ELKHART RIVER WATERSHED MANAGEMENT PLAN

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Elkhart, Kosciusko, LaGrange, and Noble Counties, Indiana

PREPARED BY:
V3 COMPANIES

PREPARED FOR:
ELKHART RIVER RESTORATION ASSOCIATION
and the ELKHART RIVER ALLIANCE

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EXECUTIVE SUMMARY

The Elkhart River Watershed occupies portions of Elkhart, LaGrange, Noble, and Kosciusko counties. The headwaters begin with the North Branch of the Elkhart River in south-central LaGrange County and the South Branch of the Elkhart River in central Noble County. The Elkhart River then flows northwest into Elkhart County, forming the Goshen Dam Pond in Goshen, and finally draining into the St. Joseph River in the City of Elkhart.

The Watershed is approximately 447,000 acres of mixed landuse consisting mainly of row crop agriculture and pasture. In recent years the Watershed has experienced rapid urban growth. Most of the growth is occurring in the Elkhart-Goshen area in Elkhart County. However, other areas in Noble and Kosciusko Counties are also experiencing growth, such as the area around Albion in Noble County.

The Elkhart River Alliance (ERA) was formed as a committee of the Elkhart River Restoration Association, Inc. (ERRA) to address concerns regarding sediment in the Goshen Dam Pond and pollution in the Elkhart River Watershed. With assistance from the Elkhart County Soil and Water Conservation District (SWCD), the ERRA obtained funding from an Environmental Protection Agency (EPA) 319 grant through the Indiana Department of Environmental Management (IDEM) for the development and implementation of a Watershed Management Plan (WMP) for the Elkhart River Watershed. A Steering Committee of ERA members was organized to work with the watershed coordinator to develop and implement the WMP.

The Elkhart River WMP is intended as a guide for the protection and enhancement of the environment and quality of the Elkhart River Watershed while balancing the different uses and demands of the community on this natural resource. These goals address items such as:

- education and outreach;
- reducing the amount of pollution and sediment entering the aquatic systems;
- increasing preservation, restoration, and protection of this vital system;
- increasing cooperation, coordination, and collaboration among all stakeholders in the Watershed; and
- building and maintaining a solid organization to look to the welfare of this important natural resource.

At a meeting on November 28, 2007, the Steering Committee studied the original stakeholder concern list, the windshield survey data, and the historical data presented by V3 Companies (V3). The Steering Committee identified the three most critical water quality components of degradation to the Elkhart River Watershed as sediment, *E. coli* and nutrients. The Steering Committee then developed the following list of problems and causes identified in the Watershed:

- There is a problem with excessive sediment loading which is causing silt deposits and accelerated eutrophication in the Watershed, especially in the Goshen Dam Pond area. For the purposes of this WMP sediment will be discussed in terms of total suspended solids (TSS) with a concentration target of 80 mg/L as decided by the Steering Committee. Additional problems identified by the Stakeholders include stream bank erosion, fertilizers and pesticides entering the water through agricultural and urban erosion and runoff. The St. Joseph River WMP indicated that the Elkhart River is a critical area for sediment in that watershed. The data collected by V3 for this WMP supports that conclusion as shown in Exhibit 29. Sedimentation is the cause of this water quality problem.

- *E. coli* levels are problematic. There is a public concern that the river is not suitable for recreational use because of poor water quality. According to IDEM data studies, almost every site tested in the Watershed violated the state water quality standard for *E. coli*, which is 235 colony forming units per 100 milliliters (235 cfu/100mL). In response to this, many streams in the Elkhart River Watershed are listed on IDEM's 303(d) list of impaired waters. Pathogens (*E. coli*) are the cause of the water quality problem.

- There is a problem with excessive nutrient loading which is causing accelerated eutrophication in the Watershed, especially in the Goshen Dam Pond area. Exhibits 22 and 28 show exceedances of nutrient limits in several subwatersheds of the Elkhart River Watershed, and the windshield survey data confirmed there are sources of excess nutrient loading in the Watershed. Nutrient loading is the cause of the water quality problem.

