtain a clearer picture of cropland and streambank erosion patterns in the watershed, the USDA Natural Resources Conservation District (NRCS) of Ogle County analyzed a "Rapid Assessment," which estimated cropland and streambank erosion for the watershed based on measurements taken over 10% of the watershed. This assessment provided statistical information to use in a water erosion prediction equation, but was not available at the time this Plan was written. Factors usually considered for such an equation included: (1) amount and intensity of rainfall, (2) ability of the soil to hold together, (3) surface cover, (4) distance for action (slope length), and (5) slope gradient (Muckel, 2004). The three sources of erosion were further discussed below.

Cropland Soil Erosion

There was no known data relating to cropland soil erosion in the watershed. The USDA NRCS Center of Ogle County measured sheet and rill erosion in 2009 and were in the process of analyzing the data, but it was not available at the time this Plan was written.

Streambank Erosion

Bank erosion was a problem in areas of the Clear Creek Watershed, as documented from various sources. Field studies and observations were being conducted by the NRCS and were documented by the Illinois Department of Natural Resources (IDNR), Applied Ecological Solutions, JadEco, and Olson Ecological Solutions. The NRCS completed field work for a rapid assessment of the watershed's fields and streams. Data had yet to be analyzed at the time this Plan was written. The photographs in Figures 2-12, 2-13, 2-14, and 2-15 showed samples of banks throughout the watershed, some of which were experiencing excessive erosion (Meisenheimer, Pers. Comm.). Karen Rivera from the IDNR (2006) documented that the stream was incising, or down-cutting its bed, within a 260 linear-foot sample section of Clear Creek at Nachusa Grasslands. Applied Ecological Services (2001) observed that bends covered with non-stabilizing vegetation was more than likely contributing to a large percentage of erosion, and that straightened stream segments and cleared riparian vegetation was resulting in increased sediment loads and water velocity. JadEco and Olson Ecological Solutions measured average bank height, bank length, and soil texture on both sides of a 1,013-foot section of Babbling Brook (2,026 feet of bank). Data is presented in Figure 2-16.

Construction Erosion

The amount of erosion from construction sites in the watershed was not known, but was believed to be insignificant. Although construction activities affected only a relatively small acreage of land in the

watershed, they could be a major source of sediment and increased water runoff. Construction activities often left the soil disturbed, bare, and exposed to the abrasive action of wind and water, which led to erosion that is commonly 100 times greater than that on agricultural land. On site, compaction of soil caused by heavy equipment driving and parking on-site lowered the rate of water infiltration and reduced available water-holding capacity. This resulted in restricted plant growth, greater watering requirements, and a greater percentage of precipitation running off the site (Muckel, 2004).

Figure 2-11: Highly Erodible Lands (HEL) in the Clear Creek Watershed.

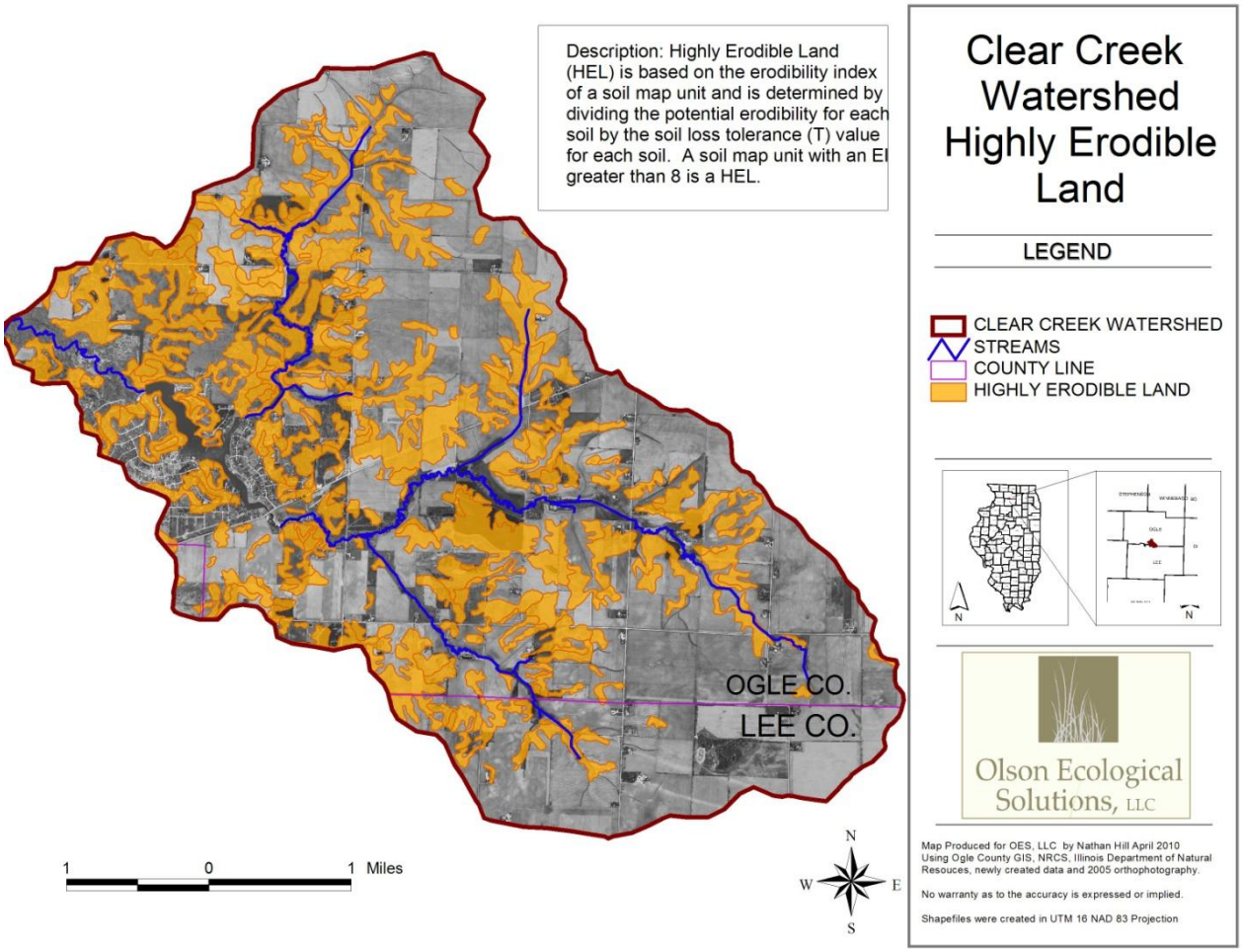


Figure 2-12: Two photographs from Stream Segment S-1 associated with the NRCS Rapid Assessment (Meisenheimer, Pers. Comm.).

Figure 2-13: Three photographs from Stream Segment S-3 associated with NRCS Rapid Assessment (Meisenheimer, Pers. Comm.).

Figure 2-14: Four Photographs from Stream Segment S-8 associated with the NRCS Rapid Assessment (Meisenheimer, Pers. Comm.).

Figure 2-15: Three Photographs from Stream Segment S-10 associated with the NRCS Rapid Assessment (Meisenheimer, Pers. Comm.).

Figure 2-16: Field data collected for Illinosi Environmental Protection Agengy's bank stabilization worksheet.

Joe Rush, JadEco and Rebecca Olson, Olson Ecological Solutions

Shorelines of Lost Lake (LL), North Bank of Babbling Brook (N.BB), and South Bank of Babbling Brook (S.BB)

9-Aug-09

Bank Height Sample (ft.)			
Sample #	LL	N.BB	S.BB
1	2.58	1.75	7
2	3.00	6.33	6.33
3	0.67	3.5	5.08
4	1.33	5.17	3.17
5	1.08	6.08	2
6	1.50		
7	1.25		
8	1.00		
9	5.00		
Avg.	1.94	4.57	4.72

Note: Measured from normal water (pool) height to top of bank. Collected 0-6" soil depth.

Soil Samples			
	LL	N.BB	S.BB
# of samples	3	3	4

Note: Samples for each site combined for an average.

Bank Length (ft)			
Proposed Action	LL	N.BB	S.BB
Total Length		1013	1013
BioEng.		544	663
No Action		70	0
Slope/Seed		399	350

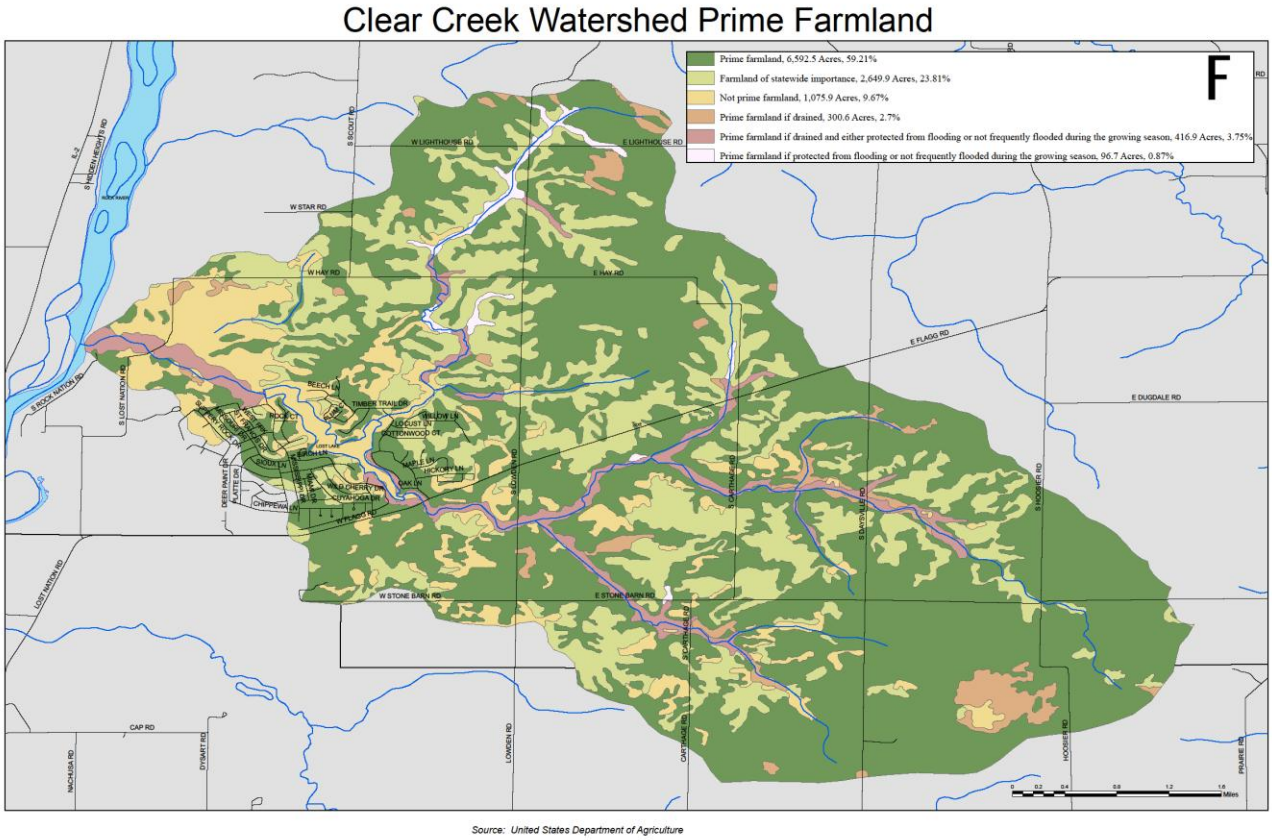
Prime Farmland

More than 90% of the soils within the watershed were of great importance for farming purposes. 59.21% of the watershed (6,591.5 acres) was considered prime farmland (Figures 2-17 and 2-18). An additional 7.32% (814.2 acres) was prime farmland if drained, protected from flooding or not frequently flooded, or both. Farmland of statewide importance covered another 23.81% of the watershed (2,649.9 acres). Only 9.67% of soils (1,075.9 acres) were not considered prime farmland (Kuhel, Pers. Comm.).

Figure 2-17: Farmland Classification of soils in the Clear Creek Watershed

Farmland Classification	**Acres**	**%**
All areas are prime farmland (Dk. Green)	6591.5	59.21
Farmland of statewide importance (Lt. Green)	2649.9	23.81
Not prime farmland (Lt. Peach)	1075.9	9.67
Prime farmland (if drained) (Dk. Peach)	300.6	2.70
Prime farmland (if drained & either protected from flooding or not frequently flooded during the growing season) (Pink)	416.9	3.75
Prime farmland (if protected from flooding or not frequently flooded during the growing season) (White)	96.7	0.87
Total	**11131.6**	**100.00**
(Source: Kuehl, Pers. Comm.)		

Figure 2-18: Prime farmland in the Clear Creek Watershed.



Source: United States Department of Agriculture

Climate

The climate of this region had four distinct seasons. It was an especially important factor to the crop producers in the area, as only one producer in the watershed used irrigation. Climactic factors included in this analysis were precipitation, snow and ice cover, temperature, wind speed, and evaporation.

Precipitation and Snow and Ice Cover

Average precipitation in the Clear Creek Watershed and the rest of the Upper Rock River Assessment Area varied greatly from year to year and between decades. The highest average occurred over the past 20 years. Trends over the past 60 years showed significant increases, while the same data only amounted to slight increases when considering the past 100 years (IDNR, 2001). On average, the watershed and the rest of northern Illinois received from 32 (ISWS, 2003) to 34 (FEMA, 2009 and Finch, 1973) inches of precipitation annually and was subject to droughts, major prolonged wet periods, and flash-floods that dropped four to eight inches of rainfall in a few hours in localized areas. There were on average 110 days of measurable precipitation, including eight days with one inch or more of rainfall and 12 days with one inch or more of snowfall. Once per year on average, the area may have experienced a snowfall of six inches or more. The average annual snowfall was 36 inches (ISWS, 2003). May and June were typically the wettest months and January and February were the driest (ISWS, 2003). Of the

annual average rainfall, 65% (22 inches) usually fell between April and September (FEMA, 2009). Thunderstorms accounted for about 50-60% of the precipitation, half of which occurred between June and August (ISWS, 2003). Typically, snow storms that released one inch or greater of snowfall per storm occurred between November 20th and March 26th (Figure 2-19) (ISWS, 2003).

Temperature

Average annual temperatures in the watershed were 48°F. Average winters experienced highs in the 30s and lows in the teens, with an average of 140 days at or below 32°F and 16 days at or below 0°F. Average summers had highs in the 80s and lows in the 60s with 10 days at or above 90°F and one day over 100°F occurring about every other year. Spring and fall had moderate temperatures, with spring highs around 57°F and lows of 36°F and fall highs of 60°F and lows of 40°F. The average length of the frost-free growing season was 160 days. The last occurrence of 32°F in the spring was on average April 28th and the first occurrence of this temperature in the fall was on average October 7th (Figure 2-19) (ISWS, 2003).

Figure 2-19: Average monthly temperatures and precipitation for Dixon, Illinois (ISWS Station 112348) for 2008 (2009 incomplete).

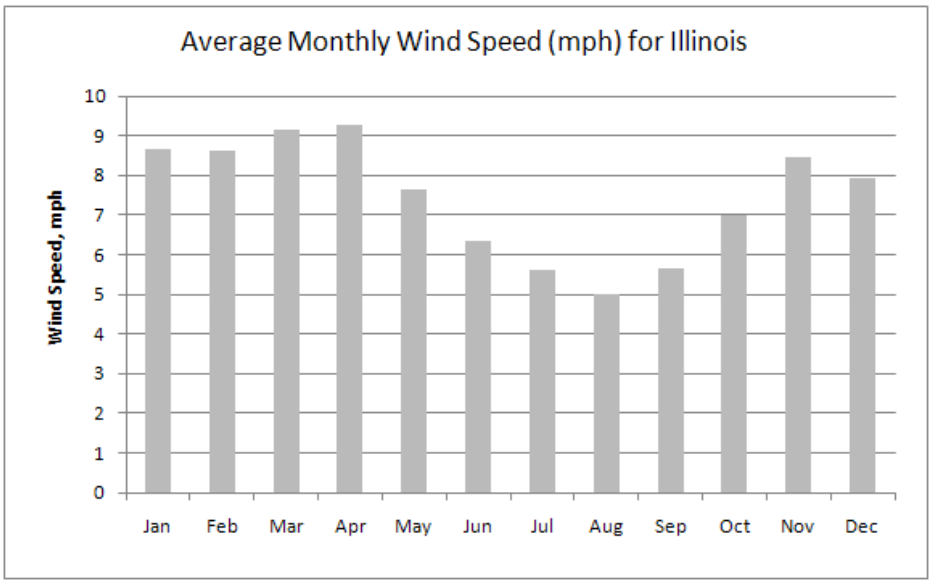
Year	Month	Precip (inches)	Rain Days	High Temp (°F)	Low Temp (°F)	Mean Temp (°F)	Snow (in.)	Daily Max Precip (in.)	Snow Days
2008	Jan.	2.2	10	30.3	9.6	20	13.9	0.42	6
2008	Feb.	4.08	13	26.7	8.2	17.5	25.3	0.98	10
2008	Mar.	1.61	5	41.5	23.3	32.4	4	0.6	1
2008	Apr.	4.97	11	60.2	38.4	49.3	0	1.08	0
2008	May	4.93	8	68.3	44.8	56.6	0	1.96	0
2008	Jun.	4.88	8	80.2	59.2	69.7	0	1.48	0
2008	Jul.	4.58	7	82.4	61.5	72	0	1.09	0
2008	Aug.	2.26	6	80.4	58.7	69.6	0	1.1	0
2008	Sep.	8.57	6	74.9	53.5	64.2	0	3.06	0
2008	Oct.	2.2	6	61	40	50.5	0	0.83	0
2008	Nov.	1.14	5	50.2	32	41.1	0	0.35	0
2008	Dec.	6.24	13	30.4	8.1	19.3	19.3	1.52	8

Source: ISWS, April 11, 2010. http://www.isws.illinois.edu/data/climatedb/ for Dixon, IL.

Wind Speed

Winds usually reached monthly averages of 5 mph to just over 9 mph in the state of Illinois (Figure 1). No information specific to the watershed was found. Information provided was based on data from 1991 to 2000 and measured at the standard height of 33 feet (10 meters) (ISWS, 2010).

Figure 2-20: Average Monthly Wind Speed (mph) for Illinois.

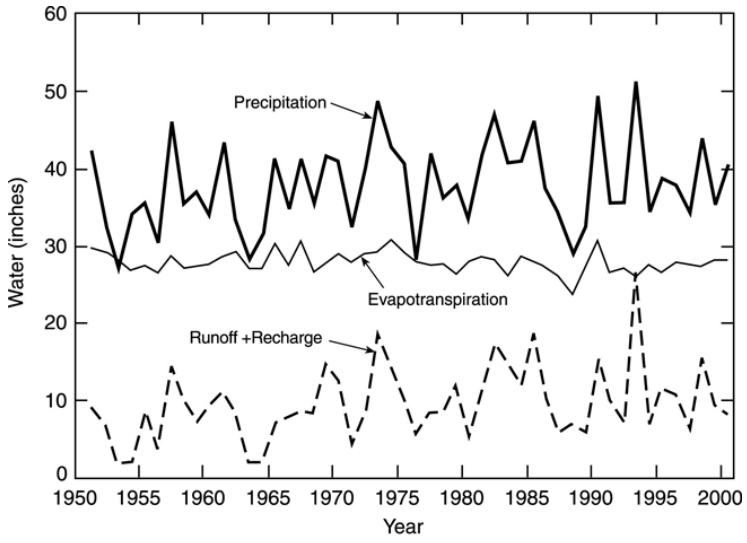


Source: ISWS, 2010.

Evaporation

Evaporation data specific to the watershed was not found. Evapotranspiration for the entire state averaged around 30 inches per year, as summarized and related to precipitation and runoff plus recharge (Figure 2-21) (ISWS, 2010).

Figure 2-21: Time series of annual fluctuations of the difference between precipitation and evaporation, averaged for the entire state, 1951-2000.



Note: Precipitation values are derived from observations while evapotranspiration and runoff values are derived from soil-water-balance model.

Source: Illinois State Water Survey, 2010.

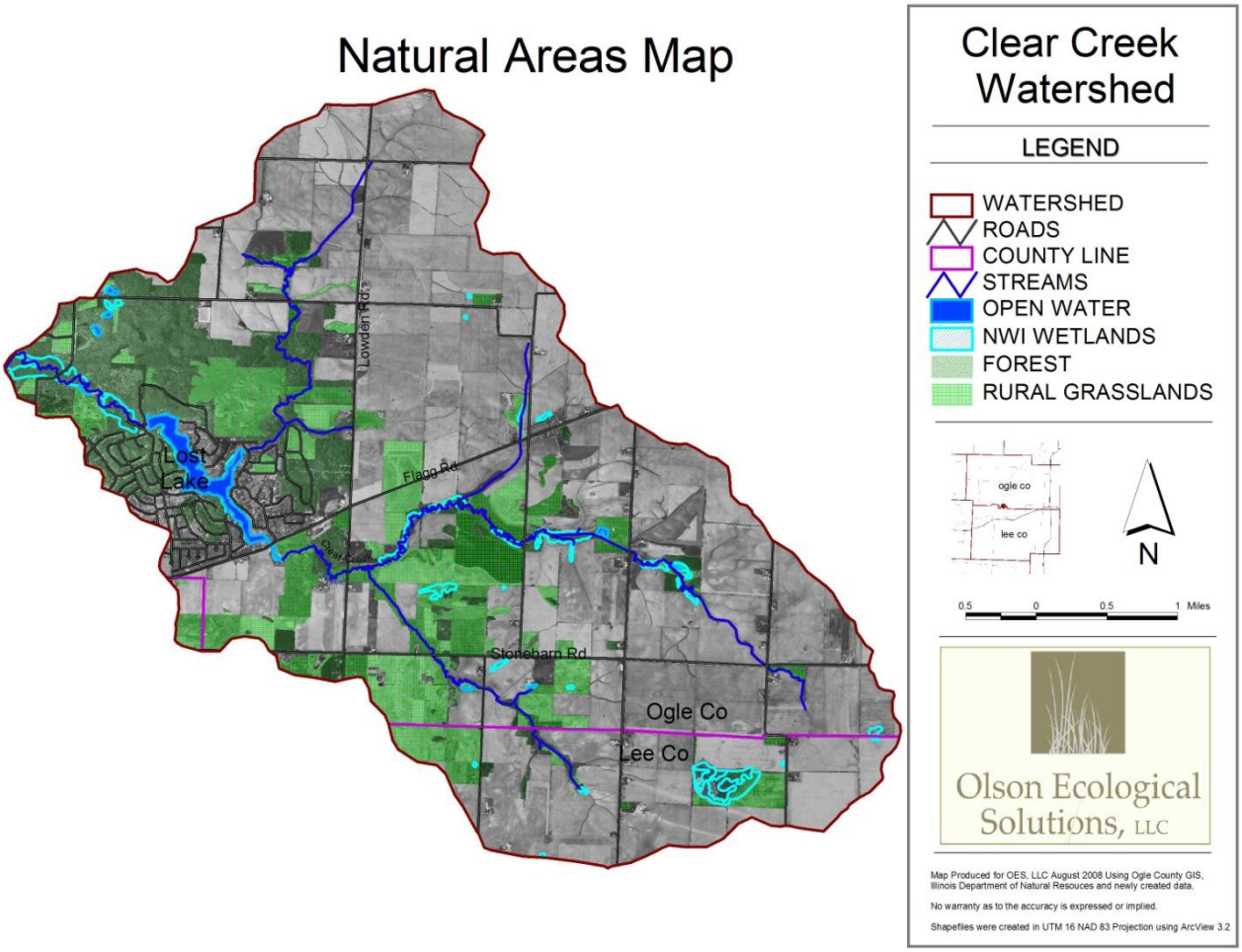
Habitat

The watershed provided aquatic and terrestrial habitat primarily in the form of streams, a lake, ponds, prairies, wetlands, forest, and rural grasslands. This complex system could be discussed as natural areas, wetlands, potential wetland restoration sites, and threatened and endangered plant species. Aquatic habitats were further described in the "Fish and Wildlife" section of this chapter.

Natural Areas

Natural areas existed within and surrounding the watershed (Figures 2-22 and 2-23), and the watershed was identified as important habitat by the Illinois Wildlife Action Plan (IDNR, 2005) and Forest Legacy Program (Gillespie, Pers. Comm.). Within the watershed, Nachusa Grasslands was the only permanently protected site, although one unprotected site has been identified. Just outside of the watershed, over 5,500 acres of state protected lands provide critical habitat to wildlife species. Nachusa Grasslands contained 1,490 within the watershed. It was considered "high priority grassland" by the Illinois Wildlife Action Plan, providing wet prairie, dry sandy prairie, open sandstone cliffs, savanna, and aquatic habitats to fish and wildlife. One additional site in the watershed was identified by Jay Friberg (1990) as part of a study of the flora of Ogle County. This was the Bottomland Forest wetland located closest to the Rock River in Sections 5 and 6 of Taylor Township (R10E, T43N) on both sides of Lost Nation Road between Clear Creek and Hay Road. This area might have still included some of the habitat types and plant communities found by Friberg, including streams and shallow ponds, muddy margins of streams and ponds, elevated sandy terrace of Rock River with degraded prairie, wet sphagnous sandy meadows, dry sandy prairies, shaded sandstone cliffs, sandy open woods, alluvial forest, mesic upland forest, dry upland forest, and margins of woodlands. In addition to habitat within the watershed, habitat within the immediate surrounding area needed to be considered for migratory or otherwise highly mobile species that utilized the watershed. The Illinois Wildlife Action Plan recognized the Rock River Conservation Opportunity Area and the Nachusa-Franklin Creek-Castle Rock-Lowden Miller Conservation Opportunity Area as areas of high value to wildlife that overlapped the Clear Creek Watershed. Large state parks and forests that were connected to the watershed were the other 1,310 acres of Nachusa Grasslands (2,800 acres total), Lowden-Miller State Park (2,291 acres), Castle Rock State Park (2,000 ac.), and Franklin Creek State Park (664 ac.). Lowden Memorial State Park (273 acres), Kyte River Land and Water Reserve (235 ac.), and a Forest Legacy Conservation Easement on adjacent private land (80 ac.) were just upstream on the Rock River (Natural Land Institute, 2008) near the point where the former Biologically Significant Stream segment of the Rock River began. All of these natural areas, other than Franklin Creek State Park and a portion of Nachusa Grasslands, were located within watersheds that drained to the former Biologically Significant Stream segment of the Rock River. Castle Rock and Lowden Miller State Parks formed the largest forest in the region and host a highly diverse nesting community of Neotropical migrants (IDNR, 2005).

Figure 2-22: Natural areas within Clear Creek Watershed.



Wetlands

Wetlands within the watershed were known from the National Wetland Inventory (NWI) (Figure 2-22). A wetland inventory was not conducted, but plants were listed for three small, isolated wetlands identified in the northwest corner of the watershed and surrounding uplands (Table 7). Most of the wetlands identified by the NWI had both native and non-native vegetation present (Figure 2-24) (Kleiman, Pers. Comm.).

Figure 2-23: Protected natural areas connected to the Clear Creek Watershed.

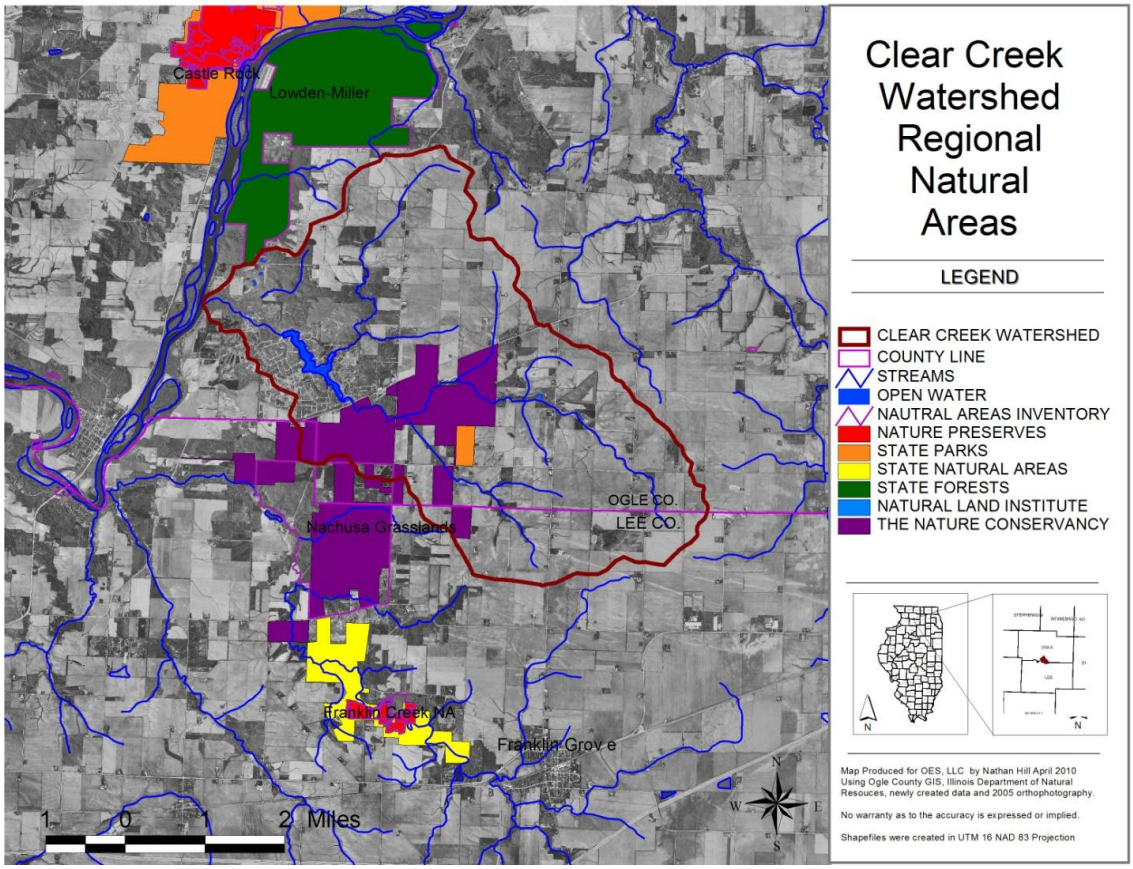


Figure 2-24: Photographs of sample wetlands within the Clear Creek Watershed.

Wetland #1:

Wetland #2: Beaver Pond

Wetland #2: Beaver Pond

Source: Kleiman, Pers. Comm.

Figure 2-25: Plants found at three wetlands near Hay Road by Bill and Susan Kleiman and Jeff Meiners on June 16, 1997.

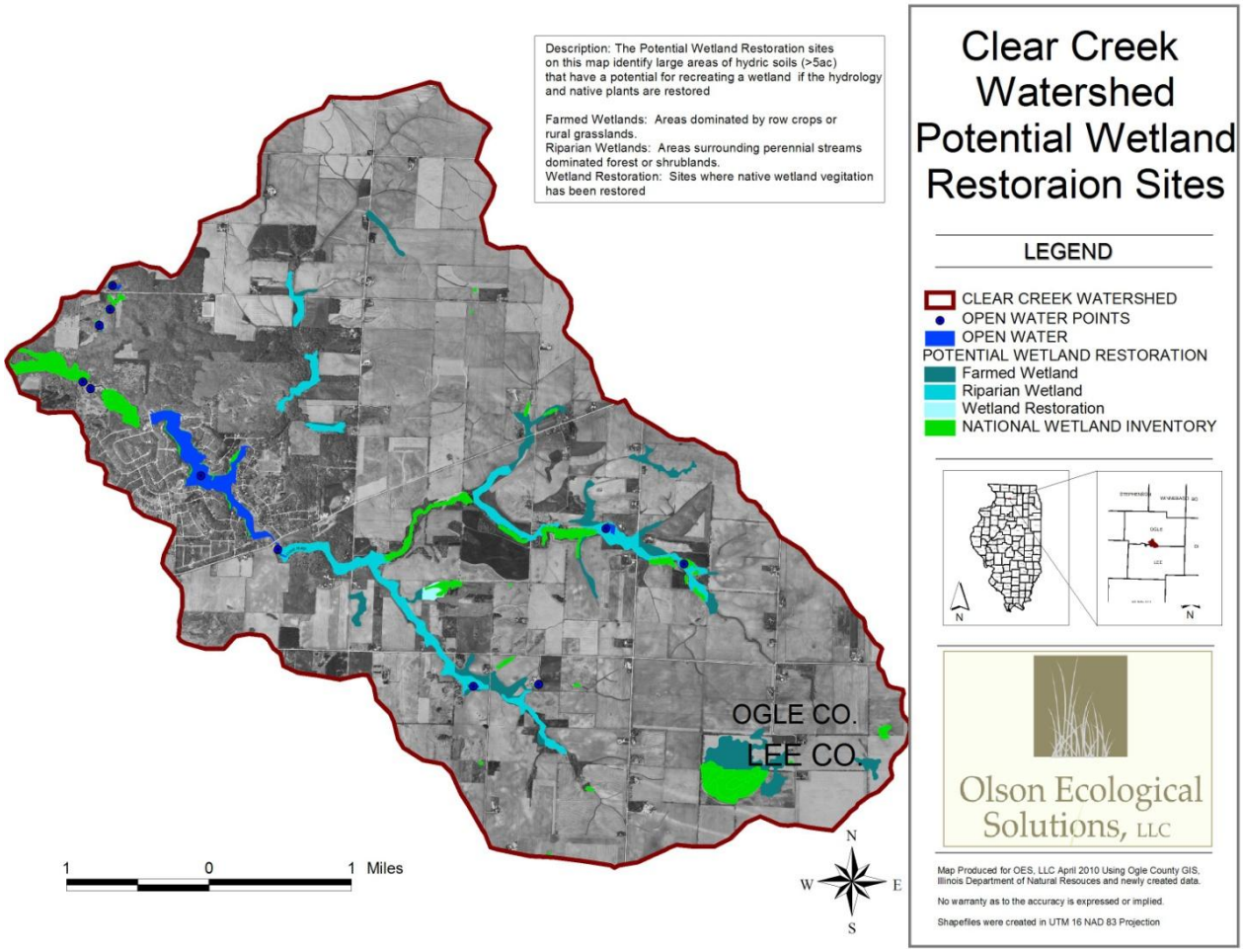
Scientific Name	Common Name
Sanquinaria canadensis	bloodroot
Amorpha canescens	lead plant
Lithospermum canescens	hoary puccoon
Tradescantia ohiensis	spiderwort
Koeleria macrantha	June grass
Potentilla simplex	cinquefoil
Panicum spp. 1	panic grass
Panicum spp. 2	panic grass
Luppinus perennis	lupine
Carex muhlenbergii	sand bracted sedge
Senecio pauperculus	balsam ragwort
Verbena stricta	hoary vervain
Rudbeckia hirta	black eyed susan
Specularia perfoliata	Venus's looking glass
Rosa carolina	pasture rose
Rosa multiflora	multiflora rose
Asclepias verticillata	whirled milkweed
Asclepias amplexicaulis	sand milkweed (blunt leaved)
Lespedeza capitata	round headed bush clover
Solidago sp.	goldenrod
Rubus flagellaris	dewberry
Rubus occidentalis	black rasberry
Hieracium longipilum	long-bearded hawkweed
Hypericum perforatum	common St. John's wort from Europe
Apocynum cannabinum	dogbane (Indian hemp)
Rumex acetosella	field sorrel (sheep sorrel)
Cacalia atriplicifolia	pale Indian plantain
Tragopogon pratensis	yellow goat's beard
Antennaria plantagifolia	pussytoes
Achillea millifolium	yarrow
Equisetum sp.	scouring rush
Oxalis stricta	wood sorrel
Source: Kleiman, Pers. Comm.	

Potential Wetland Restoration Sites

Many wetlands, aquatic habitat, and riparian buffers that provided food and nesting for fish and other aquatic species were lost by the filling and tiling of headwaters for grass waterways and channelization (Schafer, Pers. Comm.). Knowledge of the NWI wetlands was combined with hydric soils data to predict potential wetland restoration opportunities within the watershed (Figure 2-26). Sites were considered

to have good restoration potential if they were hydric, more than five acres in size, adjacent to existing wetlands, or formed corridors between existing wetlands. Much of these sites were found along the creek corridors, although isolated wetland restoration opportunities existed.

Figure 2-26: Potential Wetland Restoration opportunities in the Clear Creek Watershed.



Threatened and Endangered Plants

The following protected plants were found in the watershed and listed on the Illinois Natural Resource Database, although exact locations were not available: Prairie Bush Clover (*lespedeza leptostachya),* Queen-of-the-Prairie *(Filipendula rubra)*, and Kittentails *(Besseya bullii)* (Kieninger, Pers. Comm.). An EcoCAT report also indicated the following protected plants were possibly in the vicinity of the watershed: Downy Yellow Painted Cup *(Castilleja sessiliflora)*, Hairy Woodrush *(Luzula acuminata)*, Rusty Woodsia *(Woodsia ilvensis)*, and Prairie Dandelion *(Nothocalais cuspidata)* (IDNR, 2008*b*).

Fish and Wildlife

Species in Greatest Need of Conservation

There were many Species in Greatest Need of Conservation listed in the Illinois Comprehensive Wildlife Action Plan (IDNR, 2005) that were found within the watershed, as documented by the IDNR and The Nature Conservancy (TNC) (Figures 2-27 and 2-28). Specific locations of these species were not known, but the species most likely utilized the mapped natural areas (IDNR, 2005). Karen Rivera of the IDNR surveyed fish species in Clear Creek at Nachusa Grasslands (2006). Half of the species present were recognized as target species for The Grand Prairie, an area close in proximity and similar to Clear Creek. (Species information for the Rock River Hill Country in which the watershed is found was under-developed.) Southern Redbelly Dace *(Phoxinus erythrogaster)* and Blacknose Dace *(Rhinichthys atratulus)* were present, both of which required clean, cold water temperatures. Brook Stickleback *(Culaea inconstans)* was also present, a species that needed cold water and abundant aquatic vegetation. The Johnny Darter (Etheostoma nigrum) and the Fantail Darter (Etheostoma flabellare), present in the stream, were generally intolerant of poor water quality conditions and most often were found in streams with good flow and clean sediments, although both named species were more tolerant than most darters to silt. Non-game indicator species present included creek chub, spotfin shiner, bluntnose minnow, and sand shiner (Rivera, 2006 and IDNR, 2005). Emphasis game species present were green sunfish and bluegill. Sediment threatened the habitat of these and other species, because it covered the stream bottom, making the living conditions difficult for small aquatic insects which require clean, rocky substrates. As the insects declined, so did the small fishes which relied on them for food (Rivera, 2006).

Game fish species in Lost Lake

Historically, a survey in 1967 revealed the fish population within Lost Lake was in balance, even though there was a continuous influx of creek species (IDOC, 1968). Most of the sport fish were stocked in the lake, including walleye, muskie, and bass. Ken Clodfelter, IDNR Fisheries Biologist, surveyed the lake (October 2009) and stated that the sport fish population sample collected was excellent. He recommended developing “weed beds,” providing cover for small fish, stocking smallmouth bass, and attempting to control the carp populations, because carp removed aquatic vegetation and caused water to be muddy (Clodfelter, 2010). The RCD and homeowners added spawning opportunities for smallmouth bass during lake shore stabilization projects using rip rap in 2009 through 2011. The RCD controlled carp in the past and implemented carp control projects through bow fishing and possibly commercial fishing (Rush, Pers. Comm.).

Figure 2-27: Bird Species in Greatest Need of Conservation that have been sighted in the Clear Creek Watershed.

		Criteria								
Species Name	**Habitat Association**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Source**
Pluvialis dominica (American golden-plover)[1]	Agricultural, mudflat, grassland	0	0	1	1	0	1	0	1	TNC, 2010
Scolopax minor (American woodcock)	Successional fields, ecotones	0	0	1	1	0	0	0	0	TNC, 2010
Haliaeetus leucocephalus (bald eagle)	Forested streams, lakes	FT ST	0	0	0	0	1	0	0	TNC, 2010
Vireo belli (Bell's vireo)	Successional fields, grassland	0	0	1	1	0	0	0	0	TNC, 2010
Chlidonias niger (black tern)	Marsh	SE	0	1	1	0	0	1	0	TNC, 2010
Coccyzus erythropthalmus (black-billed cuckoo)	forest	0	0	0	0	0	0	0	0	TNC, 2010
Nycticorax nycticorax (black-crowned night-heron)	Swamp	SE	0	1	1	0	0	0	0	TNC, 2010
Vermiforma pinus (blue-winged warbler)	successional, forest	0	0	0	0	0	0	0	0	TNC, 2010
Dolichonyx oryzivorus (bobolink)	Grassland	0	0	1	1	0	0	0	0	TNC, 2010
Buteo platypterus (broad-winged hawk)	Forest	0	0	1	1	0	0	1	0	TNC, 2010
Certhia americana (brown creeper)	Bottomland forest, forest	0	0	RR	0	0	0	0	0	TNC, 2010
Toxostoma rufum (brown thrasher)	successional	0	0	0	0	0	1	0	0	TNC, 2010
Aythya valisineria (canvasback)	Rivers, lakes	0	0	1	1	0	1	0	0	TNC, 2010
Dendroica cerulea (cerulean warbler)	bottomland forest	ST	0	1	1	0	0	1	0	TNC, 2010
Chaetura pelagica (chimney swift)	swamp, urban	0	0	1	0	0	1	0	0	TNC, 2010
Chordeiles minor (common nighthawk)	urban, barren, grassland	0	0	1	0	0	0	0	0	TNC, 2010
Spiza americana (dickcissel)	Grassland	0	0	1	1	0	1	0	0	TNC, 2010
Spizella pusilla (field sparrow)	successional	0	0	1	0	0	1	0	0	TNC, 2010
Stema forsteri (Forster's tern)	Marsh	SE	0	1	1	0	0	0	0	TNC, 2010
Ammodramus savannarum (grasshopper sparrow)	Grassland	0	0	1	1	0	0	0	0	TNC, 2010
Ardea alba (great egret)	Forested streams, lakes	0	0	RR	1	0	0	0	0	TNC, 2010
Tringa melanoleuca (greater yellowlegs)[1]	Vernal pool,mudflat, marsh	0	0	1	1	0	0	1	0	TNC, 2010
Ammodramus henslowii (Henslow's sparrow)	Grassland	ST	0	1	1	0	0	0	0	TNC, 2010
Ammodramus leconteii (LeConte's sparrow)[1]	Grassland, marsh	0	0	1	1	0	0	0	0	TNC, 2010
Ixobrychus exilis (least bittern)	Marsh	ST	0	1	1	0	0	0	0	TNC, 2010
Aythya affinis (lesser scaup)	Rivers, lakes	0	0	1	1	0	1	0	0	TNC, 2010
Lanius ludovicianus (loggerhead shrike)	Grassland	ST	0	1	1	0	0	0	0	TNC, 2010
Cistothorus palustris (marsh wren)	Marsh	0	0	1	1	0	0	0	0	TNC, 2010
Colinus virginianus (northern bobwhite)	Successional field, grassland	0	0	1	0	0	1	1	0	TNC, 2010
Colaptes auratus (northern flicker)	savanna, grassland	0	0	1	0	0	1	0	0	TNC, 2010
Circus cyaneus (northern harrier)	Grassland, marsh	SE	0	1	1	0	0	1	0	TNC, 2010
Pandion haliaetus (osprey)	Forested streams, lakes	SE	0	1	1	0	0	0	0	TNC, 2010
Seiurus aurocapillus (ovenbird)	Forest	0	0	1	0	0	0	0	0	TNC, 2010
Falco peregrinus (peregrine falcon)	Urban, cliffs	FE ST	0	1	1	0	0	0	0	TNC, 2010
Podilymbus podiceps (peid-billed grebe)	Marsh, lakes	0	0	RR	1	0	0	0	0	TNC, 2010
Protonotaria citrea (prothonotary warbler)	bottomland forest	0	0	0	1	0	0	0	0	TNC, 2010
Buteo lineatus (red-shouldered hawk)	Bottomland forest, forest	0	0	RR	0	0	0	1	0	TNC, 2010
Grus canadensis (sandhill crane)	Marsh	ST	0	1	1	0	0	1	0	TNC, 2010
Passerculus sandwichensis (savannah sparrow)	Grassland, agricultural	0	0	1	0	0	0	1	0	TNC, 2010
Cistothorus platensis (sedge wren)	Grassland, marsh	0	0	0	1	0	0	0	0	TNC, 2010
Limnodromus griseus (short-billed dowitcher)[1]	Marsh, vernal pool, mudflat	0	0	1	1	0	0	0	1	TNC, 2010
Asio flammeus (short-eared owl)	Grassland	SE	0	1	1		0	0	0	TNC, 2010
Bartramia longicauda (upland sandpiper)	Grassland	SE	0	1	1	0	0	1	0	TNC, 2010
Caprimulgus vociferus (whip-poor-will)	Forest, successional	0	0	1	0	0	0	1	0	TNC, 2010
Empidonax trailli (willow flycatcher)	marsh, successional	0	0	0	1	0	0	0	0	TNC, 2010
Hylocichla mustelina (wood thrush)	forest	0	0	0	0	0	0	1	0	TNC, 2010
Coccyzus americanus (yellow-billed cuckoo)	Forest, savanna	0	0	1	1	0	0	0	0	TNC, 2010
Icteria virens (yellow-breasted chat)	Successional fields, edges	0	0	1	0	0	0	0	0	TNC, 2010
Botaurus lentiginosus (American bittern)	Marsh	SE	0	1	1	0	0	1	0	DNR, 2002*b*
Egretta thula (snowy egret)	Forested streams, lakes	SE	0	1	1	0	0	0	0	DNR, 2002*b*
Egretta caerulea (little bleu heron)	Forested streams, lakes	SE	0	1	1	0	0	0	0	DNR, 2002*b*
Nyctanassa violacea (yellow-crowned night-heron)	Swamp	SE	0	1	1	0	0	0	0	DNR, 2002*b*
Anas rubripes (American black duck)	Forested streams, lakes	0	0	1	1	0	0	0	0	DNR, 2002*b*
Lophodytes cucullatus (hooded merganser)	Forested streams, lakes	0	0	1	0	0	0	0	1	DNR, 2002*b*
Buteo swainsoni (Swainson's hawk)	Savanna, grassland, agriculture	SE	0	1	1	1	0	1	0	DNR, 2002*b*
Cotumicops noveboracensis (yellow rail)[1]	Marsh	0	0	1	1	0	0	0	0	DNR, 2002*b*
Laterallus jamaicensis (black rail)	Marsh	SE	0	1	1	1	0	0	1	DNR, 2002*b*
Rallus elegans (king rail)	Marsh, grassland	SE	0	1	1	0	0	0	0	DNR, 2002*b*
Gallinula chloropus (common moorhen)	Marsh	ST	0	1	1	0	0	0	0	DNR, 2002*b*
Calidris himantopus (stilt sandpiper)	Vernal pool, mudflat, marsh	0	0	1	1	0	0	0	0	DNR, 2002*b*
Tryngites subruficollis (buff-breasted sandpiper)[1]	Vernal pool, mudflat, marsh	0	0	1	1	0	1	0	1	DNR, 2002*b*
Phalaropus tricolor (Wilson's phalarope)	Marsh, vernal pool	SE	0	1	1	0	0	0	0	DNR, 2002*b*
Sterna hirundo (common tern)	Beach	SE	0	1	1	0	0	0	0	DNR, 2002*b*
Tyto alba (barn-owl)	Savanna, grassland, agriculture	SE	0	1	1	0	0	0	0	DNR, 2002*b*
Empidonax virescens (Acadian flycatcher)	forest	0	0	1	0	0	0	0	0	DNR, 2002*b*
Thryomanes bewickii (Bewick's wren)	Successional areas, forest	SE	0	1	1	1	0	0	0	DNR, 2002*b*
Helmitheros vermiforma (worm-eating warbler)	forest	0	0	0	0	0	0	1	0	DNR, 2002*b*
Oporornis formosus (Kentucky warbler)	forest	0	0	1	1	0	0	1	0	DNR, 2002*b*
Oporornis agilis (Connecticut Warbler)[1]	Forest	0	0	1	0	0	0	0	1	DNR, 2002*b*
Euphagus carolinus (rusty blackbird)[1]	Swamp, bottomland forest	0	0	1	1	0	0	0	1	DNR, 2002*b*
Aquila chrysaetos (golden eagle)	Rocky cliffs, tall trees									Walters, 2010

Figure 2-28: Other wildlife Species in Greatest Need of Conservation that have been sighted in the Clear Creek Watershed.										
		Criteria								
Species Name	Habitat Association	1	2	3	4	5	6	7	8	Source
Mammals										
Lontra canadensis (river otter)	Streams, impoundments	0	0	RR	0	0	0	0	0	DNR, 2002*b*
Lynx rufus (bobcat)	Forest, ecotones	0	0	RR	0	0	0	1	0	TNC, 2010
Microtus pinetorum (woodland vole)	deciduous forest, successional forest	0	0	1	0	0	0	0	1	DNR, 2002*b*
Mustela nivalis (least weasel)	Grassland, successional, ecotones	0	0	0	0	0	0	1	0	TNC, 2010
Ondatra zibethicus (muskrat)	Marshes, streams, ponds	0	0	0	1	0	0	1	0	TNC, 2010
Spermophilus franklinii (Franklin's ground squirrel)	grassland, early successional areas	ST	0	0	1	0	0	1	0	TNC, 2010
Taxidea taxus (american badger)	Grassland, agricultural	0	0	0	0	0	0	1	0	TNC, 2010
Urocyon cinereoargenteus (gray fox)	Forest, successional areas	0	0	0	0	0	0	1	0	DNR, 2002*b*
Reptiles										
Emydoidea blandingii (Blanding's turtle)	marsh	ST	0	1	1	0	0		0	TNC, 2010
Heterodon nasicus (western hognose snake, Plains h	sand prairie, sand savanna	ST	0	1	1	1	0		0	TNC, 2010
Liochlorophis vernalis (smooth green snake)	grassland, savanna, marsh, successional	0	0	1	0	0	0		1	DNR, 2002*b*
Ophisaurus attenuatus (slender glass lizard)	grassland, savanna	0	0	1	1	0	0		1	DNR, 2002*b*
Terrapene ornata (ornate box turtle)	grassland	0	0	1	1	0	0		1	TNC, 2010
Amphibians										
Hemidactylium scutatum (four-toed salamander)	pools, streams, forest	ST	0	1	1	0	0		0	DNR, 2002*b*
Necturus maculosus (mudpuppy)	gravel-bottom streams, lakes	0	0	1	1	0	0		1	DNR, 2002*b*
Rana palustris (pickerel frog)	cool, rocky headwaters, cave entrances	0	0	1	1	0			1	TNC, 2010
Fish										
Campostomoa oligolepis (largescale stoneroller)	streams, rivers over gravel, rock	0	0	1					1	DNR, 2002*b*
Carpoides velifer (highfin carpsucker)	pools, backwaters of streams, rivers	0	0	1					1	DNR, 2002*b*
Cottus bairdi (mottled sculpin)	Lake Michigan	0	0	1						DNR, 2002*b*
Culaea inconstans (brook stickleback)	vegetation in cool streams	0	0	1	1	0	0	0	0	Rivera, 2006
Erimystax x-punctatus (gravel chub)	rivers w/ gravel substrate	ST	0	1	1	0	0	1	1	DNR, 2002*b*
Ichthyomyzon fossor (northern brook lamprey)	streams and rivers	SE	0	1	0	0	0	0	1	TNC, 2010
Micropterus dolomieu (smallmouth bass)	cool streams, rivers over gravel, rock	0	0	0	0	0	0	1	0	DNR, 2002*b*
Moxostoma carinatum (river redhorse)	high-gradient rivers over rocky	ST	0	1	1	1	0	1	1	DNR, 2002*b*
Moxostoma duquesnei (black redhorse)	streams over sand, rock	0	0	1						DNR, 2002*b*
Notropis nubilus (Ozark minnow)	pools, streams, over gravel	0	0	1						DNR, 2002*b*
Notropis rubellus (rosyface shiner)	rocky runs of small-med. rivers	0	0	1						TNC, 2010
Notropis texanus (weed shiner)	vegetated streams over sand	SE	0	1	1	0	0	1	0	DNR, 2002*b*
Noturus exilis (slender madtom)	high-gradient streams, rivers over gravel, rock	0	0	1	1	0	0	1	0	DNR, 2002*b*
Perca flavescens (yellow perch)	Lake Michigan	0	0	1						DNR, 2002*b*
Phoxinus erythrogaster (southern redbelly dace)	cool streams over sand, gravel	0	0	0	1	0	0	1	0	Rivera, 2006
Rhyinichthys atratulus (blacknose dace)	cool streams over sand, gravel	0	0	0	1	0	0	1	0	Rivera, 2006
Stizostedion canadense (sauger)	large rivers	0	0	0	0	0	0	1	0	DNR, 2002*b*
Stizostedion vitreum (walleye)	streams, rivers, lakes	0	0					1		DNR, 2002*b*
Mollusks										
Alasmidonta viridis (slippershell mussel)	Streams	ST		1						DNR, 2002*b*
Cyclonaias tuberculata (purple wartyback)	Streams, large rivers	ST		1						DNR, 2002*b*
Elliptio dilatata (spike)	Streams	ST		1						DNR, 2002*b*
Epioblasma triquetra (snuffbox mussel)	Streams	SE	G3	1						DNR, 2002*b*
Fusconaia ebena (ebonyshell)	Large rivers	ST		1						DNR, 2002*b*
Lasmigona costata (fluted shell)	Streams			1						DNR, 2002*b*
Ligumia recta (black sandshell)	Streams, large rivers	ST		1						DNR, 2002*b*
Plethobasus cyphus (sheepnose mussel)	Streams, large rivers	FC SE	G3	1						DNR, 2002*b*
Quadrula metanerva (monkeyface)	Streams, large rivers			1						DNR, 2002*b*
Venustaconcha ellipsiformis (ellipse)	Streams		G3	1						DNR, 2002*b*
Crustaceans										
None										
Insects										
Speyeria idalia (regal fritillary)	xeric/mesic prairie	FC ST	G3	1						Kieninger, Pers. Comm.
Other invertebrates										
None										

Land Use and Population Characteristics

Land Use and Land Cover

Land uses and land cover changed dramatically in the watershed throughout history, but no major land use changes were planned at the time this Plan was written. Historically, forest (green) and prairie (gold) dominated the landscape in the 1840s (Figure 2-30). More recently, agriculture was the dominant land use, with residential development accounting for only 2.3% of the watershed (Hill, Pers. Comm.). The most recent, readily available land cover data was from 1999. Much changed since then, so information using 2005 orthophotography, local knowledge, and shapefiles of more recent grid files (2000-2007) from the Illinois geospatial data clearing house was referenced (Figure 2-31). The most dramatic land use changes between the 1840s and 2007 were the decline of about 7,200 acres of natural lands (65% of the watershed) and the rise of 6,235 acres (56%) of cropland with little to no habitat benefit. However, 85% of the original forested acreage and all of the bottomland remained (Figure 2-29), and much of Nachusa Grasslands was restored to prairie and other plant communities by TNC. Land uses and land cover continued to change. Land actively used for agricultural purposes declined between 2000 and 2007 by 1,000 acres (9%): from 64% in 2000 to 59% in 2006 to 56% in 2007 (Hill, Pers. Comm.). The Ogle County Comprehensive Plan did not project any land use changes for the area (Ogle County Planning and Zoning Department, 2004). Lee County had a draft land use plan, which did not identify any future economic development areas or wind mill farm opportunities within the watershed (Vandewalle & Assoc., 2009).

