

Lake Creek Watershed-based Plan

Executive Summary



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Pictured on cover: Lake Creek (streamside and aerial), Arrowhead Lake, Railroad Crossing at Confluence of Whiteash Branch and Lake Creek. (Photos by Greater Egypt)

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Beginning in early 2017, the Greater Egypt Regional Planning and Development Commission (Greater Egypt) was contracted by the Illinois Environmental Protection Agency (IEPA) to develop a watershed-based plan for the Lake Creek Watershed (071401060502) under Clean Water Act Section 604(b) funding.

The Lake Creek watershed encompasses 21,785 acres, or roughly 34 square miles and is located entirely in Williamson County, Illinois. It is part of the larger Big Muddy River watershed. One city and a single village make up the relatively small population of the watershed. Johnston City constitutes the largest urban environment in the watershed (Figure 1).

Four waterbodies in the watershed have been placed on the Illinois Environmental Protection Agency's 303(d) List of Impaired Waters. This list is comprised of waterbodies that do not meet water quality standards. In particular, Lake Creek (IL_NGA-02) has been placed on the list for impairments of dissolved oxygen and phosphorus. Beaver Creek (IL_NGAZ-JC-D1) is impaired by manganese and loss of instream cover. Both streams also exhibit impairments of changes in stream depth and velocity patterns.

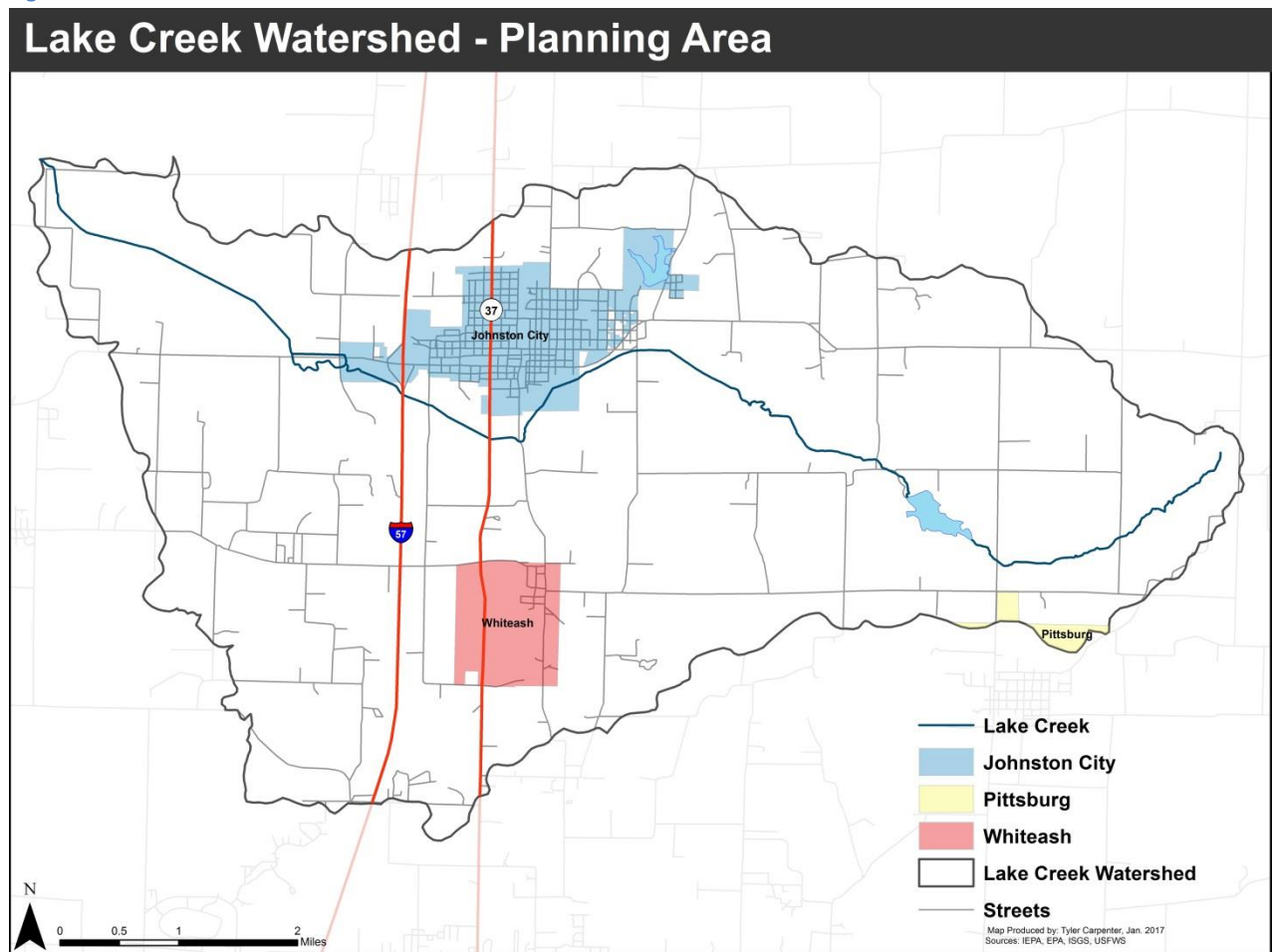
Two lakes in the watershed are also represented on the list; Arrowhead Lake (IL_RNZX) and Johnston City Lake (IL_RNZE). While both lakes are impaired by phosphorus, Johnston City Lake is also challenged by increased volumes of aquatic algae and total suspended solids.