- There is a problem with rapid landuse changes which are causing degradation in the Watershed including: hydrologic modification; loss of wetlands and floodplains; loss of wildlife habitat; spread of invasive species; and conflicts over drainage and recreational uses. Historical and current data shows that the Watershed is undergoing urban development at a more rapid rate than the state average. Landuse planning can result in sustainable growth and development.

- There is a problem with protecting valuable open space and wildlife habitat; protecting threatened and endangered species and their habitat; managing nuisance species; and stopping the introduction and spread of invasive species. State lists, the windshield survey, and public input confirm these concerns. Educating landusers to assist them with proper management can increase preservation, restoration, and appreciation of open space and maintain a proper balance between diverse landuses.

- There are several problems regarding fish populations in the rivers, lakes, and tributaries: degraded fish ladders; fear of eating fish; and fish kills. Many streams in the Elkhart River Watershed are listed on IDEM's 303(d) list of impaired waters, with a fish consumption advisory due to mercury and PCBs. Windshield survey data and public input confirm these other concerns. Habitat degradation and some pollutant concerns will be addressed by the Elkhart River WMP. It is beyond the scope of the Elkhart River WMP to address mercury and PCBs; however, we support additional research into these concerns.

- There are several problems related to lake management, including: herbicide distribution within lakes to control nuisance weeds; responsible vegetation management; boat issues such as wakes, illegal dumping, and transportation of invasive species; and septic systems around lakes. Many lake associations in the Watershed are addressing these concerns in their subwatersheds. The ERA supports their efforts to improve water quality and address lake issues.

On November 28, 2007, January 3, January 8, January 10, and January 17, 2008, the ERA Steering Committee discussed the designation of critical areas in light of the three pollutants of concern: sediment, *E. coli*, and nutrients. V3 presented a summary of the existing water quality data and loading models and the Elkhart County SWCD presented the findings of the windshield survey.

The ERA Steering Committee members located specific sites within the Watershed that would function as the critical areas of the Elkhart River WMP. These 26 critical areas, identified from all four of the Elkhart River Watershed's counties, are listed in Table 43 and depicted in Exhibit 37. They account for approximately 297,450 acres (golf courses and septic densities did not contribute acreages) or 66% of the Watershed by area. Each critical area is discussed below.

Critical Area #1, shown on Exhibit K-1 (Appendix K), is the Turkey Creek critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, degradation of open space, and degradation of fish populations. This area contains a Great Blue Heron rookery and a large wetland complex worthy of preservation for wildlife habitat and water quality improvement. The area south of Goshen Dam Pond is identified as having a sediment loading problem, which emanates in part from streambank erosion, and agricultural and residential erosional sources. The flow velocity of the Elkhart River slows down when it reaches the impoundment of the Goshen Dam Pond and suspended silts and clays that were being carried in the water column settle out as sediment deposits. There are 3,684 acres of critical area where the implementation of Best Management Practices (BMPs) would improve the condition of the Watershed.