Figure 2-29: Land use cover changes from the 1840s to 2007 (in acres).

Year	Forest	Rural Grassland	Open Water	Bottomland	Cropland
2007	2099	1812	83	37	6337
1840s	2471	8623	105	36	102
Difference	-372	-6811	-22	1	6235

Source: Nathan Hill used information from the Illinois Geospatial Data Clearinghouse (2005-2007 gridfiles), 2005 orthophotography, and local knowledge (April 2010).

Notes:

Forest measured is >80% canopy cover.

Rural grassland with little or no trees and prairie are grouped under "Rural Grassland."

Small acreages and roadside ditches are not included.

Figure 2-30: Historical land cover of the Clear Creek Watershed.

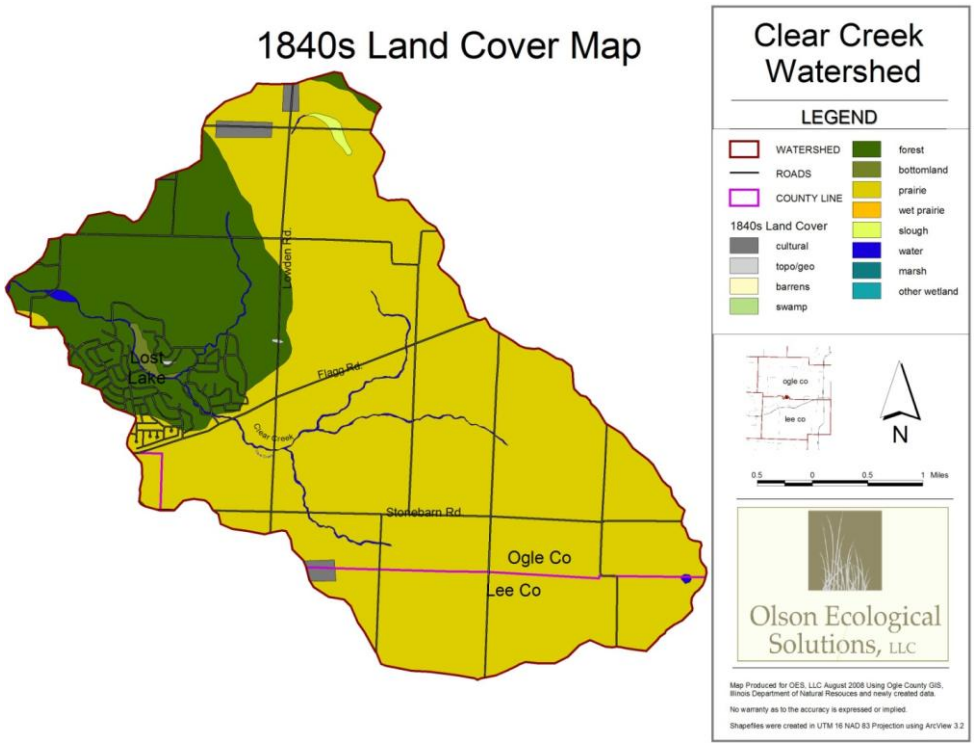
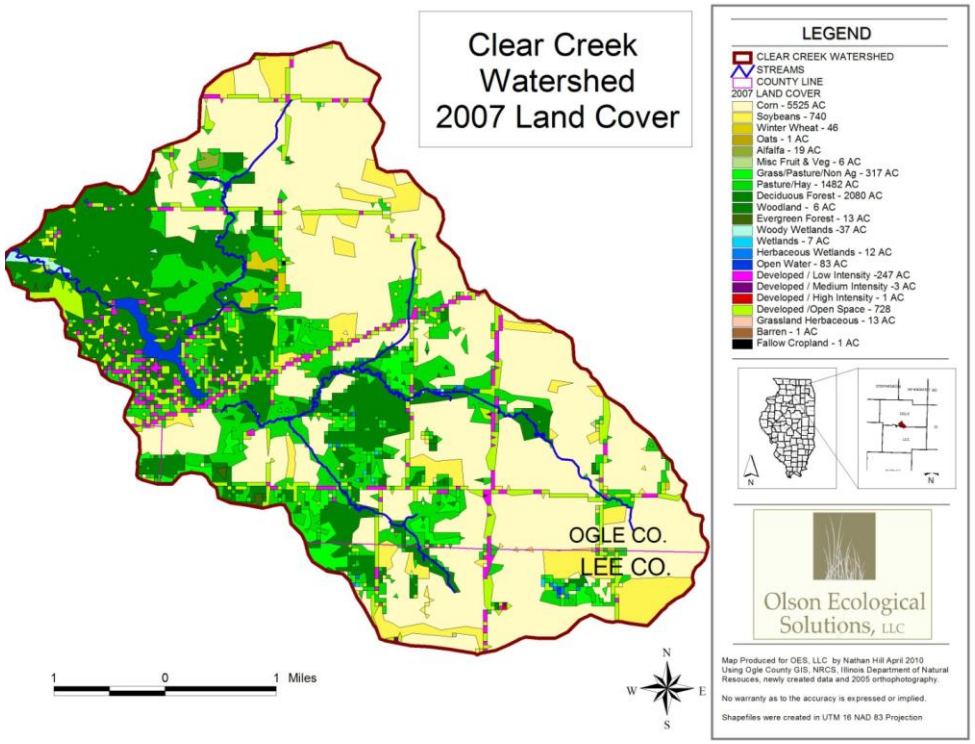


Figure 2-31: Current land cover in the Clear Creek Watershed.



Land Management Practices

Nonpoint Source Projects

Under the Clean Water Act Section 319, one implementation project was underway to combat nonpoint source pollutant loading into Babbling Brook and Lost Lake (Grant No. 3191003). The Illinois Environmental Protection Agency and the RCD funded this project to stabilize 1,575 feet of streambank along Babbling Brook and 1,981 feet of shoreline along Lost Lake. The project utilized a variety of stabilization methods in order to provide a demonstration area for other landowners in the watershed and the people of Ogle and Lee Counties and the rest of Illinois. The RCD was planning to submit another grant application under Section 319 in August 2011 to provide a silt containment area at the point where Babbling Brook flowed into Lost Lake. This was aimed at providing a cost-effective means of trapping sediment before it entered the aesthetically-impaired Lost Lake at a location easily accessible for maintenance.

Local Ordinances

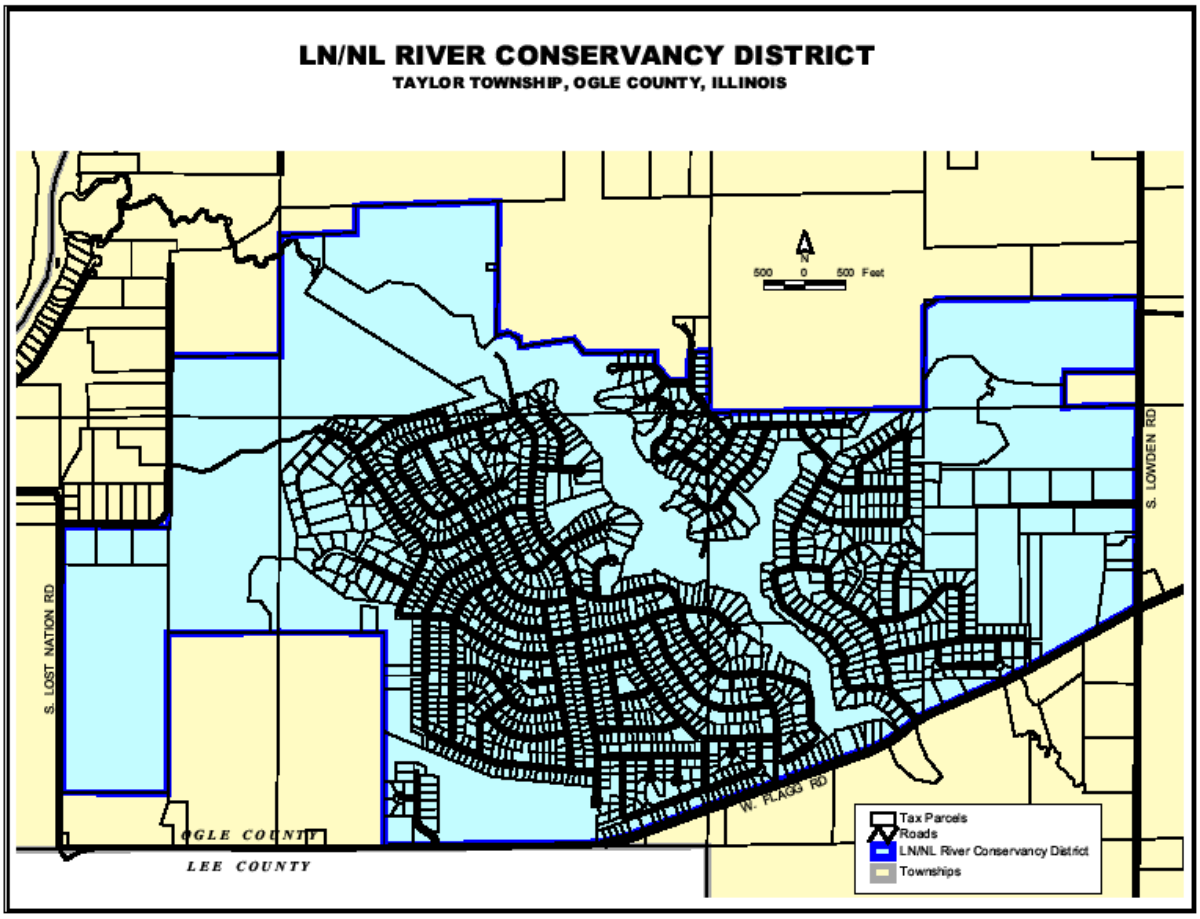
Local ordinances and comprehensive plans that applied to the watershed addressed stormwater management, flood control, and sediment and erosion control during construction in the watershed in order to lessen associated problems. These requirements originated from Ogle and Lee counties and RCD.

The Ogle County Comprehensive Stormwater Management Ordinance and Lee County Code Title 11 Chapter 3 primarily regulated activities that had the potential to increase stormwater runoff, damage and impair downstream channels, and pollute streams and lakes. The Ogle County Special Hazard Areas Ordinance, Lee County Code Title 11 Chapter 4, and stormwater ordinances controlled development in 100-year floodplains or areas known to flood “as identified by the community.” Both county stormwater ordinances also contained the purpose of preserving the natural characteristics and functions of watercourses and floodplains. These ordinances included permit requirements and construction standards for floodplains, but included substantial sections for variances (Special Hazard Areas Ordinance, 2003 and Lee County Code, 2010). Comprehensive plans for both counties addressed similar issues and strive to maintain and protect riparian areas and wetlands for their water retention and infiltration capabilities (Ogle County, 2008 and Lee County, 2010). To control sediments and erosion during construction, Ogle County referred to the “Procedures and Standards for Urban Soil Erosion and Sedimentation Control in Illinois” by The Urban Committee of the Association of Illinois SWCDs. Lee County required new developments follow the “County Development Manual” (Lee County Code, 2010).

The RCD had the power to effectuate river and flood control, drainage, irrigation, conservation, sanitation, navigation, recreation, development of water supplies and the protection of fish life over their area of jurisdiction, which extended slightly beyond the Lost Nation New Landing subdivision (Figure 2-32). The RCD formed the Lake Management Committee in 2006 to preserve and protect the Clear Creek watershed by promoting understanding and through comprehensive management plans for

the land and watershed ecosystems. They adopted standard operating procedures for shoreline re-vegetation prepared by Kaskaskia Engineering Group (2008), initiated a rebate program for homeowners to stabilize their shorelines, and they initiated a zero phosphorus lawn fertilizer program in May 2009, which is an educational tool for homeowners (Breckenfelder, Pers. Comm.).

Figure 2-32: Lost Nation New Landing River Conservancy District jurisdiction.



Source: RCD, April 15, 2010.

Land and Water Conservation Measures

TNC, NRCS, SWCD, and RCD practiced land and water conservation measures in cooperation with private landowners.

TNC used conservation easements and fee simple purchase of land to address their mission to protect and restore natural lands. Much of Nachusa Grasslands was restored to a natural state, but some continued to be farmed temporarily until resources were available to restore the land. They had conservation easements on 400 acres of private land in the watershed. They also had partnered with Northern Illinois University to conduct experimental livestock grazing within Nachusa Grasslands, which

replaced conventional grazing practices that do not restrict stream access from livestock. This new program will rest the stream bank from grazing pressure, especially during the first five years, after which time low intensity grazing may be reintroduced, while livestock will mainly be restricted to fenced, experimental areas (Kleiman, Pers. Comm.).

The NRCS delivered technical assistance, mostly focused on the development of individual farm or ranch conservation plans. They also conducted planning at a level larger than the individual farm or ranch in order to address many natural resource issues. The NRCS and SWCD had about 380 acres in the watershed enrolled in various conservation practices (Figure 2-33).

Figure 2-33: NRCS/SWCD conservation practices in the Clear Creek Watershed.

Practice	Code	Acres
Already Estab. Grasses	CP10	213
Already Estab. Trees	CP11	14.3
Wildlife Food Plot	CP12	0.3
Native Grasses	CP2	6.8
Filter Strips (Native/Cool)	CP21	16.7
Riparian Forest Buffer	CP22	2.8
Hardwood Tree Planting	CP3a	9.5
Wildlife Habitat	CP4d	108.22
Grassed Waterway	CP8a	7.6
TOTAL		**379.22**

Source: Meisenheimer, Pers. Comm.

The RCD was active in improving and maintaining the ecological integrity of the lake community. In addition to volunteer monitoring efforts, they successfully controlled goose populations and constructed a silt basin on Clear Creek in the 1980s that trapped a significant amount of sediment over the years by settling the sediments prior to their entry into the lake. The basin was approximately 1.1 acre in size with a maximum depth of about 4 feet, which was relatively small for the incoming water volume. It was mechanically dredged every other year or as needed (Rush, Pers. Comm.). Due to the success of the existing basin for Clear Creek, the RCD was planning to construct a similar basin for Babbling Brook.

Master Plans

The watershed was in an area that received well-deserved attention from local, state, and federal organizations and agencies that focus on natural resources preservation. It was recognized by the IDNR's Comprehensive Wildlife Conservation Plan and Strategy, USDA Forest Service's Forest Legacy Program, and Ogle County Regional Greenways Plan. The watershed was not of economic interest to either Ogle or Lee County.

Illinois Comprehensive Wildlife Conservation Plan and Strategy

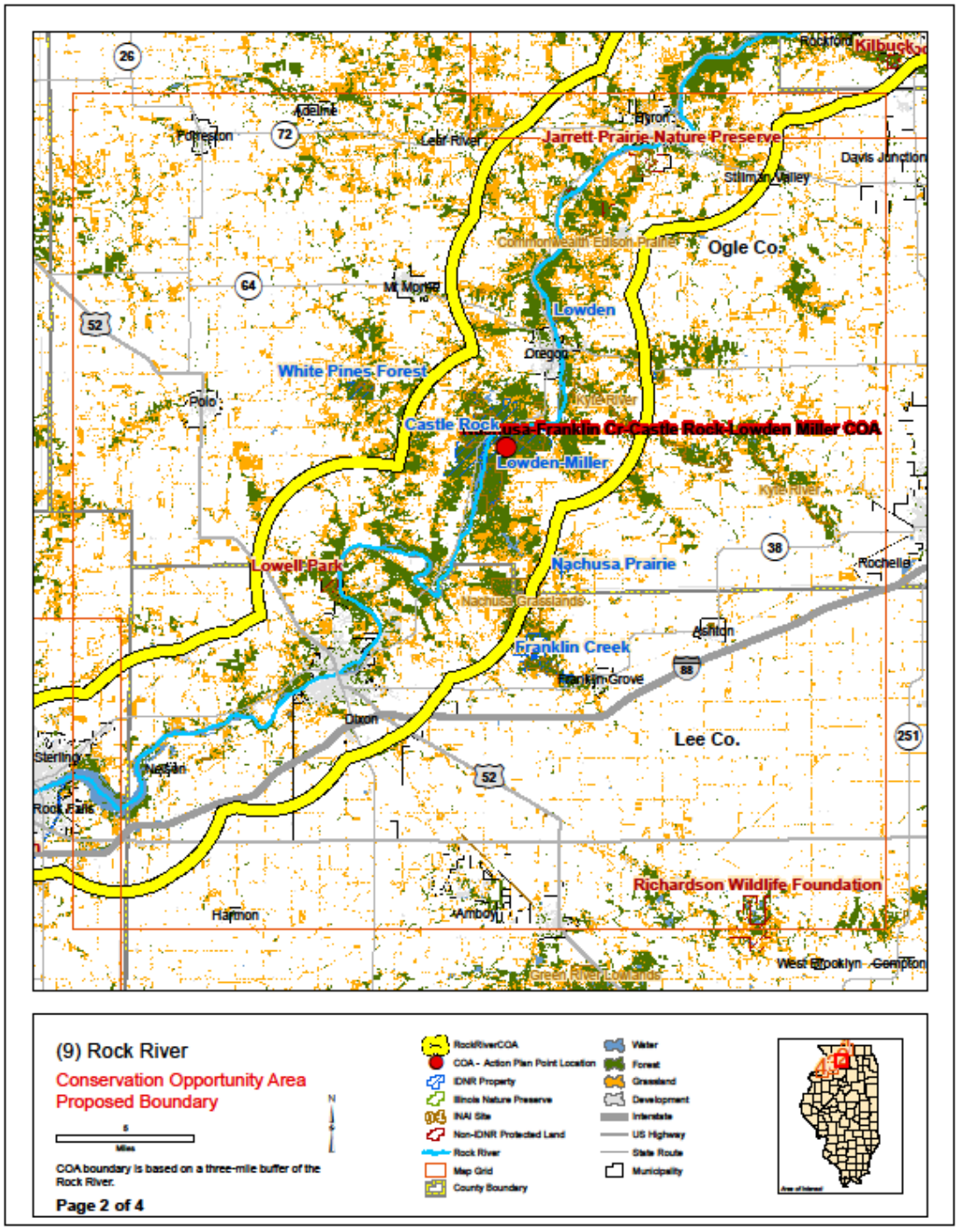
Two Conservation Opportunity Areas partially covered the watershed. The Rock River Conservation Opportunity Area included land surrounding the Rock River (Figure 2-35). The Nachusa-Franklin Creek-Castle Rock-Lowden Miller Conservation Opportunity Area enclosed most of the watershed and Nachusa Grasslands as it meandered between lands just north of Lowden Miller State Forest south to Franklin Creek State Park (Figure 2-36) (IDNR, 2005). Conservation practices within the watershed applied to goals of the Illinois Comprehensive Wildlife Conservation Plan and Strategy for a larger geographical area (Figure 34).

Figure 2-34: Goals of the Illinois Comprehensive Wildlife Conservation Plan and Strategy that apply to Clear Creek Watershed and a larger geographic area.

Habitat	Goal
Forest	Increase forest acreage by about 14,400 acres.
	Expand and improve bottomland forest habitat.
	Inventory and prioritize forested blocks of 500 acres for adding or linking other forest blocks.
	Encourage sound management practices to promote healthy upland forests.
Open Woodland/ Savanna	Increase savanna/open woodland acreage by about 15,000 acres.
	Manage existing habitat and restore degraded habitats.
	Encourage habitat in isolated woodlands <15 acres in size.
Grassland	Increase grasslands by about 52,000 acres.
	Manage rural grasslands for diverse structure and composition to support native species.
	Establish grassy buffers and terraces to reduce agricultural runoff and erosion from construction sites into waterways.
Wetland	Increase wetlands by 1,500 acres.
	Establish buffer between wetlands and adjacent agricultural land to prevent herbicide runoff and sedimentation.

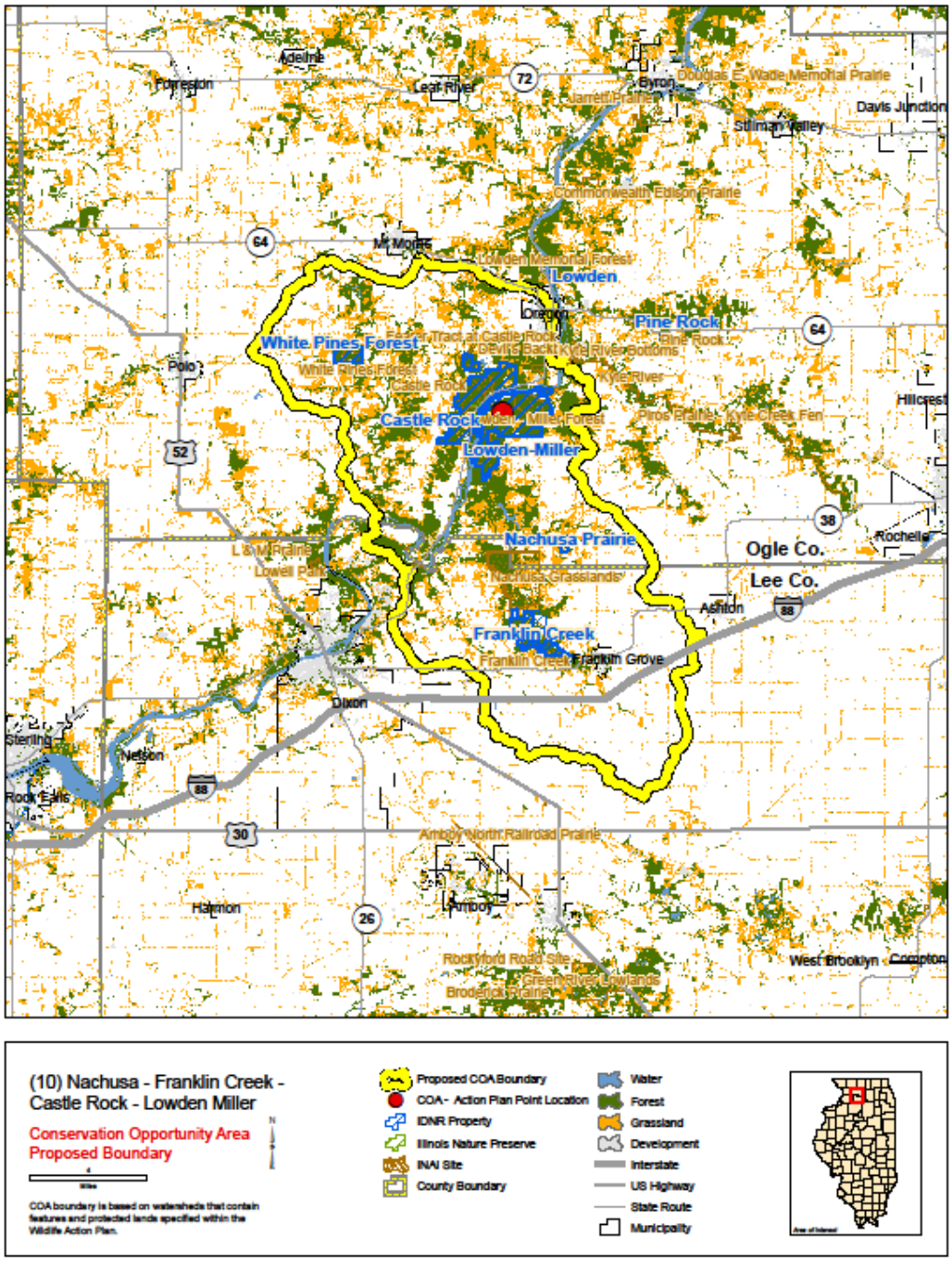
Source: IDNR, 2005.

Figure 2-35: Rock R. Conservation Opportunity Area overlaps with Clear Creek Watershed.



Source: Renn, Pers. Comm.

Figure 2-36: Nachusa-Franklin Creek-Castle Rock-Lowden Miller Conservation Opportunity Area includes most of the Clear Creek Watershed.



Source: Renn, Pers. Comm.

Forest Legacy Program

The watershed was part of a larger Forest Legacy Area, one of three nationally recognized for the state of Illinois for its mature forests (Gillespie, Pers. Comm.).

Ogle County Regional Greenways and Trails Plan

The Ogle County Regional Greenways and Trails Plan mapped potential greenways and trails. It suggested a potential recreational and canoe trail following the Rock River and a secondary trail along the north side of Lost Lake (Scheaffer, 2003).

Economic Development Plans

The watershed was not identified as economic development areas by either Ogle or Lee County (Vandewalle & Assoc, 2009 and Ogle County Planning & Zoning Dept, 2008).

Demographics

Population Statistics

Population statistics were available for Ogle and Lee counties, but the watershed was too small to derive any meaningful census data (Figure 2-37).

Land Ownership

Of the 11,130 acres in the watershed, all was privately owned except the 88-acre Lost Lake and 1,490 acres of Nachusa Grasslands. The lake was owned by the RCD, a governmental body. Nachusa Grasslands was owned by TNC, a not-for-profit organization.

Public Opinion Poll

The RCD (2008) surveyed the attitudes and opinions about the watershed of their constituents and received 289 responses. No such survey had been repeated for other stakeholders of the watershed. Responses suggested the following:

1. 84.7% of respondents either agreed (39.7%) or strongly agreed (45%) that the economic stability of their community depended on good water quality and clarity.
2. 87.6% of respondents either agreed (40.8%) or strongly agreed (46.8%) that taking action to protect water quality at Lost Lake was important.
3. 52.5% of respondents did not think that their household activities had much impact on the lake's water quality.
4. 37.9% of respondents did not think that their activities on their land had much impact on the lake's water quality.

5. 50.9% of respondents indicated a willingness to improve the lake shore to protect water quality and clarity and stop erosion.

Respondents were either extremely or somewhat concerned about many environmental factors associated with the lake.

- Over 80% of respondents were concerned about excessive nutrients, septic contamination, sediment import from water and /or loss of lake volume, and sediment contamination.
- Over 70% of respondents were concerned about shoreline erosion, lack of management in the watershed, decreased water clarity, aquatic habitat destruction, and loss of native aquatic plants and animals.
- Over 60% of respondents were concerned with over-management of the lake/chemical treatments and litter and debris.
- Over 50% of respondents were concerned with algal blooms, fish die-off, and road maintenance (i.e. de-icing).

However, only 6% of the respondents thought that Lost Lake was much polluted and 58.1% felt that the lake community was a pristine natural area.

Respondents indicated that they often performed the following behaviors to protect the lake:

- 34.2% often picked up pet waste,
- 23.5% often used phosphorous-free fertilizer,
- 30.6% often timed application of fertilizer according to the rain forecast,
- 51.9% often followed manufacturer's guidelines for fertilizer application,
- 39.1% often swept fertilizers and/or pesticides off of impervious surfaces,
- 30.7% often left or created a buffer of native plants between their home and the lake,
- 20.7% often controlled soil erosion on their property,
- 36.9% often kept yard waste away from shorelines,
- 54.9% often discouraged feeding Canada geese, and
- 36.4% often thought about the impact of the watershed and inlets on the lake.

Figure 2-37: Population Statistics for Ogle and Lee Counties in 2006-2008.							
Category	**Statistic**	**Ogle**	**Lee**	**Category**	**Statistic**	**Ogle**	**Lee**
Households	# of Households	20000	14000	Age	Median Age	38.3 yrs.	40.1 yrs.
	# of People/Household	2.7	2.4		Under 18 yrs. Old	24%	22%
	% Households of Families	71%	68%		Over 65 yrs. Old	14%	16%
	%Nonfamily Households	29%	32%	Ethnicity	White non Hispanic	89%	90%
Mobility	No mobility w/in 1 year	87%	88%		Black or African Am.	1%	4%
	Moved w/in county in past yr.	7%	6%		Am. Indian/Alaska Native	0.50%	0.50%
	Moved into county w/in yr.	7.50%	5.50%		Asian	1%	0.50%
Education	High School Graduate	70%	70%		Native Hawaiian/Pacific Islander	0.50%	0.50%
	College Graduate or Higher	17%	15%		Other	2%	1%
	No High School Degree	13%	15%		Hispanic	9%	4%
	School Enrollment Total	14000	8200		2 or More Races	2%	2%
	PreK & K Enrollment	1700	820	Housing	Total Housing Units	22000	15000
	Elem. & High School Enroll.	9800	5300		Vacant Housing Units	7%	7%
	College Enrollment	2600	2100		Single Unit Structures	83%	78%
Occupation	Sales & Office	26%	20%		Multi-Unit Structures	14%	17%
	Management & Professional	25%	27%		Mobile Homes	3%	5%
	Production & Transportation	23%	23%		Built since 1990	21%	
	Service	16%	20%		Occupied Housing Units	20000	14000
	Construction, Maint., Repairs	9%	10%		Owner Occupied	74%	73%
	Private Wage	79%	79%		Renter Occupied	26%	27%
	Federal, State, Local Gov't.	12%	14%	Median Mo.	Mortgage Owner	$1,347	$1,145
	Self-Employed	8%	7%	Costs	Nonmortgage Owner	$481	$439
Commute	1 Person per Carload	78%	80%		Renter Occupied	$612	$577
	Carpool	10%	10%	Home Price	Median Home Price in 2009	$130,000	$86,000
	Public Transportation	1%	2%		Average Home Price in 2009	$140,423	$104,176
	Other Means	7%	3%	Income	Median Income	$55,635	$49,705
	Work from Home	5%	6%	(not	Earnings Received	82%	78%
	Avg. Commuting Time	24.5 min.	22.4 min.	mutually	Retirement Benefits (non SS)	18%	20%
Population	Total	55000	35000	exclusive)	Social Security	28%	29%
& Gender	Female	28000	17000		Avg. Income from SS	$15,630	$14,802
	Male	27000	18000		Poverty	6%	11%

Source: US Census Bureau, 2008 and Illinois Association of Realtors, 2009.

Water Body and Watershed Conditions

Water Quality Reports

Water quality was gleaned from existing water quality reports, water quality standards, watershed-related reports, and watershed action strategies.

Illinois Integrated Water Quality Report and Section 303(d) List and Water Quality Standards

The Illinois Environmental Protection Agency reported the condition of the surface and groundwater in the state through the *Illinois Integrated Water Quality Report and Section 303 (d) List-2010* to fulfill the requirements of Section 305(b), 303(d) and 314 of the Clean Water Act (IEPA, 2010). From this report, designated uses and water quality standards were identified for Lost Lake and the Rock River.

Illinois' water standards provide the basis for assessing whether the beneficial uses of the state's waters were being attained. Illinois waters were designated for various uses including aquatic life, wildlife, agricultural uses, primary contact (e.g. swimming, waterskiing), secondary contact (e.g. boating, fishing),

industrial use, drinking water, food-processing water supply, and aesthetic quality. The five designated uses for the Rock River and Lost Lake were: Aquatic life, Fish consumption, Primary contact, Secondary Contact, and Aesthetic Quality. Of each of the designated uses, only Aquatic Life and Aesthetic Quality had been assessed for Lost Lake. The lake was fully supporting of Aquatic Life, but not supporting of Aesthetic Quality, due to total suspended solids, total phosphorous, and aquatic algae. These pollutants was considered to be largely stemming from nonpoint sources, including the residential district, dam, yard maintenance, agricultural land uses, and runoff from forest, grassland, and parkland. The lake was not assessed for Fish Consumption, Primary Contact, or Secondary Contact. The Rock River was fully supporting of Aquatic Life, Primary Contact, and Secondary Contact, but not supporting of Fish Consumption. Aesthetic Quality was not assessed. The cause of the Fish Consumption warning was mercury and polychlorinated biphenyls from atmospheric deposition and other unknown sources (IEPA, 2010).

Watershed-Related Reports

No existing watershed-related reports were in place for the watershed, like existing TMDL Reports or Source Water Assessments. The NRCS was in the process of creating a Rapid Assessment of the watershed, but it was not completed at the time this Plan was written. Well locations and potential for contamination supplied some information.

Existing TMDL Reports

There were no TMDL Reports found for Clear Creek or Lost Lake.

Source Water Assessments

Source Water Assessment and annual drinking water quality reports were not readily available for any public water supply in the watershed. Wells were located, and potential for agricultural chemical contamination of groundwater was assessed, but information about well contamination was not available (Figure 2-38). Using Keefer's (1995) mapping of aquifer sensitivity to contamination by pesticide leaching, which has six categories from excessive to very limited, the entire Clear Creek watershed falls into the "excessive" category (Figure 2-39) (IDNR, 2002*a*).

Watershed Restoration Action Strategies

No Watershed Restoration Action Strategies were found for the Clear Creek Watershed.

Field Assessments

An assessment by JadEco and Olson Ecological Solutions in 2009 provided insight to the condition of the shoreline along a stretch of Babbling Brook and Lost Lake. Soil samples collected were sandy loam with low to very low organic matter , moderate to high levels of phosphorus, two to five pounds per acre of surface nitrate, and a soil pH of 7.4 to 8.0 (Figure 2-40).

Figure 2-38: Well boring locations in the Clear Creek Watershed.

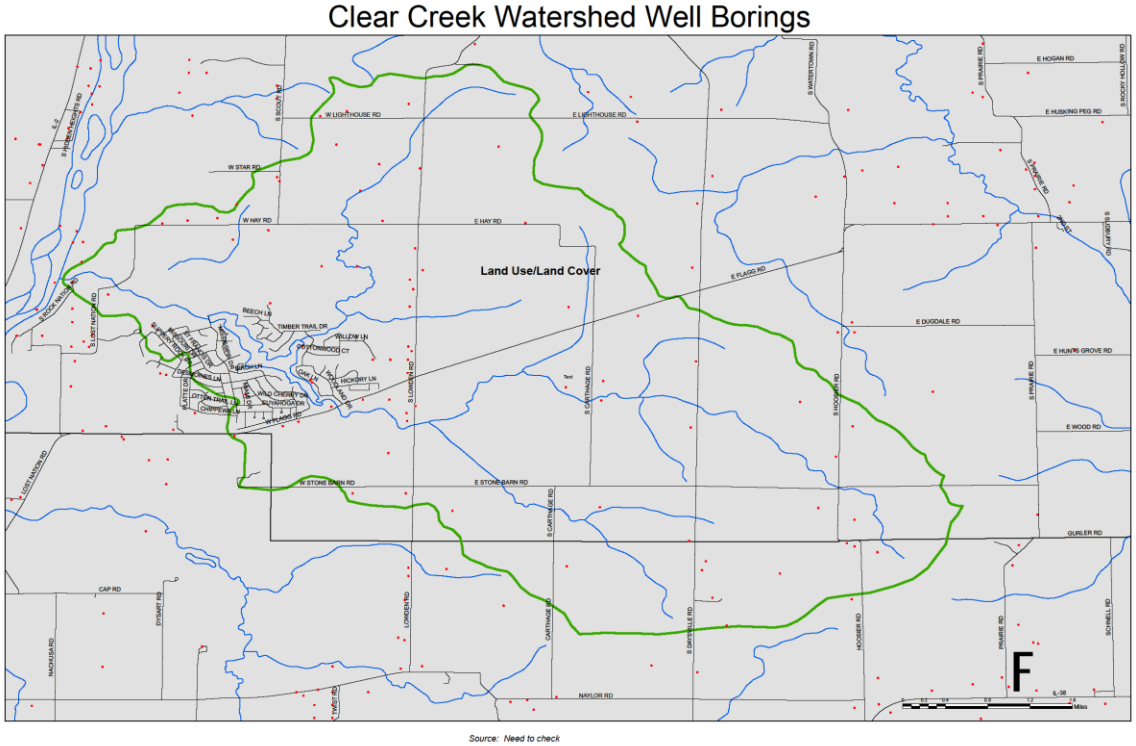


Figure 2-39: Potential for Agricultural Chemical Contamination

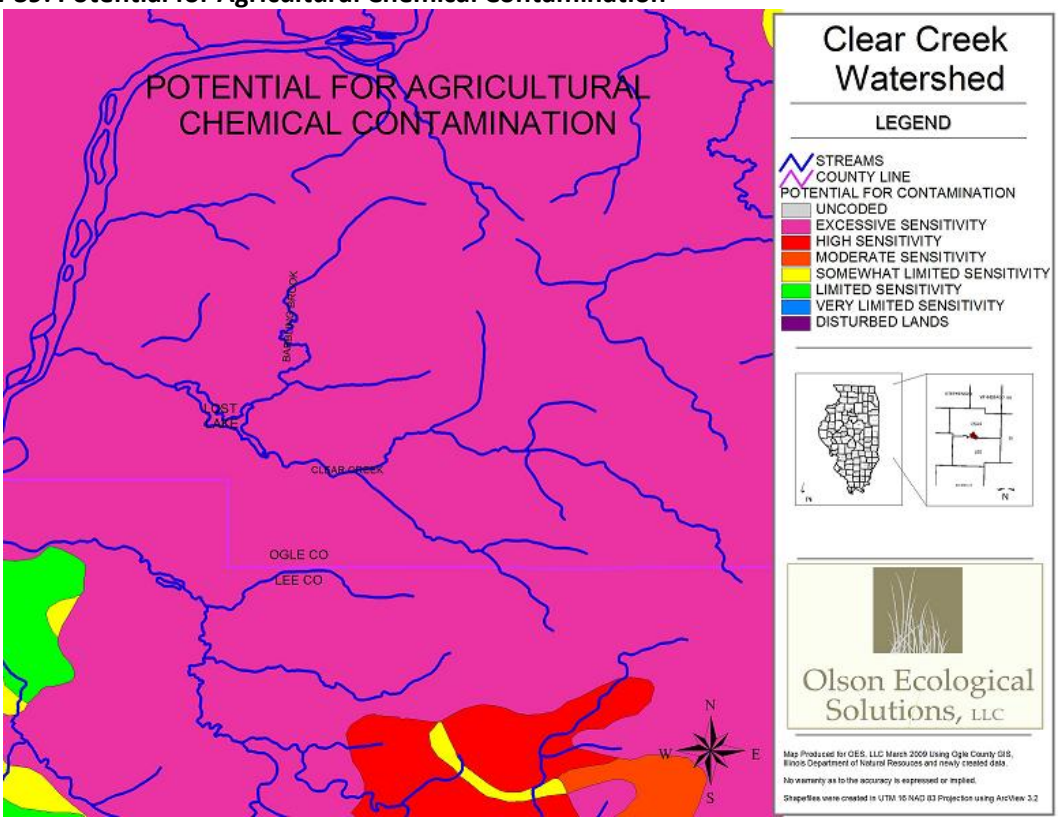


Figure 2-40: Soil Analysis Report for soil samples taken from Babbling Brook and Lost Lake shores.

August 14, 2009. Samples taken by Joe Rush, JadEco and Rebecca Olson, Olson Ecological Solutions and analyzed by Midwest Laboratories, Inc.

Sample Location	Organic Matter	Phosphorus strong bray	Nitrate	pH	Soil Type	Sand	Silt	Clay
BB North Shore	1.6 % (L)	58 ppm (H)	3 ppm (5 lbs/ac)	7.9	Sandy Loam	66%	28%	6%
BB South Shore	1.3 % (VL)	29 ppm (M)	1 ppm (2 lbs/ac)	7.4	Sandy Loam	76%	16%	8%
Lost Lake	1.2 % (VL)	36 ppm (M)	1 ppm (2 lbs/ac)	8	Sandy Loam	66%	24%	10%

*BB = Babbling Brook, VL = Very Low = Low, M = Moderate, H = High, VH = Very High

Pollutant Sources

Pollutants to the water resources came from both point and nonpoint sources. The only significant point source in the watershed was a wastewater treatment plant for the Lost Lake New Landing subdivision. Nonpoint sources included mainly eroding streambanks and shorelines, tiled hydric soils, eroding HELs, livestock access to streams, and runoff from agricultural fields, residential lawns, and impervious surfaces.

Point Sources

Permits

Two NPDES permits were associated with the watershed, one active and one permanently closed. The active permit was a wastewater permit. The closed permit was owned by Krahenbuhl Oil Company, Inc. of 217 Mulberry Lane, Dixon, Illinois 61021 (EPA Plant ID#110001386214). The compliance information was unknown and the information was last updated August 25, 2008 (EPA, April 28, 2010). There were no permits for stormwater, concentrated animal feed operations (CAFO), or industrial facilities.

Wastewater Permits

A wastewater treatment facility was permitted for Lost Lake Utility District of 100 Park Avenue, Dixon, Illinois 61021 until July 31, 2012. The plant was located at 900 Missouri Drive in Dixon, Illinois 61021 (41 55'05" North latitude and 89 22' 11" West longitude). The main discharge number and name for the existing plant was 001 STP Outfall (Keller & Dragovich, 2009), and the permit identification was IL0026590 (USEPA, 2010). Discharge flowed into Clear Creek, a stream that was classified as general use, was not rated for Biological Stream Characterization, and was not on either the 2006, 2008, or 2010 Illinois 303(d) lists. The receiving stream had a seven day once in ten year low flow (7Q10) of 0.17 cfs (Keller & Dragovich, 2009). The status of the facility was "Effective," and the database was ICIS-NPDES (USEPA, 2010).

The facility was installed around 1970, had a 1,000-home capacity, and served 177 homes on the west side of the Lost Nation New Landing subdivision. Any new homes constructed, or any homes with septic located within 200 feet of the main sewer line, were required to hook into the system (Steffens, Pers. Comm.). East-side residents used private septic (Breckenfelder, Pers. Comm.). The designed average flow (DAF) for the facility was 0.10 million gallons per day (MGD) and the designed maximum flow (DMF) for the facility was 0.25 MGD. Treatment consisted of SBR process tank, disinfection/dechlorination, and aerobic digestion (Keller & Dragovich, 2009).

The facility was in disrepair (Figure 2-41). The former owner, New Landing Utilities, had incurred multiple violations and had been threatened with a lawsuit by the Environmental Protection Agency sometime around 2007. The Lost Lake Utility District was formed to purchase the plant from New Landing Utilities and build a new facility, which opened in the summer of 2010 and had not incurred a violation as of the writing of this Plan. The monthly average influent and effluent for the closed treatment plant were listed in Figure 2-42 (Chase, Pers. Comm.). Violations were listed at the following link:

http://www.epa-echo.gov/cgi-bin/effluents.cgi?permit=IL0026590&charts=viols&monlocn=all&outt=all

To correct the problems of the wastewater treatment plant, Lost Lake Utility District opened a new facility in the summer of 2010 by order of the Attorney General's Office (Chase, Pers. Comm.). The design flows and corresponding load limits were changed from DAF/DMF of 0.10/0.25 MGD to DAF/DMF of 0.05/0.205 MGD. Treatment consisted of septic tanks, recirculation/dilution tanks, sand filter, and disinfection/dechlorination. Dissolved oxygen limits were added for the proposed plant pursuant to the final rule adapted by the Illinois Pollution Control Board under Docket No. R04-25. The EPA required a sample frequency of once a month (Keller & Dragovich, 2009).

Figure 2-41: Condition of the recently shut-down, wastewater treatment equipment at the Lost Lake Utility District facility.

Source: Chase, Pers. Comm.

Figure 2-42: Annual and monthly influent and effluent readings for the Lost Nation subdivision's wastewater treatment plant from 2006 to 2010.

New Landing Utilities

		Flow Gallons/day		pH		BOD mg/l		Suspended Solids mg/l		Ammonia Nitrogen mg/l	
Year		**Influent**	**Effluent**	**Influent**	**Effluent**	**Influent**	**Effluent**	**Influent**	**Effluent**	**Influent**	**Effluent**
2006	Total	486,400	486,400	58	57.8	2444	489	2310	344	168.56	238.98
2006	**Average**	**48,640**	**48,640**	**7.3**	**7.2**	**306**	**61**	**330**	**49**	**42.14**	**23.90**
2006	Maximum	51,200	51,200	7.7	7.5	720	270	1130	178	61.6	40.32
2006	Minimium	38,400	38,400	7.1	6.8	110	2	124	13	32.48	2.8
2007	Total	588,000	588,000	92.8	95.2	3685	329	2597	460	92.4	279.59
2007	**Average**	**45,231**	**45,231**	**7.1**	**7.3**	**283**	**25**	**200**	**35**	**46.2**	**21.51**
2007	Maximum	51,200	51,200	7.4	7.8	440	74	693	78	47.6	44.8
2007	Minimum	38,400	38,400	6.8	6.9	127	8	76	9	44.8	0.28

Lost Lake Utility District

		Flow Gallons/day		pH		BOD mg/l		Suspended Solids mg/l		Ammonia Nitrogen mg/l	
Year		**Influent**	**Effluent**	**Influent**	**Effluent**	**Influent**	**Effluent**	**Influent**	**Effluent**	**Influent**	**Effluent**
2008	Total	640,000	640,000	99.6	100.3	3867	133	2475	173		214.11
2008	**Average**	**45,714**	**45,714**	**7.1**	**7.2**	**276**	**10**	**177**	**12**		**15.29**
2008	Maximum	51,200	51,200	7.7	7.4	427	29	312	21		34.72
2008	Minimum	38,400	38,400	6.6	6.9	153	3	58	5		0.22
2009	1/8/2009	38,400	38,400	7.4	7.2	207	9	93	17		14.56
2009	2/5/2009	38,400	38,400	7.2	7.5	233	6	106	10		25.98
2009	3/3/2009	38,400	38,400	7.7	7.6	307	18	500	24		32.48
2009	4/8/2009	51,200	51,200	7.3	7.5	293	4	88	7		37.24
2009	5/28/2009	51,200	51,200	6.8	7.1	250	30	106	26		34.72
2009	6/11/2009	51,200	51,200	6.7	7.1	287	11	104	14		27.00
2009	7/7/2009	51,200	51,200	6.7	7.3	373	4	304	18		35.84
2009	8/17/2009	51,200	51,200	6.7	7.0	367	4	87	9		0.93
2009	9/2/2009	51,200	51,200	7.1	7.2	387	1	232	10		0.22
2009	10/13/2009	51,200	51,200	7.3	7.2	300	3	200	7		0.95
2009	11/3/2009	38,400	38,400	7.3	7.2	420	2	340	9		0.17
2009	12/15/2009	38,400	38,400	7.1	7.1	393	3	263	7		0.34
2009	Total 2009	550,400	550,400	85.3	87	3817	95	2423	158		210.43
2009	**Average 2009**	**45,867**	**45,867**	**7.1**	**7.3**	**318**	**8**	**202**	**13**		**17.54**
2009	Maximum 2009	51,200	51,200	7.7	7.6	420	30	500	26		37.24
2009	Minimum 2009	38,400	38,400	7.1	7.0	207	1	87	7		0.17
2010	1/27/2010	38,400	38,400	7.5	7.7	233 mg/l	14 mg/l	90 mg/l	14 mg/l		32.62 mg/l
2010	2/8/2010	38,400	38,400	7.3	7.4	307 mg/l	6 mg/l	132 mg/l	9 mg/l		36.68 mg/l
2010	3/8/2010	38,400	38,400	7.4	7.4	307 mg/l	6 mg/l	90 mg/l	14 mg/l		32.34 mg/l

Source: Chase, Gary. Pers. Comm. April 6, 2010.

Stormwater Permits

There were two stormwater outfalls that drained stormwater from the upstream watershed into Lost Lake, but no NPDES permits were associated with them. There were no known stormwater detention areas (Rush, Pers. Comm.).

Nonpoint Sources

Nonpoint sources of pollution that affected groundwater and surface water in the watershed included a myriad of activities associated with agricultural and residential land uses , such as eroding streambanks and shorelines; channelized stream segments; tiled hydric soils; converting head waters to grass waterways; eroding HELs; livestock access to streams; soil compaction; baring land of native, vegetative cover; and runoff from agricultural fields, residential lawns, and impervious surfaces. All of these activities contributed to increased soil loss, erosion, decreased capabilities of infiltration and evaporation, and decreased holding time for water. Data to quantify these claims had been collected by the NRCS and was in the process of being analyzed (Meisenheimer, Pers. Comm.).

Streambank and Shoreline Erosion

Erosion from streambanks and shorelines were caused by a variety of sources, most of which were designed to rid water from productive or developable lands upstream to the nearest drainage path, or to maximize land use by clearing land of riparian vegetation (IDNR, 2005 and AES, 2001). As a result, increased water velocity tried to carve bigger channels of the stream, resulting in erosion at a destructive rate, usually on the outer edge of a curve. Channelization was one example.

Channelization, primarily for agricultural production, affected about 10% of the open waterways within the watershed (Pierce, Pers. Comm.), or 2.2 miles of stream. The first three miles of the main channel of Clear Creek, located above Lost Lake, retained its original meandered stream channel, and woodland and grass buffers were maintained. Further upstream, the creek was channelized for over 3,200 feet. A tributary stream north of the main channel was channelized for over 2,200 feet and nearly the entire length of a tributary stream south of the main channel was channelized for a length of 6,400 feet (Schafer, Pers. Comm.).

These areas were manipulated prior to the early 1970's when there was a big push to gain farmland. Modern day drainage provisions ceased this activity, other than maintenance to remove debris and construct channels back to original design criteria. While the attempts by landowners tried to drain surface water from their properties faster, these activities only complicated the drainage systems for downstream owners. Once the increased flows returned to the natural meanders, out of bank flooding occurred more often and at increased severity. Generally speaking, manipulated channels were always under ongoing rechanneling due to natural attempts to return the stream to its natural course. These areas were usually sites of high silt loading to downstream areas (Pierce, Pers. Comm.).

Streams flowed faster without the meanders to slow the currents, which resulted in increased down cutting of the streambed and sloughing of the stream banks. This resulted in the formation of a headcut, or overfall, which migrated upstream until it reached a stable point. The headcut migrated into previously undisturbed stream, causing erosion damage and instability. The increased flow through channelized regions also resulted in aggravated flooding and increased streambed and bank erosion downstream in the meandered reaches. Increased streambed down cutting and bank erosion resulted in the loss of vegetated stream buffers, including mature trees and riparian wetlands. As the bank

sloughed, the tree roots were exposed and the trees became unstable and fell into the stream or became stressed and died (Schafer, Pers. Comm.).

Tiled Hydric Soils

The majority of hydric soils in the watershed were artificially drained using sub-surface, perforated drain tile for farming purposes. In areas of defined drainage patterns, grassed waterways were installed to safely carry surface water from agricultural fields to drainage ditches or natural streams without causing gully erosion. During early spring and excessive periods of precipitation, these tiles ran for months before slowing down. Where hill side seeps, natural springs, or additional tile from uphill properties fed the tile system, some only stopped during winter months when soils were frozen. The majority of the upper reaches of the tributaries were fed from sub-surface drain tiles, which was basically where the surface waters begin (Pierce, Pers. Comm.).

Many of the waterways in the upper headwaters of Clear Creek were filled and converted to grass waterways or tiled for drainage for the purpose of agricultural production. This has likely resulted in the loss of wetlands (Schafer, Pers. Comm.), along with their water filtering capabilities.