An initial stakeholder meeting was held in 2017 to gain awareness of planning efforts, and to garner membership for the Lake Creek Watershed Council. The council convened on a quarterly basis and provided guidance throughout the plan. This included discussing existing knowledge of the watershed, and suggesting best management practices (BMP) for the plan. The success of the plan relies heavily on the continuation of council activities. This includes overseeing implementation of the plan and monitoring progress.

Land use in the watershed is represented by large areas of agriculture and forest. Agriculture in the watershed is composed of 31.4 percent of pasture and hay and 8.6 percent of cultivated crops. Various degrees of development constitute 14

percent of the watershed. The remaining land uses in the watershed are open water (3.9 percent) and woody wetlands (2.5 percent). With 40 percent of the watershed being classified as agriculture, there is a high potential for nutrient runoff. This is exemplified by areas of cropland that run along Lake Creek.

Figure 1



While impervious surfaces in the watershed are low, the Johnston City constitutes the largest portion of the watershed’s impervious network. The watershed exhibits around 14 percent of imperviousness features (10 percent or more impervious surface).

The Spreadsheet Tool for Estimating Pollutant Loads (STEPL) and the Region 5 Model were utilized to generate existing pollutant loads for the Lake Creek watershed and its subwatersheds. While the program produces general

estimates, the baseline data was generated from multiple factors including: land use, climatic indicators, agriculture, septic rates, urban runoff, and streambank/shoreline impairments. Estimated pollutant loads are influenced heavily by urban areas and agriculture (see Table 1).

Table 1- Existing Pollutant Loads

Source	N Load (lb/yr)	Percent of Total Load	P Load (lb/yr)	Percent of Total Load	Sediment Load (tons/yr)	Percent of Total Load
Urban	27505.85	16.70%	4251.89	15.25%	631.37	4.01%
Cropland	25810.14	15.67%	7430.95	26.65%	4617.44	29.36%
Pastureland & Grassland	75732.41	45.99%	9077.97	32.55%	3425.45	21.78%
Forest	4323.70	2.63%	2039.25	7.31%	333.14	2.12%
Groundwater	20554.50	12.48%	945.82	3.39%	0.00	0.00%
Streambank/Shoreline	10751.08	6.53%	4139.16	14.84%	6719.42	42.73%
Totals	164677.68		27885.06		15726.82	

Pollutant load reduction targets were also generated for major pollutants. A reduction of nitrogen at 15 percent, phosphorus at 25 percent, and sediment reduction of 30 percent were calculated for the plan. Target goals are consistent with the Illinois Nutrient Loss Reduction Strategy (ILNLRs).

To achieve the target goals, BMP were suggested in regards to two major nutrient contributors in the watershed: urban runoff and agricultural practices. While the plan addresses watershed-wide practices, site-specific BMP have also been established to manage agricultural pollutants and urban runoff on a localized level.

These management efforts confront the impairments of the various waterbodies in the Lake Creek watershed. Some of the measures include: streambank and shoreline stabilization, agricultural and vegetated filter strips, and grassed waterways. They have also been categorized by priority based on feasibility, cost, and pollutant load reductions.

The plan incorporates the nine minimum elements required of a watershed-based plan. These elements include: a characterization of the watershed through a resource inventory and assessment to identify nonpoint source pollution, identification of BMP to address those pollutants, identifying funding and

technical assistance, an educational component, and a monitoring and evaluation component to track progress and monitor accomplishments.

Funding will mainly come through EPA Clean Water Act 319 grants. Most of the BMP in the plan are eligible to receive funding through these grants since their focus is reducing nonpoint source pollution.

Outreach and education of watershed-related activities are important in promoting awareness of the plan and progression of plan implementation. Some of the outreach components include: holding public meetings, distributing flyers on the plan and agricultural activities, and locating volunteers for litter and debris cleanups.

Implementation of the plan is divided into three phases. Phase I represents the first two years of the plan where most educational and outreach component are implemented; along with selecting site-specific BMP for grant funding. Phase II will require the watershed action committee to continue submitting grants and starting implementation of BMP. Phase III represents the last four years of the planning period in which BMP implementation will continue and evaluating the plan will begin.

Interim measurable milestones, water quality benchmarks, and a monitoring component have also been established to track progress and evaluate the success of the plan. Table 2 represents the water quality benchmarks in the plan which focuses on nitrogen, phosphorus, and sediment.

Table 2- Water Quality Benchmarks

Benchmark Period	Benchmark Reduction Target					
	Nitrogen (percent)	Nitrogen (lbs/ yr)	Phosphorus (percent)	Phosphorus (lbs/yr)	Sediment (percent)	Sediment (tons/yr)
2 Year (Phase I)	-	-	-	-	-	-
6 Year (Phase II)	6	11527	10	2789	15	2359
10 Year (Phase III)	15	24701	25	6971	30	4718

The monitoring component of the plan features programs offered by IEPA and the Illinois Division of Natural Resources (IDNR). The Volunteer Lake Monitoring Program (VLMP) and the Ambient Lake Monitoring Program (ALMP) are both ways in which water quality can be tested. Results will be analyzed by the watershed action committee to determine success of BMP implementation and the plan itself.