Critical Area #2, shown on Exhibit K-2, is the Upper Yellow Creek critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and degradation of lakes. The Steering Committee indicated problems with livestock entering the stream, log jams, streambank erosion, septic system failure, obvious sediment deposits, and concern regarding over-fertilization in agricultural, urban, and rural residential areas. There are 15,941 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #3, shown on Exhibit K-3, is the Lower Yellow Creek critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee indicated problems with livestock entering the stream, septic system failure, obvious sediment deposits, streambank erosion, and concern regarding over-fertilization in agricultural, urban, and rural residential areas. There are 5,920 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #4, shown on Exhibit K-4, is the Upper Rock Run Creek critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these problems will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee mentioned problems with lack of filter strips; lack of conservation tillage practices; livestock entering the stream; log jams; septic system failure; obvious sediment deposits caused by severe streambank, agricultural and urban erosion; and concern regarding over-fertilization in agricultural, urban, and rural residential areas. There are 13,665 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #5, shown on Exhibit K-5, is the Horn Ditch critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these problems will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee mentioned problems with lack of filter strips, lack of conservation tillage practices, livestock entering the stream, log jams, streambank erosion, septic system failure, obvious sediment deposits caused by severe erosion, and concern regarding over-fertilization in agricultural, urban, and rural residential areas. There are 11,099 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #6, shown on Exhibit K-6, is the Papakeechie Subwatershed & Lake and River Enhancement (LARE) Study critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and degradation of lakes. Included in this critical area are Allen Lake, Rothenbeger Lake, Barrel-and-a-Half Lake, and Spear Lake, which are all tributaries to Papakeechie Lake. Also included in this critical area are the areas identified in The Wawasee Area WMP. There are 2,957 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #7, shown on Exhibit K-7, is the Knapp Lake Chain & LARE Study critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and degradation of lakes. Lakes along the Knapp Lake Chain include Harper Lake, Little Bause Lake, Little Knapp Lake, Knapp Lake, Moss Lake, Hindman Lake, Neal Lake, Gordy Lake, Rider Lake, Duely Lake, and Village Lake, which are all tributaries to Lake Wawasee. Also included in this critical area are the areas identified in The Wawasee Area WMP. There are 10,167 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #8, shown on Exhibit K-8, is the Stony Creek critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee indicated problems with livestock entering the stream, log jams, streambank erosion, septic system failure, obvious sediment deposits, and concern regarding over-fertilization in agricultural, urban, and rural residential areas. There are 13,014 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #9, shown on Exhibit K-9, is the Elkhart urban critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from combined sewer overflows (CSOs), pet waste, and wildlife. This area was also identified in the St. Joseph River WMP as a critical area for urban stormwater management. There are 8,779 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #10, shown on Exhibit K-10, is the Goshen urban critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from CSOs, pet waste, and wildlife. This area was also identified in the St. Joseph River WMP as a critical area for urban stormwater management. There are 20,925 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #11, shown on Exhibit K-11, is the Ligonier urban critical area. It contributes to the problems of *E. coli*, sediment loading, and nutrient loading. Addressing these problems will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from CSOs, pet waste, and wildlife. There are 18,412 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #12, shown on Exhibit K-12, is the Nappanee urban critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from CSOs, pet waste, and wildlife. There are 9,742 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #13, shown on Exhibit K-13, is the Kendallville urban critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from CSOs, pet waste, and wildlife. There are 18,077 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #14, shown on Exhibit K-14, is the Syracuse urban & LARE Study critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and degradation of lakes. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces;

and nutrients and *E. coli* from pet waste and wildlife. Included in this critical area are the areas identified in The Wawasee Area WMP. There are 17,537 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #15, shown on Exhibit K-15, is the Millersburg urban critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these problems will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from pet waste and wildlife. There are 12,506 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #16, shown on Exhibit K-16, is the Albion urban & LARE Study critical area. It contributes to the problems of sediment, *E. coli*, and nutrient loading. Addressing these problems will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from pet waste and wildlife. Also included in this critical area are the areas identified in the Skinner Lake Engineering Feasibility Study. There are 16,970 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #17, shown on Exhibit K-17, is the Rome City urban critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these problems will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and degradation of lakes. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from pet waste and wildlife. There are 19,692 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #18, shown on Exhibit K-18, is the Milford urban critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee identified urban sources including: sedimentation from construction sites; pollutants from impervious surfaces; and nutrients and *E. coli* from pet waste and wildlife. There are 14,459 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #19, shown on Exhibit K-19, is the Jones Lake critical area. Jones Lake and the surrounding areas within Noble County contribute to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these problems from agricultural landuse practices will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and degradation of lakes. There are 5,885 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #20, shown on Exhibit K-20, is the South Branch Upper Reaches critical area. The Upper Reaches of the South Branch of the Elkhart River within York Township contribute to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also

impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. The Steering Committee mentioned problems with lack of filter strips, lack of conservation tillage practices, livestock entering the stream, log jams, streambank erosion, septic system failure, obvious sediment deposits caused by severe bank and overland erosion, and concern regarding over-fertilization in agricultural, urban, and rural residential areas. There are 15,422 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #21, shown on Exhibit K-21, is the Solomon Creek Upper Watershed & LARE Study critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. Included in this critical area are the areas identified in the Whetten Ditch, Solomon Creek, and Dry Run Watersheds LARE Diagnostic Study. The Steering Committee identified that areas along Solomon Creek have limited canopy cover, instream habitat problems, and poor dissolved oxygen (DO) levels. The Steering Committee indicated problems with livestock entering the stream, log jams, streambank erosion, septic system failure, obvious sediment deposits, and concern regarding over-fertilization in agricultural, urban, and rural residential areas. There are 15,156 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #22, shown on Exhibit K-22, is the Solomon Creek Lower Watershed & LARE Study critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, and degradation of fish populations. Included in this critical area are the areas identified in the Whetten Ditch, Solomon Creek, and Dry Run Watersheds LARE Diagnostic Study. The Steering Committee identified that areas along Solomon Creek have limited canopy cover, instream habitat problems and poor DO levels. The Steering Committee indicated problems with livestock entering the stream, log jams, streambank erosion, septic system failure, obvious sediment deposits, and concern regarding over-fertilization in agricultural, urban, and rural residential areas. There are 8,524 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #23, shown on Exhibit K-23, is the Golf Courses critical area. They contribute to the problems of nutrient loading. Addressing these problems will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and (in some instances) degradation of lakes. Eleven golf courses were identified which are adjacent to or near waterways within the Elkhart River Watershed. These golf courses include: Old Orchard Golf Course, Black Squirrel Golf Club, McCormick Creek Golf Course, Timber Ridge Golf Course, Big Boulder Golf Course, Maxwelton Golf Course, Wawasee Country Club, South Shore Country Club, Augusta Hills Golf Course, Limber Lost Golf Course and Cobblestone Golf Course. The implementation of BMPs and responsible use of fertilizers would improve the condition of the Watershed.

Critical Area #24, shown on Exhibit K-24, is the LaGrange County Lakes & LARE Study critical area. Addressing these problems will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and degradation of lakes. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. The Steering Committee mentioned problems including sediment in tributary ditches, lack of filter strips, and the need to

maintain sediment basins. Also included in this critical area are the areas identified in the Five Lakes Engineering Feasibility Study and Pettit Mill Pond Sediment Control Project Design Report. There are 11,321 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #25, shown on Exhibit K-25, is the Wawasee Area & LARE Study critical area. It contributes to the problems of sediment loading, *E. coli*, and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and degradation of lakes. Also included in this critical area are the areas identified in The Wawasee Area WMP. There are 7,596 acres of critical area where the implementation of BMPs would improve the condition of the Watershed.

Critical Area #26, not shown on an exhibit, is the Septic Density critical area. Areas in the Watershed that have more than one on-site wastewater disposal system per one-half acre are identified as being a critical area as they contribute to the problems of *E. coli* and nutrient loading. Addressing these concerns will also impact concerns regarding hydrologic modification, loss of open space, degradation of fish populations, and (in some instances) degradation of lakes. The implementation of BMPs would improve the condition of the Watershed.

The Steering Committee evaluated the priority resource concerns that were gathered from stakeholders throughout the Elkhart River Watershed, reviewed the goals and objectives of the greater St. Joseph River WMP, and examined the mission statement of the Elkhart River Alliance. With this information in mind, six goals were developed, which the committee hopes to achieve through the implementation of the Elkhart River WMP. The complete listing of the Elkhart River WMP's goals is as follows:

Goal #1: Sustain the financial and institutional capacity of a stakeholder group. Increase the collaboration of both urban and agricultural stakeholders to eliminate program duplication, reduce costs, and identify effective solutions.