Livestock

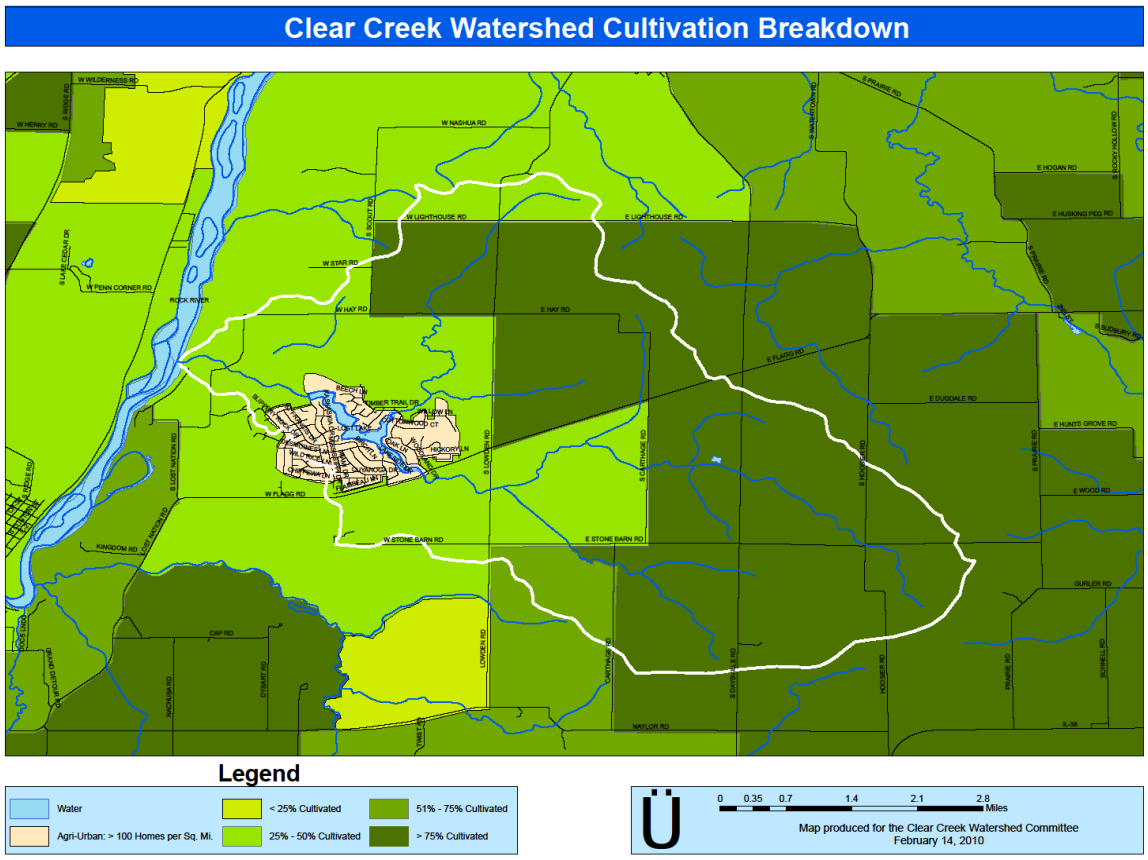
Livestock grazed on about 550 acres in the watershed (Bettner, Pers. Comm.) and had free access to approximately 17,330 linear feet of stream: 10,480 feet on Clear Creek and 6,850 feet on Babbling Brook (Hill, Pers. Comm.). Information regarding population, management, and land application of manure were not readily available for the watershed.

Cropland Sources

The eastern portion of the watershed was over 75% cultivated, and the west side was between 25% and 50% cultivated, excluding the subdivision (Map 19). According to Clear Creek Watershed Planning Committee (Pers. Comm.) most landowners within the watershed adhered to standard conservation farming techniques. A rotation of corn and beans was standard practice. Information about fertilizer application was not readily available.

Runoff from these fields was entering the stream and then Lost Lake at a faster rate compared to runoff through native vegetation, resulting in increased soil erosion. Increased above-ground runoff carried suspended sediments and agricultural chemicals to surface waters. Subsurface drainage tiles carried suspended sediments and water soluble nutrients and chemicals directly into the streams. These pollutants affected the water quality of Lost Lake. Increased flow velocities from the watershed resulted in more frequent rises of floodwater in the streams and lake following rain events (Schafer, Pers. Comm.).

Figure 2-43: Cultivation densities in the Clear Creek Watershed.



Urban sources

Impervious surfaces in the watershed were created by roads and residential roofs and driveways, which increased water velocity and runoff. The literature generally showed that water quality and habitat declined if there were more than 10-15% impervious surfaces in a watershed (Schueler, 1994 *IN* WIDNR, 2000). Impervious surfaces accounted for noticeably less than 10% of the watershed; therefore, they were not assessed.

Onsite Wastewater Systems

Homes on septic systems dominated the watershed, including 174 homes in the Lost Lake Community (Steffens, Pers. Comm.) and all homes in the rural areas. Within the residential community, there were no current requirements for septic field testing. Local agencies were not able to provide estimates of total number of septic systems on a scale appropriate for the watershed. The local health department

was not able to supply information about malfunctioning septic systems. Septic systems outside of the subdivision were judged insignificant as a nonpoint source of pollution due to low density.

Silviculture Sources

Some silviculture practices occurred in the watershed associated with natural area restoration efforts by TNC, including site preparation, prescribed burning, and chemical applications. During the fall of 2009 and spring of 2010, TNC burned just over 2,000 acres in and around the watershed (Kleiman, 2010 unpublished). Timber harvesting and road construction were not assessed.

Wildlife Sources

There were no wildlife population estimates for the watershed (Ostling, Pers. Comm.). The RCD had been controlling the goose overpopulation problem at Lost Lake since 2003. This process, permitted through the IDNR, included non-lethal techniques such as stopping the feeding of the geese, fencing, barrier plantings, and egg addling. Over the past seven years, a total of 324 eggs had been destroyed, with an average of 46 eggs per year (Breckenfelder, Pers. Comm.).

Water Body Monitoring Data

Water Quality and Flow Data

National databases did not contribute water quality and flow data for the watershed, including STORET, national listing of fish advisories, NWISWeb, BEACH Program, WATERS, and National Sediment Inventory. Limited local information was provided on fish advisories, beach closings, volunteer monitoring program data, and local sediment monitoring efforts.

National Listing of Fish Advisories

There were no fish consumption advisories specifically for Lost Lake or Clear Creek because there were no fish samples available from either water body. However, there was a state-wide advisory for women of childbearing age and children under 15 to limit their consumption of predator fish species (fish that eat mainly other fish such as bass and pike) from all lakes and streams in Illinois, including waters not accessible to the public, to one meal per week due to mercury contamination (Hornshaw, Pers. Comm.).

Beach Closings

Beaches at Lost Lake were monitored every two weeks as required by the Illinois Department of Health. Beaches were closed eight times between 2002 and 2009, twice due to flood damage, four times due to high levels of E. coli, and once due to an undocumented reason. The satisfactory level of E. coli ranges from <1/100mL to 209.8/100mL. Times of beach closings had much higher readings between 517.2/100mL and 1,553/100mL (Breckenfelder, Pers. Comm.).

Volunteer Monitoring Program Data

The lake association of Lost Lake was involved in the Environmental Protection Agency's Volunteer Lake Monitoring Program. Monitoring water chemistry and physical parameters allowed them to assess the water quality of their lake to make better decisions on management practices. The Illinois EPA ambient lake monitoring program sampled alongside volunteers from May through October 2007 as a quality control check on the samplers and laboratory. The vast majority of parameters sampled were considered within Non-Detect, Low, or Normal categories as defined by Mitzelfelt (1996). Exceptions were silver and potassium, which fell into the "Elevated" category. The reason for elevated concentrations of silver was unknown (Lesnak, Pers. Comm.). Samples indicated average levels of total suspended solids in 2007 of 8 mg/L. This relatively low level for a reservoir should cause a decrease in water clarity but should not play a large part in inhibiting algal growth (Carruso, 2008 unpublished).

Sediment Monitoring Data

Sediments were a problem within Lost Lake and Clear Creek, as supported by sediment monitoring efforts throughout the history of the lake. It was apparent in 1968 that Lost Lake already had an excessive siltation problem stemming from the large watershed feeding it. The lake was dredged within five years of being formed, where Clear Creek entered the lake (IDOC, 1968). When the dam was built in 1972, sedimentation was reported to the Illinois State Water Survey by the engineers with an estimated depth of 2 feet and 18,000 cubic yards removed (Finch, 1973). Integrated Lakes Management assessed sediment deposition at the silt basin located on Clear Creek just upstream from Lost Lake. They found that the 1.1-acre silt basin held 930 cubic yards of sediment in March 2008 and 1,231 cubic yards of sediment in October 2008. They claimed that the 132% increase in sediment was due to erosion upstream caused by storm events. They took a comparative measurement in 2006 of 1,288 cubic yards of sediment (Rysso et. al., 2008). The RCD also dredged the lake and Clear Creek silt basin on a regular basis. In 2003, 47,000 cubic yards of silt were removed from the lake for $3.65/yd, for a total of $172,062.13 (Breckenfelder, Pers. Comm.).

The sediments at the bottom of Clear Creek sampled by Karen Rivera of the IDNR at Nachusa Grasslands consisted of 40% silt/mud and 40% sand, with approximately 10% gravel, 8% cobble, and 2% boulders. The deeper pools were quite mucky, with ankle deep silt lying over a sand bottom. The riffles were composed of gravel and cobble, with some fine silty sediment in the quieter areas. Filamentous algae were present on the rocks, and overhanging terrestrial grasses provided shade along the edges. The stream in this area was incising, or down-cutting into its bed. Down-cutting caused the banks to become steep and vertical. These banks eventually failed and fell into the stream along with the trees and other vegetation growing on them. The resulting sediment covered the stream bottom. Over time, this sediment made its way downstream and contributed to the filling of Lost Lake (Rivera, 2006 unpublished).

Biological Indicators

Biological indicators in the watershed were sampled, including the algal toxin microcystin, fish, and invertebrates, resulting in rankings of trophic status and biological stream segments.

Algae

Filamentous algae were present on the rocks in Clear Creek (Rivera, 2006 unpublished) and algal blooms were experienced at Lost Lake (Rush, Pers. Comm.). During the summer of 2007, field biologists from the Illinois Environmental Protection Agency (IEPA) measured levels of microcystin, chlorophyll-*a*, phosphorus, and nitrogen in Lost Lake. Microcystin, a toxin produced by some blue-green algae, was known to harm human and animal health when ingested in large quantities. There was no standard for surface water exposure, but the World Health Organization had a standard for drinking water of 1 µg/L of water. This standard wasn't relevant for surface water (lakes and streams) where exposure to the water was minimal, but it was the only reference found for comparison. Microcystin samples were taken at sites where the most human contact was possible, including boat launches, fishing piers, and bathing beaches. Most, but not all, of the samples fell in the range of less than 0.15 µg/L, which was well below the standard of 1 µg/L. Five samples fell in a mid-range group from .22µg/L and .75µg/L. Two samples approached but did not exceed 1.0µg/L. There were three samples that exceeded 1.0µg/L, one greatly with a value of 3.56µg/L. The other two had values of 1.04 and 1.12µg/L. These values could be natural occurrences of the toxins in the lake. The July and August samples did not show spatial similarities between different lakes in the area. The lake experienced algal blooms, probably coinciding with the areas of higher microcystin content. The samples that were higher than typical were most likely due to algal blooms. All of these results were considered normal and shouldn't cause health problems to people who may have had minimal exposure to the water at these times (Carruso, 2008 unpublished). The blooms were treated during the summer of 2008 (Rush, pers. comm.).

Without suspended solids to inhibit algal growth, limiting factors for growth were phosphorus and nitrogen. Lost Nation showed a good correlation between available chlorophyll *a* concentrations and total phosphorus levels. The water quality standard for phosphorus of 0.05 ug/L for surface water of lakes was violated by all three sample sites during all of the sample months except for May. Nitrate/nitrite nitrogen levels greatly exceeded the statistical guideline on all sampling dates and at all three sites. In October 2007, one site exceeded the ammonia statistical guideline of above the 85th percentile for lakes in Illinois (Carruso, 2008 unpublished).

Fish

Index of Biotic Integrity (IBI)

Clear Creek at Nachusa Grasslands had an Index of Biotic Integrity (IBI) of 35, based on a fish survey conducted by Karen Rivera of the IDNR on June 28, 2006. This IBI translated to a Moderate Aquatic Resource (C) rating on a scale of 12 (worst) to 60 (best). A C rating indicated loss of species intolerant of pollution, fewer species and a highly skewed trophic structure (Figure 2-44). Older age classes of top

predators were rare. This IBI was lower than expected, most likely due to the blockage of the stream by the dam, which prevented migratory species like channel catfish and suckers from reaching the upstream end of the stream for spawning. The IBI could be improved slightly if deep water habitat was created that would allow channel catfish and smallmouth bass from the lake to find suitable habitat in the stream for at least part of their life cycles. For comparison, the Rock River at Castle Rock State Park had an IBI of 43 and Paige Park in Dixon (below the dam) has an IBI of 40. The area of the Rock River between these two sites was also likely to be in the 40's (Rivera, Pers. Comm.).

Figure 2-44: Parameters used to establish an IBI for Clear Creek at Nachusa Grasslands (Rivera, 2006).

Parameter	# Species or % Popn.	Extrapolation
Native fish species	16	16 (4)
Native minnow species	10	10 (5)
Native sucker species	1	1 (2)
Native sunfish species	2	2 (5)
Benthic invertivore species	3	3 (3)
Intolerant species	1	1 (2)
Prop. specialist benthic invertivores	6%	0.06 (3)
Prop. geneneralist feeders	85%	0.85 (2)
Prop. mineral-substrate spawners	22%	0.22 (3)
Prop. tolerant species	25%	0.25 (6)
IBI		**35**

Fish Kills

One fish kill within the Rock River near the mouth of Clear Creek occurred shortly after a train wreck upstream in Rockford, Illinois on June 19, 2009. The relation of these two events was under investigation by the U.S. Fish and Wildlife Service. Results were unknown at the time this Plan was written (Kenney, Pers. Comm.).

Invertebrates

Lost Lake

The Illinois Environmental Protection Agency sampled benthic invertebrates at three sites on Lost Lake at the beginning of the fall season of 2008. Sites sampled were the lacustrine area (nearest the spillway and most "lake-like" in its morphology), the riverine section (which is most "river-like"), and the center of the lake (transitional zone) between the two other sample sites and was characteristic of both the other zones. The biotic indices developed by Verneaux (2004) and Blocksom (2002) were used to evaluate the abundance and tolerance of the macroinvertebrate community within Lost Lake. The

tolerance value scale ranged from 0.1-1.0, with 0.1 indicative of higher pollution and lower oxygen levels and 1.0 representative of the most pristine water conditions. Diversity was measured using the Shannon Diversity Index, which measured the number of species found and their abundance (species evenness) using a scale of 0-1.0. A score of 1.0 meant that each species found had the same number of individuals in the sample, or complete evenness in the community. The macroinvertebrate community in Lost Lake consisted of a high diversity of species possessing a range of tolerance of water conditions, resulting in a moderate biotic index value of 0.506 for Lost Lake on a scale of 0 to 1. Only 0.395% of the species were intolerant of organic pollutants (between the tolerance range of 0.8 – 1.0), and 39% of the species were very tolerant (between the tolerance range of 0.1 – 0.4). The Shannon Diversity index was 0.734 when applied to the entire lake, which represented a fairly high evenness score. Chironomids accounted for approximately 50% of the diversity (Carusso, 2008 unpublished).

Clear Creek

Invertebrate sampling was conducted on Clear Creek by EcoWatch volunteers in 1996. EcoWatch volunteers monitored two locations along Clear Creek two and three times since 1996 (dates unknown). Clear Creek had an average overall biological score when compared to other streams within the Rock River Hill Country and the state of Illinois (0.30 and 0.52 compared to the averages of 0.44 and 0.39, respectively). This accounted for a slightly higher than average to average macroinvertebrate index (6.01 and 5.56 compared to averages of 5.52 and 5.77, respectively); less than average total taxa richness (6 and 8 compared to averages of 9.23 and 8.53, respectively); less than average EPT taxa richness representing mayfly, stonefly, and caddisfly (1 and 1.5 compared to averages of 2.66 and 2.47, respectively) and variable habitat scores (0.3 and 0.77 compared to averages of 0.69 and 0.56, respectively) (CTAP 2008 *a and b*). Overall, the studies above suggested moderate to good water quality in Clear Creek. Ed Dewalt of the Illinois Natural History Survey supported these conclusions by saying,

> "Clear Creek has a relatively healthy community of aquatic insects and other aquatic invertebrates. EPT (mayflies, stoneflies, and caddisflies) fauna tally near 15, which would rate it as "Good" in the Critical Trends Assessment Program criteria. The stream would rate better than most of the streams in the region, with the exception of Wade Creek, although these streams are fundamentally different. The latter is a true coldwater stream with the insect and fish populations to prove it (Dewalt, pers. comm.)."

Trophic Status

Trophic status of Lost Lake was determined to be between eutrophic and hypereutrophic by analyzing macroinvertebrate samples and secchi transparency. The eutrophic status was supported by the macroinvertebrate sample, which included chironomidea found in areas of good water quality in the littoral and profundal zones in the lake. The secchi transparency suggested that the lake was more hypereutrophic, but the accuracy of this test may have been compromised by sample time, weather, or glare on the water. In the future, a more accurate representation of the lake can be found applying the Trophic State Index to the total phosphorus concentrations or the chlorophyll a concentrations (Carruso, 2008 unpublished).

Biologically Significant Streams

The Clear Creek Watershed emptied into a stream segment of the Rock River between Rockford and Dixon identified as a Biologically Significant Stream Segment by the IDNR in 2007 (IDNR, 2008 *a;* Szafoni, pers. comm.; and Ogle County Zoning and Planning Department, 2004). Biologically Significant Streams (BSS) were defined generally as those streams that have a high rating based on datasets from at least two taxonomic groups (Bol et. al., 2007).

Geomorphology (characteristics, origin, and development of land forms)

Geology provided subsurface framework and landscape (topography) of a watershed. It partially determined the degree to which erosion occurred and the rate and direction of flow of groundwater and surface water, thus influencing the water quality and biology of the watershed. Geologic materials produced the soils within a watershed. The lateral extent, thickness, and properties of the geologic materials, and their variability, were related to the geologic history of the watershed (Dave Larson, Pers. Comm.). The geomorphology of a watershed was explained by stream morphology, bedrock, quaternary deposits, and factors of soil formation.

Stream Morphology

Clear Creek was a small stream, averaging only about 15 feet wide and approximately 1.5 to 2 feet deep. At the downstream end, Clear Creek flowed into Lost Lake, where it was blocked by the dam that impounded Lost Lake (Rivera, 2006 unpublished). It had an unadjusted 10-85 slope of 21,555 ft/mi and an adjusted 10-85 slope of 19.819 ft/mi (USGS, 2010*a*).

Bedrock

Bedrock in the watershed was of Prairie du Chien and Ancell groups (Map 20) with layers above of St. Peter Sandstone and Platteville Group. Bedrock occurred at a maximum depth of 400 feet in the southeastern corner of Ogle County around the watershed area, but appeared near the surface elsewhere (FEMA, 2009). Depth to bedrock measured at the Lost Nation Dam is 75_{+} ft. (Finch, 1973). There were no bedrock faults within the watershed, although there were some located just outside of the watershed to the northeast (Map 21). The northeastern and eastern portions of the watershed were in the Prairie du Chien Group, which consisted of cherty dolomite and interbedded sandstone. These rocks varied in thickness from 0 (where eroded) to about 280 ft. (0 to 85 m). Deposition of Prairie du Chien, followed by exposure and subsequent erosion, created an irregular surface with several hundred feet of local relief upon which the Ancell Group was deposited (McGarry, 1999). The Ancell Group was found at the southwestern and western portions of the watershed, although data was sparse. It was a predominantly elastic unit consisting of sandstone, argillaceous and sandy limestone, and dolomite formations (Templeton and Willman, 1963). Thickness was highly variable because the base of the Ancell rests on an eroded surface. It was generally 0 (where eroded) to 380 feet thick in this area and filled irregularities in the older Early Ordovician and Late Cambrian surface. The upper 1 to 15 feet (0.3 to 4.6 m) consisted of interbedded fine grained, impure dolomite, sandstone and green shale (Willman et al. 1975 *IN* McGarry, 1999). It lied under the Platteville Group in northern Illinois (Willman et al., 1975). The St. Peter Sandstone is the basal formation in the Group, overlain by members of the

Glenwood Formation. It was composed mainly of quartz sand that was normally pure and very fine- to coarse-grained (Templeton and Willman, 1963; Buschbach, 1964). It commonly contained less than 2% silt and 1 to 3% disseminated clay. Its heavy mineral suite was limited to the highly resistant minerals, tourmaline and zircon. It filled irregularities on a complex surface which included both karst and erosional features. The St. Peter was 100 to 200 feet thick over most of northern Illinois. Across central Illinois, the Plateville Group lied over the St. Peter Sandstone. The group was about 135 feet thick in the Dixon area near the watershed (Willman et al., 1975).

Figure 2-45: Bedrock geology of the Clear Creek Watershed.

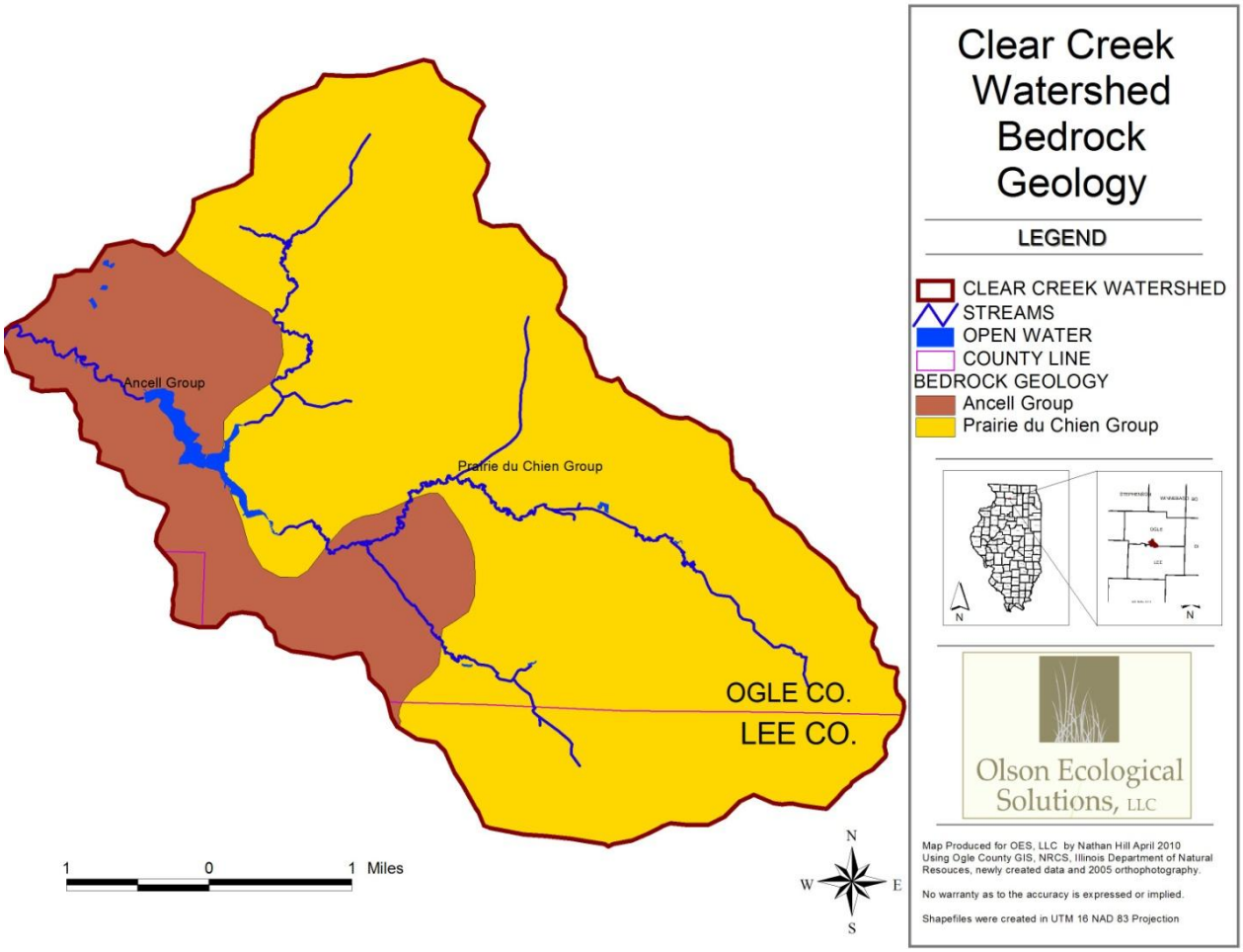
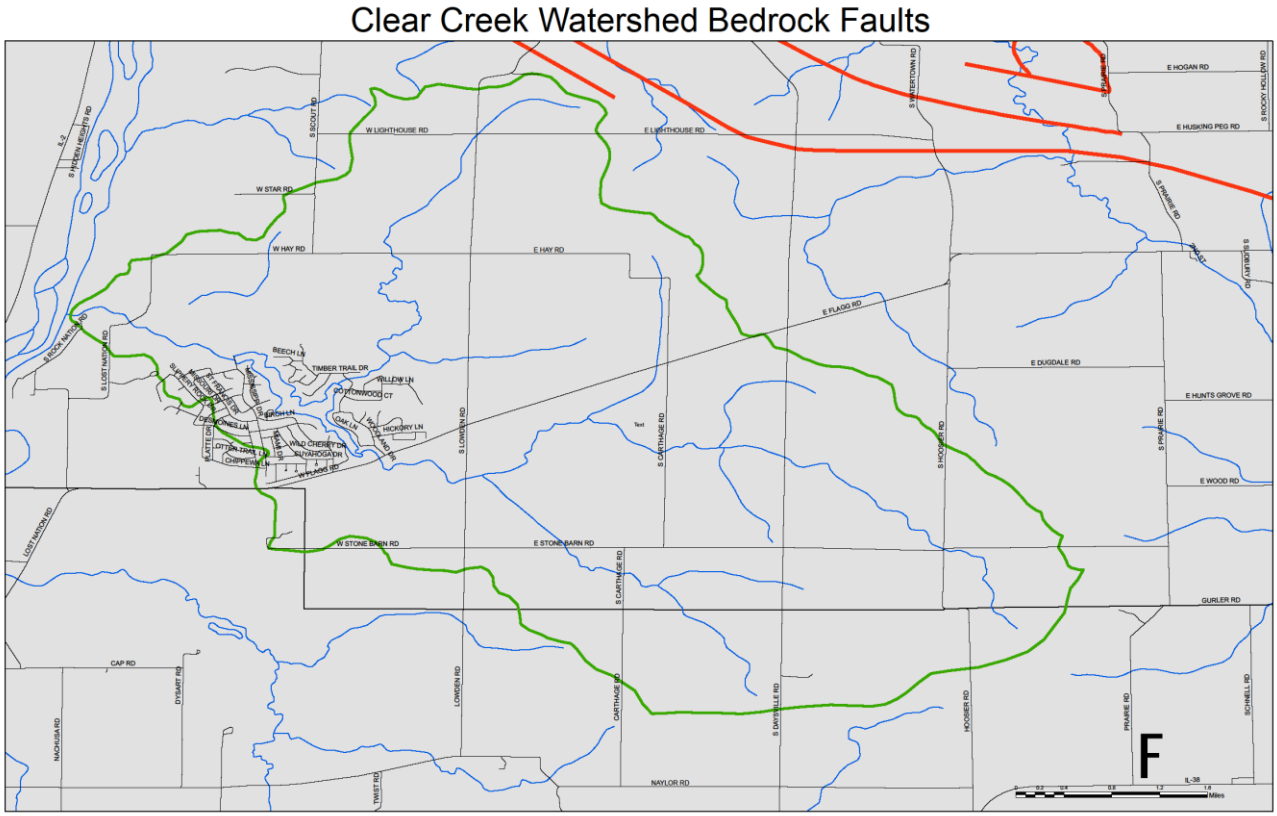


Figure2-46: Bedrock fault locations in relation to the Clear Creek Watershed.

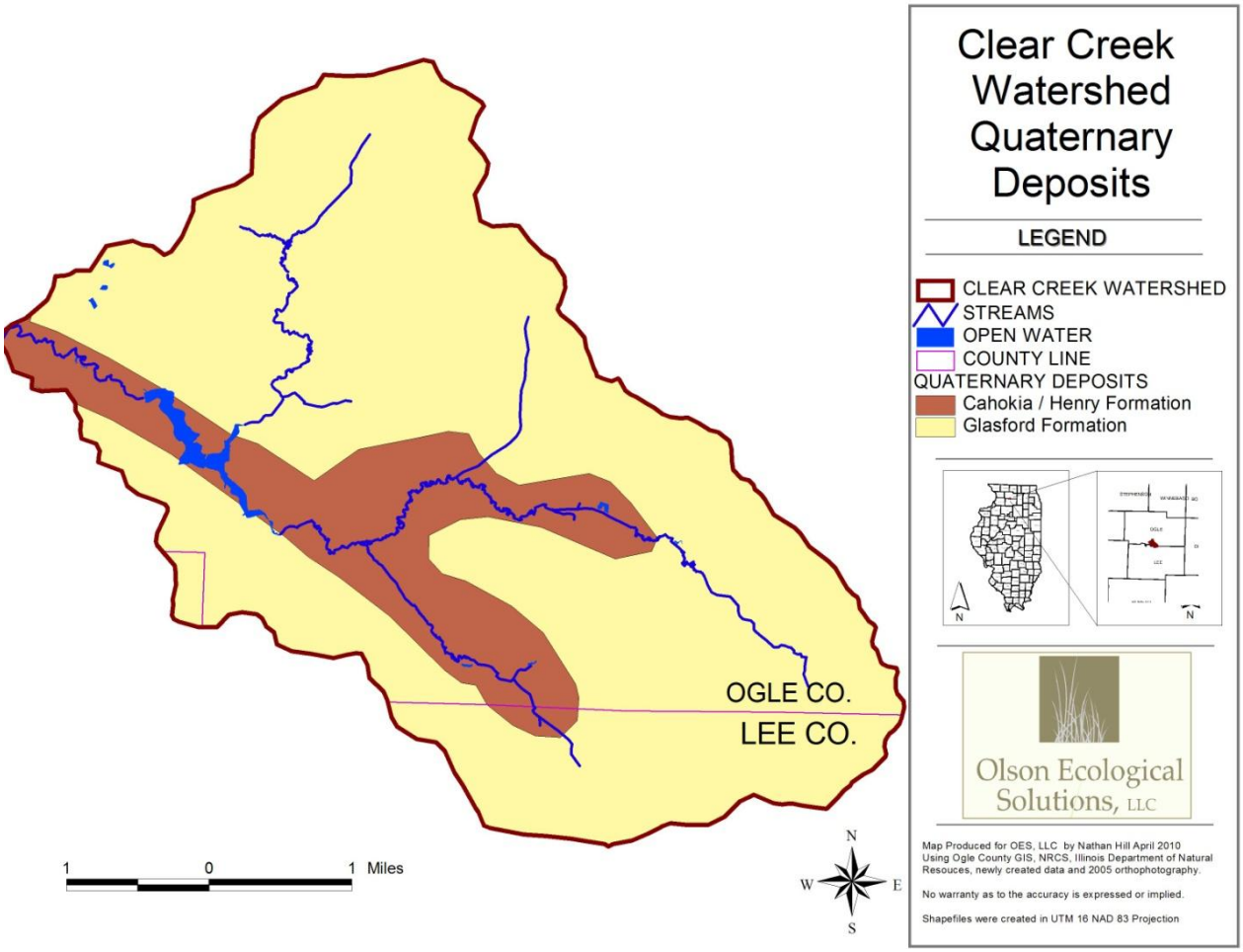


Source: Need to check

Quaternary Deposits

Quaternary deposits within the watershed included Cahokia/Henry and Glasford formations (Map 22). The Cahokia/Henry Formation followed Clear Creek to the Rock River. It consisted of channel and floodplain deposits of modern streams and rivers consisting of stratified silt containing sand and clay lenses. Thickness varied greatly, and may have been up to 75 feet along the Rock River. The Glasford formation covered the uplands of the watershed and Babbling Brook area. It consisted of calcareous, gray to tan gray, loam to clay loam diamicton that may have appeared yellowish brown when oxidized. Often small clasts of coal (less than 5mm diameter) were present within the diamicton. The silt covering may have been up to 30 feet thick in some areas. The unit typically lied over bedrock.

Figure 2-47: Quaternary deposits in the Clear Creek Watershed.



Factors of Soil Formation

Major factors of soil formation were the physical and mineralogical composition of the parent material; living organisms on and in the soil; climate in which the soil formed; topography; and length of time that the forces of soil formation have acted on the parent material (Jenny, 1941). Ogle County's soils formed from a variety of parent materials, and the most common materials now found were loess, glacial deposits, weathered bedrock, paleosols, and alluvium (FEMA, 2009). Illinois' soils developed on tills or thick loess that was mixtures of crushed bedrock particles. These soil parent materials, formed and homogenized by the grinding action of glaciers, supplied abundant nutrients vital to crops. Where glaciers did not cover the terrain, the topography, soils, and vegetation differed significantly. Soils were directly related to the composition of the immediately underlying bedrock from which they were formed by chemical and physical weathering (IDNR, 2002*a*).

Cultural Resources

Although most of the watershed was been surveyed for historic and archaeological resources, there were five reported archaeological sites in the western portion from some early archaeological surveys. Near the Rock River, in the floodplain and terrace portions of section 6, there were two prehistoric burial mound sites and one Middle Woodland habitation site. The burial mounds were identified by staff of the Illinois State Museum in 1959 and at an earlier date. The habitation site was identified in 1972 by the University of Wisconsin-Milwaukee archaeologists. Further east, in section 5, was a prehistoric habitation site on the bluffcrest above Clear Creek. In section 4, an older Archaic period habitation site was found also overlooking the creek. These two sites were identified during the Historic Sites Survey of the early 1970s conducted by the University of Wisconsin-Milwaukee (Santure, Pers. Comm.).

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GIS Data Documentation

Type: Watershed Boundary file
Source/agency: Illinois State Geological Survey
Date: 2009
Scale: 1:65,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: Border of the Clear Creek Watershed as defined by the USGS

Type: Water Bodies (polygons and line files)
Source/agency: Illinois State Water Survey,
Date: 2009
Scale: 1:65,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: Open water, including rivers and ponds, as well as creeks and manmade bodies of water.

Type: National Wetlands Inventory
Source/agency: US Fish and Wildlife Service
Date: 2009
Scale: 1:24,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: Areas of known wetlands, http://www.fws.gov/wetlands/Data/DataDownload.html

Type: Township and County Borders
Source/agency: US Census Bureau
Date: 2000
Scale: 1:65,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: Political boundaries within the two county area.

Type: Land Use Land Cover
Source/agency: United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS), Research and Development Division (RDD), Geospatial Information Branch (GIB), Spatial Analysis Research Section (SARS)
Date: 1987
Scale: 1:65,000
Projection: UTM_Zone_Number 16, Transverse_Mercator:
Description: Areas of land cover identified, NLCD 2001 Land Cover Class Definitions
11. Open Water - All areas of open water, generally with less than 25% cover of vegetation or soil.
12. Perennial Ice/Snow - All areas characterized by a perennial cover of ice and/or snow, generally greater than 25% of total cover.
21. Developed, Open Space - Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total

cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes
22. Developed, Low Intensity - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-49 percent of total cover. These areas most commonly include single-family housing units.
23. Developed, Medium Intensity - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-79 percent of the total cover. These areas most commonly include single-family housing units.
24. Developed, High Intensity - Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to100 percent of the total cover.
31. Barren Land (Rock/Sand/Clay) - Barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
32. Unconsolidated Shore* - Unconsolidated material such as silt, sand, or gravel that is subject to inundation and redistribution due to the action of water. Characterized by substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable. Erosion and deposition by waves and currents produce a number of landforms representing this class.
41. Deciduous Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change.
42. Evergreen Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage.
43. Mixed Forest - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover.
51. Dwarf Scrub - Alaska only areas dominated by shrubs less than 20 centimeters tall with shrub canopy typically greater than 20% of total vegetation. This type is often co-associated with grasses, sedges, herbs, and non-vascular vegetation.
52. Shrub/Scrub - Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.
71. Grassland/Herbaceous - Areas dominated by grammanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.
72. Sedge/Herbaceous - Alaska only areas dominated by sedges and forbs, generally greater than 80% of total vegetation. This type can occur with significant other grasses or other grass like plants, and includes sedge tundra, and sedge tussock tundra.
73. Lichens - Alaska only areas dominated by fruticose or foliose lichens generally greater than 80% of total vegetation.
74. Moss - Alaska only areas dominated by mosses, generally greater than 80% of total vegetation.
81. Pasture/Hay - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.

82. Cultivated Crops - Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.
90. Woody Wetlands - Areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.
91. Palustrine Forested Wetland* -Includes all tidal and non-tidal wetlands dominated by woody vegetation greater than or equal to 5 meters in height and all such wetlands that occur in tidal areas in which salinity due to ocean-derived salts is below 0.5 percent. Total vegetation coverage is greater than 20 percent.
92. Palustrine Scrub/Shrub Wetland* - Includes all tidal and non-tidal wetlands dominated by woody vegetation less than 5 meters in height, and all such wetlands that occur in tidal areas in which salinity due to ocean-derived salts is below 0.5 percent. Total vegetation coverage is greater than 20 percent. The species present could be true shrubs, young trees and shrubs or trees that are small or stunted due to environmental conditions.
93. Estuarine Forested Wetland* - Includes all tidal wetlands dominated by woody vegetation greater than or equal to 5 meters in height, and all such wetlands that occur in tidal areas in which salinity due to ocean-derived salts is equal to or greater than 0.5 percent. Total vegetation coverage is greater than 20 percent.
94. Estuarine Scrub/Shrub Wetland* - Includes all tidal wetlands dominated by woody vegetation less than 5 meters in height, and all such wetlands that occur in tidal areas in which salinity due to ocean-derived salts is equal to or greater than 0.5 percent. Total vegetation coverage is greater than 20 percent.
95. Emergent Herbaceous Wetlands - Areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.
96. Palustrine Emergent Wetland (Persistent)* - Includes all tidal and non-tidal wetlands dominated by persistent emergent vascular plants, emergent mosses or lichens, and all such wetlands that occur in tidal areas in which salinity due to ocean-derived salts is below 0.5 percent. Plants generally remain standing until the next growing season.
97. Estuarine Emergent Wetland* - Includes all tidal wetlands dominated by erect, rooted, herbaceous hydrophytes (excluding mosses and lichens) and all such wetlands that occur in tidal areas in which salinity due to ocean-derived salts is equal to or greater than 0.5 percent and that are present for most of the growing season in most years. Perennial plants usually dominate these wetlands.
98. Palustrine Aquatic Bed* - The Palustrine Aquatic Bed class includes tidal and nontidal wetlands and deepwater habitats in which salinity due to ocean-derived salts is below 0.5 percent and which are dominated by plants that grow and form a continuous cover principally on or at the surface of the water. These include algal mats, detached floating mats, and rooted vascular plant assemblages.
99. Estuarine Aquatic Bed* - Includes tidal wetlands and deepwater habitats in which salinity due to ocean-derived salts is equal to or greater than 0.5 percent and which are dominated by plants that grow and form a continuous cover principally on or at the surface of the water. These include algal mats, kelp beds, and rooted vascular plant assemblages.

Type: 100 and 500 Year Flood Zones
Source/agency: Illinois State Geological Survey
Date: 1996
Scale: 1:24,000

Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: This is a statewide polygon feature class of 100 year and 500 year flood zones as of 1986 for the unincorporated areas of Illinois as indicated on Federal Emergency Management Agency (FEMA) National Flood Insurance Program (FIRM) maps and Flood Hazard Boundary maps.

Type: SOILS
Source/agency: U.S. Department of Agriculture, NRCS
Date: February 2006
Scale: 1:65,000
Geographic Coordinate System: UTM 16 NAD 83
Description: Soil Survey Geographic (SSURGO) database for Ogle + Lee Counties, Illinois

Type: HEL (Highly Erodable Land): United States Department of Agriculture
Source/agency: U.S. Department of Agriculture, NRCS
Date: February 2006
Scale: 1:65,000
Geographic Coordinate System: UTM 16 NAD 83
Descripion: Soil Survey Geographic (SSURGO) database for Ogle + Lee Counties, Illinois Soil map units having an erodibility index of 8 or greater

Type: Hydric Soils
Source/agency: U.S. Department of Agriculture, NRCS
Date: February 2006
Scale: 1:65,000
Geographic Coordinate System: UTM 16 NAD 83
Description: Soil Survey Geographic (SSURGO) database for Ogle + Lee Counties, Illinois

Type: Hydrologic Soil Groups
Source/agency: U.S. Department of Agriculture, NRCS
Date: February 2006
Scale: 1:65,000
Geographic Coordinate System: UTM 16 NAD 83
Description: Soil Survey Geographic (SSURGO) database for Ogle + Lee Counties, Illinois

Type: Relief / Topography
Source/agency: USDA, NRCS
Date: December 2000
Scale: 1:65,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: Dataset containing contour elevations of the landscape.

Type: Prime Farmland
Source/agency: US Department of Agriculture
Date: January 2010
Scale: 1:24,000

Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding. Users of the lists of prime farmland map units should recognize that soil properties are only one of several criteria that are necessary.

Type: Natural Areas (Forest and Grasslands)
Source/agency: OES
Date: February 2010
Scale: 1:24:000
Projection: Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: Using the 1999 land cover created by the IDNR as a base, interpretation of the 2005 orthophotography and site knowledge new shapefiles for forest area and grasslands were created. Forests were defined as >80% canopy deciduous and coniferous trees. Grasslands were defined as cool and warm season grasses and prairie with very few shrubs and no trees.

Type: Publicly Protected Natural Areas
Source/agency: Illinois Natural History Survey IDNR
Publication_Date: April 1994
Scale: 1:24,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: Publicly protected open space including State Parks, State Forests, State, Natural Areas, State Conservation Areas, Illinois Natural Area Inventory Sites, Nature Preserves.

Type: Well Boring Locations
Source/agency: Illinois State Geological Survey
Date: 2008
Scale: 1:62,500
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: This file contains point locations from the ISGS Wells and Borings database. The attribute information include API number (the ID), well or boring type, longitude, and latitude. The spatial reference is geographic coordinates, decimal degrees, NAD83. The data are exported to a shapefile weekly from the Wells and Borings (source) database for Internet distribution.

Type: Leach Sensitivity (Pesticide and NO3)
Source/agency: Illinois State Geological Survey
Date: 1995
Scale: 1:250,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: This data set was created to classify soils and aquifer settings according to predictions of leaching potential. The classifications have not been validated by the results of water quality sampling. In addition, the use of these aquifer sensitivity ratings as predictors of water quality has not been evaluated. Nonuniform use of fertilizers might reduce the reliability of water quality predictions, which can only be validated by careful comparison with water
quality data.

Type: Cultivated Land Cover
Source/agency: US Department of Agriculture
Date: 2007
Scale: 1:65,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: This feature dataset provides the estimated percentages of cultivated cropland.

Type: Bedrock
Source/agency: Illinois State Geological Survey
Date: 2005
Scale: 1:500,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: This feature dataset shows the distribution and extent of the bedrock geologic units within the State of Illinois, as depicted on the map Bedrock Geology of Illinois.

Type: Quarternary Deposits
Source/agency: Illinois State Geological Survey
Date: 1996
Scale: 1:2,500,000
Geographic Coordinate System: GCS_North_American_1983
Datum: D_North_American_1983
Description: This feature dataset is a generalized version of Quaternary Deposits of Illinois. Updated to reflect the areal distribution of the Wedron and Mason Groups (Wisconsin and Hudson Episodes) and deposits of the Illinoian and pre-Illinoian episodes in Illinois as described in ISGS Bulletin 104. Episodes are diachronic temporal units.

Chapter 3: Goals, Objectives, and Action Items

Written by Rebecca Olson

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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Chapter 4 – Watershed Modeling Study

Written By Nathan Hill

Chapter 2 describes in detail the current conditions of the Clear Creek Watershed using readily available data from various sources. In this chapter, we utilize this data to create a watershed model for the purposes of evaluating pollution loading in the watershed and the potential reduction in loads due to the implementation of best management practices (BMPs) outlined in Chapter 3 of this Clear Creek Watershed Action Plan (Plan). This chapter describes the model used in this study, the subwaterhsed breakdown and 2011 land cover, model development process and the results, and the stream bank erosion inventory.

Introduction to BASINS Model

We utilized the U.S. Environmental Protection Agencies (USEPA) supported program package, *Better Assessment Science Integrating Point and Non Point Sources* (BASINS) to perform the modeling. BASINS is a multi purpose environmental analysis system that integrates GIS, watershed data, and modeling tools. The watershed was analyzed using the BASINS Pollutant Loading Estimator (*PLOAD*) which is a simplified, GIS-based model to calculate pollutant loads for watersheds. *PLOAD* estimates non-point sources (NPS) of pollution on an annual average basis, for any user-specified pollutant. The user may calculate the NPS loads using either of two approaches, using Export Coefficients or the EPA's Simple Method. BMPs, which serve to reduce NPS loads, point source loads, and loads from stream bank erosion, may also be included in computing total watershed loads. *PLOAD* produces maps and tables showing the NPS pollution results, and the tool can be run multiple times to compare results under various scenarios. *PLOAD* calculates loads for any sub basin polygon shapefile, which may be user-supplied or the output of one of the BASINS watershed delineation

LOST LAKE LOOKING OVER FLAGG RD TO THE NW

tools. *PLOAD* was designed to be generic so that it can be applied as a screening tool in a wide range of applications including NPDES storm water permitting, watershed management, or reservoir protection projects" (USEPA, 2011).

Watershed and Subwatershed Characterization

The Clear Creek watershed can generally be characterized as rural agricultural with residential developments around an impounded lake near the confluence with the Rock River. Considerable natural areas restoration has occurred in the watershed as well as forested land. For the purposes of this project a new land cover GIS shapefile was created to reflect current ownership and land uses in the watershed. The land cover was updated using 2005 aerial photography, 2007 land cover, site knowledge and field inventory to determine the current land cover. Land cover is the basis for the PLOAD model as well as impervious surfaces.

Clear Creek Looking over Lowden Rd to the SE

In order to break the watershed into manageable units, the BASINS automatic watershed delineator was used to create 10 relatively uniform sized sub-watersheds. The automatic delineator uses grid based digital elevation model to create the boundaries of the sub-watersheds which compared closely to the manually delineated watershed boundary that were created using the 7.5 minute topographic map. The sub-watersheds were refined to be relatively uniform in size and utilize road crossings and other natural breaks to distinguish them.

Figure 4-1: 2011 Land Cover

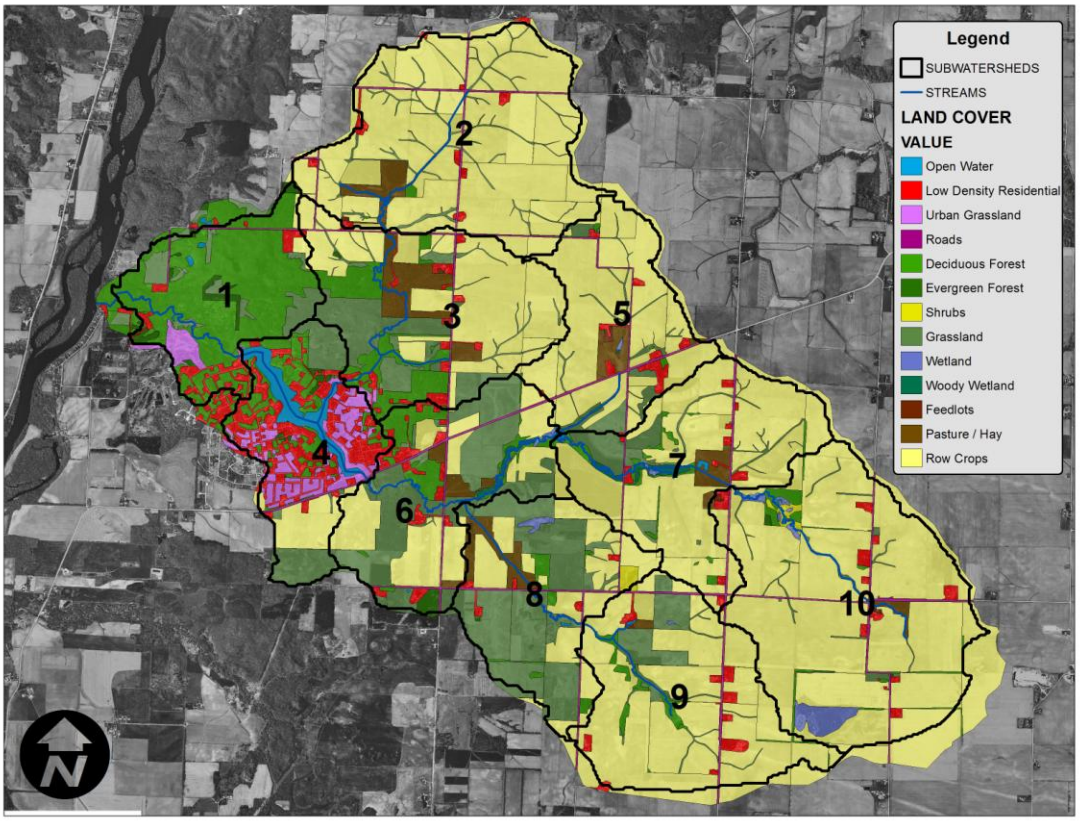


Figure 4-2: Land Cover Breakdown by Sub-watershed

	SUBWATERSHED																			
	1		2		3		4		5		6		7		8		9		10	
LANDCOVER	AC	%	AC	%	AC	%	AC	%	AC	%	AC	%	AC	%	AC	%	AC	%	AC	%
Open Water	3	0%	0	0.0%	0	0.0%	82	10.4%	1	0.1%	3	0.3%	4	0.4%	1	0.1%	1	0.1%	1	0.0%
Low Density Residential	51	7%	18	1.2%	45	4.0%	217	27.4%	31	3.7%	54	5.5%	23	2.2%	12	1.4%	37	3.3%	38	2.2%
Roads	7	1%	35	2.4%	18	1.6%	7	0.9%	23	2.9%	29	3.0%	18	1.8%	9	1.1%	18	1.6%	36	2.1%
Decuduous Forest	548	71%	5	0.3%	169	14.9%	125	15.8%	7	0.9%	97	9.9%	37	3.6%	28	3.2%	39	3.5%	44	2.6%
Evergreen Forest	30	4%	0	0.0%	1	0.1%	8	1.0%	0	0.0%	14	1.4%	0	0.0%	1	0.1%	0	0.0%	2	0.1%
Shrub	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	12	1.4%	2	0.1%	14	0.8%
Grassland	89	11%	67	4.5%	231	20.3%	133	16.8%	77	9.4%	409	41.9%	185	17.8%	493	55.5%	126	11.3%	32	1.9%
Pasture / Hay	0	0%	54	3.7%	106	9.3%	0	0.0%	38	4.7%	32	3.3%	41	3.9%	56	6.3%	5	0.5%	15	0.9%
Row Crops	15	2%	1289	87.8%	565	49.6%	92	11.6%	633	77.7%	320	32.9%	710	68.2%	267	30.0%	879	79.3%	1466	86.0%
Feedlot	0	0%	0	0.0%	1	0.1%	0	0.0%	3	0.4%	0	0.0%	0	0.0%	0	0.0%	1	0.1%	3	0.2%
Urban Graslands	34	4%	0	0.0%	2	0.2%	129	16.2%	0	0.0%	1	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Wetlands	0	0%	0	0.0%	0	0.0%	0	0.0%	1	0.1%	3	0.3%	3	0.3%	8	0.9%	1	0.1%	54	3.2%
Woody Wetlands	0	0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	14	1.4%	20	1.9%	0	0.0%	0	0.0%	0	0.0%
TOTAL	778		1468		1138		794		814		975		1041		888		1108		1704	

Watershed Modeling

Pollution loading estimates were generated using PLOAD model in BASINS. PLOAD estimates non-point sources of pollution on an annual average basis for specific user specified pollutants. For this modeling project Total Phosphorus, Total Nitrogen, Total Suspended Solids and Pathogens (fecal coli-form) were the selected pollutants. PLOAD can calculate loadings based on Event Coefficient (simple method) or Event Mean Concentrations. The latter was chosen for this project. The model requires an input table of EMC values and a runoff coefficient for each land cover type is based on the % impervious surface.

Model Development and Methods

Due to a lack of watershed storm event water quality sampling, needed to develop a local Event Mean Concentration (EMC) for the watershed, average values by land cover type were used from published sources of comparable watersheds in the Midwest, see Table below. If no comparable land cover EMC was available the basic EMC table provided in the PLOAD model was used. Sources of TP and TN include but are not limited to natural sources, row crop production, and urban storm water and lawn fertilizer. It should be noted that the lake has implemented a Phosphorus lawn fertilizer ban however the EMC value for low density residential land use was not reduced based on the difficulty to ensure compliance and due to the other sources such as, sediment, pet waste, and lawn clippings left on driveways, sidewalks, or streets that enter the lake through storm water. Sources of TSS include but are not limited to erosion from row crops, stream banks and urban storm water. Pathogen sources include but are not limited to, natural sources (wildlife), cattle, septic systems, and pets in urban areas. The model results below should be viewed as a metric for comparison of various BMP and restoration scenarios rather than an exact representation of existing pollution load conditions. Below is the Baseline EMC table and BMP EMC table developed using the criteria in Section 3.B.

Figure 4-3: Baseline Event Mean Concentrations used in PLOAD

LANDUSE	IMPERVIOUS	PATHOGENS	TSS	TN	TP
Open Water	0	500.0	70.0	1.0	0.2
Low Density Residential	25	3600.0	90.0	12.5	0.5
Roads	33	2000.0	75.0	2.0	0.5
Deciduous Forest	0	500.0	45.0	2.6	0.1
Evergreen Forest	0	500.0	45.0	2.6	0.1
Shrubs	0	500.0	1.0	1.0	0.2
Grassland	0	500.0	5.5	5.5	0.2
Pasture/Hay	0	4000.0	100.0	2.5	0.5
Row Crops	0	4000.0	210.0	14.0	0.6
Feedlots	0	4000.0	100.0	2.5	0.5
Urban Grassland	0	4000.0	100.0	2.5	0.4
Wetlands	0	500.0	70.0	0.9	0.1
Woody Wet	0	500.0	70.0	0.9	0.1

Figure 4-4: Updated EMC values based on BMPs

LANDUSE	IMPERVIOUS	PATHOGENS	TSS	TN	TP
Open Water	0	500.0	70.0	1.0	0.2
Low Density Residential	25	2700.0	67.5	9.4	0.4
Roads	85	2000.0	50.0	2.0	0.5
Deciduous Forest	0	500.0	45.0	2.6	0.1
Evergreen Forest	0	500.0	45.0	2.6	0.1
Mixed Shrubs	0	500.0	1.0	1.0	0.2
Grassland	0	500.0	5.5	5.5	0.2
Pasture/Hay	0	3000.0	87.0	1.4	0.3
Row Crops	0	4000.0	75.6	5.7	0.3
Feedlots	0	4000	100.0	2.5	0.5
Urban Grassland	0	4000.0	100.0	2.5	0.4
Wetlands	0	500.0	70.0	0.9	0.1
Woody Wetlands	0	500.0	70.0	0.9	0.1

BMP Modeling

The purpose of this model was to determine a general baseline loading and then use as many of the action items and BMP's identified and defined in Chapter 3 to modify the model and determine an estimated load reduction for total build out of the action items that could be accounted for. BMPs outlined in the plan were incorporated into the model in several ways, they were either added to the PLOAD model as a change in the Event Mean Concentration (EMC) value or the Land Cover file was modified. BMP Pollution Reduction Guidance Document (Evans & Corradini, 2001) was used to determine the percent of load reductions for each BMP. With the exception the TNC owned land, 160 acre wetland restoration area in the SE portion of the watershed and the wetland/buffer creation very little privately owned land used for row crops were converted to natural areas. Most of the BMP recommendations relate to management of the current land use specifically row crops using conservation tillage and nutrient management.

The following action items were addressed with the following BMPs in the model:

- **Action item #1 – Stabilize Stream banks along streams**. Although not included in the model if the erosion sites were not addressed in PLOAD if streambank stabilization would reduce TN by 65% TP by 78% and TSS 76%
- **Action items #3 - Stabilize highly erode able lands, and #16 - Increase acreage of conservation farming, such as no-till strip-till.** These action items were addressed in the BMP model by accounting for adoption of Conservation Tillage on all Row Crops in the watershed. Conservation Tillage reduced the EMC values for Row Crops by the following percentages (Evans & Corradini, 2001).

    - TN was reduced 50%
    - TP was reduced 38%
    - TSS 64% for Row crops
- **Action items #4 - Create filter strips and #6 Create wetlands** - The land cover file was modified by changing the current land cover to a wetland land cover. The wetland sites were based on the priority buffer and wetland restoration sites identified in Chapter 2. In the land cover file these areas simply apply the wetland EMC values for TP, TN, TSS and Pathogens.
- **Action item #15 - Manage fertilizer, herbicide, nutrient and insecticide loss.** Although much of this can be accomplished with conservation tillage, nutrient management on all cropland would reduce much of the remaining TN and TP that were applied to row crops. The total Nitrogen EMC value was further reduced by 19% and TP by 28% for row crops.
- **Action item #13 Limit access of cattle to stream** – If Pasture Land Management BMP were implemented in all pastures would expect to see a reduction in TN of 43%, TP 34% and TSS 13% and Pathogens by 25%. This would require full implementation of pasture land management including livestock exclusion fencing, pasture rotation and better forage management planning.
- **Action items #4 Create wetlands, #20 Preserve priority natural areas, #21 Create wildlife corridors, #22 Convert land around important, existing natural areas to create habitat, and #23 Manage important natural areas –** These items were addressed by having all TNC owned parcels currently in row crops restored to prairie (grassland) and by restoring the large wetland in the SE portion of the watershed with a native grass buffer around it creating a 160 acre habitat area. The EMC values for the row cropped areas were converted from Row Crop to Grassland.
- **Action items #5 Construct rain gardens near homes, #7 Create buffer strips around the lake shoreline, #18 Require septic inspections every 3 years, and #19 Continue campaign to use zero phosphorus lawn fertilizers for residential landowners.** These action items are specifically targeted to those residences around the lake. For implementation of these BMPs we reduced TP, TN, TSS and Pathogens by 25%. It is further recommended that pet waste education be done as it is another source of pathogens to the lake.

Figure 4-5: Baseline Land Cover Map

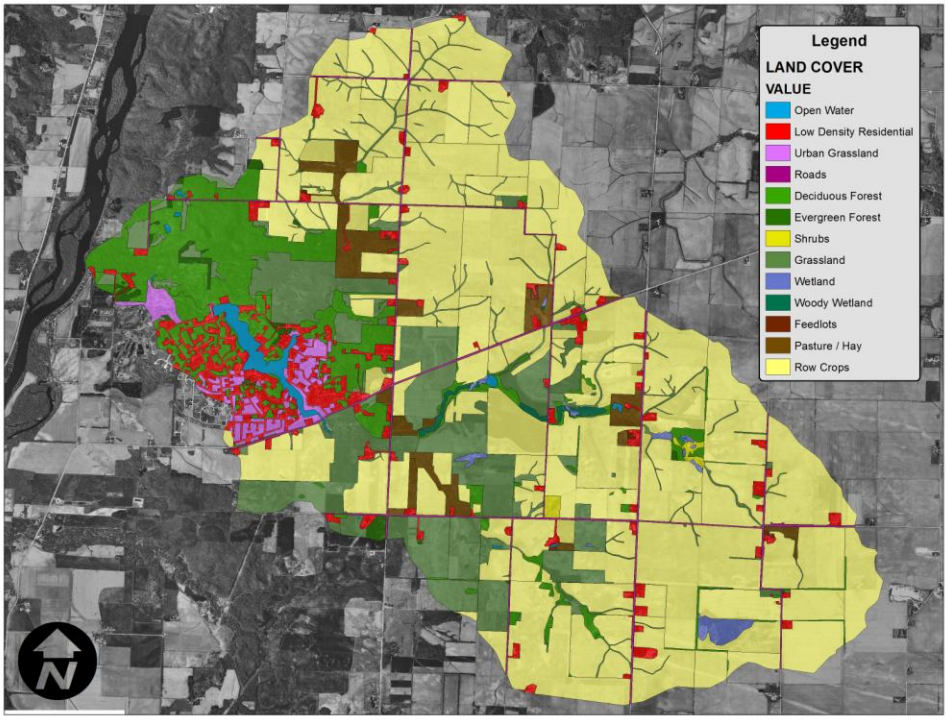
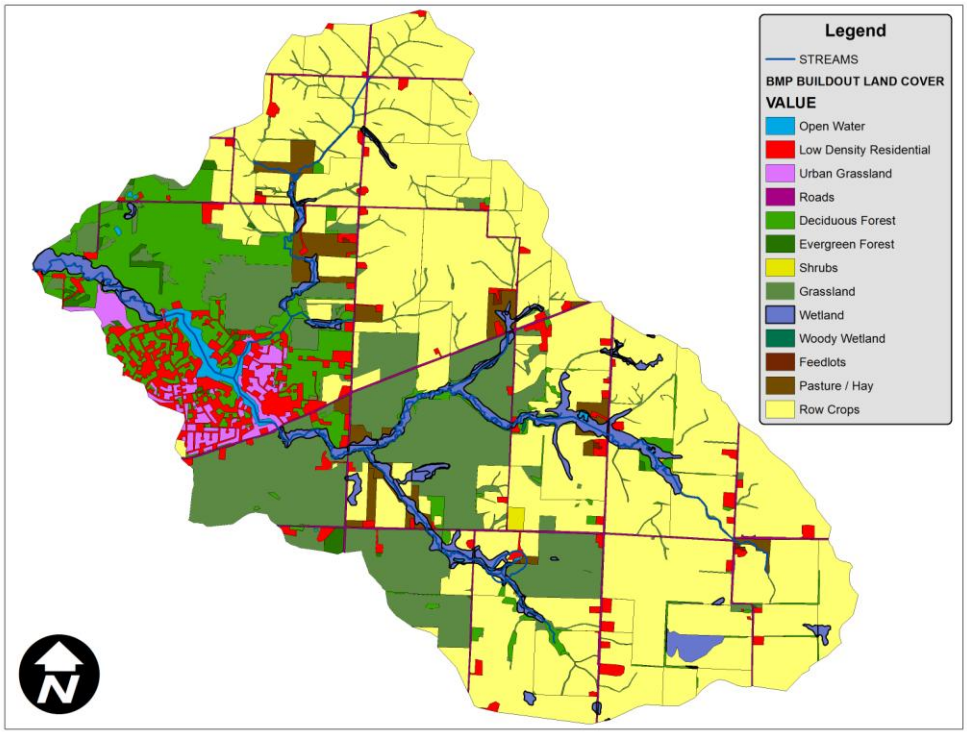


Figure 4-6: BMP Build Out Land Cover Map



Model Results

Figure 4-7: Baseline Total Phosphorus Lbs / Acre

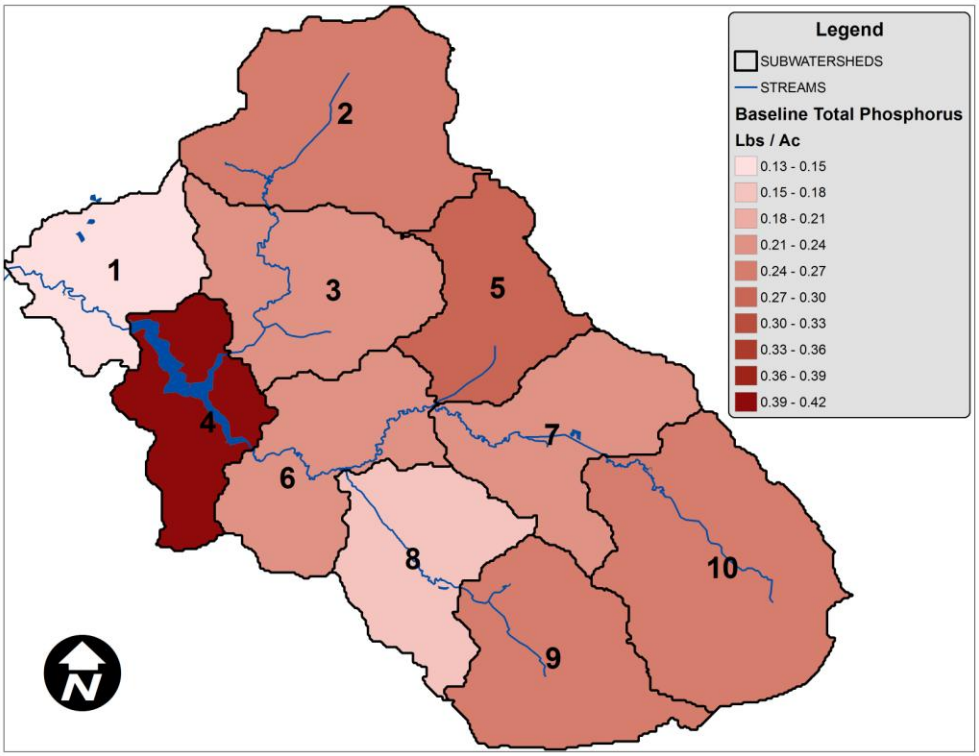


Figure 4-8: BMP Total Phosphorus Lbs / Acre

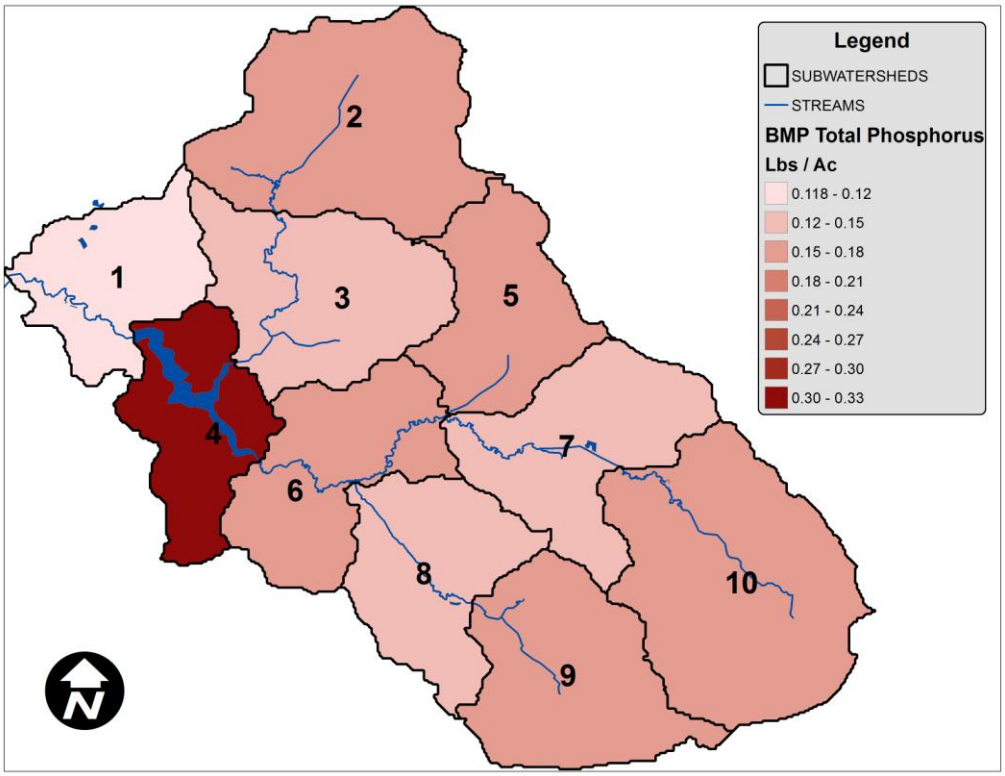


Figure 4-9: Baseline Total Phosphorus Annual Load - Pounds

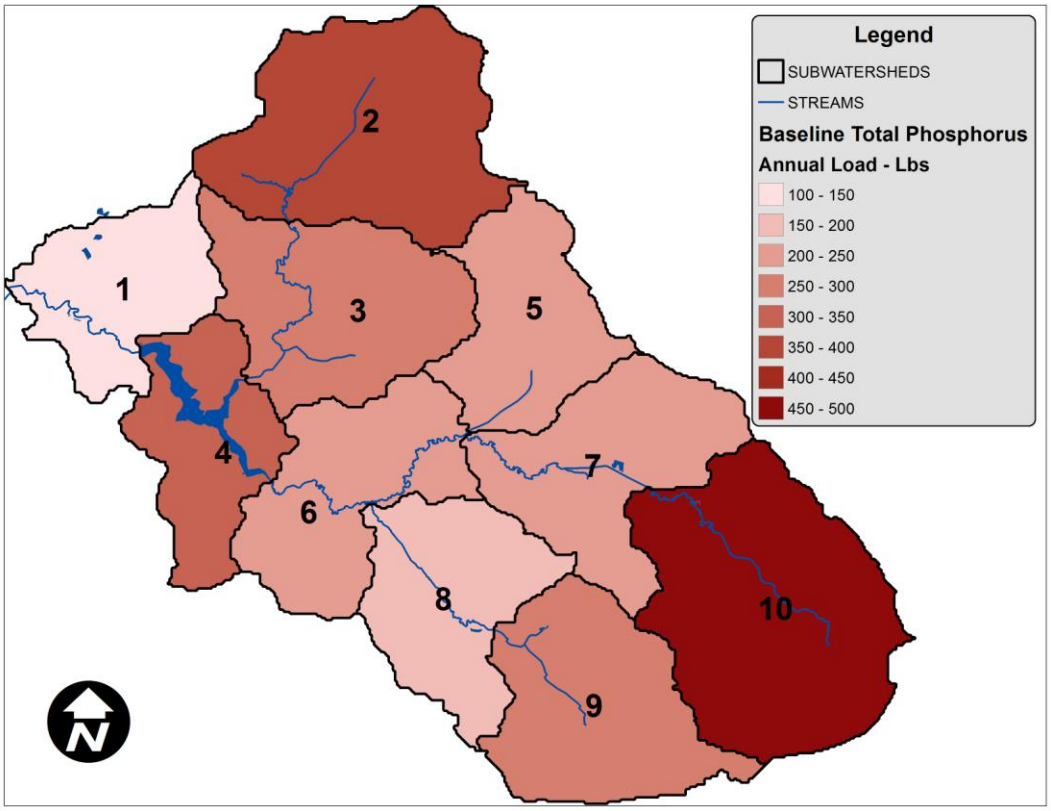


Figure 4-10: BMP Total Phosphorus Annual Load - Pounds

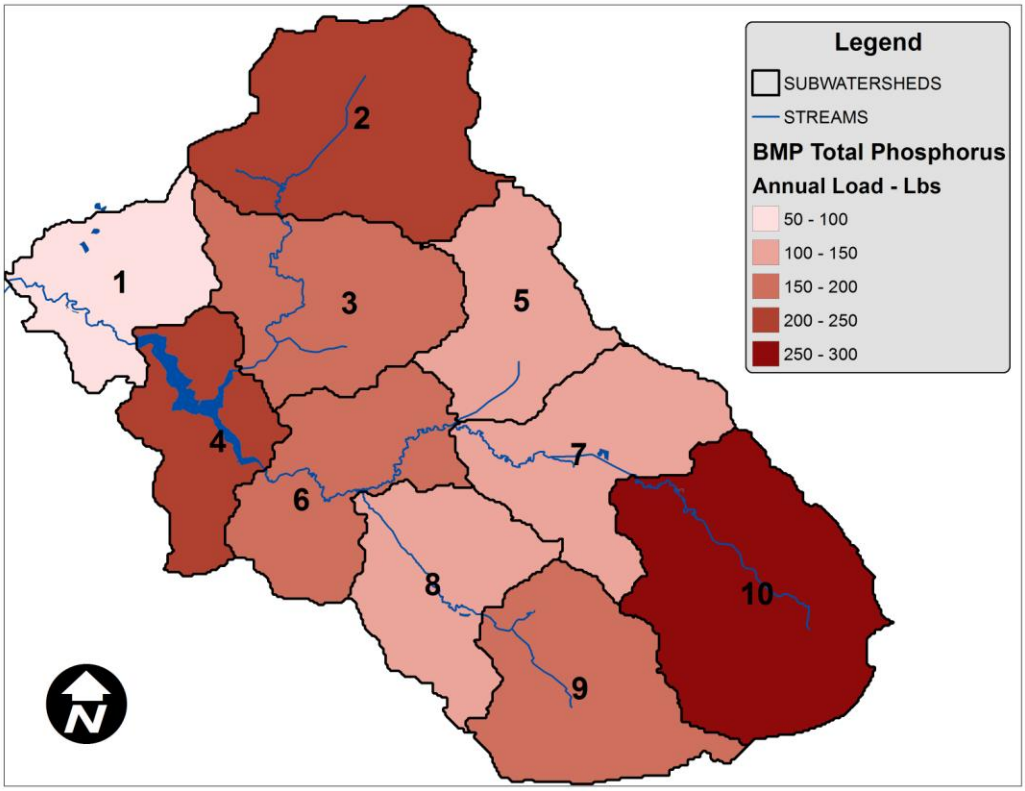


	Figure 4-11: Phosphorus Load Comparison				
	BASELINE		BMP		% Reduction
Subwatershed	Annual Lbs	Lbs/Ac	Annual Lbs	Lbs/Ac	Annual Lbs
1	105.5	0.136	91.97	0.118	12.82%
2	393.7	0.268	229.24	0.156	41.77%
3	257.6	0.226	168.96	0.148	34.41%
4	311.1	0.398	249.00	0.318	19.96%
5	232.2	0.284	142.43	0.174	38.66%
6	219.3	0.225	155.10	0.159	29.28%
7	245.0	0.235	144.58	0.139	40.99%
8	155.5	0.173	110.22	0.122	29.12%
9	287.5	0.26	168.34	0.152	41.45%
10	456.8	0.265	259.02	0.150	43.30%
TOTAL	**2,664.2**		**1,718.87**		**35.48%**

Figure 4-12: Baseline Total Nitrogen Lbs / Ac

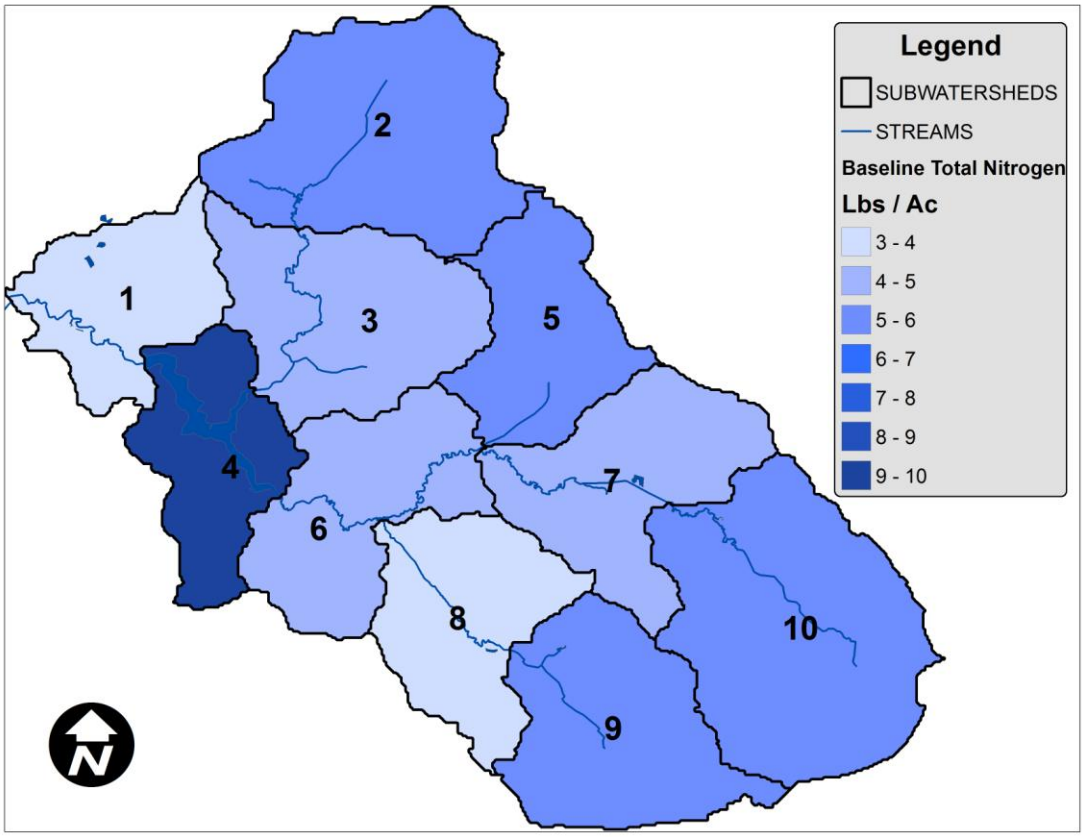


Figure 4-13: BMP Total Nitrogen Lbs / Acre

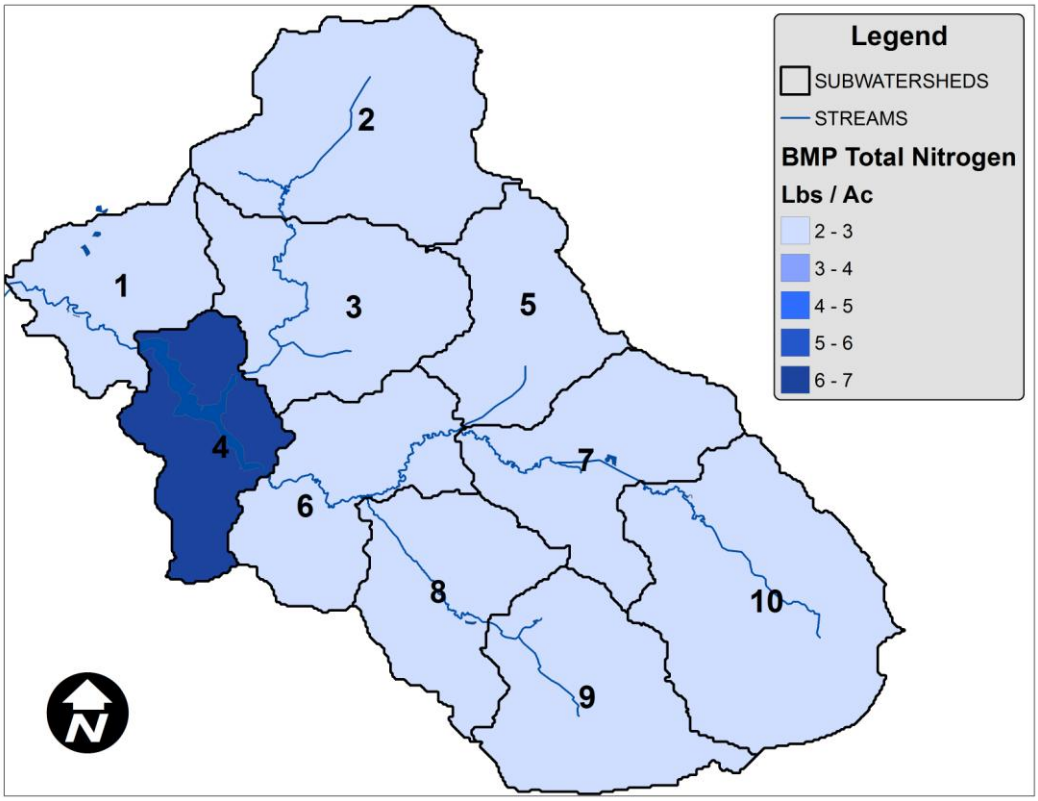


Figure 4-14: Baseline Total Nitrogen Annual Load – Pounds

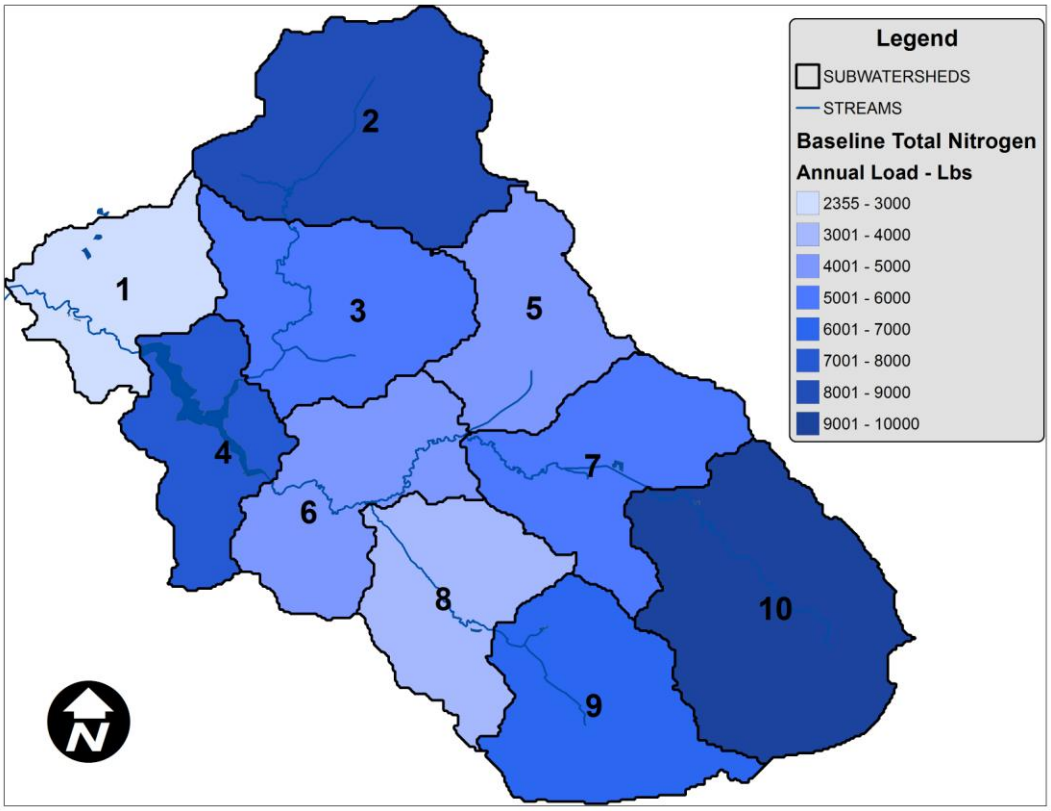


Figure 4-15: BMP Total Nitrogen Annual Load - Pounds

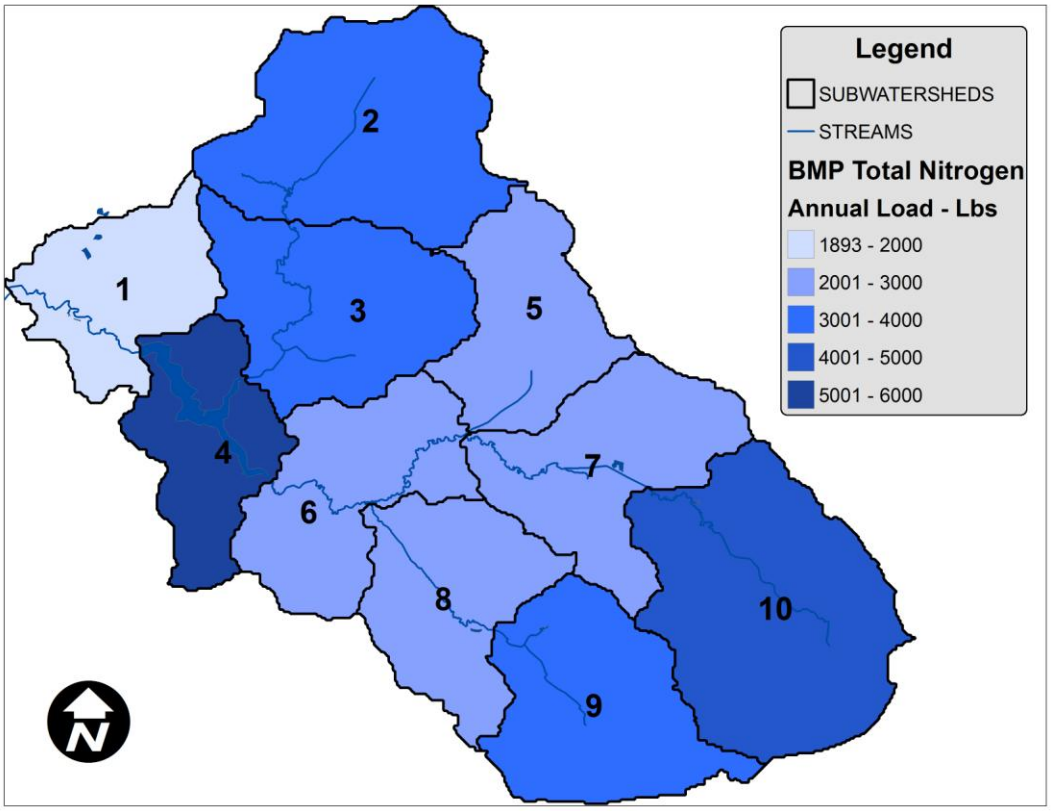


	Figure 4-16: Nitrogen Load Comparison				
	BASELINE		BMP		% Reduction
Subwatershed	Annual Lbs	Lbs/Ac	Annual Lbs	Lbs / Ac	Annual Lbs
1	2,354.7	3.02	1,892.96	2.431	19.61%
2	8,173.4	5.56	3,718.34	2.527	54.51%
3	5,304.0	4.64	3,042.19	2.664	42.64%
4	7,060.6	9.03	5,274.79	6.746	25.29%
5	4,729.5	5.78	2,356.12	2.879	50.18%
6	4,450.8	4.57	2,920.19	2.996	34.39%
7	5,166.6	4.96	2,497.01	2.399	51.67%
8	3,109.5	3.46	2,017.43	2.242	35.12%
9	6,314.7	5.71	3,095.42	2.798	50.98%
10	9,669.6	5.61	4,306.47	2.498	55.46%
TOTAL	**56,333.4**		**31,120.91**		**44.76%**

Figure 4-17: Baseline TSS – Lbs / Acre

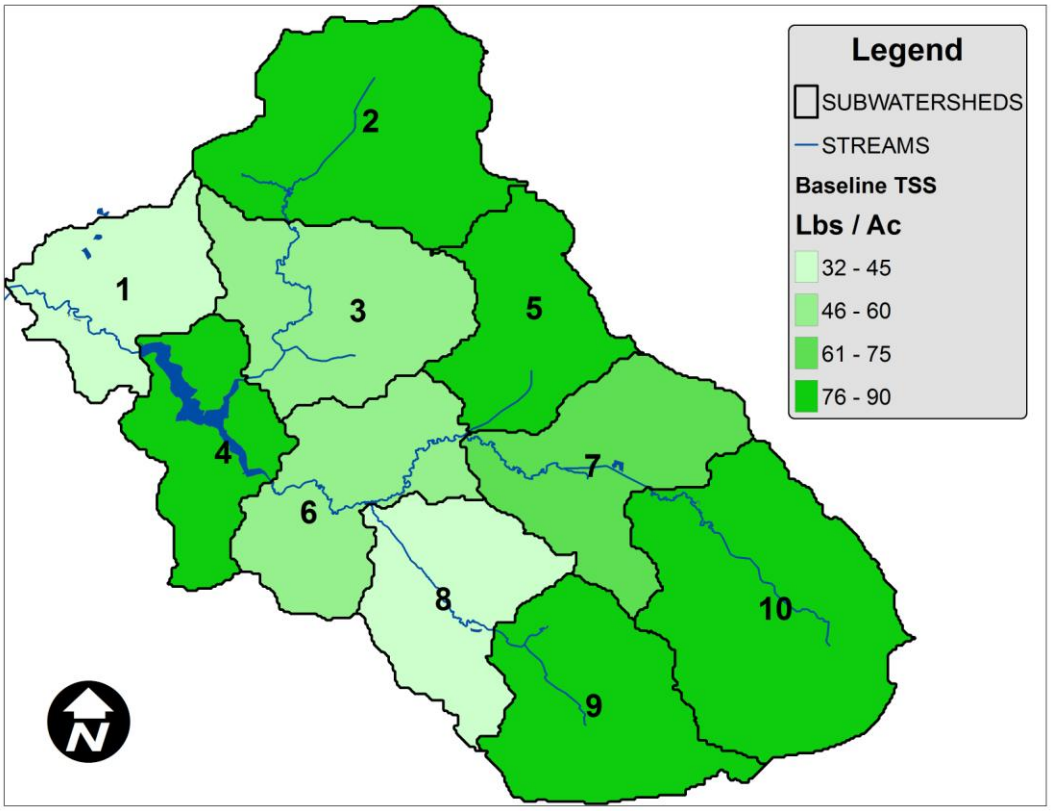


Figure 4-18: BMP TSS Lbs / Ac

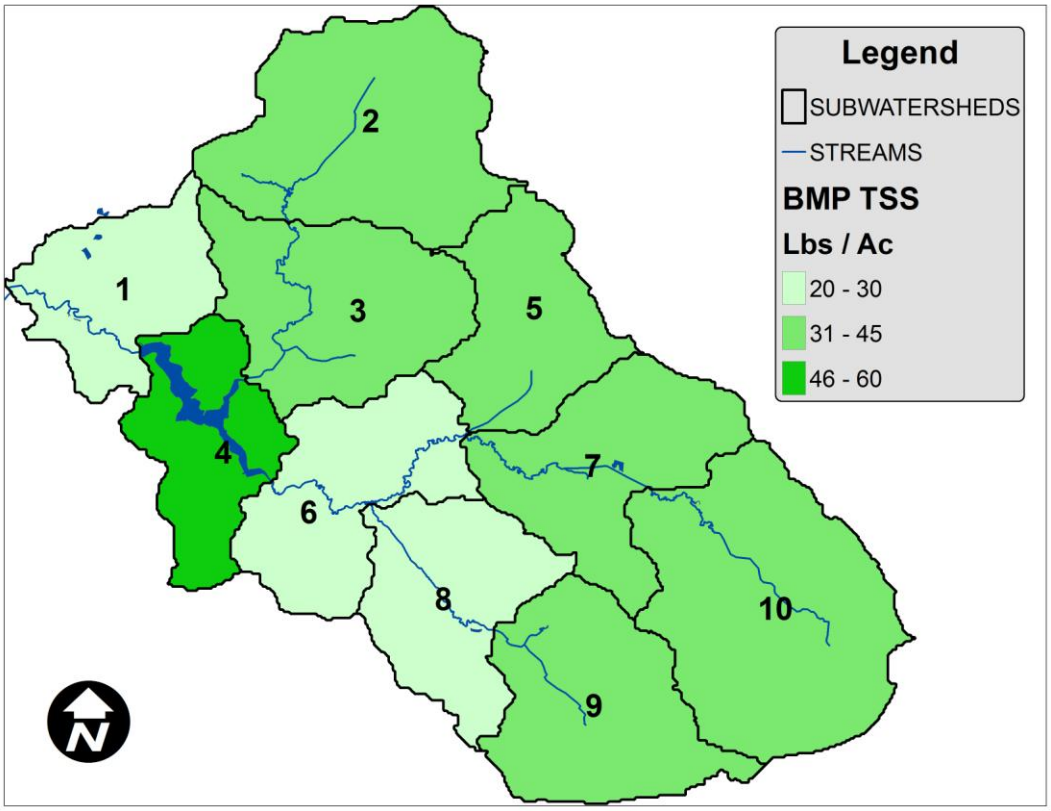


Figure 4-19: Baseline TSS – Annual Load - Pounds

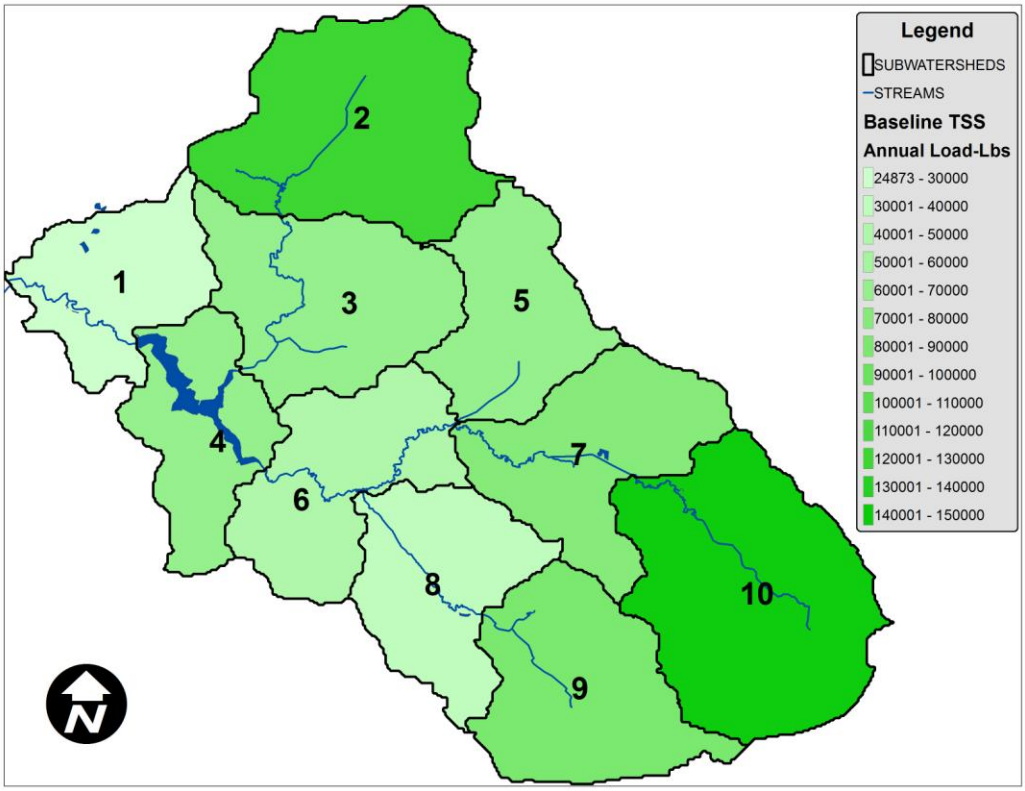


Figure 4-20: BMP TSS Annual Load - Pounds

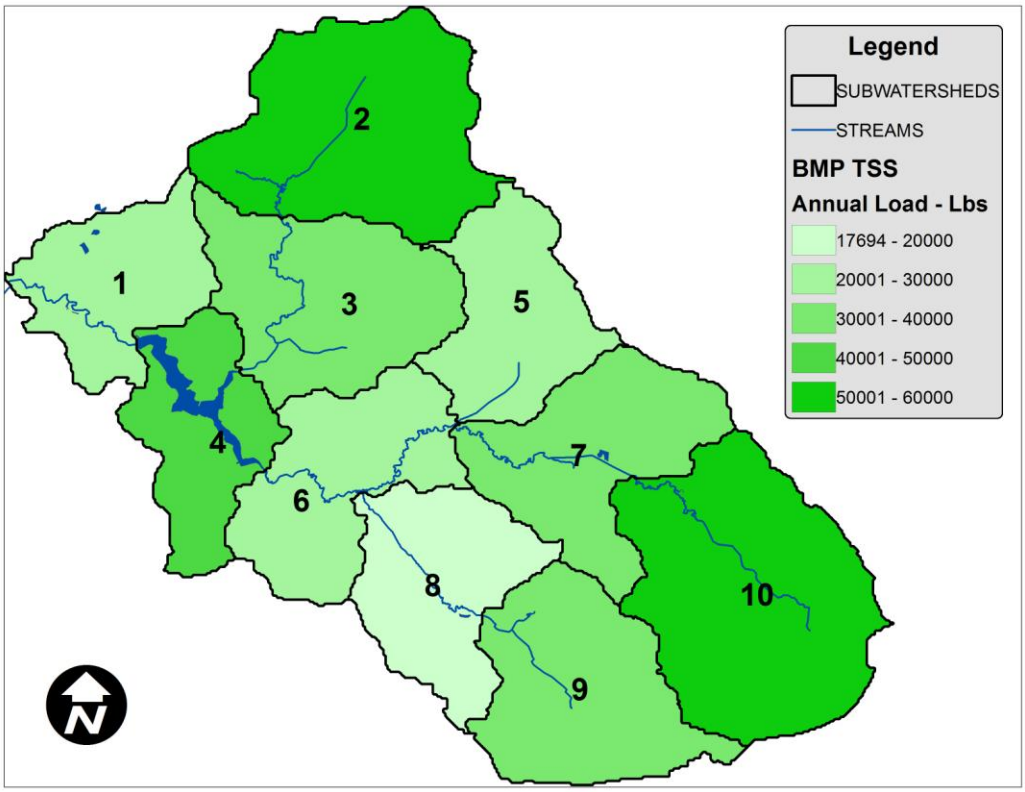


	Figure 4-21: TSS Load Comparison				
	BASELINE		BMP		% Reduction
Subwatershed	Annual Lbs	Lbs/Ac	Annual Lbs	Lbs / Ac	Annual Lbs
1	24,873.1	31.94	22,351.69	28.70	10.14%
2	121,306.0	82.48	50,976.96	34.64	57.98%
3	68,040.2	59.57	35,172.87	30.80	48.31%
4	61,904.6	79.17	43,797.24	56.01	29.25%
5	66,057.2	80.71	28,881.24	35.29	56.28%
6	47,945.6	49.19	23,065.73	23.66	51.89%
7	70,981.2	68.21	31,515.23	30.28	55.60%
8	32,782.2	36.43	17,694.24	19.66	46.02%
9	85,517.8	77.31	34,577.45	31.26	59.57%
10	142,142.1	82.46	58,916.48	34.17	58.55%
TOTAL	721,550.0		346,949.13		51.92%

Figure 4-22: Pathogens – Counts / Acre

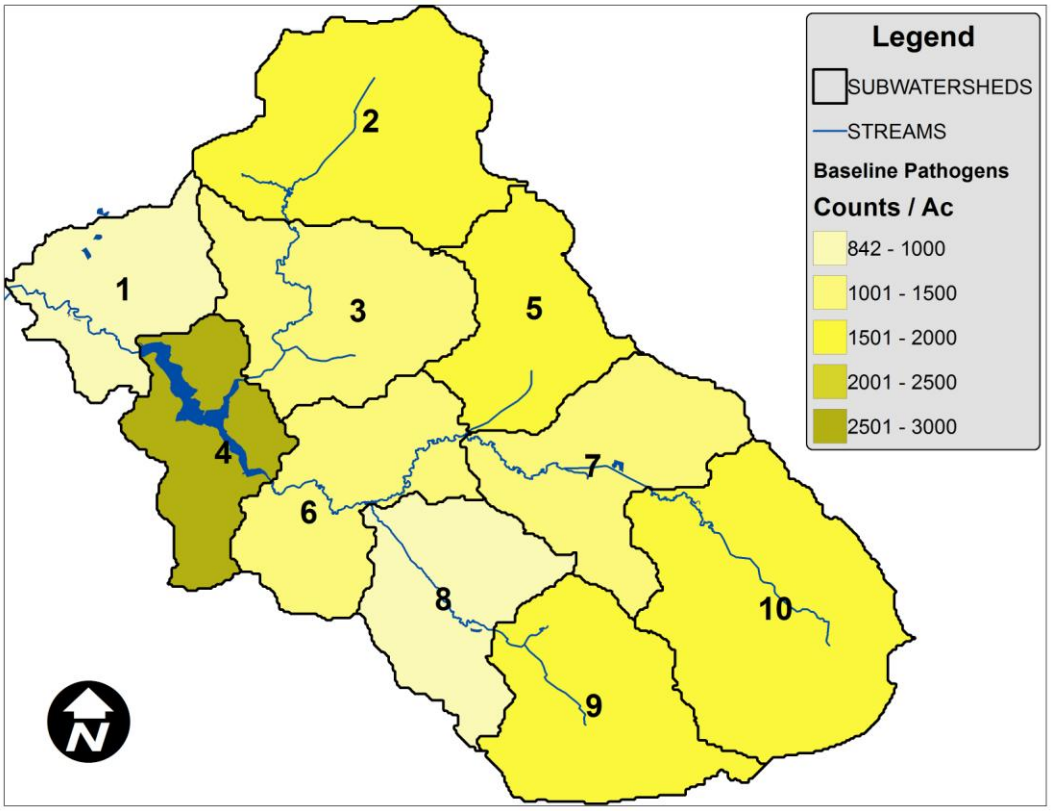


Figure 4-23: Pathogens Counts / Ac

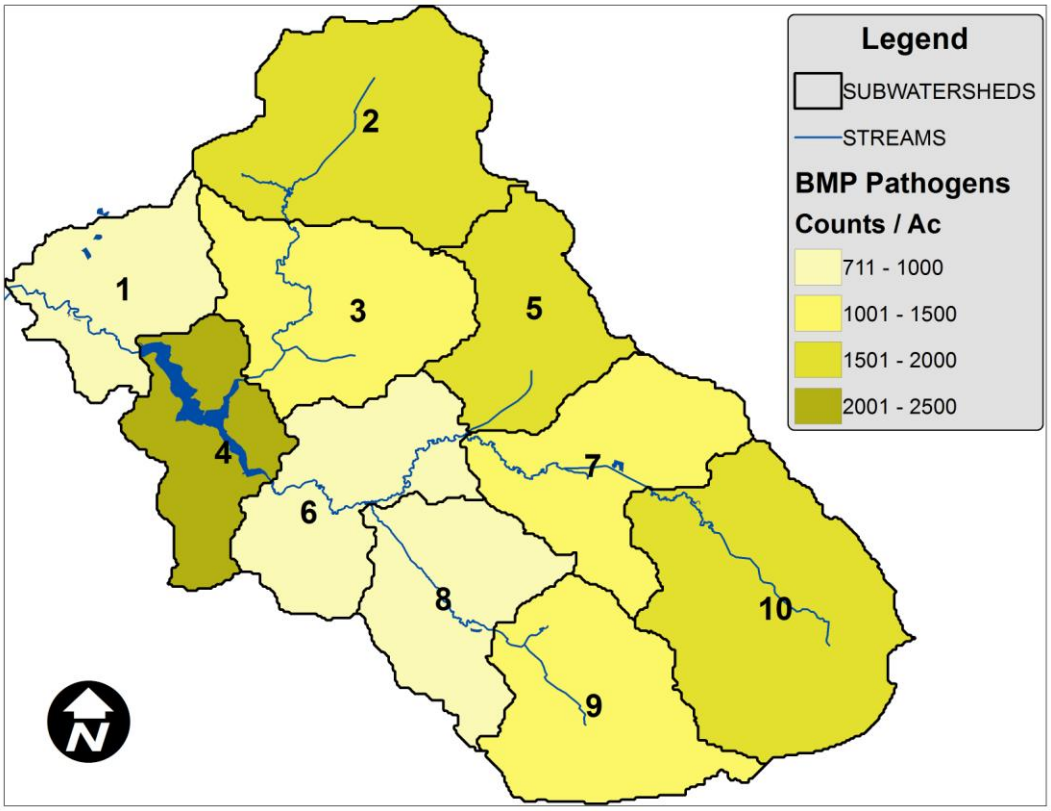


Figure 4-24: Pathogens Annual Count

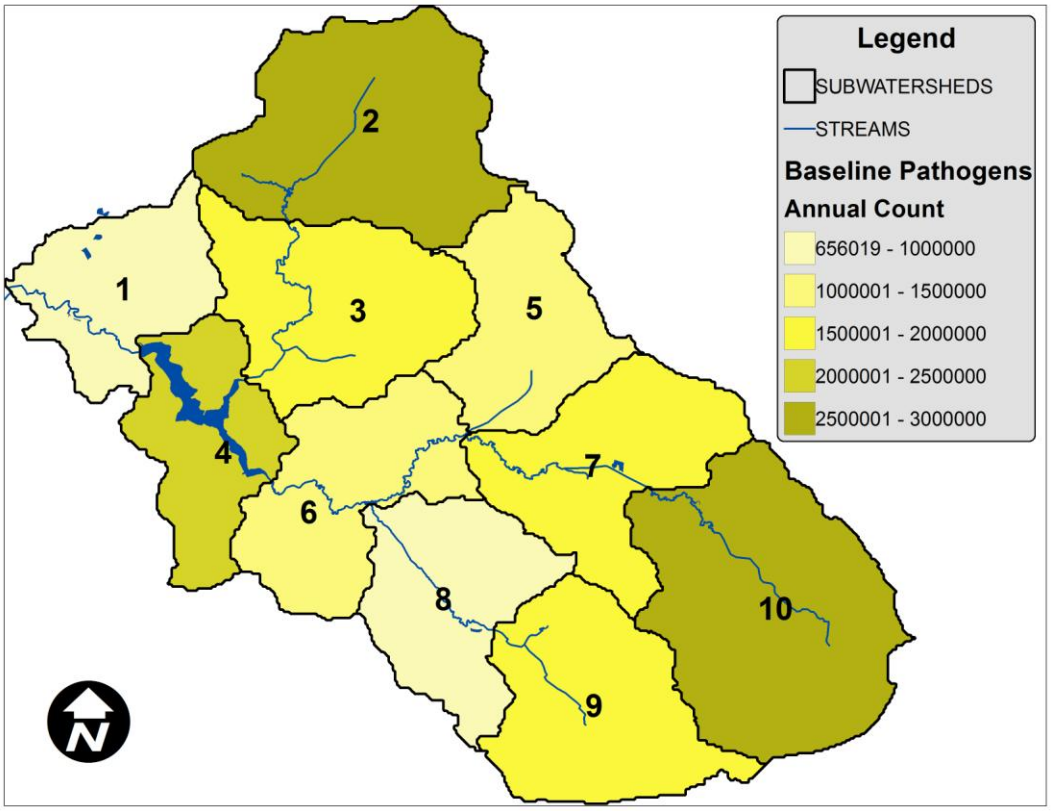


Figure 4-25: Pathogens Annual Counts

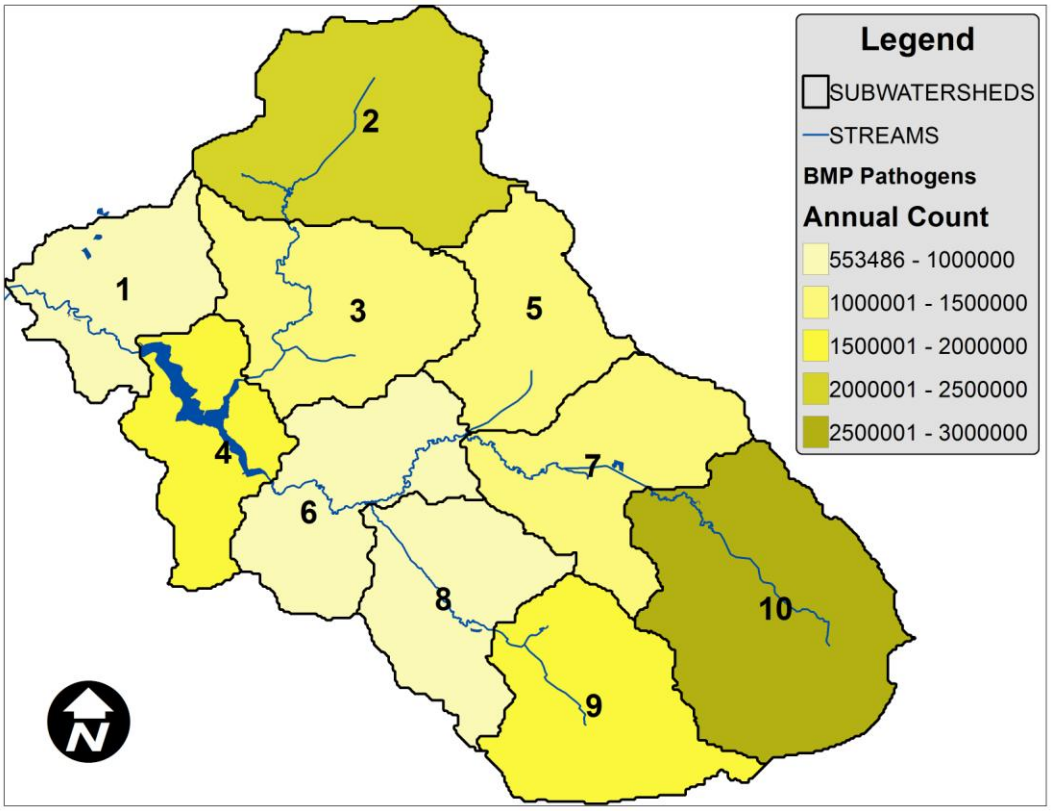


	Figure 4-26: Pathogen Count Comparison				
	BASELINE		BMP		% Reduction
Subwatershed	Annual Counts	Counts/Ac	Annual Counts	Counts/Ac	Annual Counts
1	656,018.6	842.47	553,485.61	710.80	15.63%
2	2,508,343.4	1,705.58	2,428,852.17	1,650.43	3.17%
3	1,620,835.2	1,419.16	1,465,814.77	1,283.43	9.56%
4	2,164,387.4	2,768.10	1,612,856.32	2,062.73	25.48%
5	1,465,175.9	1,790.10	1,288,606.63	1,574.37	12.05%
6	1,253,010.5	1,285.53	824,755.87	846.16	34.18%
7	1,523,237.1	1,463.70	1,373,242.22	1,319.57	9.85%
8	822,613.3	914.22	722,299.80	802.73	12.19%
9	1,828,397.1	1,652.96	1,603,103.17	1,449.28	12.32%
10	2,918,548.8	1,692.63	2,603,562.15	1,509.95	10.79%
TOTAL	16,760,567.3		14,476,578.70		13.63%

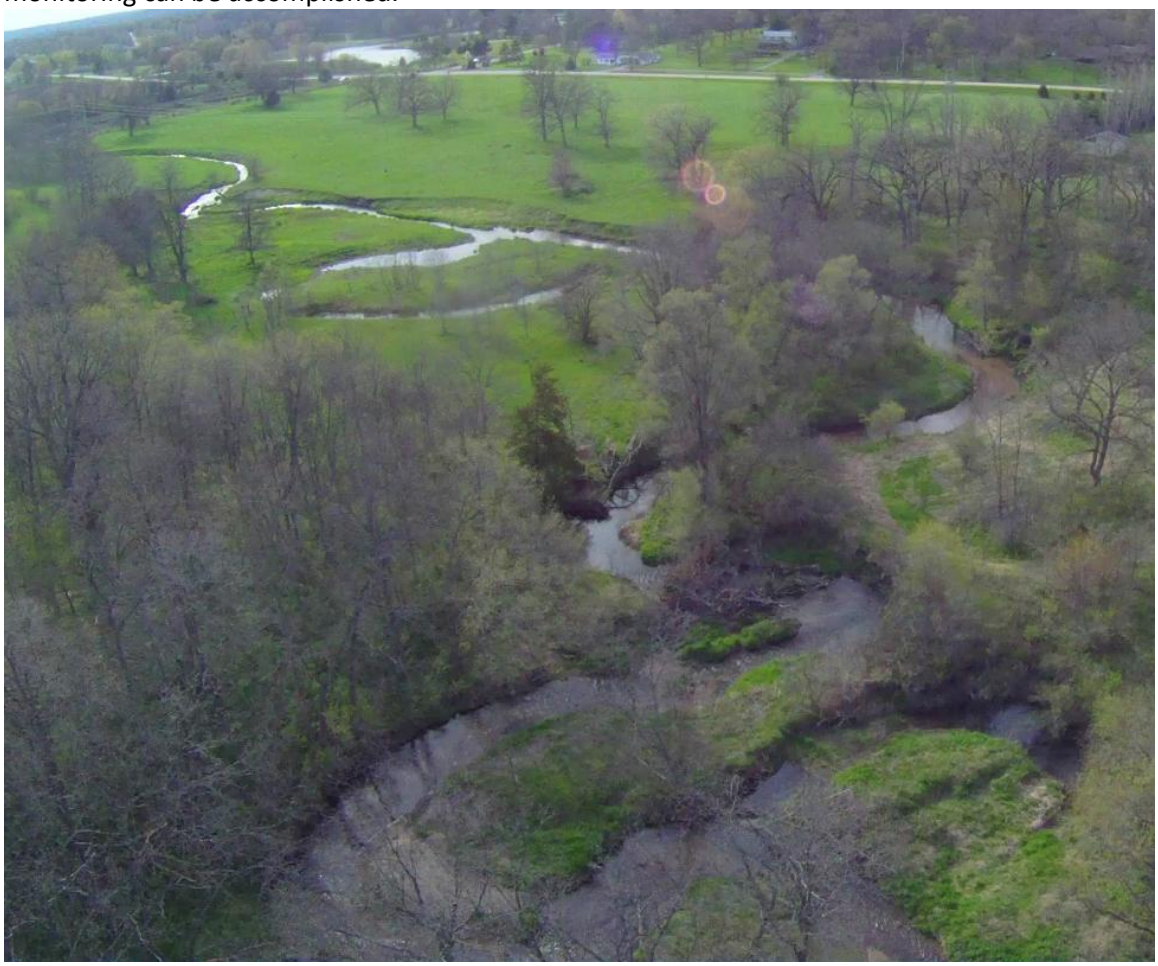
Model Confirmation

Watershed model results for TP, TN, and TSS were compared to research studies in Southern Wisconsin (Corsi et. al., 1997), Northern Illinois (Baetis, 2008), and Ontario (Coote). The comparison is suitable, given the relative uncertainty associated with this modeling and the results are comparable, most notably the median value of TSS for the comparison subwatersheds was the same as Clear Creek at 73 lbs/ac.