Objectives:

- maintain Steering Committee,
- address financial sustainability,
- address agricultural issues and concerns,
- address urban issues and concerns,
- address rural residential issues and concerns,
- educate all stakeholders,
- involve and mobilize citizen stakeholders,
- identify and establish collaborative relationships with entities within the Watershed that have potential influence on water quality in order to promote protection and improvement of the Watershed,
- communicate and participate in ongoing water quality research activities within the Watershed and identify research needs that are not being addressed,
- hire a full-time watershed coordinator, and

- establish a permanent location for activities of the Watershed.

Goal #2: Reduce soil erosion and sedimentation so that surface water functions and aesthetics are improved and protected. By the year 2027, surface waters within the Elkhart River Watershed will comply with the Steering Committee's target based on the recommended water quality threshold of 80 mg/L total suspended solids.

Objectives:

- reduce soil erosion and sedimentation from agricultural lands,
- reduce soil erosion and sedimentation from urban lands,
- reduce soil erosion and sedimentation from rural residential lands,
- reduce erosion and sedimentation from the banks of surface waterbodies and conveyance systems, and
- provide education to boaters on the shoreline impact of wakes.

Goal #3: Reduce the concentration levels of *E. coli* so the primary and secondary contact waters within the Watershed do not pose an adverse human health impact. By the year 2027, surface waters within the Elkhart River Watershed will comply with the Indiana State water quality standard of 235 colony forming units per 100 ml of *E. coli*.

Objectives:

- reduce *E. coli* levels from agricultural lands,
- reduce *E. coli* from urban lands,
- reduce *E. coli* from rural residential lands,
- provide education on how to deal with nuisance wildlife,
- provide education to boaters on proper disposal of wastes, and
- reduce *E. coli* from failing or non-existent septic systems.

Goal #4: Reduce the amount of nutrient loading (phosphorus and nitrogen) so that surface water functions and aesthetics are improved and protected. By the year 2027, surface waters within the Elkhart River Watershed will comply with the Steering Committee's target based on the recommended water quality threshold of 10 mg/L of nitrate/nitrite and 0.3 mg/L of phosphorus.

Objectives:

- reduce nutrient levels from agricultural lands,
- reduce nutrient levels from urban lands,
- reduce nutrient levels from rural residential lands,
- provide education on how to deal with nuisance wildlife,
- provide education to boaters on proper disposal of wastes,
- reduce phosphate contribution from detergents, and
- reduce nutrient contribution from golf courses.

Goal #5: Increase preservation, restoration, and appreciation of open space, and maintain a proper balance between the many diverse landuses in the Elkhart River Watershed.

Objectives:

- increase amount of open spaces in permanent protection status,
- increase and improve open space through restoration, and
- increase appreciation of open space through education.

Goal # 6: Develop an outreach and education program that keeps stakeholders involved in issues in the Watershed, and coordinate volunteer activities that benefit the health of the Elkhart River Watershed.

Objectives:

- establish an educational subcommittee that will provide education to the stakeholders,
- establish a recreation subcommittee to improve and facilitate citizen access to the waterways of the Elkhart River Watershed,
- participate in national events that coincide with our goals,
- establish a volunteer coordination subcommittee,
- establish a local advocacy subcommittee to work with government and private organizations and to identify current local issues that impact the river/watershed,
- establish a legislative subcommittee,
- establish a research subcommittee to network with local universities and others doing water quality research in the Elkhart River Watershed,
- effectively use the print media to share and communicate past, current, and future activities of the ERA with the media, public, and current and potential ERA and ERRA members,
- effectively use electronic forms of media (TV and radio) to share and communicate past, current, and future activities of the ERA with the media, public, and current and potential ERA and ERRA members,
- create and maintain an ERA website as a clearinghouse for ERA/Elkhart River Watershed information,
- assist watershed coordinator in sampling biological, chemical, and physical data as monitoring efforts occur,
- recruit and train volunteers to monitor at a minimum, each of the 37 subwatersheds, obtaining both wet and dry weather data at each site at least twice each year, and provide continuing education opportunities for volunteer monitors, and
- promote sustainable drainage practices.