Figure 4-27: Comparison Watershed studies					
	Land use	TSS Lbs /ac	TN Lbs/ac	TP Lbs/ac	
	% Ag				
Kent CR	50	80	17	0.5	Baetis
Kinninnick CR	55	66	10	0.35	Baetis
S. Pheasant Branch	84	197	NA	0.53	Corsi
Jackson	86	53	NA	0.3	Corsi
Maitland River	68	NA	12.8	0.14	Coote
Shelter Valley	43	NA	2.9	0.07	Coote
Hillman	67	NA	22.5	0.81	Coote
Saugeen River	88	NA	8.4	0.72	Coote
MEDIAN	**67.5**	**73**	**11.4**	**0.425**	
LOW VALUE	**43**	**53**	**2.9**	**0.07**	
HIGH VALUE	**88**	**197**	**22.5**	**0.81**	
CLEAR CREEK	**59**	**73**	**5**	**0.25**	**Hill**

Stream Bank Erosion Inventory

During May 2011 the watershed was visited 4 times to conduct the stream bank erosion inventory. Most of the inventory was conducted on Lost Lake New Landing River Conservancy District and The Nature Conservancy owned properties just upstream of the lake. Due to the scope of this project it was not feasible to inventory the entire watershed as many landowners did not want to allow access for the purposes of this stream inventory. Many others wanted to accompany the surveyor which became difficult to schedule during the short time frame. It is recommended that Lost Lake New Landing RCD continues to build a trusting relationship with these landowners and establish an up to date database of contacts so future inventories and monitoring can be accomplished.



Stream Bank Inventory Methods

Sites were identified using Global Positioning System (GPS) using a handheld Dell Axim PDA with a Pharos GPS receiver running ArcPad 7.0 software. The points were projected in UTM 16 NAD 83 Zone 16. Each point was named with a SITE NUMBER, the first 2 numbers are the subwatershed where it was located and last three numbers is the order in which it was inventoried. Each erosion site was photographed or video taped to measure and evaluate stream erosion data back in the office using GIS. See APPENDIX A for complete erosion

inventory data table. Stream bank erosion rates were calculated using standard NRCS direct volume method - bank height X widening rate X eroding length calculation. Widening rate is the lateral movement in ft/yr of the bank. Rates can be estimated. The volume is then multiplied by soil density to determine tons. Streams and gullies are usually not eroding throughout their entire length so eroding length needs to be measured. An average bank height and widening rate can be used. Eroding Length X bank height X widening rate X soil density (lbs/ft3) / 2000 lbs = tons/yr (NRCS FOTG).

Stream Bank Inventory Results

A total of 92 sites were identified during the walk of over 3 miles of stream segments in both Clear Creek and Babbling Brook. All of the sites identified yield 44.5 tons / year. Sites with a Severe LRR account for 59% of the total erosion from all inventoried sites. In general most of the erosion sites identified were slight to moderate in severity. Lateral Recession Rates are categorized and defined as the following:

- Slight, bank eroding 0.01-0.05 ft/year
- Moderate, bank eroding 0.06-0.2 ft/yr
- Severe, bank eroding 0.3-0.5 ft/yr
- Very Severe, bank eroding 0.5+ ft/yr

Figure 4-28: Stream bank Erosion Sites

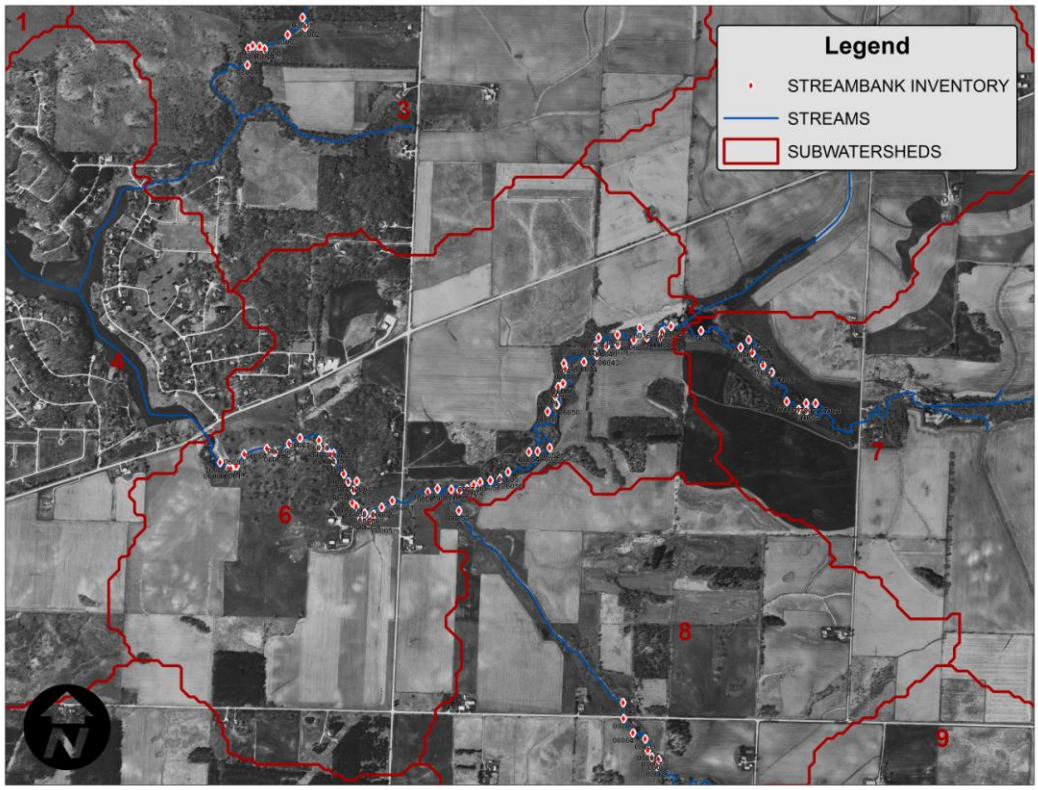


Figure 4-29: Sites with Severe Lateral Recession Rates

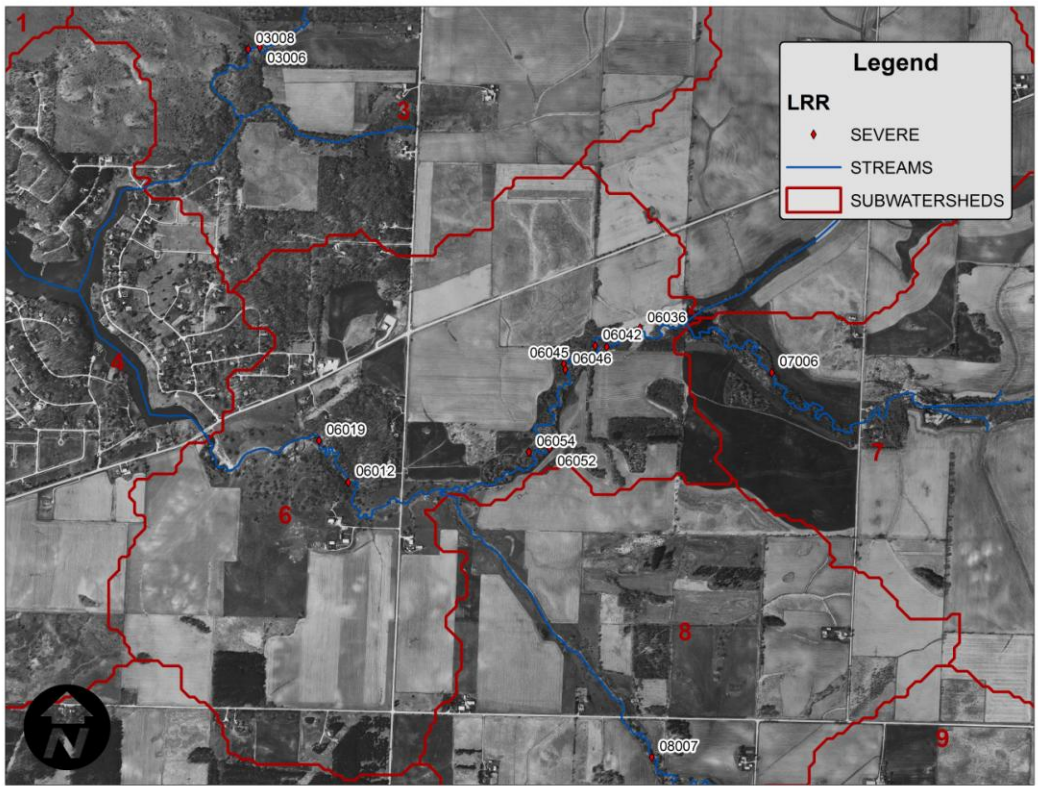


Figure 4-30: Stream bank Erosion Rates with SEVERE lateral recession rates

SITE NUMBER	HEIGHT EROSION	LENGTH OF EROSION	LATERAL RECESSION RATE	SOIL	TONS/YR
03003	4.0	20	0.40	80	1.28
03006	4.0	30	0.40	80	1.92
03008	4.0	30	0.40	80	1.92
06012	2.0	10	0.40	80	0.32
06019	4.0	40	0.40	80	2.56
06036	2.0	30	0.40	80	0.96
06038	4.0	25	0.40	80	1.60
06040	2.0	40	0.40	80	1.28
06042	3.0	30	0.40	80	1.44
06045	3.0	30	0.40	80	1.44
06046	2.0	30	0.40	80	0.96
06052	6.0	40	0.40	80	3.84
06054	6.0	40	0.40	80	3.84
07006	3.0	25	0.40	80	1.20
08007	5.0	20	0.40	80	1.60
				TOTAL	26.16

Figure 4-31: Site Number 06052

Figure 4-32: Photo Site Number 06054

Figure 4-33: Photo Site Number 06019

Figure 4-34: ALL STREAMBANK EROSION INVENTORY POINTS

SITE NUMBER	HEIGHT OF EROSION	LENGTH OF EROSION	LRR	SOIL TYPE	TONS / YR
03000	3.0	30	0.13	80	0.47
03001	3.0	25	0.13	80	0.39
03002	2.0	10	0.03	80	0.02
03003	4.0	20	0.40	80	1.28
03004	2.0	10	0.13	80	0.10
03005	3.0	25	0.13	80	0.39
03006	4.0	30	0.40	80	1.92
03007	2.0	20	0.13	80	0.21
03008	4.0	30	0.40	80	1.92
03009	3.0	25	0.13	80	0.39
06001	1.0	30	0.03	80	0.04
06002	3.0	20	0.13	80	0.31
06003	1.0	20	0.03	80	0.02
06004	10.0	10	0.03	80	0.12
06005	1.0	20	0.03	80	0.02
06006	1.0	35	0.13	80	0.18
06007	5.0	50	0.13	80	1.30
06008	3.0	20	0.13	80	0.31
06009	1.0	20	0.03	80	0.02
06010	3.0	25	0.13	80	0.39
06011	2.0	30	0.13	80	0.31
06012	2.0	10	0.40	80	0.32
06013	2.0	40	0.13	80	0.42
06014	2.0	40	0.13	80	0.42
06015	2.0	20	0.13	80	0.21
06016	2.0	40	0.13	80	0.42
06017	4.0	30	0.13	80	0.62
06018	4.0	20	0.13	80	0.42
06019	4.0	40	0.40	80	2.56
06032	1.0	30	0.03	80	0.04
06033	1.0	30	0.03	80	0.04
06034	4.0	25	0.13	80	0.52
06035	2.0	20	0.13	80	0.21
06036	2.0	30	0.40	80	0.96
06037	1.0	30	0.13	80	0.16
06038	4.0	25	0.40	80	1.60
06039	1.0	40	0.03	80	0.05
06039	1.0	30	0.13	80	0.16
06040	2.0	40	0.40	80	1.28
06041	1.0	10	0.03	80	0.01
06042	3.0	30	0.40	80	1.44
06043	10.0	20	0.13	80	1.04
06044	2.0	20	0.03	80	0.05
06045	3.0	30	0.40	80	1.44
06046	2.0	30	0.40	80	0.96
06047	2.0	25	0.13	80	0.26
06048	4.0	10	0.13	80	0.21
06049	4.0	35	0.13	80	0.73

06050	2.0	30	0.03	80	0.07
06051	3.0	10	0.13	80	0.16
06052	6.0	40	0.40	80	3.84
06053	4.0	40	0.13	80	0.83
06054	6.0	40	0.40	80	3.84
06055	2.0	10	0.03	80	0.02
06056	2.0	30	0.13	80	0.31
06057	1.0	30	0.03	80	0.04
06058	0.5	10	0.03	80	0.01
06059	0.5	100	0.03	80	0.06
06060	0.5	50	0.03	80	0.03
06061	2.0	20	0.13	80	0.21
06062	2.0	20	0.13	80	0.21
06063	2.0	10	0.03	80	0.02
06064	1.0	10	0.03	80	0.01
06065	1.0	10	0.03	80	0.01
06066	2.0	10	0.03	80	0.02
06067	1.0	20	0.03	80	0.02
06068	1.0	10	0.03	80	0.01
06069	1.0	20	0.13	80	0.10
06070	2.0	20	0.03	80	0.05
06070	3.0	30	0.13	80	0.47
06071	3.0	30	0.13	80	0.47
06072	2.0	25	0.13	80	0.26
06073	1.0	10	0.03	80	0.01
07001	1.5	20	0.13	80	0.16
07002	2.0	25	0.13	80	0.26
07003	2.0	10	0.03	80	0.02
07004	3.0	20	0.13	80	0.31
07005	2.0	10	0.03	80	0.02
07006	3.0	25	0.40	80	1.20
07007	1.0	25	0.13	80	0.13
07008	1.0	25	0.13	80	0.13
07009	1.0	30	0.03	80	0.04
07010	1.0	25	0.03	80	0.03
07011	2.0	10	0.03	80	0.02
08002	4.0	35	0.13	80	0.73
08003	4.0	10	0.13	80	0.21
08004	2.0	30	0.13	80	0.31
08005	3.0	20	0.13	80	0.31
08006	4.0	20	0.13	80	0.42
08007	5.0	20	0.40	80	1.60
08008	4.0	20	0.13	80	0.42
08009	4.0	20	0.13	80	0.42
TOTAL					44.47

Literature Cited for Chapter 4

Evans, B.M. and K.J. Corradini. 2001. BMP Pollution Reduction Guidance Document. University Park, PA: Environmental Resources Research Institute, Pennsylvania State University.

U.S. Environmental Protection Agency (USEPA). 2011. *Better Assessment Science Integrating Point and Non Point Sources* (BASINS). USEPA. http://water.epa.gov/scitech/datait/models/basins/b3webdwn.cfm.

Chapter 5: Management Recommendations, Implementation Plan, and Monitoring Plan

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Chapter 4 discussed modeling and field data collection techniques, estimated pollutant load reductions for implementing the measurable action items, and identified sub-watershed units with more or fewer concentrations of opportunities for pollutant load reductions. This chapter utilizes the information learned from the modeling exercise to form recommendations for the watershed. It summarizes the pollutant load reduction and cost estimates of the recommendations by grouping them according to the Environmental Protection Agency (EPA) best management practices (BMP) categories. Then it creates implementation and monitoring plans for specific recommendations. The implementation plan outlines a schedule of measurable milestones that address the action items, and in turn address the goals and objectives of this Clear Creek Watershed Action Plan (Plan). It contains measurable milestones, budgets, timelines, and potential sources of funding and technical assistance to the extent possible at the time of this Plan. The monitoring plan offers sampling location, elements to be sampled, schedule, and cost estimates. Details not presented in this Plan will be developed by the Watershed Planning and Technical Advisory Committee (Committee) as the milestones are addressed. Changes to the milestones, schedules, budgets, and sources of funding and technical assistance are likely, and they will be reviewed by the Committee annually. The Committee will continue their commitment to the project as the focus shifts from watershed planning to education, monitoring, and coordination of project implementation.

Summary of Recommended Best Management Practices

Action Items with measurable pollutant load reduction outcomes are grouped and represented by BMP categories as recognized by the EPA. These categories are not inclusive of all Action Items recommended by the Committee, as many of the Action Items will likely have an indirect effect on water quality. For each BMP, estimates are summarized representing the amount of land involved, cost, pollutant load reduction, priority, and responsibly entity. Summarized information is presented in Figure 5-1. To estimate the amount of land, the Committee assumes 100% participation by landowners. Cost estimates are based on current rates. Pollutant load reduction estimates are calculated using BASINS and EPA Pollutant Load Reduction Worksheets. Priority is assigned based on pollutant load reduction estimates and do not consider cost. High priority is given to any BMP that is a primary cause of reducing the loading of at least one of the measured pollutants, as highlighted in yellow in Figure 5-1. Medium priority is assigned to any BMP that provides the next highest level of pollutant load reduction for at least one of the measured pollutants, as highlighted in green in Figure 5-1. Low priority is assigned to the remaining BMPs that are not major contributors to reducing pollutant loads unless combined with other practices. The summary of these estimates suggest that implementation of all BMPs throughout the watershed will cost approximately $6 million and will reduce over 2,600 tons/yr of sediment; 740,000 lbs/yr of total suspended solids (TSS); 5,100 lbs/yr of phosphorous (TP); and 41,300 lbs/yr of nitrogen (TN).

Figure 5-1: Watershed-wide Summary of BMPs Recommended for Implementation within 10 Years of Plan Adoption.											
						Estimated Load Reduction					
No.	**Category**	**BMP**	**Unit**	**Amount**	**Cost**	**Sediment (tons/yr)**	**TSS (lbs/yr)**	**Phosphorus (lbs/yr)**	**Nitrogen (lbs/yr)**	**Priority**	**Responsible Entity**
1	AGRICULTURE	Conservation Tillage	acre	6,228	$155,700	N/A	332,406	742	20,528	High	Landowner
2	AGRICULTURE	Filter Strip	acre	40	$8,400	92	N/A	129	386	Low	Landowner
3	AGRICULTURE	Nutrient Management	acre	6,844	$136,880	N/A	N/A	416	6,579	High	Landowner
4	AGRICULTURE	Sediment Basin	number	2	$680,750	N/A	308,066	244	N/A	High	RCD
5	URBAN	Nutrient Management	acre	217	$0	N/A	N/A	58	1,392	Med	Homeowner
6	URBAN	Filter Strip	acre	3	$6,000	N/A	49,117	71	426	Med	Homeowner
7	URBAN	Rain Garden	number	351	$175,500	N/A	50,463	102	639	Med	Homeowner
8	HYDROLOGIC	Streambank Stabilization (Severe Erosion)	feet	2,500	$1,000,000	189	N/A	161	321	Med	Landowner
9	HYDROLOGIC	Streambank Stabilization (Moderate Erosion)	feet	6,860	$1,715,000	131	N/A	111	223	Low	Landowner
10	HYDROLOGIC	Shoreline Stabilization	feet	6,165	$493,200	251	N/A	213	427	Med	Homeowner/RCD
11	HYDROLOGIC	Wetland Restoration	acre	636	$990,000	735	N/A	1,399	5,244	High	Landowner
12	LIVESTOCK	Livestock Exclusion	acre	250	$132,000	332	N/A	504	1,624	High	Landowner
13	LIVESTOCK	Pasture and Hayland Management	acre	350	$32,276	15	N/A	92	878	Low	Landowner
14	OTHER2	Wildlife Upland Habitat Management	acre	480	$528,000	855	N/A	887	2,672	High	TNC
15	OTHER2	Septic system upgrade	number	1	$8,990	N/A	N/A	N/A	N/A	Unknown	Homeowner
Total					**$6,062,696**	**2,600**	**740,052**	**5,129**	**41,339**		

Key:	
	Primary load reduction per single BMP.
	Secondary load reduction per single BMP.

Estimates of costs and pollutant load reductions displayed in Figure 5-1 result from various sources as presented in Figure 5-2.

Figure 5-2: Information Sources for Figure 5-1.		
BMP No.	**Cost. Estimate Source**	**Load Red. Est. Source**
1	Cost est. based on U of I Ext. at $25/ac. (Phillips). NRCS program provides incentive payments at $14.86/ac. (Merriman).	PLOAD/BASINS
2	Cost. Est. based on NRCS program reimbursement, which reflects actual cost (Merriman) and costs to farmer (Bettner and Phillips) at $210/ac.	PLOAD/BASINS
3	Cost est. based on costs to farmer (Bettner and Phillips) at $20/ac. NRCS provides incentive of $13/ac (Merriman).	PLOAD/BASINS
4	Cost est. from Wendler Engineering (Baumann).	Wendler Eng. (Baumann)
5	No anticipated change in cost for lawn care (Rush).	PLOAD/BASINS
6	Cost est. from OES at $2000/ac. It can be accomplished for much less, but the likely piecemeal implementation increases the cost. This budget also allows for flexibility in plant material used.	EPA Load Red. Worksheet
7	Cost est. from Blue Thumb at $5/sq. ft. and an average garden size of 100 sq. ft. (Brown)	EPA Load Red. Worksheet
8	Cost est. based on Babbling Brook stabilization bids at $400/ft.	EPA Load Red. Worksheet
9	Cost est. based on Babbling Brook stabilization bids at $250/ft.	EPA Load Red. Worksheet
10	Cost est. based on rip rap est for Lost Lake stabilization bids at $80/ft.	EPA Load Red. Worksheet
11	Cost est. from AES at $1,500/ac. for a "WRP style" wetland restoration (Campbell) for 636 - 40 acres on private property, plus 40 acres on TNC property at $2,400/ac. for high quality restoration (Kleiman).	PLOAD/BASINS
12	Based on cost of fencing for the farmer at $2.50/ft (Bettner and Phillips). Feet of fencing was estimated as 4 x the perimeter of a square 250 acres (13,200 ft.) to better reflect the need for fencing of multiple parcels.	PLOAD/BASINS
13	Cost est. from NRCS based on reimbursement payments of $65.87 x 40% to reflect actual costs of $92.12, which reflect actual costs to farmer (Merriman and Phillips). Actual cost was also estimated at $80/ac. (Bettner), so the higher value was used.	PLOAD/BASINS
14	Cost est. from TNC (Kleiman).	PLOAD/BASINS
15	Cost est. from Fischer Excavating (Woodruff).	N/A

Action Item Management Recommendations

Pollutant loads can be reduced using a combination of best management practices (BMP) throughout the watershed and in concentrated areas. It is our recommendation to address the action items in areas that fit the descriptions of severe conditions throughout the watershed, with concentrated efforts in the sub- watershed units that show the greatest potential for pollutant load reductions. Highlights of these recommendations are described below, divided by planning and coordination, stream and shore, rural BMP, and urban BMP management recommendations.

Planning and Coordination Recommendations

1. Hire a watershed coordinator to be the face of the organization to work with local landowners, facilitate the implementation of the action items, and coordinate water quality monitoring.

2. Partner with other organizations with similar missions to create a more uniform and efficient approach to watershed management.

Stream and Shore Management Recommendations

3. Focus on streambank stabilization at sites with severe lateral recession rates throughout the watershed, as they contribute to over half of the sediment loading from inventoried sites. There are 92,750 feet of streams in the Clear Creek watershed. We were able to survey 16,100 feet on both Clear Creek and Babbling Brook, identifying a total of 2,290 feet (14.3%) of eroding streambanks. Of these eroding banks, 440 ft. (2.7%) were severe with a lateral recession rate (LRR) of 0.4 ft/yr; 1,195 feet (7.4%) were moderate at a LRR of 0.13 ft/yr; and 655 feet (4.1%) were slight at a LRR of 0.03 ft/yr. Since we were unable to survey the entire stream length due to lack of landowner permission, it is likely that there are other areas that qualify as eroding that should also be stabilized. If we assume that the remainder of the watershed is represented by the surveyed locations, then we would estimate 13,260 feet (14.3%) of eroding streambanks throughout the watershed. This includes 2,500 feet (2.7%) of severely eroding banks; 6,860 feet (7.4%) of moderately eroding banks; and 3,800 feet (4.1%) of slightly eroding banks. We recommend focusing restoration efforts on severely eroded sites, most of which will require a combination of bank reshaping, native plant seeding, riprap toe protection, and stream barb or weir installation. BMP implementation on all eroding stream banks would reduce total phosphorous (TP) by 78%, total nitrogen (TN) by 65%, and total suspended solids (TSS) by 76%. Once severe cases of erosion are addressed, we recommend focusing on areas of moderate erosion. We do not recommend addressing areas of slight erosion, as the pollutant load reduction estimates are minimal.

4. Stabilize severely eroding shoreline at Lost Lake as it has a direct impact on pollutant loads to the lake. Of the 21,800 feet of shoreline at Lost Lake, 12,495 feet have been identified as eroding, of which 6,165 feet are considered severely eroding with an average lateral recession

rate of 0.4. Other areas contribute less sediment to the lake and are less cost effective to stabilize due to their steep cliffs. Efforts to stabilize 1,981 feet of shoreline are already in progress as part of Section 319(h) EPA Grant No. 3191003 and are scheduled to be completed by July 15, 2012.

5. Monitor storm event water quality for at least TN, TP, TSS and Pathogens. Sample at several locations thought the watershed in order to establish existing loads. The monitoring will give a more specific picture of the actual pollution loads throughout the entire watershed and provide a way to measure the success of BMP implementation over time.

6. Construct a sediment control basin at the confluence of Babbling Brook and Lost Lake and expand the basin at the confluence of Clear Creek and Lost Lake to capture nonpoint source pollutants that will remain after the full build-out is implemented to the extent possible. Currently, 377,995 lbs/yr of total suspended solids (TSS) and 474 lbs/yr of total phosphorous (TP) enter Lost Lake from the Babbling Brook tributary. A sediment basin in this strategic location is estimated to reduce the pollutant loads to the lake by 81.5% and 51.48%, respectively (Baumann, Pers. Comm.). The Lost Nation/New Landing River Conservancy District (RCD) plans to expand the basin at the confluence of Clear Creek and Lost Lake in conjunction with their normally scheduled dredging program. The basin will be expanded at the upstream end of the pool where most of the sediment is found. This will improve the capabilities of the basin to contain more silt and increase the time between necessary silt removals (Larry, Pers. Comm.).

Rural BMP Management Recommendations

7. Focus agricultural BMP implementation efforts in sub-watershed units #2 and #10, because they have the highest TN, TP, TSS, and Pathogen annual loading, due to the large size of the sub-watersheds and the dominance of row crop agriculture. Sub-watersheds #5, #7 and #9 are also dominated by row crops and should be secondary for the focus of agricultural BMPs. Action items that should be addressed are: wetland restoration, filter strips, nutrient management planning, pasture management, and conservation tillage. The BMP model build out for these action items showed significant reductions. TP would be reduced by 42 & or 164 lbs per year (from 393.7 lbs to 229.2 lbs) in sub-watershed #2, and 43 % or 198 lbs (456.8 lbs to 259.02lbs) in sub-watershed #10. TN would be reduced by 55% or 4,455 lbs per year (8,173 lbs to 3718 lbs) in sub-watershed #2 and 55% or 5363 lbs per year (9,669 lbs to 4,306lbs) in sub-watershed #10. TSS would be reduced by 58% or 70,328 lbs per year in sub-watershed #2 and 59% or 83,225 lbs per year in sub-watershed #10. In conjunction with these recommended BMPs, it would be prudent to explore alternative markets for agricultural products to offset the higher costs associated with production. Some of the BMPs included in the above build-out estimates can be analyzed separately. Converting farming techniques from conventional to no-till for planting soybeans into corn greatly reduces erosion. There are currently 6,844 acres in agricultural row

crop production. According to the Soil Erosion Inventory of the Ogle County Soil and Water Conservation District (SWCD), 9% or 616 acres already receive no-till farming techniques, leaving 6228 acres in conventional till. The current row crop TSS load is 533,053 lbs per year. Conservation tillage BMP implementation for all row crops would reduce TN by 50%, TP by 38%, and TSS by 64% (Evans & Corradini, 2001). Implementation of nutrient management on all row crops in the watersheds would reduce TN by 19% and TP by 28%. The conversion of row crops to wetlands would reduce TP by 84%, TN by 93%, TSS by 67%, and Pathogens by 87.5%. The implementation of pasture land management BMP on all 350 acres of pastures would reduce TN by 43%, TP by 34%, TSS by 13%, and Pathogens by 25%. This would require full implementation of pasture land management, including erecting livestock exclusion fencing from streams, providing alternative water sources, implementing pasture rotation, and planning better forage management.

8. Partner with Local SWCD/NRCS and American Farmland Trust to address agricultural BMPs emphasizing conservation programs that compensate producers to set aside lands in production for restoring wetlands and buffers and programs that provide insurance against potential loss of yield for practicing conservation farming techniques.

9. Work with local livestock producers to exclude livestock from the streams. This includes constructing fencing, filter strips, and designated stream crossings. Benefits include reduction in streambank erosion by trampling and surface runoff.

10. Work with the Nature Conservancy to facilitate prairie restoration and wildlife upland habitat on cropland nearest to the lake sooner than would otherwise be scheduled. Purchase seed, provide funds for TNC staff to collect seed on-site, and establish and create Lost Lake volunteer workdays at Nachusa. Currently the Nature Conservancy owns about 480 acres of land in row crop production within the watershed. Restoration of these areas would considerably increase the habitat size and reduce TN by 60%, TP by 66%, TSS by 93%, and Pathogens 88%.

Urban BMP Management Recommendations

11. Focus Urban BMP implementation efforts within sub-watershed unit #4 because it is the major sub-watershed unit that houses low density residential development situated around the lake. This sub-watershed unit has the highest rate of pollutant loading of TP, TN, and Pathogens when measured in pounds per counts per acre. The BMP model build out shows significant load reductions by implementing the following action items: wetland restoration, prairie restoration on TNC property, rain gardens, rain barrels, lake buffers, lawn nutrient management education, and the continuation of the zero phosphorous fertilizer campaign. In sub-watershed unit #4, TP would be reduced by 20% (from 0.398 lbs/ac to .318 lbs/ac), TN would be reduced by 25% (from 9.03 lbs/ac to 6.746 lbs / ac.), and Pathogens would be reduced by 25%.

Wisconsin research found residential lawns yielded the highest phosphorus (P) concentrations of twelve urban pollutant sources examined (Bannerman *et al*, 1993). Lawn runoff typically contains 0.5–2.0 mg P/L, compared with levels around 0.1 mg P/L that typically result in lake eutrophication. Hence, lawns are probably the major source of P to stormwater in residential areas (Baker et al. 2007b). A tailored education and soil sample campaign should be implemented to help home owners know the levels of nitrogen (N) and P being applied to their lawns to ensure that they fertilize within the needs of the turf and keep runoff and grass clippings out of stormwater.

12. Implement a septic system inspection program at Lost Lake Community. The National Environmental Service Center estimates that there are 155 septic systems within the watershed with a 0.58% failure rate, which equates to about one failure per 155 systems.

13. Focus Urban BMPs and educational aspects of this Plan closest to the lake, as these areas are most likely to provide pollution directly to the lake, including rain gardens, lawn care, shoreline stabilization, and buffers.

14. Many open lots remain around the lake, which have the potential to be developed and increase pollution loads directly to the lake. Use a covenant or other form of restriction to require the design of new construction to incorporate storm water treatment BMPs like rain gardens, bio-swales, vegetative filter strips, and pervious pavement.

Implementation Plan

The Plan recommendations for all action items are presented in the implementation plan in Figures 5-3, 5-4, and 5-5. The implementation plan is designed as a five-year plan. The first year is separated from the second through fifth years (Figures 5-3 and 5-4), offering measurable milestones traced to the Action Item(s) that they address. This five-year plan also categorizes each Action Item by management area, including stream or shore, rural BMP, urban BMP, and planning and coordination. It provides potential sources for funding and technical assistance and estimates of cost. The Committee can only identify perceived long-term needs for each action item at this time, as accuracy of long-term measurable milestones will be based on the status of each milestone at Year 5. Perceptions of needs after the fifth year are summarized in Figure 5-5.

The Committee will update this implementation plan annually, and they will provide details for the upcoming year separately from the remaining years. For example, after the completion of Year 1, the Committee will provide greater detail to the tasks that they plan to accomplish in Year 2. They will group Years 3 through 5 separately and edit the long-term perceived needs as necessary. After Year 5, they will address the next five years in an updated plan, or they will use an alternative length of time as deemed necessary.

Dates for the Plan are as follows: Year 1 runs from October 1, 2011 to October 1, 2012, and Years 2 through 5 run from October 1, 2012 to October 1, 2016. During the first year, the Committee will focus on stabilization of streambank and shoreline, wetland restoration, demonstration of urban BMP projects, wildlife upland habitat restoration, program development, and education. It will be necessary to educate watershed stakeholders about this Plan, the existing problems within the watershed, and potential benefits of implementing the suggested projects before asking them if they would like to implement any projects on their private properties. Most of the implementation of recommended action items will be initiated during Year 2 through 5. The details for these measurable milestones are less developed than for Year 1, because many of the details depend on actions that occur in Year 1 and cannot accurately be portrayed at this time. The Committee recognizes that many of the action items to be initiated during Years 2 through 5 will need to be continued long-term, until all possibilities are explored with voluntary landowners. It is their intention that their efforts will continue past this five-year plan.

Figure 5-3: Schedule for Year 1, October 2011 through October 2012 (1 of 3).					
Action Item Addressed	**Category**	**Measurable Milestone**	**Potential Funding/Tech.**	**Est. Cost ($)**	**Notes**
1,27,28: Streambank, Pilot, Demo	Edu, Demo	Hold 1 public event to showcase the stabilization of 1,575 feet along Babbling Br. & 1,981 ft. of shoreline at Lost L.	EPA	$ 1,200	Already funded through Grant No. 3191003.
1: Streambank Stabilization	Imp	Complete the stabilization of 1,575 ft. of streambank along Babbling Br.	EPA	$ 290,000	Already funded through Grant No. 3191003.
2: Shoreline Stabilization	Imp	Complete the stabilization of 1,981 ft. of shoreline at Lost L.	EPA	$ 113,000	Already funded through Grant No. 3191003.
2: Shoreline Stabilization	Imp	Stabilize an additional 465 ft. of shoreline at Lost Lake with two voluntary property owners.	EPA, F&F	$ 37,200	Estimated cost based on $80/ft. for rip rap installation.
3,13: Conserv. Farming, Nutrient Mgt.	Edu	Hold 1 meeting to introduce landowners and farmers to the BMP Challenge for Reduced Tillage and the BMP Challenge for Nutrient Management offered by the American Farmland Trust. Sign up at least one farm (up to 160 acres) for each program.	AFT	$ 1,000	Estimated cost to arrange, facilitate, and follow up for the event.
4,6,24,25,26: Wetlands, Filter Strips, Runoff, Land Mgt.	Edu	Provide an educational series to discuss with landowners the importance of restoring wetlands, creating filter strips, managing runoff, and managing soils, residues, and contours. Provide educational guidelines to landowners and farmers about the management of runoff. Integrate the effort with other local efforts when possible.	EPA, NRCS, BWP, F&F	$ 4,000	Estimated cost to arrange, facilitate, and follow up for the 4 events.
4: Wetlands	Imp	Create a 25-acre wetland complex within Nachusa Grasslands by removing drain tile, creating wetland scrapes, and planting species for prairie, wet prairie, and wetland planting zones.	TNC	$ 60,000	Estmiated cost from TNC.

Figure 5-3: Schedule for Year 1, October 2011 through October 2012 (2 of 3).					
Action Item Addressed	**Category**	**Measurable Milestone**	**Potential Funding/Tech.**	**Est. Cost ($)**	**Notes**
5,7,29: Rain Gardens, Buffer Strips, Yard Care	Edu	Encourage working with orgs., such as Master Gardeners or Blue Thumb, to implement 4 or 5 rain gardens as demonstration areas. Work with 1 property owner to construct a demonstration area for a lake buffer strip with mowed diagonal path, and 1 property owner to demonstrate recommended home & yard maintenance. Hold an educational series about rain gardens, buffer strips, and BMPs for home and yard, including a tour of the demonstration areas.	Blue Thumb, BWP	$ 2,500.00	Cost est. based on avg. garden size of 100 sq. ft. x $5/sq. ft. for materials and labor.
9: Sediment Control - BB	App	Apply for an EPA Section 319 grant to construct a sediment control basin at the confluence of Babbling Brook and Lost Lake.	EPA Section 319	$ 2,000.00	Estimated cost for drafting grant application.
10,28: Sediment Control, Demo	Imp, Demo	Expand the sediment control basin at the confluence of Clear Creek and Lost Lake.	RCD	$ 2,500.00	Est. cost part of RCD regular dredging program.
12: Alt. Source	Imp	Initiate a program to plant shade trees for cattle.	EPA, NRCS, F&F	$ -	Program costs unknown until implementation plan is drafted.
15: Septic Inspections	Edu	Explore the possibility of working with the POA for the inspection of septic systems within the Lost Lake Utility District, create an implementation plan (budget, schedule, rules and regulations, etc.), and initiate an education and awareness program for homeowners.	BWP	$ -	Program costs unknown until implementation plan is drafted.
16: Zero phosphorous	Imp	Continue the campaign to use zero phosphorous fertilizers in the Lost Nation/New Landing community and draft a campaign plan.	BWP	$ -	Program cost unknown until campaign plan is drafted.

Figure 5-3: Schedule for Year 1, October 2011 through October 2012 (3 of 3).					
Action Item Addressed	**Category**	**Measurable Milestone**	**Potential Funding/Tech.**	**Est. Cost ($)**	**Notes**
17: Land Preservation	Edu	Discuss preservation interest and options for funding and technical support with at least two voluntary landowners that have important natural features on their properties.	GVF, ICECF, IDNR	$ 2,000	Estimated cost for outreach to 2 landowners.
19: Natural Area Buffer	Imp	Plant 15 acres of high diversity prairie within Nachusa Grasslands to buffer important natural areas.	TNC	$ 36,000	Estimated cost of $2,400/ac. from TNC.
30: Partners	Plan/ Coord	Facilitate partnerships with organizations that have similar missions, including the milestones listed in this figure.	None	$ -	Estimated cost is included in individual milestones.
Other	Plan/ Coord	Hire a facilitator of the Clear Creek Watershed Planning and Technical Advisory Committee.	None	$ 2,000	Estimated cost to facilitate 2 meetings per year. Other facilitation costs listed per milestone.

Figure 5-4: Schedule for Years 2-5, October 2012 through October 2016 (1 of 5).					
Action Item Addressed	**Category**	**Measurable Milestone**	**Potential Funding/Tech**	**Est. Cost ($)**	**Notes**
1: Streambank	Imp	Stabilize the known 440 ft. of severely eroding streambank, as allowed by landowners.	EPA Section 319, NRCS, F&F	$ 176,000	Probable cost is based on $400 per ft. for severely eroded sites.
1: Streambank	Edu	Implement an outreach program to identify new areas of severely eroding streambank and discuss stabilization options with all 18 private landowners located along the streams.	GVF, ICECF, F&F	$ 9,000	Estimated cost is based on a complete outreach program for 18 landowners.
1: Streambank	Imp	Stabilize newly identified, severely eroding streambank, as allowed by landowners at a rate of approx. 700 ft./yr.	EPA Section 319, NRCS, F&F	$ 824,000	Est. cost based on est. 2,060 remaining ac. of severely eroding banks at $400/ac.
2: Shoreline	Imp	Stabilize an additional 2,000 ft. of severely eroding shoreline at Lost Lake.	EPA Section 319, BWP	$ 160,000	Estimated cost is based on $80/ft. for rip rap installation.
3: Conserv. Farming	Imp	Implement conservation farming or other stabilization practice on 200 acres per year of HEL that have not been no tilled or strip tilled in the past 5 years, or 800 of the 2,373 acres of HEL that is considered to be already eroded.	NRCS	$ 20,000	Probable cost based on $25/acre (Univ. of IL Ext.).
3: Conserv. Farming	Imp	Implement the BMP Challent for Reduced Tillage from the American Farmland Trust on at least one farm (up to 160 acres) per year.	AFT	-	Probable cost is not calculated, because it is a reimbursement program for any lost yield.
4: Wetlands	Imp	Restore 25 acres of wetlands per year, or 100 acres of the 636 acres identified within years 2 through 5.	NRCS, EPA Section 319	$ 150,000	Cost est. based on "WRP style" wetland restoration (AES).

Figure 5-4: Schedule for Years 2-5, October 2012 through October 2016 (2 of 5).					
Action Item Addressed	**Category**	**Measurable Milestone**	**Potential Funding/Tech**	**Est. Cost ($)**	**Notes**
5: Rain Gardens	Imp	Construct 10 to 15 rain gardens per year for a total of up to 60 rain gardens between years 2 through 5 within the Lost Nation/New Landing community.	Blue Thumb	$ 30,000	Cost est. based on $5/sf for an avg. size garden of 100 sf (Blue Thumb & Brown).
6: Filter Strips	Imp	Establish 20 acres of filter strips (120 ft. wide) of the total 40 acres identified.	NRCS, EPA Section 319, F&F	$ 4,200	Estimated cost based on $210/ac. (NRCS, Univ. of IL Ext., Bettner).
7: Buffer Strips	Imp	Establish buffer strips (10 ft. wide) with mowed diagonal paths along 100 ft. of shoreline per year, for a total of 400 ft. or 4,000 sq. ft. of shoreline in years 2 - 5.	EPA Section 319	$ 184	Estimated cost based on $2,000/ac.
8: Stormwater holding ponds	Edu	Explore opportunities for stormwater holding ponds within the watershed. This may be coupled with wetland restoration opportunities.	EPA Section 319, F&F	$ -	Program costs unknown until initial exploration is conducted.
9: Sediment Containment	Imp	Construct a sediment containment area at the confluence of Babbling Br. & Lost Lake.	EPA Section 319, F&F	$ 680,750	Est. cost based on initial estimates for submitted grant application, Aug. 1, 2011.
11&12: Limit Cattle Access, Alternatives	Edu	Continue the NRCS educational series for farmers & landowners that was initiated in Yr. 1. Discuss the importance of limiting the cattle access to the stream, & providing alternative water sources and shady areas for cattle away from the stream.	NRCS, F&F	$ 2,000	Estimated cost to arrange, facilitate, and follow up for 2 meetings.
13: Nutrient Mgt.	Imp	Implement the BMP Challent for Nutrient Management from the American Farmland Trust on at least one farm (up to 160 acres) per year, for a total of 4 farms (up to 640 acres) between years 2 and 5.	AFT	$ -	Estimated cost is not calculated, because it is a reimbursement program for any lost yield.

Figure 5-4: Schedule for Years 2-5, October 2012 through October 2016 (3 of 5).					
Action Item Addressed	**Category**	**Measurable Milestone**	**Potential Funding/Tech**	**Est. Cost ($)**	**Notes**
13: Nutrient Mgt.	Imp	Implement a NRCS nutrient management plan following University of Illinois fertilizer recommendations on at least one farm per year (160 acres), for a total of at least 4 farms (640 acres) between years 2 and 5.	NRCS	$ 8,320	Estimated cost is calculated on a payment rate of $11 to $13 per acre depending on the level of change in management.
14: Ag. Easements	Plan/ Coord	Join effort of American Farmland Trust to establish farmland protection opportunities and financial incentive programs in Illinois.	AFT, NRCS	$ -	Estimated cost unknown until planning effort is defined.
15: Septic Inspect.	Imp	Implement septic inspections according to the implementation plan developed during Year 1. Upgrade failed systems.	None	$ 900,000	Estimated cost based on upgrade of est. 90 failed systems (Nat'l Environ. Svc. Ctr.) at $10,000 ea. (Fischer Excavating)
16,29: Zero Phosphorous, Yard Care	Imp	Continue the implementation of the zero phosphorous fertilizer campaign within the Lost Nation/New Landing community according to the implementation plan. Combine this with the implementation of home and yard BMPs.	None	$ -	Estimated cost unknown until campaign is better defined.
17: Land Preserv.	Edu	Continue to build relationships with landowners in the watershed and identify opportunities. Reach out to at least 2 landowners per year (8 landowners in this 4-year period).	LTA	$ 8,000	Estimated cost based on preparation, outreach, and follow up for 8 landowners.
17: Land Preserv.	Imp	Implement one voluntary, land preservation project in the watershed with a willing landowner.	GVF, ICECF	$ 15,000	Est. cost based on easement & transaction costs.

Figure 5-4: Schedule for Years 2-5, October 2012 through October 2016 (4 of 5).					
Action Item Addressed	**Category**	**Measurable Milestone**	**Potential Funding/Tech**	**Est. Cost ($)**	**Notes**
18,19,20: Corridors, Buffers, Mgt.	Edu	Identify strategic wildlife corridors, natural areas management, and natural area buffer opportunities, and discuss partnership options with the individual landowners involved.	None	$ 15,000	Cost est. based on planning & outreach.
19: Natural Area Buffers	Imp	Plant at least 5 acres annually in the watershed to high diversity prairie, for a total of over 20 acres between Years 2-5.	TNC	$ 22,000	Cost est. based on $1,100/ac (Kleiman).
21: Rec. Trails	Edu	Draft an implementation plan for creating recreation trails in the watershed according to the Ogle County Greenways Plan trail locations in partnership with the landowners involved.	None	$ -	Estimated costs unknown.
22: Wildlife Control	Edu	Work with the appropriate authorities to manage nuisance wildlife that negatively affect water and natural area quality, such as deer, Canada goose, and beaver.	DNR	$ -	Estimated costs unknown until plan is drafted.
23: Community Planning	Plan/ Coord	Continue to participate in long range planning efforts with the community.	Ogle Co. Planning & Zoning	$ -	Continued, voluntary effort.
28: Demo	Demo	Hold at least one demonstration event per year (4 events) with voluntary landowners for each of the following: streambank stabilization, conservation farming, wetland restoration, rain garden construction, creation of filter strip/buffer strip along streams and lake, nutrient management, agricultural easement, land preservation.	NRCS, EPA, Blue Thumb, BWP, F&F	$ 8,000	Estimated costs based on preparation, facilitation, and follow up of 4 demonstration events.

Figure 5-4: Schedule for Years 2-5, October 2012 through October 2016 (5 of 5).					
Action Item Addressed	**Category**	**Measurable Milestone**	**Potential Funding/Tech**	**Est. Cost ($)**	**Notes**
30: Partners	Plan/ Coord	Continue to partner with organization that have similar missions whenever possible, including the milestones listed in this figure.	None	$ -	Estimated costs included with individual measurable milestones.
Other	Plan/ Coord	Continue to support a facilitator for the WPC/TAC, either hired or volunteer.	None	$ 8,000	Estimated costs for prep., facilitation, and follow up of 2 meetings per year (8 meetings.) Other facilitation tasks listed under other measurable milestones.
Other	Monitor	Sample designated points during Year 2 within the streams and lake within 24-hours of storm events for TP, TN, TSS, and Pathogens as oulined in Figure 5-2.	EPA, IDNR	$ 6,000	Estimated costs based on 6 sampling events.

Figure 5-5: Perceived Needs for Long-Term, October 2016 and beyond (1 of 3).		
Action Item Addressed	**Category**	**Perceived Long-Term Needs**
1: Streambank Stabilization	Implementation	After all severely eroding shoreline has been either stabilized or addressed with the landowner, we recommend that the focus move to moderately eroding shoreline.
2: Shore Stabilization	Implementation	There are 6,165 feet of severely eroding shoreline along Lost Lake. We plan to stabilize 4,446 ft. during Years 2 - 5, after which time there will likely be opportunity to continue shorelin stabilization of the additional 1,719 ft. of severely eroding bank. Once the severely eroded shoreline stabilization opportunities have been explored with homeowners, it is our intention to begin exploring opportunities for stabilizing moderately eroding shoreline.
3: Conservation Farming	Implementation	Given the large quantity of farmland and HELs that are already considered eroded in the watershed (2,373 acres), it is likely that we will need to continue work in this area long-term to ensure that all areas are explored with the landowners.
3: Conservation Farming	Implementation	There will likely be continued opportunity to enroll farms in the BMP Challenge for Reduced Tillage offered by the American Farmland Trust, as there are 33 landowners in the watershed.
4: Wetlands	Implementation	After restoring 100 acres of wetlands during Years 2-5, there will still be 536 acres of hydric soils with restoration potential. It is our intent to explore wetland restoration potential with all landowners that possess hydric soils.
5: Rain Gardens	Implementation	After creating up to 65 rain gardens during Yr. 1 - 5, it is our intent to continue exploring the potential to create more rain gardens with all 351 homeowners in the Lost Nation/New Landing community.
6: Filter Strips	Implementation	After constructing 20 ac. of filter strips in Years 2 - 5, there will still be an additional 20 ac. along the streams that could potentially be converted to filter strips. It is our intent to explore these options with the landowners until all 40 acres of potential filter strip areas identified in this Plan have been explored.
7: Buffer Strips	Implementation	After establishing 400 ft. of buffer strips during Yr. 2 - 5, we intend to continue to explore opportunities to establish buffer strips along the shoreline of Lost Lake until all shoreline homeowners with lawn near the water's edge have been approached.
8: Stormwater holding ponds	Implementation	There may be opportunity to construct stormwater holding ponds within the watershed. It is best to determine the need for these ponding areas based on the implementation of wetland restoration opportunities and remaining needs for water storage.

Figure 5-5: Perceived Needs for Long-Term, October 2016 and beyond (2 of 3).		
Action Item Addressed	**Category**	**Perceived Long-Term Needs**
11&12: Limit cattle access	Implementation	At this time, the NRCS does not have a grazing specialist to write grazing plans for farmers interested in limiting cattle access to the stream and providing alternative shade and water sources for cattle. Therefore, cattle operators are not eligible for funding assistance to provide these amenities for their cattle. The implementation of these programs should begin when a funding source is identified. Education only is recommended by this Plan.
13: Nutrient Management	Implementation	There will likely be continued opportunity to enroll farms in the nutrient management programs offered by the AFT and NRCS, as there are 33 landowners in the watershed. There may also be new programs discovered that apply to the watershed.
14: Agricultural Easement	Planning/ Coordination	Continue the effort with AFT to establish agricultural easement opportunities in Illinois. Assist landowners when agricultural easements become available.
15: Septic Inspections	Implementation	Long-term commitment to septic system monitoring and remediation of failed systems is expected.
16: Zero Phosphorous	Implementation	Long-term commitment to the implementation of a zero phosphorous campaign is expected.
17,18,19,20: Land Preservation, Wildlife Corridors, Natural Area Buffers, Management of Natural Areas	Education & Implementation	The preservation and management of natural resources and creation of corridors and buffers is a long-term effort. Since the immediate concern for the watershed is water quality, most of the activity related to wildlife habitat and natural areas will likely take place after the 5-year time frame of this Plan.
19: Natural Area Buffers	Implementation	After the 40 ac. are planted to high quality prairie during Yr. 1 - 5, there will likely be continued opportunity until all 480 ac. are converted at a low rate, such as 5 acres per year, especially at Nachusa Grasslands.
21: Recreation Trails	Implementation	There may be a long-term planning and implementation effort required based on the results of the implementation planning process in Years 2-5.
22: Nuisance Wildlife Control	Implementation	Controlling nuisance wildlife is an ongoing, long-term effort. We foresee the need to continue to work with the proper authorities to manage wildlife that negatively affect water and natural area quality.
23: Community Planning	Planning	Participating in long range planning efforts with the community is a long-term commitment.

Figure 5-5: Perceived Needs for Long-Term, October 2016 and beyond (3 of 3).		
Action Item Addressed	**Category**	**Perceived Long-Term Needs**
28: Demonstration	Demonstration	It is likely that projects with voluntary landowners can continue to be used for demonstration.
30: Partners	Planning/ Coordination	We recognize that partnerships with other organizations will continue to be an important component to the long-term success of this Plan.
Other	Planning/ Coordination	We recognize that a successful planning and technical advisory committee will need a facilitator, and suggest the long-term support of a facilitator, either hired or volunteer.
Other	Monitoring	We recognize that monitoring is a long-term commitment. A monitoring plan will need to be updated from time to time to address long-term monitoring needs.

Key to Figures 5-3, 5-4, & 5-5.	
Abbreviation	**Name of Organization**
AFT:	American Farmland Trust
BWP:	Blue Water Project
DNR:	Illinois Department of Natural Resources
EPA:	Environmental Protection Agency
EPA Section 319:	Section 319 of the Clean Water Act
F&F	Fishers and Farmers Partnership for the Upper Mississippi River Basin
GVF:	Grand Victoria Foundation
ICECF:	Illinois Clean Energy Community Foundation
LTA:	Land Trust Alliance
NRCS:	Natural Resources Conservation Service (U.S. Department of Agriculture)
POA:	Property Owner's Association
RCD:	Lost Nation/New Landing River Conservancy District
WPC/TAC:	Clear Creek Watershed Planning and Technical Advisory Committee

Monitoring Plan

The Committee recognizes the need to monitor physical and chemical factors of the surface and ground waters of the Clear Creek watershed in order to determine if the implementation of the Plan is having the desired effect of increasing water quality. Monitoring activities are suggested for each goal and objective in Figure 5-6.

Figure 5-6: Monitoring needs and schedule as related to goals and objectives.

Goal	Obj.	Data Collection Methods		Monitoring Schedule	Est. Cost ($)	Notes
		Sampling Location	Element Sampled			
1	a	Entire streams & lake	Length, ht., LRR, photos	Yr. 5 or extreme storm events	$ 6,000	Est. cost based on one study
	b	Lake & designated in-stream sampling points	TN, TP, TSS, Pathogens	Yr. 2 & Yr. 5 remote sampling	$ 40,000	Est. cost for 7 mo. remote sampling per yr. for 2 yrs.
	d	Varies	Project/ success	Per Project	$ -	Est. cost to be included w/ea. project.
	e	Lake & Sediment Basin	Sediment	By Yr. 5	$ -	Est. cost for dredging is not part of this program.
2	a	LLUD well water sampling points	TN, TP	Yr. 2 & Yr. 5	$ -	Cost part of regular sampling & not included
	b	Drain tile outlets & Artesian wells	TN, TP	Yr. 2 & Yr. 5 after spring fert. app. & storm event	$ -	Est. costs based on number of drain tile outlets, yet to be determined.
	c	Lake & designated in-stream sampling points	TN, TP, TSS, Pathogens	Yr. 2 & Yr. 5 remote sampling	$ -	Included in 1b above.
3	a	GIS	Land use	Yr. 5	$ 6,000	
4	a	GIS	Land cover & pers. comm.	Yr. 5	$ -	Included in 3a above.
	b	GIS	Vegetation	Yr. 5	$ -	Est. cost based on acreage & site locations. Cannot be accurately estimated at this time.
	c	GIS	Land cover	Yr. 5	$ -	Included in 3a above.
	d	IDNR sites	Population counts	Yr. 5	$ -	Cost assoc. w/ normally scheduled DNR work
	e	GIS	Land cover	Yr. 5	$ -	Included in 3a above.
5	a	GIS	Land use	Yr. 5	$ -	Included in 3a above.
	b	N/A	N/A	Yr. 5	$ -	Included in 3a & 4 above.

Conclusion

As you can see, the Committee focused on water quality concerns within their moderately-sized watershed by identifying sources of pollutant loading; creating goals, objectives, and action items to address these sources; and estimating the quantities of possible pollutant load reductions and associated costs. Sources of pollutants are agricultural, urban, and hydrological in nature. The greatest pollutant load reductions will be achieved by converting farming practices to conservation tillage, implementing nutrient management, constructing a sediment basin, restoring wetlands, excluding livestock from the streams, and managing wildlife upland habitat. Additional reductions will be gained by stabilizing streambanks and shorelines, constructing rain gardens and filter strips, altering management of lawns and pastures, and upgrading septic systems when necessary. When fully implemented, this plan has the potential of reducing sediment by 2,600 tons/yr, TSS by 740,052 lbs/yr, TP by 5,129 lbs/yr, and TN by 41,339 lbs/yr. The cost of fully implementing this plan is estimated to be approximately $6 million.

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*Note: For other citations, see Chapter 3.

Addendum A: Clear Creek Watershed Planning and Technical Advisory Committee Agendas and Meeting Minutes

Agendas Created by: Rebecca Olson
Minutes Written by: Rebecca Breckenfelder and Dan Boehle

Lost Nation-New Landing
River Conservancy District of IL
100 Park Drive; Dixon, IL 61021

NRCS Natural Resources Conservation Service

AGENDA

WATERSHED PLANNING

COMMITTEE MEETING

APRIL 1, 2009

11:30-12:15

1. Introductions - Dan Pierce, Natural Resources Conservation Service
2. How did we get here? - Steve Larry, Lost Nation River Conservancy District
3. Why is watershed planning is important? –Dave Meisenheimer, NRCS
4. What are the incentives for watershed planning? - Dave Meisenheimer

12:15-12:45

Lunch

12:45-1:30

5. What are the opportunities for watershed planning and implementation?
   Dan Pierce and Rebecca Olson, Olson Ecological Solutions
6. What is involved in the planning process? – Dan Pierce
7. What are your resource concerns? – Dan Pierce
8. Who would like to be involved? - Dan Pierce
9. When is the next meeting? – Dan Pierce

LNNLRCD
100 Park Drive • Dixon, IL 61021 • 815 652-2006

Lost Nation-New Landing
River Conservancy District of IL
100 Park Drive; Dixon, IL 61021

Natural Resources Conservation Service

WATERSHED PLANNING
COMMITTEE MEETING MINUTES
APRIL 1, 2009

11:30-12:15

1. Introductions - Dan Pierce, Natural Resources Conservation Service – Dan said that the NRCS has opened up the amount of conservation things that they cost-share on to a lot more items, for example, timbers, managing wood lots, and stream bank erosion control. Nationwide, the whole approach is to get watersheds to implement an active planning group to come up with ideas and issues so that the NRCS can use some of their programs and open doors to other potential technical assistance from other agencies.

2**. How did we get here? - Steve Larry, Lost Nation River Conservancy District-** Steve said that the RCD is a steward of the lake, however, over the last two years, they have created a new focus goal from "How do we maintain what we are stewards of?" to "How can we improve what we have for this and future generations?". One of the realizations that they came to was that the 10,000 acre watershed that we are a part of is that we are just a small part of the entire watershed and what we are doing as landowners and stewards of the land and what goes through our land, affects more than just our lake, it goes someplace else, namely, to the Rock River and eventually the Mississippi River. We need to move from maintaining to improving the property that we have and once we have improved it then we can move into a maintaining stance. To do this, they enlisted the help of a gentleman named Joe Rush, who has a background in lake management – he has worked with the RCD getting outside agencies involved in studying the level of the lake and the amount of silting in the lake and in giving the RCD guidance on how to better manage the lake. About a year ago, the RCD enlisted Rebecca Olson to help the RCD with obtaining grants to help support the watershed and with the watershed planning committee. The RCD's first goal is to improve the ecosystem of Lost Lake, with ecosystem being the key word here as it is bigger than the lake. One of their current projects is a lake shoreline stabilization using riprap and vegetation of the RCD properties and a cost sharing rebate program for private lake front property owners to stabilize their shorelines. Tonight they are going to interview two engineering firms about the design of a silt basin on Babbling Brook, which empties into the lake, just as they do on Clear Creek. They are also going to look at a lake dredging program to get some of the existing silt out of the lake. By stabilizing the shorelines removing the silt, and reducing the amount of silt coming into the lake, the water clarity of the lake will improve, hopefully enabling native vegetation to grow in the water, thereby giving the fish breeding grounds and increasing the fish population so that they can reduce the amount of money that they spend on stocking the lake with fish. Another program that they have implemented is a Phosphorus Free Community

campaign for all the people that live around the lake and in the community to get them thinking about what they use on their lawns and when washing their cars. They met with Dan and Dave with the NRCS and talked about how the RCD can be better stewards of the watershed themselves and they would like to partner with other landowners in the watershed to form a watershed planning committee and extending the services of the RCD in terms of paying for Rebecca Olson and Joe Rush's services and even looking down the road at possibly participating in some cost sharing and financial assistance with local landowners in terms of helping improve how they handle the watershed in their area.

3. Why is watershed planning is important? –Dave Meisenheimer, NRCS – They brought maps that the IDNR provided that shows the boundary lines of the watershed and a relief map of the area. A watershed is an area where the water falls and it all drains into a particular outlet. The Clear Creek Watershed, of which drains into Lost Lake, is 10,000 acres covering Lee and Ogle counties. What we do in this watershed affects the Rock River, the Mississippi River, and eventually the Gulf and New Orleans area. It's important to create a watershed plan so that they can determine what exists in the watershed and then they want to identify the resources, which can be remembered by the acronym SWAPAH (Soil, Water, Air, Plants, Animals, and Humans), that are important to them in their plan. They also want to identify what is happening in the watershed, for example, like increased farming. And finally, they want to shape the future and make a positive change to the environment and take advantage of opportunities of technical and financial support.

9 Steps of the Watershed Planning Process:

Phase 1.

1. Identify Resource Concerns
2. Determine Objectives
3. Conduct a Resource Inventory
4. Analyze the Resource Data

Phase 2

5. Develop Alternatives
6. Evaluate Alternatives
7. Make Decisions
8. Implement the Plan
9. Evaluate the Plan

1. Inventory streams to identify causes and sources of pollutant loading.
2. Estimate load reduction expected from plan management standards.
3. Describe any other depth management practices (DMP) and identify critical areas where they could be implemented.
4. Estimate technical and financial assistance needed so that the plan will have some solid numbers that they can ask for grant money for.
5. Identify educational components to enhance public understanding of the project.
6. Schedule the implementation of management measures.

7. Measure their milestones.
8. Determine the progress that they have made.
9. Monitor their success.

The watershed planning committee will have an important part in the watershed plan a – they will be the ones to actually help implement it. There will be another committee called the technical advisory committee, which would be made up of agencies like the Fish and Wildlife Service, the EPA, the NRCS, and the DNR that will be able to advise in a technical capacity on some of the questions that the planning committee might need information on.

Some examples of point source contamination that can affect the watershed would be a construction site, livestock producers, agricultural row crops, construction activities, unstable stream banks, & septic systems. They want to estimate the load reductions of each of those pollutants and develop an informational and educational campaign using fact sheets and brochures, and educational activities.

They need a watershed mission and watershed description, which Rebecca has done but doesn't have with her today. They'll need to determine which conservation practices will achieve their goal, how much money it will cost, and where they can make the biggest impact. Eventually the planning committee will turn into an implementation committee.

4. What are the incentives for watershed planning? - Dave Meisenheimer – the landowners live and work here, and raise their families here and you want them to be raised in a healthy environment and to ensure that the watershed remains productive for agriculture for our current and future generations. Soil productivity refers to soil conservation measures to control erosion on farms, residential area, and timber areas. They want to promote clean water and healthier natural resources in this watershed and be proud of it. As stewards of the land, they have an impact on that land and they have the opportunity to be a part of the planning process.

At Bureau County, a 500 square mile watershed, Dave had the opportunity to get a grant and hire a coordinator for their watershed plan. Steve asked Dave what types of results he has seen in terms of the watershed plan and benefits to the landowners. Dave said that they have had grants issued for cost sharing of stream bank stabilization.

Marian Baker asked about the Nachusa Grasslands' project to take down trees; she would think that would be a negative effect and Rebecca replied that it would seem that way, but it's not. The Nature Conservancy has taken aerial photographs from the 1920's that they are looking at to try to figure out what the area was because now that there are no natural prairie fires that would normally not allow forests to grow there, they have trees growing where they didn't before. A lot of the trees may not be of good quality, like box elders or non-native trees and so they are basically weeds even though it's hard for people to think of them as such. The downstream portion of the watershed used to be forest and the upstream portion used to be all prairie land and the mission of

the Nature Conservancy is to restore that. Steve said that it would be a good question for Bill Kleiman; he has talked to him and walked the land with him and feels that he is a good steward of the land.

12:15-12:45: Lunch

12:45-1:30
5. **What are the opportunities for watershed planning and implementation? Dan Pierce and Rebecca Olson, Olson Ecological Solutions** – Rebecca said that they don't want to come in and tell the landowners what they should do, rather they want it to be the landowners' plan and they can provide the support that they need. With technical support, they will be able to identify the situations that they have and come up with great ideas of what needs to be done. On the Nature Conservancy's land, they wrote a grant for the IEPA to see if they could do something about an erosion problem that they are having. Rebecca showed pictures where you can see the silt falling into the stream there and then she showed a picture of a weir (or rock wall) that juts out into the Kishwaukee River. That may or may not be appropriate for the Nature Conservancy due to the size difference of the two bodies of water. Rebecca showed an example of a very successful project that was done on the south branch of Kishwaukee County near Monroe Center and Kirkland. One landowner initiated a program that originally involved 7 landowners who applied for a grant that has grown to involve 13 landowners over a six-mile stretch of river between two forest preserves. The property had cropland on it that the farmers would only be able to produce crops on every three years and so was not profitable to them. The program lasts 15 years and gives them an annual payment for planting the property back into trees, which was financially better for them and better for the environment because 400 acres of flood plain got planted into trees to prevent the continued loss of soil. The grant gave them a lump sum to help take care of the property and protect the forest that they just put in with a 30 year easement on the property. The DNR really liked the program – agencies like when property owners partner up like that.

Dan said that he wonders what would have happened if they had started this program 5 years later because 3 weeks ago they just started a sign up for a new program that is part of the stimulus program signed by the president EWP floodplain easement program, of which he has 6 applications in his office, where the NRCS will pay $3,200 an acre for a lifetime easement to take it out of production to plant trees and have the NRCS own an easement to restore the land back to its natural condition. With farming they have been promoting no-till in the area with fuel prices the way they are. Dan said that there are two sides to the EPA, the regulatory side and the non-regulatory side and the NRCS' office usually works with the farmer to help them meet the regulatory requirements of the EPA. Most of the farmers and landowners deal with the regulatory side and tend to cringe when they have to get involved with the EPA, but actually, they do have a lot of very useful programs that can benefit them in many ways. Rebecca Olson said that she has never worked with the regulatory side of the EPA.

6. What is involved in the planning process? – Dan Pierce – They are trying to get a group of individuals together who have a strong conservation background. He wants the group to start thinking about what their concerns are then they would get the planning committee together to go through the nine steps that Dave mentioned. The inventory of the watershed would be done from Dan's office – they've already started some of it, their state office has a process where they randomly choose six different 160 acre sections to do an inventory on (about 10%) of the watershed to find out what the erosion rate is with the current practices in place.

7. What are your resource concerns? – Dan Pierce - It's not just about soil erosion and water quality. Usually they try to get resource concerns from the property owners; they want to find out what is bothering them. By working as a group, they can get different agencies involved and get the help that they need. They ask questions like "How does our watershed rank with other watersheds"? Dan said that most everyone there has a conservation plan and he strongly encourages that everyone get an updated plan. Dan asked Dave how many meetings Bureau County had before they started seeing results and Dave said 3 or 4 meetings a year and the plan started in 2006 and took about two years to get into place.

8. Who would like to be involved? - Dan Pierce Steve said that Dan has brought some of the conservation minded landowners in the watershed together today to explain what the vision is that they came up with and he asked them if this was a direction and opportunity that they would be interested in participating in. If there is an overwhelming yes, then they would sign up to be a part of the committee with the understanding that he is interested enough in what the outcome could be that he is willing to spend some time with this group doing whatever they feel that he can bring to it and what resources the RCD can bring like paying for Rebecca and her time. She has already started drafting a watershed planning program. If they were to try to do this without someone like Rebecca, they would have a daunting task before them, however; she has already done the homework on it. Dave asked how the RCD pays for Rebecca's watershed planning services and Steve replied that the RCD is funded by tax money from district members and they budgeted some of that money to pay for her grant writing services this past year and they will budget to fund her grant writing and watershed planning this year. Rebecca said that it is also possible to get some of her services paid for by grants. The grants can come from State, Federal and private sources. Discussion ensued about various grants and programs that are potentially available. Dan said that they need to develop a plan first so that they can apply for the appropriate grants and programs that fit their needs. The participants indicated that they would be interested in participating.

9. When is the next meeting? – Dan Pierce – June 22, 7:00PM at the Lake Court Center

Lost Nation-New Landing
River Conservancy District of IL
100 Park Drive; Dixon, IL 61021

AGENDA

TECHNICAL ADVISORY

COMMITTEE MEETING

June 8, 2009

11:30-12:15

1. Introductions - Dan Pierce, Natural Resources Conservation Service
2. How did we get here? - Steve Larry, Lost Nation River Conservancy District
3. Why is watershed planning is important? –Dave Meisenheimer, NRCS
4. What are the incentives for watershed planning? - Dave Meisenheimer

12:15-12:45 - Lunch

12:45-1:30

5. What are the opportunities for watershed planning and implementation?
   Dan Pierce and Rebecca Olson, Olson Ecological Solutions
6. What is involved in the planning and advisory process? – Dan Pierce
7. Who would like to be involved? - Dan Pierce
8. When is the next meeting? – Dan Pierce

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

TECHNICAL ADVISORY COMMITTEE MEETING

Attendees:

Steve Larry – President, LNNLRCD

Aaron Seim – District Conservationist, Lee County NRCS

Frank Ostling – Ogle County District Wildlife Biologist, IDNR

Sonja Vogl - VP., PPSOC and RRRRAEP

Rebecca Breckenfelder – Administrative Manager, LNNLRCD

David Meisenheimer – Soil Conserv. Tech, Ogle County NRCS

Marty McManus – IL Dept of Agriculture

Karen Rivera –Region 1 Streams Biologist, IDNR

Bob Vogl – President, PPSOC and RRRRAEP

Mike Reibel – Ogle County Planning and Zoning

Sharon Hartgold – Resource Conservationist, NRCS

Rebecca Olson – TAC Group Facilitator

Dan Pierce – Soil Conserv. Tech, Ogle County NRCS

I. Introductions - Dan Pierce – On April 1, the Clear Creek Watershed Planning Committee, of which there are about 12 members, met for the first time. The Clear Creek watershed consists of 10,000 acres that drains into Lost Lake. The guests here today have been invited to participate in a technical advisory committee that would provide the skill and knowledge that the Watershed Planning Committee (WPC) might need if they came up with resource concerns like excessive erosion, invasive species and lack of wildlife. It usually takes 1-2 years for a group to come up with a watershed plan, however, the group here that the Lost Nation- New Landing RCD (LNNLRCD) is a part of is more aggressive than others. The reason that the NRCS strives for a watershed plan is because as money gets tighter for special projects and cost sharing on projects in the watershed, the different agencies want groups with an organized plan. Sharon Hartgold is an employee of the NRCS and covers 19 counties as a resource conservation planner and has been involved in this type of group before.

II. How did we get here? - Steve Larry – In the past year or so that Steve has been a part of first the RCD's Lake Management Committee (LMC) and then as an RCD board member, he has looked at what the RCD is trying to do in terms of preserving the lake and would like to see them become proactive vs. reactive in their preservation efforts. They participate in a variety of programs such as wildlife management, lake stocking, VLMP, maintaining their properties and facilities, periodic dredging, the installation of a silt basin on Clear Creek, and maintaining docks. A couple years ago they hired Joe Rush as a lake manager and he has provided them with a lot of information from various studies. Last year they hired Rebecca as a grant manager and now as a watershed planning coordinator. They have another creek that empties into the lake, Babbling Brook, that doesn't have a silt basin and they are looking at building a silt basin on that creek. The RCD realized that the lake affects everything downstream as well and so implemented a Phosphorus Free Community program. The shorelines of the lake itself need to be stabilized and so this year the RCD will offer a shoreline stabilization rebate program to private property owners around the lake to have the RCD fund half of their stabilization efforts up to a certain amount. They developed an SOP to help in doing this. They wanted to think beyond the lake and so they

contacted other stakeholders in the watershed and formed the WPC. The RCD is paying for the services of Rebecca Olson and Joe Rush and they have the Lake Court Center available as a meeting place. Steve will not be a full time member of the TAC, rather he is a full time member of the WPC. They got to this point after several meetings with the NRCS. Rebecca added that they have a grant that they wrote for 319 funds from the IEPA and in that grant they asked for watershed planning money that can be used to hire other consultants to gather information that they don't have or putting together a plan and going through the nine steps of watershed planning.

III. Why is watershed planning is important and what are the incentives for watershed planning? – Dave Meisenheimer, NRCS – Dave presented a slide show which explained the Nine Step, 3 Phase Process of watershed planning. The planning committee will be identifying resource concerns within the watershed and they have a meeting the 22nd of June to do that. Then the TAC will have another meeting to review that and pool their resources to help them with their resource concerns, with the ultimate goal being a documented watershed plan to address them. Dave said that if the participants here have other people in their organizations that are well suited to identify a particular concern that they are invited as well. Steve said that much of the data that they need for the watershed plan has already been done, for example, when they were looking at designing the silt basin, one of the engineering firms hired by the RCD did a study that tells them how much silt is flowing into the lake, there is data from Joe Rush on the biological make up of the lake, and there is data that Bill Kleiman from the Nachusa Grasslands can provide. Rebecca explained what is in the packet that she supplied the TAC. She compiled GIS system data and included general maps (if more detailed map information is needed, it is in the system and she can provide that). Sharon said that for a watershed plan, the information that a TAC would typically provide would be a write up of the historical basis of the resources (soil, water, plants, and animals) and what it looked like, for example, the percentage of native plants, type of trees, animal species, population, and how was it managed, basically, what was the general ecology of the watershed what does it look like today. As a technical expert, a TAC member would identify the problems and opportunities facing the resources within the watershed. The planning committee will identify what their concerns are and what their perspective on those concerns and what their objectives are. The TAC will determine whether they are on target with their resource concerns (are they identifying a resource concern that truly exists out there and can we give them an idea of what the scope of that concern is). Are there resource concerns that a TAC member might identify that the planners are missing and should they make the WPC aware of it? The planning committee will ultimately decide what they want the watershed to look like and as technical advisors they can take it from where it is now to what the WPC's future vision is.

IV. What is involved in the planning and advisory process– Sharon said that the TAC would be asked:

A. To gather whatever historical data they can on the watershed or Ogle County. Having the information in electronic format, e-mailed to Rebecca would be ideal.
B. As technical experts, what do they currently know about the watershed or Ogle County?
    1. Issues with aquatic species, are there water quality issues in the county, are there 303D listings, fishery information from the IDNR,
    2. # of automobile or chronic wasting disease deer kills, what is the current wildlife here, what are the current problems or opportunities of the resources within the watershed for the future? Are there challenges due to fragmentation of the habitat that has occurred?
    3. Are there challenges because of the amount of agriculture that is here compared to the past or have we overcome that because we have gone back to some of the grasslands in the watershed and farming practices have changed from intensive plowing to more no-till methods? What are the current zoning regulations that exist, for example minimum lot size if someone were going to separate an agricultural area down for development. Are there regulations on storm water management?
    4. What are the primary invasive species in the watershed and where are they located? Do they see new invasive species that have been pinpointed but have not spread yet?

The members of the TAC all come at the watershed from their own perspective of information and they would like to take that information and give it to the planners in writing so that they can have more of a broad base

understanding of the watershed. Historical information and current baseline with some keynote opportunities, challenges, and resource concerns. Much of that information can be gathered individually and provided to Rebecca to share with the planning committee. The bulk of the workload will occur once the planning committee identifies resource concerns and that future condition and then the TAC would have an opportunity to get back together to share their information so that they can recognize how the watershed is defined based on their knowledge and what the watershed planning committee wants it to look like. Then they can map out some ways and give them some alternative of how to get there and give them information as to how it will look in the future if they don't make any changes. Someone asked if Lost Lake has goose problems and Steve replied that they have a goose control program in place where they keep track of the method of disposal and the amount of nests and eggs that are involved and it has been quite effective to the point that the LMC has recommended that they need not implement it next year.

V. Who would like to be involved? – Steve stated that the members gathered here have to figure out if they feel that having a TAC is worthwhile, whether they are interested in being involved, and how they would be organized. Initially, Rebecca would be the facilitator of the group to keep it going but eventually they will morph as operating units with their own chairpersons and secretary to take minutes of the meeting. For the time being, the RCD will provide Becky's services as an administrative assistant to keep a repository of the information that is gathered, however, she won't be attending all the meetings to take the minutes because the committee will operate independently.

Questions: Bob Vogl said that he was surprised at the amount of people that were here from the different agencies and he suspects that the demands on their time are great and so he wondered how many formal meetings they would have and how much could be accomplished through e-mail. Steve said that they can decide how many meetings they will need to have, although he doesn't see them as needing to meet once a month or anything and he agrees that a lot could be handled via e-mail.

Everyone agreed that it was a worthwhile endeavor and there was an overall agreement that those present would be able to be on the committee.

Karen Rivera said that the creation of Lost Lake has resulted in a huge loss in fish migration when you talk about fish migratory patterns and fragmentation. She sampled Clear Creek above the lake and it has a fairly nice minnow population but nothing else can get there like suckers. There is an opportunity to maybe create a habitat for small mouth bass that come out of the lake. Rebecca said that they need those comments. Karen said is the goal to keep the lake and keep the silt out of the lake or is there something overall for the watershed and the fish species in that watershed – to keep that viable they would have to get rid of the lake. Sharon Hartgold said that the planning committee will decide what they will choose to address in the watershed, but they need to know those resource issues and if they don't get rid of the lake, are there other ways to mitigate or other things that can be done, otherwise, at you can let them know that these are the type of species that will exist in the upper streams because there is no other connectivity to change it.

Steve said that the watershed committee's goal will be much more than just the lake, they are going to look at water quality in the lake and the watershed, and they will look at stopping erosion of the stream banks within the watershed, fish population, field cultivation to avoid soil loss and the reintroduction of native species throughout the watershed. Sharon suggested that in Karen's write up she may want to say what if the lake wasn't here and what the negative impact of the lake on the stream species in the watershed upstream and downstream of the lake.

Sharon said that the planning committee will have to be made aware that the TAC will provide to the planning committee with factual information on the watershed for them to make an informed decision on and they will ultimately choose which resource issued to address.

VI. When is the next meeting? – The next meeting will be held on Monday, July 27th from 10-Noon.

Lost Nation-New Landing
River Conservancy District of IL
100 Park Drive; Dixon, IL 61021

NRCS Natural Resources Conservation Service

AGENDA

WATERSHED PLANNING COMMITTEE MEETING

June 22, 2009

7:00 PM to 9:00 PM

Lost Lake Community Center

Dixon, Illinois

1. Determine leadership necessary, nominate and elect leadership for the committee.
2. Updates since last meeting:
    a. Natural resource inventory completed so far.
    b. Formation of Technical Advisory Committee.
3. Discuss current conditions of the watershed. Discuss current conditions in terms of agricultural and natural resources. For example, what land uses currently exist? What types of agriculture, productivity, recreation opportunities, natural areas, wildlife habitat, etc.?
4. Identify strengths and obstacles. Identify strengths, challenges, limitations, and obstacles as a community and as individual producers.
5. Prioritize natural resource concerns. Prioritize the concerns for the watershed and resource issues.

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive; Suite A
Dixon, IL 61021

WATERSHED PLANNING COMMITTEE MEETING

June 22, 2009 7:00 PM to 9:00 PM
Lost Lake Community Center; 404 Lake Court; Dixon, Illinois

1. **Determine leadership necessary, nominate and elect leadership for the committee:** No leaders determined yet.

2. **Updates since last meeting:**

   a. **Natural resource inventory completed so far:** Rebecca explained how she originally came to work for the RCD as a grant writer and has since taken on the role as facilitator for the WPC and the TAC. The RCD has applied for a couple grants, however, to be more successful in obtaining grants, it is helpful for a watershed planning committee to determine the needs of the watershed and the technical advisory committee to give the WPC the information (resource inventory) on the watershed that it needs to make an informed decision. Someone said that the RCD hired Applied Ecological Services about 15 years ago to do an analysis of the problem with the silt and they told the folks that they need to work with the watershed, however, it they weren't successful because it is difficult to work on the watershed.

   b. **Formation of Technical Advisory Committee:** The Technical Advisory Committee (TAC) met for the first time on June 8th and identified a few individuals from different governmental and environmental organizations who would have the expertise that they would need to make informed decisions. They will be able to provide the WPC with watershed inventory data, for example the fisheries biologist said that she has data that goes back a long time that she can provide. When the WPC comes up with resource concerns, the TAC can either validate them or give reason why they don't think it is a concern or give them other concerns to consider. Someone asked how much money would be available to do something on the watershed and Rebecca said that it depends on the project. The Natural Resource Conservation Service has a lot of programs available and sometimes a program will have a set dollar amount for a particular project, for example on erosion control they may provide a certain amount per lineal foot that they will provide. The RCD has offered to work with the NRCS to pay for part of those projects and the Fish and Wildlife service has a Partners for Wildlife program and has committed funds and is really straightforward, for example, if you do an erosion control project on this stream they will give them up to $2,500 in seed. There are other grant organizations that have different criteria like funding 60% of the project or some that may not have a set criteria. The more partnerships and money coming from other places, the better your chances of getting aid. It is also common to combine grants and programs.

3. **Discuss current conditions of the watershed: Discuss current conditions in terms of agricultural and natural resources. For example, what land uses currently exist? What types of agriculture, productivity, recreation opportunities, natural areas, wildlife habitat, etc.?** After the significant rainfall that they had this morning, the current conditions are the worst that they have been in a long time. The watershed is dominated by row crop agriculture with water runoff and flashy hydrology. Someone asked if we have acreage from the south creek and the north creek and someone said that they do and on the plus side

they have a lot of grass on that property from the Nachusa Grasslands and the Orland property and grazing land. They were looking at whether they can turn a row crop farm into a grazing farm and make money at it but so far has been difficult. There are a lot of natural springs that help keep the lake full and someone said that on their property they can put down something and get water from natural artesian springs. They have a well that they only dug 30' deep and it has never gone dry. The houses in the watershed may or may not be using fertilizer and insecticides on their lawns. Some of the streams have really bad bank erosion. There are many soil types in the watershed. Rebecca asked how the productivity and someone said that there is a really good vein on the east edge of the watershed that holds a lot of class A soil. The closer you get to the river, the poorer the soils get. A lot of recreational opportunities in the watershed – fishing, boating, hiking, horseback riding, hunting. A lot of wildlife.

4. **<u>Identify strengths and obstacles.</u> Identify strengths, challenges, limitations, and obstacles as a community and as individual producers.**

   a) **Strengths:**
   - The watershed has a fair amount of cover that holds the soil – more than 64% agricultural (20% pasture, 23% cropland, & 21% row grass) and 36% is covered by forest.
   - The lake at the end of the watershed acts as a sediment pond before the Rock River, which helps the Rock River, but doesn't help the lake out. The golf course has less sand on it because of this.
   - Conservation tillage practices in use because they don't like to see their fields wash away
   - Nature Conservancy has a Mackinaw demonstration farm where they try to take the tiles and run them into a wetland to clean it up before it is released further into the watershed.
   - Abundant Wildlife
   - Good quality soil
   - Lots of recreational opportunities
   - Producers more educated about conservation farming than previous generation
   - Many owner/operator farmers
   - Area is not commercialized

   b) **Challenges:**
   - Dollars rarely support the agricultural producer. Bill Klyman said that a future answer could come if someone invents perennial corn so that they don't have to plow as much. He also mentioned using drainage tiles to catch their water before they release to the next property.
   - Nitrates in water runoff
   - Most people in the watershed have done the standard conservation projects and they may not invest in anything more.
   - Cannot control macroeconomics, corn and soybeans are annual crops that have proven profitable vs. having grazing land for raising beef cattle; it's also easier for a farmer to do row crops longer than raising cattle. Cattle are typically grazed only on land that cannot be row-cropped.
   - Stream banks eroded
   - Stream specialist said that Clear Creek is in pretty good shape so may be harder to get funding than a stream that is worse off.
   - Houses within the subdivision introduce fertilizers and insecticides into the water table

5. **<u>Prioritize natural resource concerns.</u> Prioritize the concerns for the watershed and resource issues.**

   Top Priority
   - **Minimize Creek Bank Erosion**
   - **Landowners & operators find that it is easiest to work with stream banks.**
   - **Begin with creek bank stabilization, then work into the waterways & fields**
   - **Landowners would probably allow stream bank improvements**
   - **Work with landowners that are currently not practicing steam bank conserbation**

- **Save Class A & other Soils**

Secondary Priority

- **Minimize row crop erosion, including tiling, waterways and filter strips**
  i. Difficult to control erosion in row crops
  ii. Easier to farm straight rows vs. contoured rows
  iii. Developing wetlands to filter runoff
- **Implement best management practices as pilot projects to use as examples, test procedures, and determine if others want to try it**
  i. For example: break tiles to create a wetland to reduce nutrients in runoff
  ii. Nature Conservancy has an example of this

Low Priority

- **Reduce runoff, use of fertilizer and other pollution from lawns**
  i. Residential: Mowed Lawns and Possible Chemicals Used On Them

Other Priorities

- **Protect Wildlife and the rural lifestyle**
- **Maintain opportunities for recreation, hunting, and fishing**

Rebecca stated that the protection of the Rock River was a high priority to agencies that she has talked to for grant funding and that they would like to see projects started at the top of the watershed first. Whatever they do to the watershed will help the Rock River. Lost Lake acts as a sediment basin for the Rock River – they would like to make smaller basins before the lake to increase the quality of the water coming to the lake.

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

NRCS Natural Resources Conservation Service

AGENDA

TECHNICAL ADVISORY

COMMITTEE MEETING

July 27, 2009

10:00 AM – 12:00 PM

1. Approve minutes from June 8, 2009 Technical Advisory Committee meeting.
2. Updates
    a. Watershed Planning Committee meeting on June 22, 2009.
    b. IEPA Section 319(h) Grant awarded for watershed planning!
3. Determine leadership necessary. Nominate and elect leadership for the committee.
4. Review current conditions of the watershed listed by the WPC. Add other conditions, if necessary.
5. Review strengths and obstacles identified by the WPC. Provide feedback to the WPC.
6. Review natural resource concerns prioritized by WPC. Provide feedback to the WPC.
7. Compile list of any and all readily available data to add to the natural resource inventory. Determine who on the committee will provide each set of data.
8. Schedule next meeting.
9. Adjourn

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

NRCS Natural Resources Conservation Service

AGENDA
TECHNICAL ADVISORY COMMITTEE MEETING

July 27, 2009 10:00 AM – 12:00 PM

Attendees:

Frank Ostling- IDNR

Marty McManus- IDOA

David Meisenheimer- NRCS

Rebecca Olson- Olson Ecological Solutions

Rebecca Breckenfelder-LNNLRCD

1. **Meeting started at 10:10AM; Approve minutes from June 8, 2009 Technical Advisory Committee meeting.**
2. **Updates**

A. **Watershed Planning Committee meeting on June 22, 2009.** The WPC met on June 22 and identified and prioritized their concerns. Their job is to see what they want this watershed to become and the TAC's job is to make sure they are on track technically. Stream bank erosion was their number one priority. Working into the waterways and fields was a second priority. They know that row-crop agriculture produces a lot of pollutant and sediment runoff but they also recognize that economically, it is the only way you can farm. Grazing isn't as profitable and you can't do it as late in life. The meeting took place the same evening that a huge flood occurred, taking out roads and doing a lot of property damage. Someone asked what damage occurred and Becky Breckenfelder said that there was a significant amount of water that came through and it took out the bridge on Babbling brook, confining several residents to their homes, as well as several docks and sea walls. The water came so fast that it covered roads and lifted boats off of the racks (about 18 of them went over the dam). The pipes at the dam bent early the morning of June 22 like they are engineered to do, thereby lowering the lake. The RCD had an engineering study done on the dam and pipes and it indicated that they it worked properly and that there was no significant damage to the dam. Rebecca said that riverbanks and fences around the watershed were damaged as well. About 4-6 inches fell on the entire watershed in 3-4 hours on an already saturated ground.

B. **IEPA Section 319(h) Grant awarded for watershed planning!** – Rebecca said that they received a grant from the IEPA for watershed planning for $88,000. The planning involves many steps like holding the WPC and TAC meetings, getting the right stakeholders and technical people in place and work forward to form their concerns and goals, get out in the field and collect and analyze data, and come up with a plan that can be published. That opens the door with the EPA to fund the stabilization projects that will take place in the watershed. They need to identify the best and cost effective projects to do in the watershed with the goal of improving water quality. Rebecca asked the TAC members if they could keep track of their hours, including drive time and their financial information such as salary and benefits so that they can account for all of the volunteer hours that are going into the project and turn it in at the end – Rebecca will provide them with a worksheet to keep track of that so that everyone's is the same. Rebecca has outlined the planning that the grant will cover (STEPS FOR DEVELOPING WATGERSHED ACTION PLAN FOR THE CLEAR CREEK

WATERSHED, OGLE COUNTY, IL), with the TAC's involvement listed in Steps 6, 7, 11, 14, and 15. The first five steps of the plan have already been completed. They would figure out how much of the watershed to assess, usually 10% and strategize what properties would be a high priority, second priority, on down.

3. **Determine leadership necessary. Nominate and elect leadership for the committee. –** Rebecca figured that at minimum they would need a chairperson and secretary. No leadership determined yet – will wait until more people are on hand to make a decision. Marty McManus said that if someone else doesn't do it, he'll step up and be chairperson.

4. **Review current conditions of the watershed listed by the WPC. Add other conditions, if necessary. –**

- **Current Conditions**: GIS information shows that 36% is forested, 40% agricultural and 20% pastureland. Frank Ostling said that he would like to look at the grazing practices and find out if the farmers rotate their fields or are receptive to rotating their grazing fields. Rebecca said that she doesn't know the farmers' rotation practices; however, she does know that the stream is the water source for the cattle, which beats down the stream banks to the point that there is concern. Rebecca said that Steve said that the RCD may be willing to help financially support some of the projects that the NRCS has available for farmers along the stream banks such as fencing and alternative water source to keep cattle off of the stream banks. Nachusa Grasslands wasn't listed in the current conditions of the watershed, although they have 1,400 acres within the watershed.

- **Soil Productivity**: Many different soil types with a good vein of Type A soil on the East side of the watershed.

- **Hydrology and Stream condition of the watershed**: Water runoff, Flashy hydrology, undercut banks, and bank erosion. Frank said that Karen River can speak on that better if she has concerns.

- **Recreation and wildlife**: Frank asked if Lost Lake has a goose problem and Rebecca said that they did, however, they've had an effective goose control program in place for a few years now. Becky added that they oil eggs in the nests each year and bury the eggs and they also fence the beaches and other RCD shorelines during the off season as well as keeping riparian buffer strips on RCD properties and educating lake shoreline owners about doing the same on their properties.

5. **Review strengths and obstacles identified by the WPC. Provide feedback to the WPC.**

- **Strengths –** more than 10% of the watershed is covered by grass or woods, (36% forest, 20% pasture), landowners can most easily work on stream banks, Lost Lake acts as a sediment basin to protect the Rock River, producers living and working in the watershed are more educated about conservation farming than the past generation. Most owners are also the land operators. The watershed is not commercialized, the watershed is relatively flat, limiting erosion potential, and most soil types have class B slopes or better. Rebecca added that this watershed is included in a couple of conservation opportunity areas and that it is also recognized under the forest legacy program as one of the key places in the state for mature forests. Frank was concerned about listing the stream bank erosion control as a strength because it could end up being too expensive for a landowner to do, which could be an obstacle to getting it done. Rebecca said that she would put that under obstacles. Regarding Frank's statement, Becky inquired as to whether some of the costs to the landowner could be addressed in some of the grants that they are applying for. Rebecca said that they are planning on doing that – they are applying for another 319 grant application this year with landowners that have already indicated an interest in stabilizing their stream banks, and although it would be a stronger application if they waited until the watershed planning was done so that those properties were recognized as the most important, that's years away and so they are going to see what they can do now. Frank asked what type of stabilization they were looking to fund with the grant - weirs, riprap or grasses. Rebecca said that they are 1. Looking at installing a silt basin upstream of the lake on Babbling Brook and an expansion of the silt basin on Clear Creek 2.Remeandering the stream bank that lies within the Nature Conservancy's property 3. Nature Conservancy - stone tow protection on a highly eroded bank 4. RCD is providing a Stabilization Rebate program to lake shore owners. Dave added that the Clear Creek watershed is located between two high quality natural sites – Lowden-Miller and anything that can be expanded on to connect those two areas would be a good thing.
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- **Obstacles –** Stream banks are most likely expensive to stabilize and sedimentation resulting from bank erosion is greater than that originating from fields, There are fewer fence rows on current farms compared to historical farms, which results in waterways handling more storm water, tiled fields exist, which carry nitrates

to the streams, the economics of livestock farming are difficult and the dollars earned rarely support the producer, most landowners have already accomplished the standard conservation practices and it would be difficult to convince them to do more, waterways are expensive to install and difficult to maintain, individual producers cannot control macro-economics, it's easier to raise corn and beans than cattle and farmers are physically able to raise those crops longer than cattle. Cattle are typically raised on land that cannot be row-cropped; houses within the watershed may be introducing fertilizers and pesticides into the water table. Becky said that the RCD print a couple of pages in the bimonthly newsletter that goes out to all of the property owners in the district and in there they put out articles to make the owners aware of the danger of phosphorus in the watershed and ways to minimize contributing to the problem. Becky asked if septic fields that are on properties that are adjacent to the lake were a concern and Dave said that they could be and asked if they are inspected regularly. Becky said that she didn't know as the RCD doesn't regulate private property – perhaps the ULLPOA would know something. Becky also asked about the sewage plant that is owned by the LLUD and what do they do to ensure that they are not contaminating the water downstream of the lake and how are they regulated. Rebecca said that Karen Rivera brought up fish passage at the last meeting and how the dam is an obstacle to that. Dave Meisenheimer disagreed with the statement that waterways are expensive to install and difficult to maintain – stating that it is a common practice and there is a cost sharing program through the NRCS that helps out with that. They are also easy to maintain by mowing. Marty said that waterways may be inconvenient to producers. Frank said that as far as the WPC's second priority listed as installing tiles to create a wetland to reduce runoff – that it is great if you can do it, however, sometimes you run into neighbors and once you start breaking tiles and changing waterways, there is always going to be someone who will object to it, stating that you are either holding too much water or taking too much water away – so it can be a potential obstacle. Water management is in everyone's best interest and maintaining good neighbor relations is an important goal too. Dave said that the tiling is affecting farmers as to when they are applying their fertilizer – more and more are putting it on in the spring.

6. **Review natural resource concerns prioritized by WPC. Provide feedback to the WPC –**

- **Top Priority –** minimize creek bank erosion, begin with creek bank stabilization then work into the waterways and fields, work with landowners that are currently not practicing stream bank conservation, save Class A soils and other soils. Marty asked if the stream banks are more in agricultural setting are urban setting and Rebecca said agricultural. Becky asked if they would want to list obtaining grants for creating filter strips along the stream banks and paying the landowner for an easement so that they don't use the land that is right on the stream bank. Dave said that producers would be less apt to put money into stream banks than their own fields, especially due to the high cost of stabilization. Dave asked if working with landowners that are not currently practicing stream bank conservation is an educational goal of the WPC and Rebecca said that she is not sure.

- **Secondary Priority –** Maintain good neighbor relations and outreach to more property owners – Frank said that Dave knows producers here and when they come in he could let them know about the watershed program. Frank asked if they identified priority landowners in the watershed and Rebecca said yes, they met with some committee members of the RCD along with Bill Kleiman and identified some key owners. One of their concerns was cattle grazing up to the stream banks. They have the addresses for all the landowners in the watershed and they can target mailings for pertinent programs are available to them. Minimize row crop erosion, including tiling, waterways and filter strips, implement best management practices as pilot projects to use as examples, test procedures and determine if others want to try it. For example, break tiles to create a wetland to reduce nutrients in runoff.

- **Low Priority –** Reduce runoff, use of fertilizer, and other pollution from lawns

- **Other priorities –** protect wildlife and the rural life-style; maintain opportunities for recreation, hunting, and fishing. Frank said that it is nice to keep a rural lifestyle; however, it is a hard thing to keep when there is money at stake. Frank asked if they have any problems with beaver and dam activity and Becky said that they have had beaver activity in the past and the RCD had a wildlife control specialist come out and trap the beaver. The community is pretty good about letting the RCD know when there are signs of beaver damage. Frank suggested that someone in the association could obtain a trapping license for $15 a habitat stamp to trap the beaver and then they wouldn't have to pay a specialist to trap the beaver, which would save the RCD money. Becky said that they have done similar things to that other wildlife with the goose control program and a carp bow-fishing derby.

7. **Compile list of any and all readily available data to add to the natural resource inventory. Determine who on the committee will provide each set of data.** – Rebecca has a working document created with GIS information and she would like the TAC to decide what information they need to add to it and who can provide that information.

   - **Plat of Ownership** - Frank said that it would be nice to have a plat representation of ownership so that they can get an idea of who the big landowners are. Rebecca said that they already have that and that it can be added.

   - **Hydrology** - The grant that Rebecca just wrote asked a lot about the hydrology – Dave said that the DNR water resources may have a description of the hydrology. Dave suggested Bill White, with the Illinois Water Survey might be able to help with that. Rebecca said that she would need the information for the grant by Wednesday – Dave said he will send her anything that he might have.

   - **Geomorphology** - Rebecca asked if they know of anyone who knows anything about geomorphology and Dave said no but that they will have a meeting on Thursday and he can ask then. Frank said that it would be a good idea to divide the watershed up into priority areas.

   - **Cultural Resources** - Dave said that they have an archeologist and he could ask her to put together a report on cultural resources without pinpointing the exact locations of them to protect against people coming out and excavating it. Rebecca said that they could also keep the information confidential or just report general information.

   - **Rapid Assessment** - Dave said that they have the first part of the rapid assessment on soil erosion on the sample areas in the watershed done. He went out this spring and did surveys of all the fields in that and looked at crops, crop rotation and erosion. The second part, the gully portion, of the survey will probably be done this fall. Rebecca asked Dave to send her an e-mail indicating what has been done so that she can note it in her report.

   - **Fish Data** - Rivera sent data to Rebecca that she can add to the document. Dave asked if there was any information on the fish kill that occurred and Frank said that supposedly there was an alcohol spill that might have deoxygenated the water - they were going to do tissue studies but he hasn't seen anything yet on it. Karen might have more information on it. Local people think it might have been manure or some other contamination.

   - **Lost Lake Beach Closings** – Rebecca asked Becky if there have been any beach closings and Becky said that she has a record of all the water samples that list e-coli levels and all the beach closings that have taken place over the past few years. She recalls that it was closed once last year and this year they closed it after the big rain even in June until the beaches were repaired and the water tests came back good.

   - **Lost Lake Dredging and how much silt was removed** – Becky will get Rebecca the information on how much silt was removed from the lake when they dredged in 2003. They dredge their silt basin a couple times a year as well and there was a bathymetric survey done on the basin as well. Jerry Sellers or Joe Rush may know more about that.

   - **VLMP** – Rebecca asked about the work that the VLMP does and Becky said that Joe Rush or Jerry Sellers would be the ones to talk to on that.

8. **Schedule next meeting** – Possible dates - September 14 or 21st and once date is determined than Becky will send out a save the date notice. Next meeting – identifying goals and prioritizing them – Marlon Schafer offered to do a program and they are going to ask if he can present what they can offer at that meeting as well. They are going to plan to make it a joint meeting between the WPC and the TAC.

9. **Adjourn** – meeting ended at 12:05PM

Lost Nation-New Landing
River Conservancy District of IL
100 Park Drive; Dixon, IL 61021

AGENDA

WATERSHED PLANNING COMMITTEE AND

TECHNICAL ADVISORY COMMITTEE

JOINT MEETING

September 14, 2009

1:00 PM to 3:00 PM

Lost Lake Community Center

Dixon, Illinois

1. Introductions.
2. Approve minutes from June 22, 2009 Watershed Planning Committee meeting.
3. Approve minutes from July 27, 2009 Technical Advisory Committee meeting.
4. Presentation: Marlyn Schafer, U.S. Army Corps of Engineers.
5. Updates since last meeting: EPA grant application submitted by RCD for demonstration/stabilization projects.
6. Review stages and tasks for watershed planning.
7. Establish planning group structure.
    a. Determine leadership necessary, nominate and elect leadership for the committee.
    b. Committee structure: separate or one committee with sub-component.

8. Review geographic scope of watershed.
9. Review natural resource concerns and priorities.
10. Create preliminary goals for watershed/waterbodies.
    a. Restorative and remedial.
    b. Protective and preventative.
11. Prioritize key goals.
12. Discuss next steps.
    a. Assemble all ready available data.
    b. Visually evaluate key water bodies and natural resources.
13. Adjourn.