Based on what is practical for this Watershed and what BMPs will provide the most cost effective pollutant reduction, the Steering Committee has chosen eleven agricultural BMPs and ten urban BMPs to help achieve the Watershed goals and objectives by decreasing the concentrations of sediment, *E. coli*, and nutrient loads.

Agricultural Best Management Practices:

1. Exclusion Fencing
2. Rotational Grazing
3. Nutrient Management Plan
4. Manure Management Plan
5. Alternative Watering System
6. No-till/Reduced Till (Conservation Tillage)
7. Grassed Waterways
8. Buffers/Filter Strips
9. Grade-Stabilization Structures
10. Cover Crop
11. Wetland Restoration

Urban Best Management Practices:

1. Rain Barrel/Rain Garden
2. Naturalized Wet-bottom Detention Basin
3. Filtration Basin
4. Green Roof
5. Pervious Paving Options
6. Soil Infiltration Trench
7. Sand Filter
8. Bioretention Practices
9. Natural Stream Buffer
10. Wetland Restoration

Based on the aforementioned potential BMPs to implement within the Elkhart River Watershed, load reduction calculations were estimated for both sediment and nutrients. Sediment loading estimates used measures in terms of Total Suspended Solids (TSS), and nutrient loading estimates used measures in terms of total nitrogen and total phosphorus. Pollution load reductions were estimated for sediment and nutrients. Load reduction calculations were not applied for *E. coli*, as its practice is not technically sound or readily applied in the industry. Therefore, the Elkhart River WMP will only present pollutant load reductions for sediment and nutrients.

The Steering Committee established both an implementation plan and measurable milestones for the goals of the WMP. The implementation plan identifies the objectives and action items, assigns a priority order ranking using a low/medium/high system, identifies the responsible party or parties involved with the implementation of the actions, and outlines both the technical and financial assistance needs for each action item (see Section 5 of this report). Table 48 in Appendix A lists the measurable milestones for each of the six goals identified by the Steering Committee. Each goal is divided into three categories consisting of: Short Term Milestones and Measurable Goals, Medium Range Milestones and Measurable Goals, and Long Term Milestones and Measurable Goals. These milestones have been suggested in order to help track the process of implementing action items within the Elkhart River Watershed.

A monitoring plan is needed to track the indicators and evaluate the effectiveness of the implementation efforts over time. Indicators of success are listed for each of the six goals.

Goal #1: Research done by V3 indicates that approximately $18.2 million is needed to accomplish the pollutant reduction goals over the next 20 years.

Indicators of Success:

- Ratio of dollars obtained to dollars needed
- Increase in ERA members/supporters
- Procuring other grants
- Quarterly Steering Committee meetings
- An active subcommittee for each high priority concern

Goal #2: The selected water quality indicator for accomplishing goal #2 is based on the measurable improvements to the pollutant concentrations in the TSS load reduction modeling. As the implementation of agricultural and urban BMPs takes place within the Watershed, improvements to the TSS loads can be projected.

Indicators of Success:

- Number of Agricultural BMPs
- Number of Urban BMPs
- Model reflects TSS load reduction

Goal #3: The reduction of *E. coli* levels are not based on modeling of water quality, so indicators for this goal can be expanded to evaluate the implementation of BMPs to reach goals #2 and #4. Successfully accomplishing outreach and education components of goal #6 will also indicate reductions of *E. coli* levels in agricultural lands, urban lands, and from rural residential lands.

Indicators of Success:

- Number of Agricultural BMPs
- Number of Urban BMPs
- Monitoring samples collected without exceedances of 235 colony forming units per 100 ml of water for concentrations of *E. coli*

Goal #4: The selected water quality indicator for accomplishing goal #4 is based on the measurable improvements to the pollutant concentrations for total nitrogen and total phosphorus load reduction modeling. As the implementation of agricultural and urban BMPs takes place within the Watershed, improvements to the nitrogen and phosphorus loads can be projected.

Indicators of Success:

- Number of Agricultural BMPs
- Number of Urban BMPs
- Model reflects nitrogen and phosphorus load reduction

Goal #5: An indicator of accomplishing goal #5 can involve the general inventory of lands held within preservation and open space landuses. Indicators of successful restoration of uplands, wetlands, shoreline, and stream channels are all positive indicators of reaching this goal. An increase in appreciation of open space is difficult to quantify, so focus should be on areas providing opportunities for diverse user groups

Indicators of Success:

- Acres protected by land trust organizations
- Acres of wetlands restored
- Acres of public open space protected
- Number of programs providing opportunities to appreciate open space

Goal # 6: Indicators for achieving goal #6 can be identified by the successful accomplishment of the high priority action items for this goal, which include:

Indicators of Success:

- Number of programs and people in attendance
- Number of individuals accessing the ERRA and ERA websites
- Number of volunteers
- Number of volunteer hours dedicated to the goals of the Elkhart River WMP
- Number of printed materials distributed

This Management Plan is meant to be a flexible tool to achieve water quality improvements within the Elkhart River Watershed. The Watershed Management Plan will be evaluated by assessing the progress made on each of the six goals identified. The evaluation and adaptation of the plan will be the responsibility of the ERA Steering Committee.

The plan should be evaluated every five years to assess the progress made as well as to revise the plan, if appropriate, based on the progress achieved. The plan will also have a comprehensive review every 15 years. Amendments and changes may be made more frequently as laws change or new information becomes available that will assist in providing a better outlook for the Elkhart River Watershed. As goals are accomplished and additional information is gathered, efforts may need to be shifted to watershed issues of higher priority.

INFORMATION AND OBJECTIVES

Elkhart River Alliance

The Elkhart River Alliance (ERA) was formed as a committee of the Elkhart River Restoration Association, Inc. (ERRA) to address concerns regarding sediment in the Goshen Dam Pond and pollution in the Elkhart River Watershed. With assistance from the Elkhart County Soil and Water Conservation District (SWCD), the ERRA obtained funding from an Environmental Protection Agency (EPA) 319 grant through the Indiana Department of Environmental Management (IDEM) for the development and implementation of a Watershed Management Plan (WMP) for the Elkhart River Watershed. A Steering Committee of ERA members was organized to work with the watershed coordinator to develop and implement the WMP.

ELKHART RIVER ALLIANCE MISSION STATEMENT

The Elkhart River Alliance is a group of concerned citizens, landowners, organizations, businesses, and governments, who promote good stewardship to improve, preserve and protect the environmental, recreational and economic benefits of the Elkhart River Watershed, through education, proper landuse practices, and by showing respect and care for this valuable resource.

History of Elkhart River Alliance

To fully understand the background of the ERA it is necessary to briefly look at the history of the ERRA and some of its goals, objectives, and history.

The ERRA was founded in 1983 to study the needs of the Elkhart River and its Watershed. The original officers were Harold Weaver, President and Director, and Frank Yoder, Secretary and Director. Other Directors were James Siegmann, Frank Kummeth, J. Lawrence Burkholder, Larry Beachy, Max Chiddister, Max Kercher, and Daniel Sherman. Presently, the Board of Directors include: President, David Troup; Vice President, Milt Thomas; Treasurer, Nelson Bushong; and Secretary, Tim Cataldo. Other Directors are Stuart Meade, George Buckingham, Nancy Brown, Harold Weaver, Dr. Ray Swanson, and Leo Seltenright.