LNNLRCD
100 Park Drive • Dixon, IL 61021 • 815 652-2006

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive; Suite A
Dixon, IL 61021

Natural Resources Conservation Service

Minutes
WATERSHED PLANNING COMMITTEE AND TECHNICAL ADVISORY COMMITTEE JOINT MEETING

September 14, 2009 1:00 PM to 3:00 PM
Lost Lake Community Center Dixon, Illinois

Attendees:

WPC Members:	Dan Boehle	Steve Larry	
TAC Members:	Sharon Hartzold	Bill Lindenmeier	Dave Meisenheimer
	Mike Reibel	Joe Rush	Marlyn Schafer
Facilitator:	Rebecca Olson		
Minutes Recorder:	Rebecca Breckenfelder		

1. Introductions.
2. Approve minutes from June 22, 2009 Watershed Planning Committee meeting. - approved
3. Approve minutes from July 27, 2009 Technical Advisory Committee meeting. - approved
4. Presentation: Marlyn Schafer, U.S. Army Corps of Engineers. Dave Meisenheimer introduced Marlyn Schafer, a regulatory project manager with the US Army Corps of Engineers, a position which he has held for the past 15 years. He specializes in agricultural projects, especially stream bank stabilization. Marlyn has worked on watershed projects at Blackhawk Lake in western Iowa and Springfield Lake in Springfield. Marlyn said that the presentation that he is giving is a pretty broad perspective of the corps' programs so some of the things may not apply. He reviewed the RCD's LMC Mission Statement to get an idea of what they have planned for the watershed. The Corps' authority through the clean water act involves perennial streams (like Clear Creek) and intermittent and ephemeral streams (tributaries), natural and manmade lakes, abandoned quarries and borrow pits, manmade ponds adjacent or connected to a jurisdictional stream or wetland, and jurisdictional wetlands (abutting or adjacent to rivers and streams). Steve Larry asked if a county road commission does work on a road and changes a culvert is the Army Corps consulted on that time of work or do they just do it? Marlyn said that it depends on the circumstances – if they are putting in a new road then they need to get a permit, however, if it is an existing road and they are just replacing the culvert with the same size culvert then that is considered maintenance and it is not necessary to contact the corps. If there is going to be a change in the road (widened or reshaped) or a bigger culvert put into place that is going to increase the footprint then they may need to get a permit from the Corps, albeit, it is a simple one – a nationwide permit under linear transportation. A diagram of the regulatory jurisdiction shows that Section 10 covered all structure and work

in a navigable waters of the US and Section 404 covers the discharge of dredged or fill material in the swamps, marshes and bogs adjacent to the waterways. They don't have any jurisdiction in the upland area. Rebecca asked for confirmation that streams or wetlands that are isolated from navigable waterways are not under the corps jurisdiction and Marlyn confirmed that statement. The blue lines on the USGS topographic map show them where there might be streams in the watershed, however, some of the streams may have been tiled and converted into grass waterways and non-wetland grass waterways are not regulated by the Corps. Marlyn gave examples of activities that are exempt from requiring a corps permit such as:

1. Work in upland drainage ways, ditches, and grassed waterways
2. Work in ponds, abandoned quarries, abandoned borrow pits, wetlands and farmed wetlands which are isolated from jurisdictional streams/wetlands (would still need to coordinate with the NRCS if they are in the farm program)
3. Installing drainage tile outlets and ditch outlets into stream channels for drainage of non-wetland
4. Replacing or installing drainage tile thru a wetland or farmed wetland (tile must be the same size and depth as old tile, must not drain any additional wetland and must be non-perforated tile
5. Excavation and dredging removal of accumulated sediments, gravel and debris from streams and drainage ditches to original depth and banks (excavate no deeper than original ditch bottom, material cannot be side cast into wetland), cut and remove fallen trees and woody debris, remove damaged/unstable trees from stream bank by cutting (must work from bank or gravel sandbar and material must be disposed of in a non-wetland area to be exempt)
6. Construction or maintenance of farm ponds for livestock
7. Construction or maintenance of farm and forest roads thru wetlands or across streams (permanent or temporary roads, stream and wetland impacts must be held to a minimum, road fill must be bridged, culverted or otherwise designed to prevent water flow restrictions thru stream or wetland
8. Maintenance and emergency reconstruction or recently damaged dikes, dams, levees, riprap, breakwaters, causeways, bridge abutments, approaches, another structures, (reconstruct to condition prior to the event that caused the damage, should be done within one year after event
9. Maintenance of drainage ditches (manmade ditches including previously manipulated streams, must not convert an area of waters of U.S. to another use, such as draining wetlands
10. Regrading stream bank for seeding or planting vegetation (2:1 slope)
11. Excavation of sediments from degraded or farmed wetland. including removal of emergent or small scrub shrub vegetative cover (removal of mature trees from wetland or streambed by grubbing the root balls is not allowed)
12. Construction of a wetland berm or structure for shallow water ponding if structure fill is on non-wetland
    NOTE: Type of equipment used for excavation includes backhoe, excavator or dragline that scoops up material so that there is only incidental fallback. Equipment must be positioned at the top of the stream bank, edge of the wetland, or on a sand /gravel bar excavated material must be removed and disposed of in a non-wetland location

    NOT ALLOWED: No channel relocation allowed. Use of bulldozers, graders, tractors with front-end loaders and blades where soil and vegetative material would be pushed around in waters or wetlands - these discharges requires a permit.

Rebecca asked the construction of a berm in the wetland or stream itself would require a permit as far as dirt moving and digging out the area for a wetland and Marlyn said that if the work gets into a wetland or stream itself than they would need to get a permit unless they are working from the shore and taking the material out and putting it on a non-wetland site then they do not need to get a permit. Joe rush asked if they get equipment into the stream or wetland than would they need to get a permit and Marlyn said yes.

If a permit is required, then they can get an application from the NRCS office or call the Corps and they will send them out to you. The joint application includes:

- US Army Corps of Engineers
- Illinois Dept of Natural Resources Office of Water Resources (Any work done in the floodplain of Clear Creek would require the submittal of a permit application to the DNR)
- Illinois Environmental Protection Agency (they will process the water quality certification and their review coincides with the corps' review process)

Not all projects are going to require a prolonged process – there are a lot of projects that involve stream bank and wetland restoration that require a permit, but because they fall under the nationwide permit program it is a very quick process. Once they receive the permit application, it typically takes under 30 days for them to approve it, depending on what the project involves or whether they have to coordinate with any other agencies such as the fish and wildlife service or the Illinois soil preservation agency. Types of Department of the Army Permit:

- **Nationwide Permit 3. Maintenance** – authorizes major repairs of currently serviceable stream structures damaged by natural events (culverts, bridges, farm crossings, etc) Repairs should be done within reasonable time (2 years of event)
- **Nationwide Permit 13. Bank Stabilization** – up to 500 feet along lake shoreline and stream banks blanket riprap stone toe protection gabion baskets and concrete walls are included. Structures extending into the channel are not included (Jetties, Bend way Weirs, stream barbs, etc.) **Permit application is not required for projects 500 feet or less in length 27:00**
- **Nationwide Permit 16. Bank Stabilization Activities in State of Illinois** – up to 1000 feet (riprap, stone toe protection, sheet piling, seawalls, gabion baskets, etc.) Includes Bend way Weirs, stream barbs, current deflectors, hard points and other low profile jetty structures. IEPA certified. Regional permits are issued for 2-5 years. No channel relocation permit application required.
- **Nationwide Permit 27. Stream and Wetland Restoration Activities** – Restoration and enhancement of streams and open waters, re-meandering previously straightened stream channel restoration, enhancement, and creation of wetlands and riparian areas. Includes projects under CRP, WRP and other federal contracts with NRCS, Farm Services Agency or Fish and Wildlife Service. Projects under IL Dept of Ag Illinois Stream Stabilization and Restoration Program, IL DNR and other state programs. Private and locally funded projects, includes installation of rock riffles (boulder weirs). IEPA certified.
- **Nationwide Permit 41. Reshaping Existing Drainage Ditches** – previously straightened streams that need to have minor work done. Permit application required if reshaping more than 500 feet of drainage ditch in waters of the US, ditch banks can be regraded but the channel cannot otherwise be increased in drainage capacity beyond original design, cannot change the ditch center line IEPA issued the Water Quality Certification with Special Conditions
- **Nationwide Permit 45. Repair of Uplands Damaged by Discrete Events** – restore storm-damaged stream banks – limit of 2 years from time of event can go back and restore bank and will cover riprap work that they want to install to cover fresh fill. Cannot be used to reclaim lands lost to normal erosion processes over an extended period.

Standard Permit Process:

Applicant submits application⟶ Application Received Acknowledged and Processed⟶Public Notice Issued⟶ Application Reviewed - Corps/Individuals/Special Interests/Local Agencies/Commonwealth Agencies/Federal Agencies ⟶ Public Hearing may be held⟶ Evaluation Factors-Conservation/ Economics/Aesthetics/Environmental Concerns/Public Welfare/Water Supply Quality/Navigation/Etc. ⟶Application Either Approved or Denied

Public notice is issued for a 21-30 day comment period. Sent to federal state county and local government agencies, legislator, organization, adjacent landowners, and others. Adverse comments must be addressed by the applicant. This will delay project approval. Standard permits may take 9 months to 1 year or longer to complete. Very advisable that there be a watershed plan – if the work is contrary to a watershed plan, then it is very unlikely that they would get the permit. Projects that help the environment such as remeandering of streams or recreating wetlands would go under nationwide permits and would be much easier to obtain.

Stream & Wetland Mitigation – The clean water act requires no net loss of waters of the U.S. If a project will result in permanent adverse impacts or permanent loss of stream or wetland, then mitigation must be provided prior to or concurrent with the project causing the impacts. Typical projects are stream channelizations, filling of streams to convert to grassed waterways, and draining/filling of wetlands. For example, if they have an acre of wetland that they want to drain, then they are going to have to provide a 1½ to 2 ratio or mitigation, or create 1 ½ to 2 acres of wetland somewhere else. Because of this rule, most of the time it is not economical for the landowner to do the work, so they won't proceed with the work.

Threatened and Endangered Species – Before issuing a standard permit or certain nationwide permits, the corps will coordinate with the Threatened and endangered species, the U.S. Fish and Wildlife Service (FWS) in Rock Island, and the IDNR in Springfield. If the NRCS/SWCD is involved with the project, then they may perform the coordination with FWS and IDNR.

National Historic Preservation Act – Before issuing a standard permit or certain nationwide permits, the corps will coordinate with the Illinois Historic Preservation Agency. If NRCS are involved, then their Cultural Resources Review process will satisfy the NHPA requirements. Marlyn listed contact information for his agency and the other agencies that are involved in the permitting process.

Continuing Authorities Program - As a taxing authority, the LNNLRCD is eligible for assistance for use of various programs for example: **Small Flood Control Projects** ; **Emergency bank Protection Projects** – The corps may spend up to $500,000 in one locality during any fiscal year for the construction, repair, restoration and modification of emergency stream bank and shoreline protection works designed to protect : highways, bridge approaches, and public works, as well as churches, hospitals, schools, and other non-profit services endangered by bank erosion and shoreline protection on public property – **Cannot be used for protection of private property.** Joe Rush asked if it was for before or after damages have occurred and he said that it could apply to either before or after damage occurs.

Aquatic Ecosystem Restoration - provides authority for the Secretary to carry out an aquatic eco-system restoration and protection project including manipulation of the hydrology in an along bodies of water

including wetland and riparian areas Each project if limited to a federal cost share of not more than $5 million.

5. **Updates since last meeting: EPA grant application submitted by RCD for demonstration/stabilization projects.** The RCD submitted a second grant application to the EPA for some implementation of stabilization of some property that is upstream of the lake and some lakeshore property owned by the RCD. They would use the sites as a demonstration area to showcase various stabilization techniques. They received EPA funding for a grant that they submitted last December for the clear creek watershed planning effort although they haven't seen the contract yet. The work that they are doing now will count as a match toward the project and eventually they will get a contract signed and they can start submitted some of the costs of this effort to the EPA. Steve asked what type of cost sharing work they can do and Rebecca said that that question segues nicely into item 6.

6. **Review stages and tasks for watershed planning.** Rebecca took the EPA's guide to watershed planning and broke it down into a step by step process. After today's meeting they will be done with stages 1 and 2; stage 3 involves some of the major costs because they are inventorying the watershed, which will involve going out into the field and collecting and organizing data for the watershed. The NRCS is working on some of this, which Rebecca has asked Dave Meisenheimer to talk about later. Some other major costs are outlined in stage 4 – assess water body/watershed problems some of which will involve computer modeling. Creating their published plan will be somewhat costly because they will need to hire consultants such as computer modelers and GIS analysts to do the work, as well as someone to take all of their WPC's prioritized concerns and goals and putting them into a formal plan. Based on the assessment of the watershed they will be identifying areas that they can work on that will give them the best bang for their buck. They will also have someone doing an assessment from the air. The time that the two committees put in can be used for matching funds for grants. Steve asked who would keep track of the volunteer hours that are used for matching funds and Rebecca said that It is very important that everyone keep track of their time and she has a form that everyone can use for this purpose to keep a standard. If it is a volunteer, then they have a set rate for volunteers, otherwise, if a person is working on behalf of an organization, then he or she would put the set rate that he or she is paid by that organization. Rebecca will e-mail a copy of that to everyone so that they will have it electronically. Steve asked when they should start keeping track and Rebecca said right away and retroactively, they should record any of their time spent at meetings, traveling, and any other work outside of the meetings that they have performed. Joe Rush asked if the recon work that he and Rebecca has done and she said yes.

7. **Establish planning group structure.**

   a. **Determine leadership necessary, nominate and elect leadership for the committee**. They have been trying to do this since the very first meeting; however, they haven't had very good attendance and so have put it off. What they need is someone to take over facilitating the meetings from Rebecca and someone to take the minutes when Becky is unable to. The job of the facilitator is basically to attend the meetings and help them move along. Rebecca can work with the individual on creating the agendas for the meetings and Becky helps coordinate the mailings and e-mails to inform committee members of the meeting dates.
   Marty McManus – TAC Chairperson / Joe Rush - Vice-Chairperson Marty McManus volunteered at the last meeting to be the chairperson if no one else stepped up. Joe Rush is willing to be the vice-chair as he feels that it is important for the chairperson to be at all of the meetings and doesn't know if he will be able to do so.
   David Meisenheimer – Help take TAC Minutes Steve thinks that for both groups if the chair can't make it, then the vice-chair should try to come. Steve asked how often the TAC will plan to meet and Rebecca said that the next meeting will not be until after harvest because they have assessments that need to happen before the meeting won't happen until the crops come off, although she doesn't know the frequency of the meetings. Steve asked Becky what her time availability was to take minutes and Becky said that during the winter she has a lot more time to devote to minute taking. She becomes overloaded between March through September with budgeting, boat stickers, etc. Steve said that there probably wouldn't be very many meetings during March because that is when they start planting season. Dave Meisenheimer volunteered to help with taking the minutes of the TAC meetings.

Steve Larry – WPC Vice Chairperson – Steve volunteered to be vice-chair, but would like to have more members present to discuss appointing a chairperson. He asked Rebecca to be the facilitator for one more meeting to make that happen. Steve said that it would be nice to have a well-known stakeholder take on the role of chairperson because other stakeholders in the watershed would be more likely to know and relate to that person.
Dan Boehle – Help take WPC Minutes – when Becky is not available to take the minutes, Dan will take the minutes or record the meeting and pass it on to Becky to type up.

b. **Committee structure: separate or one committee with sub-component.** Steve suggested that the two committees could continue to meet together unless it becomes a purely technical or purely planning based meeting. Joe Rush said that it may be difficult getting the two groups together on a continual basis since they each have different times that the watershed planning committee and TAC meets. Sharon Hartzold said that January through March the WPC may be more available to meet during the day as they are not out in the fields. Dan Boehle said that livestock operators may still have issues with meeting during the day. Sharon said that if the two groups meet jointly, that they have to be careful to ensure that decisions only are made by the planning committee. They discussed having a separate WPC meeting in December, coordinating the best date with the WPC members and keeping it open to TAC members to come if they'd like.

8. **Review geographic scope of watershed.** The Clear Creek watershed was defined as the areas draining in to Babbling Brook and Clear Creek and Rebecca wants to discuss it to see if that definition should be changed. The group agreed that it was a good definition of the area. Sharon said that they should look at whether they should include the area between the dam and the Rock River to keep that designation. Steve asked what the advantage was in having the area between the dam and the Rock River defined in the watershed and Joe said he is not sure but he wonders if there are more grant opportunities if it goes all the way to the Rock River as opposed to stopping at the dam and Rebecca said yes. The Rock River was a biologically significant stream, although it is no longer, in talking with the EPA they recommended that she highlight that their work would be protecting the Rock River. Sharon said that much of the work that they perform upstream of the dam would only affect the lake and so they may have to focus some specific inventories, evaluations, and possible treatment to the area between the dam and Rock River to keep that designation.

   Green River Conservation Group – Karen Rivera sent Rebecca an e-mail asking if the Clear Creek Watershed would like to partner with the Green River Group to create a plan very similar to the Clear Creek Watershed's goals, to attract Federal Fish and Wildlife funds, which, in the near future, are supposed to be much larger than currently available. Rebecca asked the group if they wanted her to explore that further. Steve asked where the Green River is and Bill Lindenmeier said that it is in Lee Center about 25 miles south east of here. The commonality between the Green River and the Clear Creek Watershed is that they both run into the Rock River. The Green River Group has a large area defined in their group of which the Clear Creek Watershed is within. Rebecca can look into what they have in mind. Steve said that he doesn't want to overwhelm the planning group with bigger plans. They may just be able to partner on certain grants.

   At their last meeting the TAC pointed out that the Clear Creek Watershed is close to two protected areas that are outside the watershed and Rebecca wondered if they needed to enlarge their focus area to go outside the watershed to look at Lowden State Park to Franklin Grove State Park. Steve said that to enlarge the scope they might be taking risks and that at least initially, he would like to stay focused on just the watershed. Sharon said that they might lose some of the credibility of their plan if they try to bring other areas outside of the watershed in to selectively include a high priority that someone has to "look good". **Those present decided to stay with the current defined geographic scope.**

9. **Review natural resource concerns and priorities.** The WPC came up with a list of resource concerns and the TAC reviewed them and put in their input. Sharon asked how the group defines a waterway – she wants to make sure that they are all thinking of the same thing (in obstacles and priorities, it is mentioned). Rebecca said that as she recalls it is the same thing and as you get into the fields and away from the streams you get into grass waterways. Sharon asked for clarification on the statement under secondary priorities and Rebecca said that they had discussed directing tiling into a wetland; however, at the next meeting they will clarify that statement.

10. **Create preliminary goals for Watershed/Water bodies** - Tabled for next WPC meeting

    a. **Restorative and remedial.**

    b. **Protective and preventative.**

    Sharon said that an easier term for people to grasp is "future conditions" as in "What are the preferred future conditions that they want to see in the watershed in 50 years." Rebecca asked the TAC if there were any recommendations that they would make to the WPC on future conditions. Sharon said that they could look at land use, land cover, current recreational and wildlife conditions and how they want them to look. What is there idea for future row crop agriculture or natural areas – do they want to sustain, improve, increase, decrease, etc. This is where we are now and this is where we want to go. The technical committee will come up with some different options as to how they get from where they are now to where they want to be.

11. **Prioritize key goals. –** Tabled for next WPC Meeting Steve said that items 10 and 11 will be what they will tackle the next WPC meeting. Sharon said that the inventory will hopefully confirm the conditions that the WPC has identified to help clarify some of the priorities that they established and perhaps they may either find that it is not as big an issue as they thought or they may take some of their priorities to a higher level.

12. **Discuss next steps.**

    a. **Assemble all ready available data**. The technical committee will next meet after they have collected and assembled some data. They have already assembled most of the data that is already available.

    b. **Visually evaluate key water bodies and natural resources.** Dave said that the NRCS has done the field portion of the rapid watershed assessment (it is down with Roger Windhorn) and they have still yet to walk the streams segments to assess those, which they will do this fall. Cultural resources - Sharon Santure has a summary of the cultural resources of the area.

    Rebecca said that she would like the TAC to provide whatever information that they have on the watershed to the WPC. If there is an aspect of the watershed that the members have expertise in then they could share it with the group and become part of the planning process to be considered. If they have a list of information that they have identified that they need or anything that they can think of then they can send it to Rebecca and she can work with them to see what they are in the process of doing. Sharon talked about census information such as demographics, ages, population, income level, farm size, typical crops.

13. **Adjourn.** Meeting adjourned a 2:55PM

Lost Nation-New Landing
River Conservancy District of IL
100 Park Drive; Dixon, IL 61021

AGENDA

WATERSHED PLANNING COMMITTEE

January 7, 2009, 7:00 p.m. to 9:00 p.m.

Lost Lake Community Center

Dixon, Illinois

1. Introduce committee leadership
2. Accept minutes from September 14, 2009
3. Watershed Resource Inventory
4. Determine watershed goals, desired outcomes, and vision for future
    a. Revisit the current conditions and rewrite as preferred future conditions
    b. Categorize the future conditions as goals
5. Updates
    a. Green River Conservation Opportunity Area
    b. NRCS Rapid Assessment
    c. Next steps
6. Adjourn

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive; Suite A
Dixon, IL 61021

NRCS Natural Resources Conservation Service

Minutes
WATERSHED PLANNING COMMITTEE

January 18, 2010 12:00PM to 2:00PM

Lost Lake Community Center

404 Lake Court, Dixon, Illinois

Committee Members	Guests	Coordinators/Employees
Ed Bettner – Chairman Steve Larry – Vice Chairman Dan Boehle – Secretary Joe Baker Marian Baker Bill Kleiman Sherrie Taylor	Nola Colwell Curtis Fruit Richard Gates Jerry Sellers Audrey Taylor Les Taylor	Becky Breckenfelder – LNNLRCD Admin. Manager Rebecca Olson – WPC Coordinator Shannon Thruman – Olson Ecological Assistant

1. **Introduce Committee Leadership** – Steve made some opening comments regarding the formation of the Watershed Planning Committee. He stated that the Clear Creek Watershed consists of 10,000 acres that drain into Lost Lake, which subsequently feeds downstream to the Rock River so what the committee does is much more far reaching than the lake. The goal is not necessarily to take care of the lake but to take care of the whole ecosystem. Ed Bettner has agreed to chair the committee with Steve Larry as Vice-Chair and Dan Boehle as Secretary. Becky Breckenfelder takes the minutes of the meeting as her schedule allows and Dan's role will be to take minutes when Becky is not available to. Rebecca Olson is a consultant to the RCD and facilitates the meetings. Shannon Thruman works with Rebecca. All the committee members introduced themselves.

2. **Approve minutes from September 14, 2009 Meeting** – Steve motioned to approve September 14th meeting and Dan seconded the motion. The board approved the motion unanimously.

   Funding – Rebecca Olson – Rebecca said that the RCD initially funded the start up of this committee and hired Rebecca to be a grant writer. There are two sides to the EPA, the regulatory side and voluntary grant side – we are working with the grant side. Rebecca talked to the EPA regarding grants that they have available for groups that want to get involved in voluntary watershed planning. They are also a good resource for support if an individual landowner wants to do something on their planning. The RCD requested $88,000 in funding for the watershed planning process and the EPA granted that funding, with the RCD required to match $22,000. The planning process will take approximately 2 years to complete with the goal of creating a written plan that states very objectively where some of the priority areas are. In all fields, especially the environmental field there is very limited resources in terms of money and technical support. They have to figure out where they are going to get the "biggest bang for their buck", for

example, if they want to clean up the water, they would ask themselves which projects they want to do at which locations. Whatever the goal may be the plan will identify what the best priority projects would be, then opening up the door for support of those projects. They would then go back to the EPA and say – this particular land owner wants to do this project on the creek and this watershed plan says that we have identified it as a priority. Because it would already be identified as a priority it would have a good chance of getting approved. They don't have to just work with the EPA - there are lots of grant sources out there. The RCD has a demonstration project that they want to do on RCD property located at the mouth of Babbling Brook (Indian Creek) that would involve several stabilization techniques and so have asked the EPA for grant money to do those projects. The RCD is also stabilizing its own properties on the lake and has been working with Joe Rush to determine what is best for the lake. Steve added that with the match, the RCD has to account for everything they do and they have to match 25% of the grant in money or services. (Becky said that they have met about $20,000 of the $22,000 so far). The EPA is pleased when a requester shows that they have spent their own funds and time on a project.

3. **Watershed Resource Inventory –** This is the 4th meeting of the WPC – on the first meeting they identified what they were concerned about and what they wanted to do and asked property owners if they would like to be a part of the process. On the second meeting, they identified what the priorities, strengths, and weaknesses were for the watershed. At the third meeting they had a joint meeting with the TAC (technical advisory committee. While the WPC is in charge with coming up with the priorities, goals and leadership of how the community wants to proceed, the TAC is made up of knowledgeable people in the field that would have the expertise to provide technical assistance, for example, many government agencies such as Ogle County Zoning and Planning, U of I, NRCS, state of Illinois, etc. They can let us know what information they have on a concern that is in their area. The TAC looked over what the WPC had identified to see if they were on track or missing anything. They had very few comments, but Rebecca added those in and in September both groups met to go over it so that it was a solid list. Becky added that they also formed the leadership for the WPC at that last meeting. Rebecca said that at this meeting, they are going to be looking at that list of priorities and using it to make their goal. Rebecca and Shannon have been gathering the information for the watershed – the EPA would like to see a Watershed Resource Inventory by this May. They are trying to pull together readily available information (much of it is computerized such as GIS) and some of it they have to dig a little deeper by talking to the people and agencies that know this watershed and have folders of information that they have been looking at. For example, what types of fish are in the creek, what are the soil types? The inventory that they create will become a chapter in the watershed plan. They mailed out a memorandum outlining the goals of the inventory for the WPC to review and at the next meeting they will talk about the inventory.

   Rebecca has been working around NW Illinois for nine years in the field of natural resources and this area is really special – as far as natural resources, it is a very important area with a lot of protected land and state parks. There are also migratory routes that pass through here because of the expanse of forest that is here, a bird has this area of forest and then nothing until the Mississippi River – that is actually recognized at a federal level. This opens up more opportunities for federal programs such as the Forest Legacy Program. Some landowners in this area have received grants through the Forest Legacy Program to protect the mature forest that they have on their land.

   The state recognizes this area as well, with the most recent recognition being as a conservation opportunity area. There is a comprehensive plan for the state of Illinois for wildlife called the Wildlife Action Plan that covers the whole state of Illinois and what species are of concern in certain areas. This area has two recognitions under that plan – the Nachusa/Lowden…Miller Conservation Area and the Rock River Opportunity Area and if the state had any money; they might give it to us rather than someone else. The Clear Creek runs into what was known as a biologically significant section of the Rock River (the updated plan doesn't have it but perhaps the lower half of the watershed could be covered by that area). Ed asked Rebecca what the dark grey area on the inventory represented and Shannon said it represented information that is out there that still needs to be gathered from others (like soil type) and the light grey is information that is not available that they would have to actually go out and specifically gather themselves. Steve asked if the NRCS has access to this information and Shannon said yes and added that a lot of the information is easily gathered through GIS and other services. Steve said that some of the things that they are doing within the grant require this information and there is a report that Rebecca is putting together that has to be submitted to the EPA by May.

4. **Determine Watershed Goals –**

a. **Revisit the current conditions and rewrite as preferred future conditions –** Rebecca passed out copies of a report that they came up with earlier in the watershed planning process that is a summary of some of the computerized information that they gathered. Ed said that usually the NRCS has a representative at their meetings, however, because today they are off for a federal holiday. Don Hay and Dave Point are regular members of the committee that were not available today. Rebecca added that they would love it if they would all become a part of the committee and come to the meetings regularly and if they know anyone who would be interested in just coming and seeing what is going on or becoming a regular committee member, please let them know.

Rebecca handed out copies of the current conditions and priorities identified by the committee and explained that they are just looking at the goals that they would like to see happen rather than measurable objectives, which will come at a later meeting. For example, today they can decide that they want to fly to the moon and later they can decide how they will get there. Rebecca said that they are going to take the priorities that they have listed and try to rewrite them as what we want to see in the watershed. Jerry Sellers suggested that Rebecca put the watershed map up and show everyone how far in each direction the watershed goes. Rebecca pulled up a map and Steve said that they have determined that Babbling Brook is actually known as Indian Creek – a landowner renamed it Babbling Brook but the real name is Indian Creek. Ed said about 10-12 years ago Doc Orland passed away, one of his last wishes was to change the name of the stream and the year that he passed away, they renamed it - prior to that it was always know as the Clear Creek, the North Branch. Ed said that when Jerry had mentioned it being called Indian Creek, he didn't recall ever hearing that name. Steve said that Jerry told him that the maps indicate that the name is Indian Creek. Ed said that he thinks that it is Babbling Brook and we'll grant Doc Orland's wishes and keep it Babbling Brook. Ed helped Rebecca pinpoint roads that run through the watershed including Stone Barn Road, Lowden Road, Lighthouse Road, Hay Road, which turns into Carthage and runs south, Daysville Road and Hoosier Road. Jerry said that it was interesting to note that Nachusa owns about 10% of the watershed. Sherrie Taylor said that the creek that runs behind her house has quite a bit of tributaries that feed it and was wondering if most of the others from that or are there springs feeding them – do they know where most of the water is originating from? Rebecca said that they don't know that yet –someone said that the Fruit property is spring fed. Ed said that most of the lower ends where the creek starts to take form, is bigger and you see the trees form are typically spring-fed and where they see farm fields, most of that is run-off and tiled fields. A guest said that there is a huge spring east of Daysville that they were thinking of selling water out of at one time and the creek through the Fruit property has never run dry – someone said that they think that that spring is fed all the way from Wisconsin.

Rebecca asked if the watershed committee sees the current conditions, such as row crop agriculture, as being the preferred future conditions and what is important to the committee?

Preferred Future Conditions

Land Use:

- **Agriculture (crops/livestock/grazing)** - Dan Boehle said that from his standpoint agriculture is important as it's his livelihood, Ed added that it although it doesn't have to be row crops –100 years from now they could all be grazing cattle. Steve said that this is a very rich agricultural area from a land standpoint and he doesn't see that changing. Ed said that the good soils are going to stay row crop and the poorer soils are going to be used for grazing land.
- **Protect Natural Areas/Wildlife Habitat**
- **Artesian and Natural Springs –** Bill Kleiman said that the springs are important to the life of the creek and stabilizes the temperature of the water
- **Lost Lake and ULLPOA Subdivision**
- **Ogle County Comprehensive Plan (on website)** Ogle county's master plan foresees keeping much of the agricultural and rural characteristics while projecting Rochelle and Oregon's potential growth. Rebecca said

that she is adding that to the list of things to research; it is on the website and Steve said that she can talk to Mike Reibel with zoning and planning about that too.

Soil Productivity:

- **Many different soil types**

- **Protect Class A soils on the east side of the watershed** – Joe Baker suggested that class A soils (that start on Lowden Road and flow south and east) would stay used as row-crop agriculture

Hydrology and Stream condition of the watershed:

- **Manage water runoff and Deter Flashy Hydrology** – Steve asked them to explain flashy hydrology and Bill Kleiman said that it occurs when rain hits the watershed, causing the creeks to rise immediately, causing a lot of damage and then goes back down rapidly. The more developed a watershed is, the more instances of flashy hydrology that occur. Bill said that they don't have any flow meters at the entrance of the lake and they should probably have one so that they can measure over time what the rate of water flowing in is. You empty them once a month or every 3 months. Sherrie asked if they have an inventory of where the field tile is in the watershed and how much they catch and how much flow they catch - is something that they need to be concerned with in the future? Marian said that when a farmer wants to put field tile in, he hires someone to put it in exactly the way it is mapped and Ed said that typically all landowners have a field map that shows tile within that field but there is nothing saying how much water is going through that tile. Newer tiles are pretty well known, but older tiles aren't recorded very well at all. Shannon said that a lot of the watershed research inventory actually has maps of all of the current tile in the whole watershed. Rebecca asked where they can get the map of tile that Marian and Ed were talking about Ed said that typically the guy that does the tiling leaves you with a map of the size and location of the tile that he installs on an individual landowner's property. Perhaps some of the information (that Shannon is referring to) came from when the government funded some of the tile and you had to report where you had it installed. Rebecca said that there are some major connections to water quality and tiling, which has to do with how substances of fertilizers are carried off – phosphorus stays on the surface and is carried off with run-off while nitrogen sinks into the soil and is carried off by the tile. Many times when they start with wetland restoration they begin by breaking tile in an area where they want the wetland. Wetlands are really important for cleaning water before it travels on to streams. Steve said that it would be nice to know something about the tiling that is in the watershed. Shannon said that it is important for them to know what goals are important to the group so that they spend their time on those goals. For example, if the group felt that horseback riding was important than it wouldn't make sense to spend their time researching tiling. However, if they determine tiling to be important, then they would spend their resources on that. Rebecca said that when it comes to prioritizing goals today, Rebecca wants everyone to vote on it by putting a check by the goal that is important to them.

- **Repair Existing Undercut Banks/Decrease Bank Erosion -** Bill Kleiman said that you can repair the existing undercut banks, however, if you can decrease the severe flooding that helps keep your banks intact. You can't riprap every bank in your creek for various reasons and the creek will change its course over time anyway. Rebecca said that they could try to decrease the amount of new undercut banks and addressing the undercut banks that they already have. Joe Baker said that banks are expensive to maintain because you have to put something pretty heavy so that the water won't move it but if you get the flood that we got, it'll move anything. Joe said that they have a couple farms where they have actually straightened the creek because the meanders will run up against the side and tear the whole side down. They are going to need government help if they are going to address the banks. Rebecca said that the preventative goal is trying to decrease the undercutting that is occurring while restoration involves repairing the undercutting that they already have. Rebecca said that restoration is usually a lot more expensive than prevention, however, she

doesn't know whether this specifically (would be more expensive). Shannon said that some of the goals of other watershed have been to have a educational consultant to talk about bank erosion, ecology and the latest products out there. Steve said that that is exactly what they want to do at Babbling Brook – put in a multitude of stabilization method examples to use as a training and educational tool that shows different forms of controlling bank erosion. Jerry said that on Babbling Brook, the Gabion baskets that were put on there in the 90's held pretty good and Gabions aren't really expensive – they are big wire baskets full of rock that are laid on the side of the bank. The Gabions held, but what didn't hold was the shoreline behind the Gabions.

Recreation and Wildlife Values

- Wildlife
- Horseback Riding
- Fishing and Hunting
- Boating
- Swimming
- Nature Tourism
- Trapping
- Rural Lifestyle

Strengths

- **Maintain the current percentages of land use** – Ed asked how they came up with the percentages and Rebecca said that they came off of GIS reports. There was some question as to the accuracy of the percentages; however, the committee agreed that they wanted to maintain the current use of the land.

Natural Resource Prioritization

Top Priority

- **Minimize Creek Bank Erosion** – Ed said that an easy way to attain that goal is for individual property owners to look at their own property to see what they can improve to slow erosion. Sherrie asked what the definition of the area of original concern was and Rebecca said that the TAC came up with that and it refers to wherever concerns they had in mind when they made the list - they are not located on any map. Steve said that what he sees as a top priority is the minimize creek bank erosion with the smaller bullet point explaining methods of how to do it. Ed said that they want to focus on landowners who own the land where the worse problems are.

- **Save Class A soils and other soils** – Ed said that he thinks it's pretty important to the farmers in the area to preserve the soil.

Secondary Priority

- **Minimize Row Crop Erosion** - implement best management practices to use as examples (such as break tiles to create a wetland)

Low Priority

- Reduce runoff,

Other Priorities

- **Protect wildlife and the rural lifestyle**

- **Maintain opportunities for recreation, hunting and fishing**

Rebecca asked the members to step up and check off what they felt was most important, suggesting that they could check off their top five or top three important items. Someone said that they have a problem with listing only the top five because when you only list the top five, the rest of the priorities get lost. Rebecca said that they have a good point. Shannon said that she hears what they are saying, (however), the reason that they want them to do this is that when they go to gather all of this information you have to point the resource person (which is Shannon) in the right direction to gather the information. While gathering the information, if she comes across a huge watershed issue that hasn't been addressed, all of the literature says not to ignore that stuff. In the planning book, they talk about even though you bring up the five priorities; this is just a direction to start moving the train in because there is an enormous amount of information out there. Rebecca said instead of prioritizing the top five, they could leave all of the items on the list and keep them in the categories that they designated before (Top, Secondary, and Low). Steve said that they could also combine many of the goals

Sherry asked if the quality of the water is an issue and Ed said that Bill Kleiman may know more than anybody how their streams are – Bill said that they do fish surveys along the creeks but they think that the RCD has been testing the lake for certain e-coli and nutrient levels. They probably should have a goal of improve water quality. Steve agreed that that is a goal that they have. Steve said that they take water samples all the time (through the VLMP). They are working on bank stabilization, silt containment goose control, and identifying phosphorus levels.

Ed said that they need to plan the next meeting and recommended the second weekend in March. The committee agreed on March 9th at 12:00PM again. In the summer they will probably move their meetings to the evening. Steve said that they will provide a lunch again for the meeting.

b. **Categorize the future conditions as goals** – The committee checked off their priorities as 1 2 or 3 after the meeting was adjourned.

5. **Updates – not discussed**
   a. **Green River Conservation Opportunity Area**
   b. **NRCS Rapid Assessment**
   c. **Next Steps**
6. **Adjourn** – Bill motioned to adjourn the meeting at 2:02 and Joe Baker seconded the motion. The committee adjourned the meeting unanimously.

Lost Nation-New Landing
River Conservancy District of IL
100 Park Drive; Dixon, IL 61021

NRCS Natural Resources Conservation Service

AGENDA

WATERSHED PLANNING COMMITTEE AND

TECHNICAL ADVISORY COMMITTEE

March 9, 2010, 12:00 p.m. to 2:00 p.m.

Lost Lake Community Center

Dixon, Illinois

1. Accept minutes from January 18, 2010 Watershed Planning Committee meeting
2. Review and revise goals, objectives, and future conditions
3. Watershed Resource Inventory
   a. Update on progress
   b. Identify information gaps
   c. Assign individuals to provide information to reduce gaps
4. Adjourn

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive; Suite A
Dixon, IL 61021

WATERSHED PLANNING COMMITTEE
and
TECHNICAL ADVISORY COMMITTEE

Meeting Minutes

March 9, 2010 12:00PM to 2:00PM

Lost Lake Community Center

404 Lake Court, Dixon, Illinois

Meeting Attendees	
WPC Members	**TAC Members**
Joe Baker Marian Baker Ed Bettner Dan Boehle Jim Brown Bill Kleiman Dave Point	Marty McManus David Meisenheimer Dan Pierce Karen Rivera Joe Rush Roger Windhorn
Guests	**Coordinators/Employees**
Audrey Taylor Les Taylor	Rebecca Breckenfelder Rebecca Olson Shannon Thruman

1. **Accept Minutes from 1/18/2010 Watershed Planning Committee Meeting –** Marian Baker motioned to accept the 1/18/2010 minutes and Dan Boehle seconded the motion. The committee passed it unanimously by a call of aye.

2. **Review and Revise Goals, Objectives, and Future Conditions –** In January the WPC met and took the list of natural resource priorities that both committees commented on last summer and changed them into preferred future conditions. Rebecca organized and consolidated the list and thoughts that came from it and made a list of "Goals and Preferred Conditions" that consists of 6 goals, some with related objectives listed alongside. They got about half way through the concerns before they ran out of time so what is on the list is what they discussed at the last meeting as well as what was on the prior list that they hadn't had time to go through. She wants to wrap it up and accept their preliminary goals, which may change in the process as they find out more about the watershed. She would like to go through the Goals and objectives list and, in the future, she may add another column titled "Measurable Results".
   Goals

   A. Minimize Erosion & Sedimentation – Rebecca asked the WPC if goal #1 covers everything that they talked about and if they are missing anything. She added that she would like the TAC's input on the goals. Audrey asked if they were going to talk about the means with which they are going to do this and Rebecca said, "Not today, but we will". Rebecca said that after she categorized the goals she looked back over the list and felt that #6. *Reduce negative environmental impact of road improvement projects and the installation of culverts* should be an objective

under #1 because she believes that it is really talking about sedimentation & erosion and is really more of a specific thing that could fall under #1. Jim Brown asked if there anyone has any input from the DOT and Rebecca said that they could be a suggestion to formulate something like that. She asked if anyone knows if there is a process that already exists for the DOT in this area and Ed said there is a code for putting in culverts. Dan Pierce said that the DOT announces ahead of time when they do projects, unfortunately, IDOT doesn't have any control over it, rather, it is townships and counties. In the Parking Lot of Ideas, Rebecca put down the idea of contacting the group in charge of planning road projects in the area in order to keep aware of their future plans. Jim Brown said that he lives on a 3200 acre glacial lake in NW Wisconsin that has a county road that runs along side it and in several places where the road comes down low is adjacent to the lake and they are getting a lot of erosion there to the point where the shoulders are collapsing on them. When they did their watershed study, they inventoried all of those and monitored what the influx was there after heavy rains. They were able to very effectively get them to go along with reconstruction - some of the ditches that came down and had culverts; they were able to get boulders in and to blacktop the bottom of the ditch and along the shoulder of the areas a blacktop curb was installed. Rebecca said that they could look at that and the proper way to do it would be to gather the information, pinpoint on a map where the areas are and decide how to go forward and possibly make it an action item. Dan said that they can talk to the DOT about things that they put in and make suggestions if necessary; remembering that they have to follow safety standards to try to get the water off of the road that may not coincide with erosion control (practices). Ed asked if the lake has any regulations when new houses are built and Becky said that last month the RCD worked with the POA to put a paragraph in their covenants that requires the property owner to install fencing on construction sites to mitigate soil entering the lake through runoff. The RCD also adopted shoreline stabilization SOP's for re-vegetation & rip-rap for lakefront property owners in 2008.

B. Minimize Pollutant Loading – Rebecca listed the four objectives, a. Reduce the use of fertilizer, herbicides…, b. Reduce fertilizer loss from soils, c. Reduce pollutant leaching into groundwater, d. Practice conservation tillage under the second goal and added that she kept a, b, and c general because those goals apply to both lawns and agricultural fields. Bill Kleiman asked if they should also say that they are protecting the stream from pollutants in runoff as well as in the groundwater.

Jim Brown asked about infiltration and runoff and whether the Lost Lake community had ditching to get water off of the roads. Dan Pierce replied that there is ditching along the roads for standard hard surface runoff as well as a couple of culverts that run off the roads and lead directly into the lake. Jim asked how many places does the ditching system run off into the lake and Joe Rush said that there are only two places that he is aware of. Jim said that for the ditches that actually drain into the lake that between compaction and bluegrass they are probably too efficient. Joe Rush said that in some ways that is not necessarily a bad thing, especially due to the size of the watershed. We don't have a lack of water entering the lake so they don't feel that they need more water so anytime that they can filter the water through plantings, that is a good thing. Jim asked if there was groundwater and Joe Rush said that without doing any studies he would tend to believe so and even the septic systems push water through to the groundwater.

Karen Rivera asked if there are any rules for the landowners on the lake regarding the type of fertilizer that they can use on their lawns and Joe said that the RCD classified the community as a phosphorus-free community and through an educational program they are trying to help residents become good stewards of the community and reduce phosphorus. Becky said that they put out information on ways to reduce phosphorus in a bi-monthly newsletter that goes out to all of the property owners in the district. They also mailed out a Phosphorus-Free brochure to all of the district constituents last year. Joe said that it is a difficult thing to police, so they are approaching it from an educational standpoint. They are also looking at making recommendations on septic maintenance; which shouldn't cost the homeowner more than a couple hundred dollars every few years.

Joe asked what lead to committee's objective to reduce pollution leaching into the ground and surface water. Rebecca said that Shannon has been requesting a lot of data and some of the pollutants that they have been focusing on are fertilizer and septic systems. Someone asked if they had a major problem with a septic system down here and Joe said that there was a private system that failed. Becky added that the utility had to fix the sewer plant and have the city of Dixon's water company come in and pump out the tanks periodically a couple years ago. Joe said that they have a lot of livestock in the watershed as well and he wondered if there was a concern about livestock in the streams.

Bill Kleiman commented on 2a – and stated that whether a farmer uses those things or not is their business, rather, he is more concerned with it entering the streams and so thinks that the wording should be changed to reduce the amount of fertilizer, herbicides and insecticides entering the streams. Dan Pierce added that the NRCS tries to

ensure that the farmers are not putting on more nutrients than their crops can use and most farmers are aware of that. Their goal is to find a balance and for the most part he thinks that most producers do that. Marian asked if there is GPS so that when applications are made whether they can control that and Dan said yes. Marian asked in creating their objectives, how they are going to measure it and Rebecca said that that is an important step that will come later – right now they don't have to worry about how, they just have to figure out what they want to do. Ed said that the majority of the herbicides that are used today are contact killers –they are applied to the weed and are soaked into the plant rather than into the soil. Rebecca said that it sounds like they want to reword objective 2a to indicate fertilizer, herbicides and insecticides entering the stream and they want to add another objective to ensure that the correct amount fertilizers and herbicides that can be taken up by the plants is applied. Ed suggested that they could word it as "Manage fertilizer, herbicide and insecticide loss. Ed said that anytime they have a massive amount of water and flash runoff; for example, a spring thaw before snow melts, then it's going to bring down a higher rate of fertilizer into the streams. Joe Rush said that that did happen last December. Ed said that if they get heavy rains this spring after the fertilizer is down then they will lose a lot of fertilizer. Rebecca added that even when they do everything right, things can happen. Joe said that even if they can't control fertilizer loss when flooding occurs, at least, if they are doing everything right, over the long run, it'll make a difference. Karen Rivera asked if they manage a lot of the fertilizer runoff through buffer strips along the stream and Ed said that typically they don't farm right up to the creek bed – there are buffer strips; however, anytime the ground is frozen, even a buffer strip won't help. Dan suggested that they could add even more buffer strip area to what is already there. Karen said that they could increase the number of people who have buffer strips through an educational program.

C. Protect "Class A" and other productive soils. – Rebecca asked if there are any specific objectives that would go underneath this goal. Jim Brown asked what they meant by protecting it and Rebecca said that they want to protect the Class A soil from a land usage change like development.

D. Protect wildlife and their habitats – Jim Brown asked if, during hunting season, the deer that live in the surrounding areas congregate in the protected area of the Lost Lake subdivision. Rebecca said that she is sure that the deer do come into the protected area as the deer range is too large to think that the deer wouldn't move out of their area. Karen said that at the nature preserve at Castle Rock State Park, all of the deer move into the preserve to the point that they were destroying the nature preserve's habitat to the point that they had to allow hunting there – she can guarantee that if there is no hunting allowed that the deer are moving in there. Karen asked what type of wildlife they are targeting. Rebecca responded that she can think of a lot of examples of animals, for example, this a really important area for forest interior migratory birds. Karen said that they could create corridors to connect the significant areas that are already in place. With streams and the fish in them – if you have a stream that is channelized and muddy, it actually creates a blockage that the fish won't move through. Bill Kleiman said that they could list several strategies under the goal such as corridors, buffering, habitat areas, managing natural areas using fire, etc. Rebecca said that this would be the time to come up with the goals, not necessarily the strategies, but what she is hearing from them as strategies is buffer and manage existing natural areas, create corridors between existing habitats and reduce fragmentation. Karen said that they should come up with criteria of what constitutes a higher quality natural area vs. a lower quality natural area. For example, is a wooded area an Oak Wilt free wooded area, Dan said that they could do that –they are using GIS. Rebecca said that another objective that she sees coming from this and that is to tie into some of the planning efforts that have already been made – there are a couple of organizations that recognize this area as biologically important such as the Forest Legacy Area and some conservation opportunity areas that have been identified and whose boundaries are known. Jim Brown asked if the RCD has considered stabilization of the lakeshore and Joe said that the RCD as an SOP established for re-vegetation of the shoreline as well as rip-rap – both of those options are available to the property owner. For the upstream area, they are looking at creating an educational area to show people the different methods to effectively stabilize their shorelines. Karen said that if you start working on a stream bank, you could do more than just add rock by incorporating reptile habitat or a wetland off to the side for amphibians there is a whole other pile of money that they could tie into for that work and it wouldn't cost a whole lot more to do.

Rebecca said that there is a state wildlife grant application coming up April 2 – there are a lot of different pots of money coming up from the different organizations; for example, the State Wildlife Organization focuses on specific wildlife that is identified as in greatest need of conservation in certain plans. For implementation of a project, they would provide 65% of the funding. Karen said that there is a new partnership grant that covers this area called Fishers and Farmers that addresses streams to benefit fish. Rebecca said that there are other ones too that cover this area – she said since she has worked a lot with various groups that rather than trying to fit what they want to do into a program, they should first decide what they want to do and then they can talk to her to find out what organizations have the same mission as what they are trying to do that they should pursue for funding. They could

also talk to Dan and Dave with the NRCS because their programs are also quite extensive. Jim Brown asked about the types of groups in the area that would hold titles on land and Rebecca said that the Nature Conservancy is the one in this area and the Natural Land Institute pretty much defers to the Nature Conservancy in this area. So if it didn't fit the mission of the Nature Conservancy District then the Natural Land Institute would be the one to talk to. There are a couple of private organizations that they could go to for buying up land for conservation such as the Grand Victoria foundation and the Illinois Clean Energy Foundation. Rebecca said that some people don't like to take property off of the tax rolls and there is a way to keep the property on the tax books by creating a conservation easement, which would change the land use while the landowner still maintains ownership of the land. The Nature Conservancy or Land Institute could monitor that it remains natural. The value of it could be seen in a tax deduction or a purchase.

E. Protect the Rural Lifestyle – Karen asked if there is any public fishing in the area or whether there were any areas that they could open up to the public for fishing, canoeing, or other recreation opportunities. Rebecca said that depending on how the committee feels, they could make that a goal. Becky said that in the past the RCD had talked about cleaning up the Flagg Road Silt Basin on Flagg Road to make a fishing area. Ed said that the township looked at getting a bike trail through the township and hooking up with Grand Detour to install a crosswalk across the Rock River – there was a lot of interest in it; however, it didn't seem to progress very far. Byron was real big on it and until they open up between Byron down where Lowden State Park is at, this area is not really being looked at. Once they get Byron down to Lowden Park then he thinks that their plan will kick in. Karen said that things don't start getting looked at until people start asking for it. Rebecca said that grants like to see plans – they like to see the effort that they are going through right now and on paper – then they are more likely to get funding for a project. There are some hunting opportunities available by the Nachusa Grasslands. Becky said that perhaps the reason that they are not focusing on creating more public opportunities in the watershed is because there are already so many public options nearby on the Rock River and Lowden and Castle Rock State Parks. Ed said that he could see them installing public trails in the future and that it is very doable. Rebecca said that she would add support opportunities for recreation, hunting and fishing and that when they get to their strategies, they can talk about it again.

3. **Watershed Resource Inventory**

A. **Update on Progress –** Rebecca said that they have been working on the watershed resource inventory and have accumulated a great amount of information for it, for example, Marty McManus gave them a lot of information on the watershed's soil and geology. Shannon has spearheaded that and although they have a lot of information already, they need more. The deadline is coming up and so they are going to focus on what they are missing right now so that they can get the report written in time for the group to review it so they can submit it to the EPA by May 1st.

B. **Identify Information Gaps –** Shannon went through the memorandum that outlined what the data they are collecting for the Watershed Inventory. They need assistance on

#4: Groundwater/Surface Water as far as how much information the committee wants them to pursue. It is complicated to explain the connection between the two and they may want a speaker to explain it. She asked if there was anyone that would be able to help them with this or guide them to someone that could.

Karen asked where they got the designated use information from and Rebecca said from the EPA. She asked if they did Lost Lake and Rebecca said that they have it listed it hasn't been identified as impaired because the EPA hasn't sampled it. The EPA has sampling and categorization and they have categorized some streams as impaired according to criteria that they measure. Becky said that she recalls an e-mail that Joe Rush sent a couple years ago that said that the diversity of the micro-organisms of Lost Lake were very good and wondered if those tests were considered. Joe said that that was a report from Diane Caruso from the EPA so he is trying to understand what they are talking about. Karen said that the DNR works in conjunction with the EPA when making an impaired designation, which usually comes from their basement survey– the DNR samples the fish and the EPA tests the water quality and sediments. They also do other tests that the DNR doesn't do involving monitoring sites all over the state. Karen said that if the EPA has a monitoring site on Lost Lake then they can get all kinds of information - usually any kind of lake that has a lot of public use they have monitored. They could call the EPA to find out if they have a monitoring site or if they would consider adding one. Bill Kleiman said that they did a sampling of Ed Dewalt's property on Clear Creek for them for macro-invertebrates and asked if Karen did fish sampling for them on Clear Creek and Karen said she did a sampling of Nachusa Grasslands. Rebecca asked if they did any tests on water velocity and Bill said that they started doing it using a ruler on the bridge on Lowden

Rd that Clear Creek goes under – they kept data for awhile but then it got pretty tedious. Rebecca asked if the data was still relevant and Bill said the whole purpose of using the ruler was to build up an argument that they need a data logger to make it easier to collect the data. Karen said that the DNR was putting up temperature loggers on a lot of streams all over N. Illinois to try to locate cold-water streams – she can look and see if they put any on Clear Creek.

#5: Irrigation: Shannon asked if anyone knows of any farmers who are using irrigation in the watershed and someone (Ed?) said that the Caldwell farm on S. Carthage Rd on the far east and there is irrigation on Stone Barn Rd between Daysville and Hoosier – that is the only irrigation that he knows of in the watershed.