As a not-for-profit corporation the association works with IDEM, the Indiana Department of Natural Resources (IDNR), the Army Corps of Engineers (USACE), the Soil and Water Conservation Districts, local officials, and others to improve and protect the Elkhart River. The Association works to identify the various needs along the river, informs officials of concerns and needs related to the river and its Watershed, seeks to make the river a public priority, and assists in the planning of cleanup and other enhancement projects. Membership is open to anyone with an interest in the river for fishing, boating, and its natural wildlife and beauty.

The mission of the ERRA is “to provide a clean environment for wildlife and community recreation within the Elkhart River and the Goshen Dam Pond Watershed”.

The original focus of the group was on the Goshen area. Work was done to clean up the Goshen Dam Pond and the Elkhart River in the vicinity of Goshen and to repair the Goshen Dam Pond. As

the membership of the organization grew, so did its vision. The ERRA began to study the water quality not only of the Goshen Dam Pond, but the Elkhart River itself. They began to meet with various governmental agencies and tackled issues such as clearing and snagging of the river.

By 1992, they had completed a water-quality study for the Goshen Dam Pond, completed a clean up of the north and south branches of the Elkhart River, and had built a new dam. They continued to work along areas of the Elkhart River, conducting riverbank clean-ups, clearing of snags, and they began to seek funding for repair of riverbanks and other improvement projects.

As their work within the Elkhart River continued to grow and they began to gain knowledge of the workings of this natural system, the ERRA saw the need to look beyond the borders of the River itself and to the Watershed as a whole. It was realized that in order to protect, preserve, and enhance this valuable river, it must be studied in the context of its watershed. To broaden the focus of the ERRA to this level it was determined that a broader stakeholder group needed to be developed to tackle such a large and complex system. The ERRA, along with the Elkhart County SWCD and support from an IDEM Watershed Specialist, created the ERA. This alliance would be tasked with evaluating the Watershed and proposing solutions to identified problems. The ERRA, at the request of the ERA, applied for an EPA 319 grant through IDEM in 2005 to develop and begin implementation of a WMP. The grant was awarded in late 2006, and in February 2007, ERRA contracted with V3 Companies, Ltd. to create a WMP for the Elkhart River and to begin implementation of practices to address problems within the Watershed.

For information about the ERRA, visit www.elkhartriver.org. Please visit www.elkhartriveralliance.org to learn more about the ERA and this Watershed Management Plan process.

INTENTIONS OF THE WATERSHED MANAGEMENT PLAN

The Elkhart River Watershed Management Plan (WMP) is intended as a guide for the protection and enhancement of the environment and quality of the Elkhart River Watershed while balancing the different uses and demands of the community on this natural resource. These goals address items such as:

- education and outreach;
- reducing the amount of pollution and sediment entering the aquatic systems;
- increasing preservation, restoration, and protection of this vital system;
- increasing cooperation, coordination, and collaboration among all stakeholders in the Watershed; and
- building and maintaining a solid organization to look to the welfare of this important natural resource.

The WMP follows IDEM requirements for watershed management plans, including sections on: Watershed Description, Problem Cause and Stressor Identification, Stressor Source Identification, Critical Watershed Areas, Setting Goals and Indicator Selection for Performance Assessment, Selecting Measures for Improvement, Calculating Load Reductions, Implementation of Planned Measures, Monitoring Indicators, and Plan Evaluation and Adaptation.

To ensure the sustainability and success of the effort, public input and participation is essential. Stakeholder input was sought and included during all aspects of the planning process. This local input was essential for developing a plan that would have broad appeal throughout the Watershed and would earn continual support. A Steering Committee and a number of subcommittees were developed to ensure that the diverse needs in the Watershed would be properly addressed.

As mentioned above, the Elkhart River WMP is intended to be comprehensive, identifying problem areas and suggesting improvement measures for both water quality and quantity concerns. The Elkhart River Watershed is large and diverse; thus, it has a variety of issues and concerns that need to be addressed. To address these issues, Best Management Practices (BMPs) ranging from buffer strips to rain gardens will be needed to achieve the necessary results. This plan will also be used as a platform on which to pursue additional grants and other funding for implementation of the many different improvement measures recommended in the plan.