#6: Drainage: How do they classify a ditch vs. a tributary vs. a creek? Karen asked if there was some kind of rules for the ditches on private property that carry runoff to streams and Dan said that there are strict rules about manipulating natural streams and how close to a stream a ditch is dug. Property owners are pretty good about following the rules. Livestock waste is carefully monitored. Drainage tiles - on some of the aerial photos they can actually see the pattern of the drainage tile. How much info does the committee want to gather – do they want to contact every farmer or go off of the aerial maps? Dan Pierce said that the photos aren't going to show much unless they were constructed within the last year. There is a lot of drain tile that some of them don't even know is there. Someone said that you could look at soil type which might be more accurate. Dan said that drainage contractors typically keep records but they change often and it would be a nightmare to try to find information that is 40-50 years old. Karen asked if it is important information to have and someone said that if there was a landowner that wants to work with the watershed committee to do something a little progressive like creating a wetland to filter the water that their drain system goes into then you could find out where their tiles are. Rebecca suggested that they could make a statement about the likelihood of the existence of drain tiles based on soil type.

#7 Floodplain Boundaries: Have a lot of data but need someone to explain in paragraph form why flooding can create problems when a natural flood plain has been taken for other uses. She would like committee members to list on the map provided areas, with dates, that have been affected by flooding and any known damage estimates.

#8 Municipal Industrial Point Sources: finding storm water outfalls, illicit discharges. Jim Brown talked about looking at septic system repair permits and Shannon said that the only way they can do that is to get a FOIA on permitting on repairs that have been done on every single address in the watershed and that would be very time consuming. The most important ones would be those closest to the streams and lake.

#10 Hydraulic Modifications: Shannon asked if someone was interested or knew of someone interested in writing an explanation of the detrimental effect that hydro modification has on the biological characteristics of the stream system. We are working on some projects with Wendler Engineering already and Joe said that they could see what it would take for Dick Bauman of Wendler Engineering to do it for them – Dick may have something based on some of the silt basin design study that he could give them.
#11 Storm water management/residential non-point run-off: Joe said that with residential run-off (roof, management of property, asphalt) all of those come into play as to what the impact of hard-surface run-off would be. Joe said that there may be road areas that are not draining properly that are creating an impact in those areas – he has talked to Shannon about those.

#13 Biological Indicators: Fish IBI – Explain for report – Karen has a tape that she can send them that has the categories on it.

#14 Chemical Parameters: They don't have a lot of info on this and EPA has asked them to gather info on this.

#15 Priority Wetlands: If anyone knows of any organization that have similar priorities to the watershed committee, please let Shannon know - she will also be calling various organizations to find out.

#16 Soil Classifications: Marty did a great job getting info for soil classification.

#17 Soil Erosion: NRCS is doing a rapid assessment. Dan said that they are waiting for ice melt and that it would really be pushing things to have the info by May 1st – perhaps they can have a preliminary report of some kind.

#18 Geology - They have very general data on the geology of the area.

#19 Topography – NRCS office has topography maps

#20 Land Use/Cover

#21 Pollutant Loading: They don't have a lot of information out there and she doesn't know where to go. Joe may have info on this from VLMP.

#22 Best Management Practices (BMP): Have a lot gathered. If anyone is doing BMP's and is not in and NRCS or SWCD program – let them know. Where and what are they, what is the effectiveness? Ed talked about trying to get a plan together (75 acres) to water livestock using the creek – it will probably involve using some rock to put in designated crossings on the creek.

#24 Wildlife: Has some good information. Joe asked if they are concerned with goose management because they have been doing that at Lost Lake for a few years now. Karen asked if they checked the ENT list for hits in the area and Rebecca said yes. Rebecca said that instead of documenting a list of all of the wildlife species that has been documented in the area, they are only taking the species that have been identified as in greatest need of conservation or endangered (using the Illinois Wildlife Action Plan Report) and go through all the sources that they know about to find out which ones are in this watershed. Karen said that they have to go through a CIRP review and part of that process is looking at an internal endangered species database to see if there are any hits - Rebecca asked if that involved EcoCat and Karen said she didn't know and added that she could access the database for them. Rebecca said that would be good – she has done the EcoCat report herself and it comes up with hits – they don't know if it is the same information or not. Joe said that the RCD has records of fish species found in the lake as well.

#25 Socio-Economic/Human Resources: Sherrie Taylor works for the center of governmental studies and has provided a list of the socioeconomic makeup of the watershed. Joe said that the RCD put out a survey of all of the property owners in the district in 2008 that has questions about their attitudes on the lake and watershed that should be of some help to them. Becky said that they had about a 35% response rate to the survey. Land use – they want to get land use/land cover info – there are two ways that they can do it, either go to the FSA for that information or, if there are not a lot of farmers to contact, they could ask the farmers themselves what they planted last year. Jim Brown suggested that they could go off of the FSA aerial photos to figure out what was planted. Karen asked if there was anyone on the committee from the Blackhawk RC&D and Rebecca said Dave Dornbusch. Karen said that they have a lot of land use records and GIS. Dave Meisenheimer said that he can submit that he can give a percentage rather than exact acreage, for example, about 75% planted corn. Jim said that the department of revenue should have a record of statements of assessments from last year and look at the number of acres that are on there and perhaps what the land use is – he said that he can check on that.

C. **Assign Individuals to Provide Information to Reduce Gaps**

4. **Adjourn –** Meeting adjourned at 2:25PM. Ed motioned to adjourn; Jim Brown seconded the motion.

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

AGENDA

WATERSHED PLANNING COMMITTEE

July 13, 2010, 2:00 to 4:00 p.m.

Lost Lake Community Center

Dixon, Illinois

1. Accept minutes from March 9, 2010 Watershed Planning Committee/Technical Advisory Committee joint meeting.
2. Accept or revise preliminary goals, objectives, and major focus.
3. Project updates:
   a. Watershed Resource Inventory and next steps (Grant No. 3190816).
   b. Babbling Brook & Lost Lake Stabilization Project (Grant No. 3191003).
   c. Lost Lake Silt Containment Area (Grant application for 2010).
4. Explore possible WPC involvement for:
   a. Educational outreach aspects of Grant No. 3191003 and proposed 2010 project.
   b. Silt containment program.
5. Explore and WPC provide direction for:
   a. Watershed-Based Action Plan.
   b. Potential projects (landowner outreach, implementation of BMPs…).
   c. Utilize current project funding as "match" for future projects.
6. Adjourn

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive; Suite A
Dixon, IL 61021

Minutes
CLEAR CREEK W ATERSBED PLANNING COMMITTEE

July 13, 2010 2pm to 4pm

Committee Members	Ed Bettner - Chairman Steve Larry - Vice Chairman Dan Boehle - Secretary Joe Baker Marian Baker Dave Point Dave Meisenheimer
Coordinators/Employees	Beck Breckenfelder - LNNLRCD Admin. Mgr. Rebecca Olson - WPC Coordinator Shannon Thruman - Olson Ecological Assistance

President Bettner called the meeting to order at 2:05pm. Minutes of the March 9, 2010 meeting were approved on a motion by Steve Larry and seconded by Marian Baker.

Committee members introduced themselves.

Steve Larry explained to the guests the history of the watershed planning committee, the assistance of the technical advisory committee, how Rebecca Olson was brought in as a coordinator, and how the RCD web site and Becky Breckenfelder's time is provided by the RCD. He further explained the EPA Grant which requires a 25% match that has been satisfied by volunteer hours of the committee and the RCD. Further explanation is on the web site.

President Bettner explained that the committee has been working on their goals and asked Rebecca Olson to lead the review of the goals. She presented "Draft Two of Preliminary Goals and preferred future Conditions", After some discussion regarding '.Class A" land, Joe Baker moved and Marian Baker seconded that the goals and preferred future conditions for the WPC be adopted. Motion passed.

Steve Larry proposed the following, Success Mission Statement:

"To minimize the amount of pollutants entering the watershed by recommending, instituting and maintaining environmentally sound practices that support the ecosystem and the productive use of the land that is inclusive of the Clear Creek watershed."

Steve made a motion to amend the previous motion to include it with the goals and preferred future conditions.

Dave Meissen had concerns about portions of the statement including the word "entering", the word "pollutants" the word inclusive and thought the type of practices should be clarified.

After further discussion Steve amended his motion and Dave M. seconded it to adopt the following success/mission statement.

To minimize the amount of identified impairments impacting the watershed by recommending, instituting and maintaining environmentally sound conservation practices that support the ecosystem and the productive use of the land that is within the Clear Creek watershed."

The motion was approved.

Project Updates:

Rebecca - The watershed inventory was submitted to EPA in May and has been approved. No action is needed now but she would like another meeting before harvest to identify the next step. Between now and then Rebecca and Shannon will be identifying additional inventory and information and doing a literature search to provide a guide for high priority practices.

Babbling Brook - Lost Lake Stabilization Project

Steve reported on activities of RCD and the approval in May of a $520,000 grant written a year ago to stabilize the shoreline along Babbling Brook from Lost Lake to the boundary utilizing different methods of stream bank stabilization. The grant application was written to include this as a teaching tool for the Lake. The state and other communities to show how each practice worked. An organization of Steve, Rebecca and Joe Rush are working on this now.

Lost Lake Silt Containment

A $650.000 grant application will be submitted at the end of July for silt containment at the end of Babbling Brook. A map showing the area was provided. Steve explained the wing dam and the break wall shown on the map. It is different than the Clear Creek silt containment structure. The containment area should contain 70-80% of the silt entering the area before it reaches the lake. It can then be cleaned. Part of the project *is* to clean the area before the dams are put in place. RCD does not expect to hear whether the project is approved until May of20II.

A discussion was held on the effectiveness of the Clear Creek containment area .. the slowness of Clear Creek above the lake to clear up after rains, the tact that the lake *is* murkier than normal for this time of the year and the fact that the beach has been closed because of e-coli.

Educational Outreach

Rebecca is looking for a college class to be involved with the teaching portion of the Dabbling Brook Lost Lake stabilization project that was a part of grant (3 J91 003). She would like a "before and after" video. Marian suggested NIU Taft Campus. North Central College was also suggested.

It was also agreed that the WPC would host tours of the project.

Also, Rebecca would like data on lake clarity before and after the project. Before data has been collected for several years and is available. This data will help determine how well the silt containment project is working. The lake is not as clear now as it has been in the past

Rebecca suggested that the watershed action plan be postponed until the next meeting.

Rebecca is looking for direction from the committee for a potential project

The money from the EP A grant to RCD can be used as a match for other grants provided they are not EPA or federal grants. This EP A money could be used to leverage additional funds for potential projects that enhance the present grant. Once the money is utilized, it is gone and cannot be regained. If there are potential projects the committee needs to proceed now. Land owner outreach and implantation of BMP's, etc. are examples.

Such a project would be geared toward natural area acquisition, natural area protection, and water and land protection projects.

Rebecca used an example of the Sugar River natural land institute project. They tied a land owner outreach to their project, asking land lords if they have an interest in land stabilization. Several projects were discussed. The consensus was to offer additional incentives to NRCSIFSA funded projects and to prioritize where we would get "the best bang for the buck".

A different opportunity would be preserving natural areas by acquisition or by conservation easement. Working with the Pegasus wetland was suggested.

The question was asked if there were regulations for road improvements in the lake community. The committee does not regulate rather it suggests and offers opportunities.

Rain gardens were explained as a way to contain water.

Rebecca and Shannon explained the map of the Clear Creek water shed and the locations of flood damage.

The next meeting was set for September 14, 2010 at 2pm.

Marian moved, Steve seconded the meeting be adjourned - Motion passed.

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

Natural Resources Conservation Service

AGENDA

Watershed Planning Committee and Technical Advisory Committee

Executive Session

September 14, 2010, 2:00 p.m. to 4:00 p.m.

NOTICE CHANGE OF LOCATION

Nachusa Grasslands Headquarters (in the red barn)

8772 South Lowden Rd., Franklin Grove, Illinois

1. Accept minutes from July 13, 2010 Watershed Planning Committee meeting
2. Initiate succession plan for committees.
3. Update – EPA 2010 draft assessment of Lost Lake.
4. Initiate the development of measurable objectives and possible management strategies in relation to the preliminary goals and objectives.
    a. Identify environmental indicators used to measure progress.
    b. Identify possible causes and sources of pollution.
    c. Discuss potential measurable management objectives targeted at specific sources or pollutants.
    d. Discuss potential management strategies for meeting these objectives.
5. TAC - Direct facilitator to sources to develop numeric targets for pollutants of concern.
6. Choose a best management practice as a focus for a presentation at the next meeting.
7. Set next meeting date and location.
8. Adjourn.

Directions

Contact Information

The Nature Conservancy
Nachusa Grasslands Preserve
8772 S. Lowden Road
Franklin Grove, Illinois 61031
Phone: (815) 456-2340
Fax: (815) 456-2342

From Chicago and points east:

- Take I-88 West (East-West Tollway)
- Exit at Route 251 North (Rochelle) to Route 38 West (To get on 38 West in Rochelle, you need to follow a few signs due to one-way streets.)
- Travel through Ashton and into Franklin Grove (approx. 16.5 miles), go two blocks past Casey's gas station and turn right (north) at Daysville Road/1700E (sign: Franklin Creek State Park)
- Travel 1.5 miles north to Naylor Road/1950 North, then turn left (west) and go 2.2 miles to Lowden Road/1500 East
- Turn right (north) and go one mile to entrance on left.

From South:

- Take I-39 to Route 38 West
- Then, follow previous directions. (Route 38 makes a few turns in Rochelle so follow signs.)

From North (I-39):

- Take I-39, and exit at Route 64
- Go west towards Oregon, Illinois for 16 miles to Daysville Road/1700 East, which is just before Oregon
- Go left (south) on Daysville for 2.5 miles to Lowden Road/1500 East (just past LaVigna Restaurant)
- Turn right and continue southwards on Lowden Road for eight miles (you will pass Flagg and Stonebarn Roads) to entrance, on the west (right) side of the road.

(http://www.nature.org/wherewework/northamerica/states/illinois/preserves/art15492.html)

Local traffic:

- Travel 1.8 miles south of Flagg Road on Lowden Road.
- You will pass Stone Barn Road.
- There is a sign for "Preserve Headquarters" on the west side of the road. The meeting is in the red barn.

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

NRCS Natural Resources Conservation Service

AGENDA

Watershed Planning Committee and Technical Advisory Committee

Executive Session

September 14, 2010 2:00PM-4:00PM

NOTICE CHANGE OF LOCATION

Nachusa Grasslands Headquarters (in the red barn)

8772 South Lowden Rd.; Franklin Grove, Illinois

Attendees

Ed Bettner
Becky Breckenfelder
Bill Kleiman
Marty McManus
David Meisenheimer
Rebecca Olson
Frank Ostling
Mike Reibel
Joe Rush

1. **Accept minutes from July 13, 2010 Watershed Planning meeting** – Ed Bettner called the meeting to order at 2:04PM. Dave motioned to accept the minutes with a correct of Dave Meisenheimer's name. Bill Kleiman seconded the motion. Approve unanimously.

2. **Initiate succession plan for committees** – Rebecca said that she would like to talk about outlining the timeframe that they are working on and start thinking about how they are going to proceed after the Watershed Plan is completed. The final watershed plan is due October 2011. They have her as a facilitator until that time when the grant is completed. She wants to know how they want to continue and if they want to go forward, what scenario do they want to pursue after the plan is complete.

Education - Ed said that they have set some definite goals and now they need to decide where they are going from there. From the farmers' standpoint; Ed thinks they need to educate landowners about runoff and come up with some simple solutions that landowners and farmers can use to manage it. With the abundance of rain that they have had in the last couple years things have been more hectic. As a committee, they can come up with simple waterway management topics like when to mow it, what type of grasses to put on it, etc. Joe Rush asked if he wanted to create some kind of guide to educate the farmers and Ed said the simpler the better because they would be more apt to do it. If it gets too complicated and starts costing a lot of money then they (the group) won't have very good support. Rebecca asked what kind of support can the WPC provide and Ed said that they can come up with a guideline that they can use and then send out mailings to the owners. Bill Kleiman said that farmers have get-togethers where they learn best-management practices and he wondered if there were opportunities in this watershed where the watershed planning group can be a presenter to give information on things such as no-till farming and waterway management. There is a tilling seminar in January in Joliet where the EPA will be doing a presentation on nutrients. Ed said that the Ogle county extension is always putting on presentations and maybe the WPC could get on that. Bill Lindenmeier would be the contact for that. Joe Rush asked what would be barriers for farmers to attend those types of meetings and what would attract farmers to attend them. Ed said that staying local would be best – if the scope of the work went beyond the county they probably wouldn't get to many people from the watershed involved. Ed suggested a slide show showing stream banks that were eaten away vs. a nicely rip-rapped shoreline to show them the difference. Rebecca said that they have one project that has been approved from the EPA for shoreline stabilization on Babbling Brook and the demonstration of different stabilizing techniques – it will be a good opportunity as they will be planning on having pre and post construction tours. The area length is about 1100 feet in which they will be putting in several different examples of stabilization techniques. Joe asked what they would need (besides showing these different techniques) to get farmers to implement the techniques. Is there any other information that they can provide to help them? Ed said that they could show them the costs involved and what it took to get a waterway established and have it broken down. Someone mentioned cost share opportunities and Ed agreed that they could update them on the programs that are available (like through the government). Ed said that the buffer strips have been popular. Dave said that the committee structure that they have here is designed to stand alone without a facilitator and that the NRCS should be able to offer a facilitator to take Rebecca's place if resources are available at that time.

3. **Update – EPA 2010 draft assessment of Lost Lake** – They finished the watershed inventory in April 2010. They looked at all the possible pollutants that could be affecting water quality and since the watershed is mainly agricultural, they looked at non-point sources. There is also a water treatment plant that is a point source. They decided not to consider septic or developed areas because it didn't make up enough of a percentage of the watershed to make a difference. The plan is going to lean on those two sources and the education that they discussed fits right in – if that is what they are focusing on then that is what it should be about. They found an important update from the

EPA – they sample different water bodies for impairments and report them. Lost Lake was never sampled until about the same time as the inventory was finished. The new information says that there is an impairment to the aesthetic quality of the lake with the listed indicators (or causes) being total suspended solids, phosphorus and algae. The sources that the EPA listed are upstream agriculture, run-off from forest, parkland and grassland, residential deposition, yard maintenance and the dam. It will be up to the group if that will be the focus or if they would be focusing on other things. There is another impairment update on the Rock River and that is that it has a fish consumption impairment caused by mercury, polychlorinated bi-final, dam and atmospheric deposition. There are several dams on the Rock River so they don't know which dam they are talking about. They discussed the 319 grants for watershed planning and the work on Babbling Brook and how it will be easier to obtain future grants because they already have grants in place. Rebecca added that if a project is not at least $20,000, then it is not worth filling out all of the paperwork on an EPA grant.

4. **Initiate the development of measurable objectives and possible management strategies in relation to the preliminary goals and objectives** - the NRCS completed a rapid assessment, which is still being analyzed. Once the data is completed then they can decide how they will use the data and whether they have enough data or not.

   a. **Identify environmental indicators used to measure progress** – (what is in the water that tells them whether they need to improve it)
      - Silt
      - Total suspended solids (TSS)
      - Aquatic inventory
      - Fish diversity (Karen Rivera)
      - Insects (Bill Kleiman said that Ed DeWalt does an insect survey every five years))
      - Macrobiotics (EPA Diane Caruso (different last name now))
      - Water quality/Nutrient sampling (phosphorus, nitrogen, algae, chlorophyll) – Joe asked Rebecca if the EPA was concerned with blue-green algae vs. a different kind of algae and wanted to follow up on that
      - Beach closings due to E-coli (higher than usual this year) (Becky has data for the past few years on that)
      - Geese – the RCD has a goose control program in place that has been in effect for a few years now (this is the first year that they didn't oil or addle goose eggs) – they saw an increase in the young and goose droppings on the beaches so they will probably do it again next year. Other measures that they use is silt fencing along the shorelines of the beaches and low grass areas of RCD property during the off-season to discourage the geese from coming onshore, owl decoys and Mylar tape, and educational mailings to shoreline owners and Frank Ostling recommended 10' buffer strips that have diagonal trails mowed through

the grass so that the shorelines can be accessed by fishermen and boaters (which the RCD has also employed in the past and which Becky will recommend to them once again).

- Other: measure TSS at various location in stream – they discussed renting equipment or cost sharing with entities in the watershed (like the RCD)
  Joe will look into monitoring equipment on the streams to get data. They can look at the rate of the flow of water through the streams and some equipment even grabs a sample of water so that you can test it if the water velocity reaches a certain level. USGS gauging stations. They discussed getting data from weather websites such as wunderground.com. Bill Kleiman said that he would like to have readings taken in low, medium and hi flow conditions. Joe said that in high flow conditions you would have more nutrients because there would be more sediment and run-off. Joe said that if they do sampling of fish and insects and macrobiotics every 3-5 years as an indicator of water quality that after they do a project there should be an improvement in 3 years; otherwise, if there is a depredation in quality then they would have to look at what has happened to cause it. Constant weather and stream gauges go hand-in-hand because once that weather condition is gone you have no way of gauging its effect on the environment. They discussed mercury and polychlorinated bi-final and how it comes from the atmosphere or industrial sources. Joe said that PCB's might be more of a concern on the Rock River side of the watershed rather than the upper reaches of the watershed. We don't have industry in our watershed so there are no sources to look at for those contaminants. Joe asked where the watershed ends and Rebecca showed Joe what they have been using as their definition and that it just touches the Rock River. Joe said that knowing that future efforts and funding might be focused on cleaning up those types of contaminants could be helpful to them; however, it wouldn't be realistic for them to clean up the PCB's and mercury. Bill Kleiman mentioned a baseline and Rebecca agreed stating that they need to know the conditions now vs. where they want to be. Joe asked if they have information about soil loss w/ wind erosion on the farm fields and Dave Meisenheimer said that landscape changes are made it would be nice to know what was there prior to that and when they start to see trends they could see a cause and effect such as putting in 50 acres worth of buffer strips. Rebecca said that one of their goals is to create a baseline and with the measurable goals that they decide they can figure out how many acres of filter strips (for example) could go. Marty McManus said that correlating the data is important. Joe Rush asked how often they need to look at the areas on the stream banks that are affected by erosion and whether they want to put in pins and measure off pins. Joe said that most of their projects are revolving around soil management and they could look at the areas that are degrading and any improvements that have been made. Rebecca asked that if they are measuring silt and total suspended solids and they identify a problem can they take a snapshot of the area or do they actually need to put a pin in – would that give them more data? Joe said that even if they took photos from specific established locations, recently the landscape changes from one day to the next. Ed said that in the past 2 years it has changed more than in the past 40 years and how do you heal those banks up now?

b. Identify possible causes and sources of pollution –

- **Annual Tillage of Ground** - Someone said that the main cause of everything they are talking about is annual tillage of ground, the crops they put in, annual crops – if the whole watershed was grazing pasture – they wouldn't have any of these problems. Cattle on grass. Joe added that one of the issues with grazing of livestock is not excluding them from the streams so consequently they have a lot of stream bank erosion. They could have a huge impact if they just created specific watering points on the shorelines for the cattle. Joe Rush said that this watershed is an agricultural one and finding BMP's to minimize that impact is their goal because they don't want nor can they realistically stop farming. Ed agreed, adding that no-till is the best way to address crop run-off but it's the poorest answer for economics of raising corn. Year after year tillage is the way – they try to keep residue there and they come around and check their residue levels and if they have a certain slope and there's not residue then they get in trouble. For the most part the farmers try to control it because they don't like to mucking through the ditches with the equipment either. Mother Nature is out of their control and in the last two years it's been their biggest problem.
- **Cattle on the Stream Banks** - Joe asked Ed what the major deterrent to land owners to exclude cattle from their streams and how could they offset those concerns. Ed said that in hot weather the cows do like to get into the creek to cool off. They need tree cover if they don't have a place to cool off – they can't be in direct sunlight. Someone said that they talked to a grazing expert for the NRCS and he said that he would need to install fences on both sides of the creek and design it a certain way and the good thing is that they will do cost sharing on that. Ed said that with the flooding that they had – no fence in the world would have held up unless it was a ways away from the creek – he suggested them using hotwire fencing. Joe said that the stream banks need a specific slope and if they allow vegetation to establish then even a flood condition won't eat away that sediment base because the root systems will keep it in place. If they can keep the cattle off of it and grade the stream banks back to get vegetation to be established they would be in good shape. The Bettner's have the closest farm with cattle on it to the lake and they run about 65-75 cows annually. Bill Kleiman said that they retired a feedlot on their property and Joe said that they want to have on record those types of changes that affect the environment positively. Joe asked about the statement that Ed made earlier about cows naturally preferring to enter at specific points on the stream and whether they could encourage that behavior, even with limited fencing until plants are established along other portions of the stream bank. Rebecca said that she questions whether it is really as big of a cause of erosion of the shoreline as she witnessed that they only enter limited areas of the stream. Dave said that cattle concerns would be more focused on E-coli than erosion.
- **Sewer System/Septic Systems of Lost Lake Community –** Joe said that part of the community is on septic and the other part is on sewer that goes to a Water Treatment Plant (which was one of the point-source pollution concerns of the watershed). There aren't

enough septic systems in the watershed to consider it a major impact on the environment and Rebecca said that there is no organized way to know if they experience a septic failure. Joe recommended to the RCD that they require the homeowners to do a 3-year inspection of their septic systems to make sure that they aren't failing – for about $200 you can have your system tested and he feels that they ought to do that anyway for their own property anyway.

- **Extreme Weather Events**
- **Waterfowl**
- **Household Impact**
- **Farm Nutrients**
- **Pesticides/Herbicides/Fungicides (looking at farm fields, lawns and golf course)**

c. **Discuss potential measurable management objectives targeted at specific sources of pollutants**
   - **Create a Specific Amount of Acreage of Wetlands and Filter strips** - Bill said that the Nature Conservancy has a project on the Mackinaw River where they have been comparing two small watersheds – one they are encouraging BMP's on and the other they are not and they are measuring the quality at the bottom of each watershed. They think they are seeing a difference that the BMP's are making. One of the BMP's that they did is reran the tile (it cost a lot of money) on a farm into a wetland collecting pond. It doesn't look as handsome as it could have looked; however, all the runoff coming into the wetland is full of phosphorus and other nutrients but what comes out of it is a lot lower. The wetland was established in an area that couldn't be farmed easily anyway and they are seeing if they can create a habitat. Joe said that the RCD looked at establishing a wetland off of clear creek but the costs were so prohibitive for a ¼ acre it would have cost $90,000 at that area. Ed asked what that entailed and Joe said that he would have to go back and look at it, but it was through Pizzo and Associates- a lot of the work involved plantings and the maintenance of them. Someone said that he and Bill work with and have some of their budget go toward a lot of wetland work with private landowners to excavate shallow scrapes and reseed areas in the landscape that lend itself to a wetland for a couple thousand dollars. They want to keep that option in mind. Ed talked about possibly incorporating a wetland and pond on a property so that the owner could utilize it; however, Bill said that one problem could arise from pumping the tile into a pond is that it could be too nutrient rich and cause algae blooms.

d. **Discuss potential management strategies for meeting these objectives –**
   - **Access points for cattle and tree cover for shade**
   - **No-Till Farming-** Rebecca asked how it will be received. Ed said that it has been around for awhile and it has its place. Ed said that the most common practice is to no-till a soybean farm into corn as it has the huge benefits as it does reduce erosion tremendously.

- **Create Wetlands/Filter strips –** tiling surface water into a wetland and then taking it back to the stream

5. **TAC – Direct facilitator to sources to develop numeric targets for pollutants of concern –** try to choose measureable objectives so that they know when they are done. Rebecca said that there is information in the literature that would give them actual numbers on pollutant reduction of different techniques – for example: in filter strip planting, prairie grasses decrease the ground level of phosphorus by a specific amount. They discussed different goals, such as creating wetlands & buffer strips or offering support to farmers with improving their feedlots and different things that they would need to measure to know that they met those goals. Rebecca asked the TAC members if, besides the scientific literature that has data associated with prairie grasses that she mentioned above, is there any other sources of data available that they could give her because she has searched for it and it is difficult to find.

6. **Choose a best management practice as a focus for a presentation at the next meeting –** Rebecca suggested that they could use the committee forum as a starting point for the education of the community and take one of the BMP's that they mentioned and present it at one of their future meetings – she asked whether the group thought that was a good use of time or whether they felt it shouldn't be done there. Someone said that he thinks that most everyone around the table are familiar with the BMP's and know what they look like. Joe said that the group could promote the information to the rest of the community at the extension office and save the committee meetings for planning and development. They talked about forming an Education Committee to come up with topics and venues such as an open house for the public. They suggested Bill Lindenmeier as heading up that committee. Dave Meisenheimer said that he would personally love to help with something like that but he doesn't have the background to establish something like that. Ed said that he would be willing to help with the planning but he these next couple months are his busiest time and by the time his schedule frees up it should be time for them to have the get-togethers. Joe asked if there is there money available for hosting that kind of operation. Usually there are sponsors that pay for things like that. For example, if they offer a pancake breakfast to attract members to the meeting. Ed asked if they would only host it for those in the watershed or if they would open it to a county-wide presentation and Joe said that they should have it in a local venue but to include people who want to come that aren't in the watershed. Ed suggested that if they used their meeting as a presentation platform then they could use funds from the watershed planning grant to pay for the presentation. Rebecca agreed, stating that they could make the meeting longer to accommodate the program. They discussed having an open meeting in January.

7. **Set next meeting date and location** – November 16, 2010 at 2:00PM at the Taylor Township Building
8. **Adjourn** – meeting adjourned at 4:13PM

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

Natural Resources Conservation Service

AGENDA

Watershed Planning Committee and Technical Advisory Committee

December 14, 2010, 2:00 p.m. to 4:00 p.m.

NOTICE CHANGE OF LOCATION

Taylor Township Building

280 W. Flagg Rd.

Dixon, IL

(West of the intersection of Flagg and Lowden)

1. Accept minutes from September 14, 2010 WPC and TAC joint meeting.
2. Determine data needed or the Watershed Action Plan.
3. Continue the development of action items and management strategies.
4. Updates - Conceptual plan for Babbling Brook shoreline stabilization.
5. Set next meeting date.
6. Adjourn.

DIRECTIONS TO TAYLOR TOWNSHIP BUILDING, 280 W. Flagg Rd., Dixon, IL

From Chicago (2 hours) and Parts East:

Option 1) Go west on I-88 (East-West Tollway): Exit at Route 251 North, (Rochelle) to Route 38 West. Travel through Ashton and into Franklin Grove (approx. 16 miles), go 2 blocks past Casey's and turn right (North) on Daysville Rd./1700E (brown sign: Franklin Creek Natural Area). Travel 1.5 miles north to Naylor Rd./1950N, turn left (West) and go 2.2 miles to Lowden Rd./1500E. Turn right (North) and go about 1.5 miles to Flagg Rd. (stop sign). Turn left, and the Township Building is on the right.

Option 2) Take I-88 West and then follow directions from Parts South taking Option 2: Route 39 North to Route 38 West.

From Rockford (1 hour plus), IL and Parts North:

Take Route 39 South, exit at Route 64 West towards Oregon, IL for 16 miles to the light at Daysville Rd./1700E, which is just before Oregon. Go left (south) on Daysville Rd. for 2.5 miles to Lowden Rd./1500E (past LaVigna Restaurant). Note brown sign for Lowden-Miller State Forest. Turn right and continue southwards on Lowden Rd. for 6.5 miles to Flagg Rd. (stop sign). Turn right, and the Township Building is on the right.

From the Mississippi River, Dixon, IL and Parts West:

Exit from I-88 Tollway at Route 26 North towards Dixon then in town:

Option 1) Take Route 38 East for approx. 9 miles into Franklin Grove, turn left (North) on Daysville Rd./1700E (brown sign Franklin Creek Natural Area). Travel 1.5 miles north to Naylor Rd./1950N, turn left (West) and go 2.2 miles to Lowden Rd./1500E, turn right (North) and go 1.5 miles to Flagg Rd (stop sign). Turn left and the Township Building is on the right.

Option 2) Take Route 2 North out of Dixon, and in approx. 2 miles, turn right (East) on Lost Nation Rd./1950N. Go 6 miles, and the Township Building is on the left.

From: La Salle, IL and Parts South:

Option 1) Take Route 39 North to Route 30 West, go 16 miles to Franklin Rd./1650E. Turn right (North) go 6 1/3 miles to the town of Franklin Grove turn left (North) on to Elm St. go to Route 38 and turn left (West) and go two blocks, turn right (North) on Daysville Rd./1700E, (Franklin Creek Natural Area). Travel 1.5 miles to Naylor Rd./1950N, turn left (West) and go 2.2 miles to Lowden Rd./1500E. Turn right (North) and go 1.5 miles to Flagg Rd. (stop sign). Turn left, and the Township Building is on the right.

Option 2) Take Route 39 North exit at Route 38 West (left) to Rochelle. Go through several traffic lights for approx. 2 miles to Caron Rd. Turn right (North) and follow the curve to Flagg Rd. Turn left (West) and go 14 miles through the intersection of Lowden Rd./1500E. The Township Building is on the right just after the intersection.

Option 3) Take 39 North to Route 38 West and follow directions under Option 1 from Chicago and Parts East (second sentence through Ashton).

From: Peoria, IL (2 hours plus):
Take Route 29 North, go past Chillicothe and Henry, IL. Route 29 merges into 180 North, take this to Route 80 West. Take Route 80 west for a few miles to Route 26 North. Take Rt. 26, past Route 30, past I-88 Tollway and into Dixon, IL. At the first traffic light in Dixon follow Option 1 under Mississippi and Parts West.

*Thank you to the Nachusa Grasslands website (www.nachusagrasslands.org) for the directions. I altered them slightly to end at the Township Building instead of Nachusa Grasslands.

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

Natural Resources Conservation Service

AGENDA
Watershed Planning Committee and Technical Advisory Committee
December 14, 2010, 2:00 p.m. to 4:00 p.m.
NOTICE CHANGE OF LOCATION
Taylor Township Building
280 W. Flagg Rd.
Dixon, IL
(West of the intersection of Flagg and Lowden)

Members Present:

Joe Baker – Local Land Owner
Marian Baker – Taylor Township
Ed Bettner – Local Land Owner
Dan Boehle – Local Land Owner
Rebecca Breckenfelder - LNNLRCD
Steve Larry – LNNLRCD
Abby Merriman – NRCS
Rebecca Olson – Olson Ecological Solutions
Joe Rush – JadEco

1. Accept minutes from September 14, 2010 WPC and TAC joint meeting – Ed Bettner called the meeting to order at 2:07PM. The Committee accepted the minutes from the September 14, 2010 meeting with no questions or changes to those minutes.

2. Determine data needed for the Watershed Action Plan. – Rebecca reviewed an action plan for the group that would be acceptable to the EPA and serve as a template for the committee.

Chapter 1 – Who was involved, what they did, and how they came up with ideas

Chapter 2 – Inventory and Analysis (completed last May) Take a look at rapid assessment to see if they have enough data or if they need to collect on their own. When they did the grant application for the Lost Lake silt basin Dick Baumann from Wendler Engineering estimated the pollutant load coming off of Babbling Brook into the lake and then estimated that the silt basin would trap about 70% of that. Rebecca asked if he could do that estimation on a larger scale for the watershed and it sounded like he would be able to obtain the estimate using GIS information. Joe said that the information on soil types has different estimates of soil loss that would typically be experienced for that type of soil during a certain type of rain event and the estimation of the specific pollutant load reduction for taking different actions. Gives grant agencies the information on what their expected return on their investment would be and tells them that this group knows which areas are high priority areas.

Chapter 3 – Watershed Management Toolbox (ordinances, existing policies, regulations, recommendations) –Rebecca/Steve- looking at what is available and enforcing them or creating needed policies. Educate public on these. Joe - most people will use BMP's if they're not too expensive.

Chapter 4 – Watershed Management Recommendations –

- Where is pollution coming from? – make it a high priority so it is more likely to get grant assistance.
- Restate goals and objectives
- Recommend an action item
- Look at a tributary chart of suspended solids and phosphorus and take a reading before and after plan is implemented.

Chapter 5 – Take action items and areas and prioritize them.

- Who they can get to implement this portion of plan, cost, and where to get financial assistance
- Education and monitoring plans

3. Continue the development of action items and management strategies. – Rebecca led a discussion on the revision of Draft one of "Chapter 4 Watershed Management Recommendations" which will be contained in Draft two.

Goal 1: Minimize Erosion and Sedimentation

Objective 1. Decrease stream bank and shoreline erosion –

Taking water samples looking at affordable testing equipment to take readings of the tributaries. Steve suggested that they contact a local college professor and find out if they could make taking those readings a part of their class curriculum. Becky suggested that Sherrie Taylor may be a good contact at NIU for that.

Limiting Access of Cattle to the Stream – Ed said that there are options out there through the NRCS – he's been signed up for two years but haven't been funded yet. Abby said that farmers submit an application and applicants compete for a plan – they are based on priority and how many points they get in a ranking. Joe asked how the ranking is decided and so that they can know before they apply for it whether they meet the criteria for a high priority. Abby said that the rankings change annually. The more projects that are listing on an application, the more points they will get, which will make it more likely that they get funded. They have a grazing specialist out of Bloomington that covers half of the state and can write the TSP that is needed; however, because he covers such a large area it's hard for him to find the time to write a whole plan. Joe Baker said that his cattle drink out of the creek and that fencing is an expensive way to exclude cattle from parts of the stream bank. Rebecca said that limiting access of cattle may not be as high a priority versus a technique such as remeandering a channelized stream, especially if it is cost prohibitive.

Objective 2: Deter Flashy Hydrology & Minimize Storm water Runoff– Preserve priority open space, enhancing or developing wetlands. Ed suggested that they could incorporate dikes or berms to slow the water coming through and divert it to holding ponds. Steve said that he sees the divisions between farm fields (like fence rows) that would create a natural barrier between fields disappearing more and more. Rebecca asked if there was a way to encourage small farming operations and Joe said that one way you could do it would be through conservation reserve programs that give a financial incentive to the farmer to create buffer strips.

Objective 3: Reduce Soil Loss form Crop Fields – soil and contour management BMPs.

1. **Education**: Joe asked how farmers know this and Joe Baker said that they are required to follow a BMP for to prevent soil loss. Joe said that an action item of the Watershed Planning Committee could be an educational program to make sure that farmers are aware of best management practices for soil conservation. Ed said that there will be a class held by the U of I

extension at the Farm Bureau in Oregon on February 23rd from 8:30-2:00PM. He is going to attend it to see if they can get any ideas out of it. They will be talking about tillage, nutrient research, how to manage flood risks (creating dikes, etc.), & erosion control structures and practices. There is a $45 per person fee for the class. Joe asked Abby if the NRCS offers those type of services to landowners (like making recommendations to farmers on BMPs). Abby said that they will answer any questions that they would have. If the ground is considered HEL (highly erodeable land) then they require that they do a certain amount of tillage that the soil remains at a tolerable soil loss amount or less. They have an equation that they use that they put in everything they do for tillage based on the crops that they do. That generates a number of the soil loss for that location. Otherwise there are no restrictions on their land use; however, program such as CSP (conservation security program), where they are doing no-till farming the landowner can get incentives for that. One educational tool that they will be using is the stabilization of Babbling Brook with a pre and post tour of the site along with video and photographic documentation. She wants to get the TAC involved in writing up why they are doing it and what the method it in layman's terms. It'll be a public presentation and they would invite everyone within the watershed.

Objective 4: Implement Best Management Practices –

1. Use Babbling Brook/Lost lake as a pilot project.
2. Have a presentation on techniques done on Nachusa Grasslands by the Nature Conservancy

Goal 2: Minimize Pollutant Loading into Surface Waters and Groundwater

Objective 1: Manage fertilizer, herbicide, nutrients and insecticide loss- Steve saw more farmers repairing their waterways and reseeding this year so that they won't wash away - so he thinks that the farmers in this area are well-educated and will do the steps necessary to conserve their land if they can.

4. Updates - Conceptual plan for Babbling Brook shoreline stabilization - Steve asked Rebecca that if they do the Babbling Brook project right, could it be used as a catalyst for a private property owner to in the watershed to obtain a grant to perform similar stabilization techniques and Rebecca said yes. That is why part of the watershed plan is to prioritize the projects that they want accomplished within the watershed so that they can get funded.

Steve said that the RCD has obtained a grant from the EPA to fund 60% of the stabilization of Babbling Brook with the RCD matching 40% of the funding. Dick Bauman, Joe Rush, Steve Larry and Rebecca Olson walked the stream bank and came up with 5 stabilization techniques to implement there and they had the NRCS come out and walk the stream and they offered 4 suggestions that they could incorporate into the plan to benefit the stabilization and act as an educational tool for the watershed and/or other watersheds in the state. They expect construction to begin late next fall. It'll be a great tool for the Watershed Committee to use.

Rebecca reviewed the "Clear Creek Watershed Rapid Assessment" plan completed by the NRCS. The data should be available soon. Rebecca said that she'd like to look closer at the circled areas of the assessment and what data they are collecting because perhaps they can use that data.

5. Set next meeting date. Next meeting to be held Tuesday, January 11th from 9-11AM

6. Adjourn. The meeting was adjourned at 4:05PM

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

Natural Resources Conservation Service

AGENDA

Watershed Planning Committee and Technical Advisory Committee

January 11, 2011, 9:00 a.m. to 11:00 a.m.

Taylor Township Building

280 W. Flagg Rd.

Dixon, IL

(West of the intersection of Flagg and Lowden)

1. Accept minutes from December 14, 2010 WPC and TAC joint meeting.
2. Continue the development of action items and management strategies.
3. Determine data needed for the action items identified above.
4. Set next meeting date.
5. Adjourn.

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

Natural Resources Conservation Service

Watershed Planning Committee and Technical Advisory Committee
January 11, 2011, 9:00 a.m. to 11:00 a.m.
Taylor Township Building
280 W. Flagg Rd.
Dixon, IL
(West of the intersection of Flagg and Lowden)

Attendees:

Joe Baker	Steve Larry	Rebecca Olson
Marian Baker	Jeff McKinley	Joe Rush
Becky Breckenfelder	Marty McManus	Jerry Sellers
Jim Brown	Abby Merriman	Bill Wurtz

1. Accept minutes from December 14, 2010 WPC and TAC joint meeting. – Ed Bettner called the meeting to order at 9:10AM. The minutes from 12/14 meeting were not ready for approval yet.

2. Continue the development of action items and management strategies. - Rebecca said that they will finish listing areas of concern and, figure out what the affect of and action item is (pollutant load reduction) and prioritize those items. Rebecca met with Joe Rush to update the draft – areas in blue are ideas that she and Joe came up with. Rebecca made a big change to the draft by adding a table that correspond the goals w/ the action items that would pertain to each goal.

No-till vs. Till Farming - There was discussion as to the pros and cons of no-till vs. tillage farming and at the end it was decided to reword #19 to say "increase conservation farming such as no-till and strip-till". Steve said that they may not have to have a defined amount of acres as a goal as most of these practices are being implemented by farmers where feasible already. Rebecca asked if the NRCS has records of the farm acreage that is designated no-till and Abby said that if they are on a highly-erodeable field (HEL) the farmer is supposed to have a conservation plan written on it; however, probably not even half of this county is comprise of HEL. The other types of fields don't have any limits as to what they can do. Jim asked if there was any other crop that is rotated in with soybeans and corn and Marian said alfalfa, hay, oats and wheat; however, Ed said that those make up a very small percentage compared to corn. There aren't very many vegetable crops in the area either.

Lake Turnover - Jim Brown asked if Lost Lake and the silt basin were deep enough to undergo an annual turnover and Joe Rush said yes; the lake is deep enough; however, the silt basin may not be deep enough for it.

Goal 2A – Minimize pollutant loading into surface waters and groundwater. Many sources of pollutants such as: Livestock, fertilizer, septic systems, and wildlife. The EPA updated their use-attainment standards of different water bodies. They assessed Lost Lake in 2010 and they said that it has impairment for aesthetic qualities with the causes being phosphorous, total suspended solids, and aquatic algae with the sources being non-point source pollution from run-off, agriculture, yard and the dam. The EPA didn't mention nitrogen and e-coli but Rebecca thinks that nitrogen might be important as it goes hand in hand with phosphorus. E-coli is important to her because the beaches have been closed a number a times in the past due to high levels of it in the water samples taken on a bi-weekly basis. Jim Brown said that there are 75 lakes in Wisconsin that are getting phosphorus loading from glacial deposits in artesian wells. 70 wells were tested and they were able to determine the sources of phosphorus. Jim suggested that if they take actions to reduce phosphorus and still have an unexplained high level of it, they may want to incorporate volunteer well testing in the periphery of the lake to see if those could be a source.

Action Item 7 – Create storm water holding ponds with dikes and berms to slow water velocity – Jim asked if they have areas in the lake where the grading is steep enough that boulders could be used to slow the water velocity down and Steve said that they have already addressed those – they are working on the stream bank stabilization of Babbling Brook.

Planting Native Grasses in Ditches vs. Mowing - Rebecca discussed the practice of planting native vegetation in the ditches to slow down the velocity of the water. The ditches are mowed instead because of the safety concern of wildlife running out onto the road and drivers not being able to see them in time. Ed also said that with a saturated ground along the roadways there would be a longer soft soil period which would break up the roads quicker. Another advantage of having the ditches mowed is that it prevents a "snow fence" from forming that blows the snow back onto the road.

Marian said she would like to slow the water that comes across Daysville Rd and into the creek because it comes down so fast it comes right over the road. Ed said that they need a series of dikes and he doesn't think that there would be a landowner against putting one in at the end of his/her property. Rebecca suggested that a rock riffle or a ben-way weir could be used as well.

Action Item #6: Rebecca suggested breaking up #6 to make separate action items for wetlands, filter strips and grassed waterways.

Steve said that they need to narrow the watershed plan down to highlighted 1-3 doable projects and have the rest there as information to address at a later date. Make sure the projects are realistic, cost-effective and have the biggest "bang for your buck". The matrix that Rebecca and Joe created will help them prioritize those items.

Goal #3 – Protect "Class A" and other productive soils – Rebecca defined class A soil – they are the best type of soil (most productive). Took out item A. minimize soil loss since it is listed in Goal 1c. Jim Brown asked if there was an agency that prevents the conversion of the use of class A soil and Marian said that soil and water board controls that. Rebecca said that the future land use plan doesn't show any conversion of Class A land. Rebecca listed Agricultural easements as an action item that would address that. Jerry Sellers recommended looking at the Ogle County long-range plan, which ensures the retention of class A soils and that only a certain amount of industrialization would be allowed. They show which corridors in Rochelle that they would permit – all of which can be found on their website – it also shows growth statistics.

Goal #4 – Change from "Protect Wildlife and their habitat" to Protect, Enhance and Manage Wildlife and their habitat; make objective 4b an action item.

Goal #5 – Protect the Rural Lifestyle – They discussed the fact that there is no public land in the watershed and how they are not necessarily trying to provide more public access; rather, they are more concerned with the use of the private land. Joe Baker brought up the point that if anyone hunts or snow-mobiles on his land and gets injured, (even if he doesn't give them permission to do so, under Illinois law, he is liable. They are trying to get that changed through the Illinois legislators. There are many public areas just outside of the watershed so the committee deemed that it was not necessary to try to make more public areas. Add action items: Creating a brochure that educates property owners on the incentives that are available to them to convert their property into natural areas, such as forest. Partner w/ wildlife organizations that have similar missions.

3. Determine data needed for the action items identified above.

4. Set next meeting date – February 22, 2011 10-Noon - Rebecca is going to see if she can get the Nature Conservancy as the next meeting site.

5. Adjourn – Meeting adjourned at 11:05AM.

Lost Nation-New Landing
River Conservancy District of IL
205 Cuyahoga Drive, Suite A
Dixon, IL 61021

Natural Resources Conservation Service

AGENDA

Watershed Planning Committee and Technical Advisory Committee

February 22, 2011, 10:00 a.m. to 12:00 p.m.

Nachusa Grasslands Headquarters (in the red barn)

8772 South Lowden Rd., Franklin Grove, Illinois

1. Accept minutes from January 11, 2011 WPC and TAC joint meeting.
2. Approve preliminary action items and changes to goals and objectives (Section 1 of Chapter 4, attached).
3. Identify data gaps and ongoing monitoring needs.
4. Determine field data collectors and methods. Recruit volunteers.
5. Discuss realistic expectations of landowners to implement strategies recommended by the Clear Creek Watershed Action Plan. Decide what percentage of implementation is to be considered in the data analysis.
6. Updates
    a. Lost Lake Utility District effluent reports.
    b. NRCS Rapid Assessment.
7. Set next meeting date.
8. Adjourn.

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AGENDA

Watershed Planning Committee and Technical Advisory Committee

June 7, 2011, 2:00 to 4:00 p.m.

Taylor Township Building

280 W. Flagg Rd.

Dixon, IL

(West of the intersection of Flagg and Lowden)

1. Accept minutes from February 22, 2011 WPC and TAC joint meeting.
2. Consultants present information for review:
    a. Portions of the watershed action plan draft.
    b. Results of GIS-based computer modeling.
3. Prioritize action items based on new information.
4. Determine the continuing role and structure of the two committees.
    a. Elect a new meeting facilitator.
    b. Redirect focus of committee from planning to education and implementation of the plan.
5. Set next meeting date.
6. Adjourn.

MINUTES OF CLEAR CREEK WATERSHED PLANNING & TECHNICAL ADVISORY COMMITTIES JUNE 7, 2011

IN ATTENDANCE: Ed Bettner, Steve Larry, Becky Brekenfelder, Rebecca Olson, JoeRush, Bill Kleiman, Abby Merriman, Sherrie Taylor, Nathan Hill, Jerry Sellers, Karen Rivera, and Dan Boehle.

President Ed Bettner called the meeting to order shortly at 2:02pm.

No minutes were available.

President Bettner turned the meeting over to Rebecca:

The plan draft is due July 1, 2011. This will be the last meeting before then. Some input will still be needed but it can be done by email.

Rebecca said that today we should discuss the model and put a measurable time frame on the plan and decide what we can accomplish in a reasonable period of time.

Steve commented that this is the first phase of the plan to manage the watershed. The R.C.D. will manage the basin. Hopefully this committee can stay together to review the plan, get updates and make the plan happen. Meeting once or twice a year should be sufficient. Steve said RCD has a budget to keep Rebecca as facilitator for the group working with NRCS, grants and with Joe in his role.

Everyone seemed to be in favor of keeping the committee together.

Ed suggested one project a year. Joe felt we should prioritize projects for a 5 year plan and depending on who is doing the project, perhaps more than one a year can be done.

Rebecca explained chapter 4 that was sent to everyone. Nathan Hill built a GIS Model. He had a land cover map that was not up to date so using a new aerial photo and other information built a new land cover map. He used all of the best management practices that we came up with that were measurable, and plugged them in to come up with a pollutant reduction factor.

Since he didn't have a 2 year history of monitoring water events for this watershed he used similar watersheds as examples. Not all recommendations were measurable. Not all owners agreed to let him walk the stream bank thus he was not able to walk all of the stream bank.

Recommendations were then measured separately and prioritized according to the amount of pollutant reduced. Very little row crop land is expected to change so priority is on addressing severe

stream bank erosion. A definition of severe stream bank erosion is needed to be put into the report. In summary:

1. Very little row crop land is expected to change
2. Priority is given to land next to the stream
3. Restoration of wet land and filter strips is recommended

The report recommends property in the southeast corner of watershed be converted into nature cover. Bill was concerned that putting this on the map might antagonize that owner.

Nachusa Grasslands is planning some work this fall that may be considered one of the projects. Others are coming down the road.

RCD is working on a grant for the sediment control area.

Rebecca reviewed the recommendations in the report. The areas that we need to focus on are:

1. Residential areas
2. Row crop areas
3. Pasture and hay

Rebecca introduced Nathan Hill. Walking the streams Nathan found:

440 ft. severe stream bank erosion
40a filter strips could be implemented
636a could be restored as wet land
3145a are highly erodible
100 rain gardens are recommended
4a should be put in sediment control
350a are in pasture
13,200 ft of creek
9% is in conservation farming
160a are in conservation easement
3222 could be put into natural areas
recreation trails could be built

Discussion of priority items and putting a timeline on them.

A list of action items was passed around. Items #1,2, & 4 were prioritized by the report. Nathan listed the items he felt would be most measurable. He put them into 3 categories: Urban, Cropland BMP and in stream.

EPA will be most interested in the items that will reduce pollutants and by how much. Action items most important are 1, 2, 3, 4, 5, 6, 8, 10, 11, 15, 16, 18, 19, 20. the remainder of action items are good goals.

A five year plan was suggested. Karen suggested putting things that we are already doing in the 1st year of the plan and then planning actions for years 2 – 5. Don't just put everything in that you plan to do in 5 years.

Ed explained how H.E.L. farmed soils are monitored randomly.

Items that could be put in year one include the Babbling Brooke stabilization project, adding more owners to that property, the wetland creation planned by the natural land institute, initiating a plan for a 3 year septic system inspection, and rain garden education.

The intermediate items could be implementing the septic inspection, getting a few owners to put in the rain gardens, stabilize 100 ft eroding streak banks, 40 acres of filter or buffer strips and restore some wetlands.

Rebecca will put this together in a report and email it to the committee for suggestions and approval.

Meeting Adjorned.

Respectively Submitted,

Daniel J. Boehle