Lake Creek Watershed Management Plan Public Meeting

Arrowhead Lake
May 3, 2018
6:00 PM

Agenda

I. Welcome and Introductions

II. Watershed Basics

III. Overview of Lake Creek Watershed

IV. Elements of a Successful Watershed-based Plan

V. Best Management Practices/ Priority Areas

VI. Discussion

Greater Egypt Regional Planning and Development Commission

Tyler Carpenter

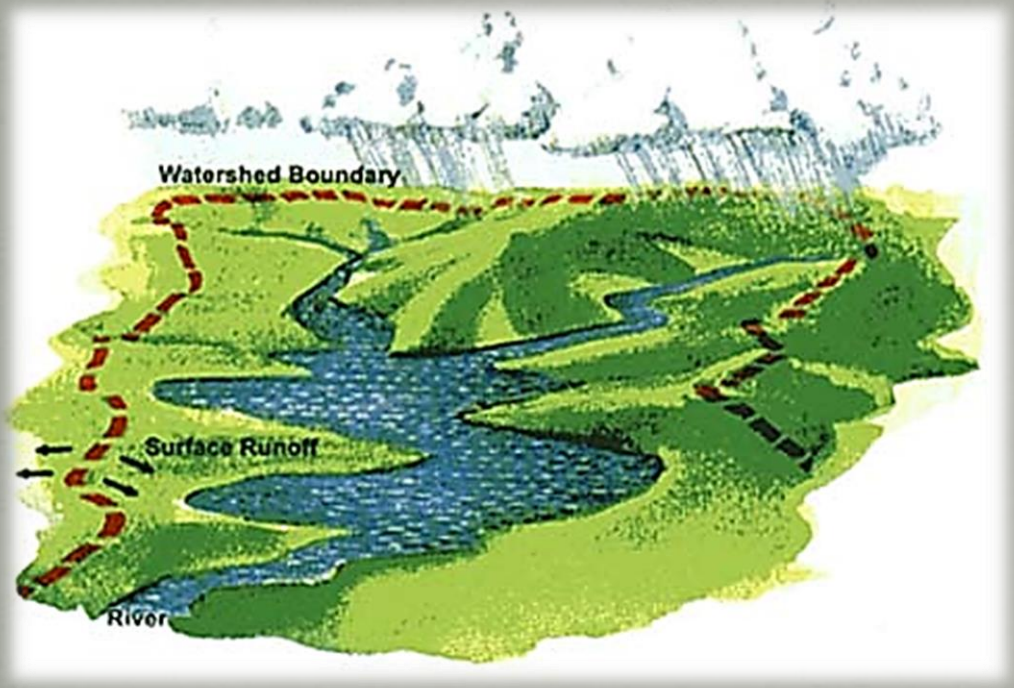
GIS & Environmental Planning Manager

Illinois Environmental Protection Agency

IEPA- 604(b) Program

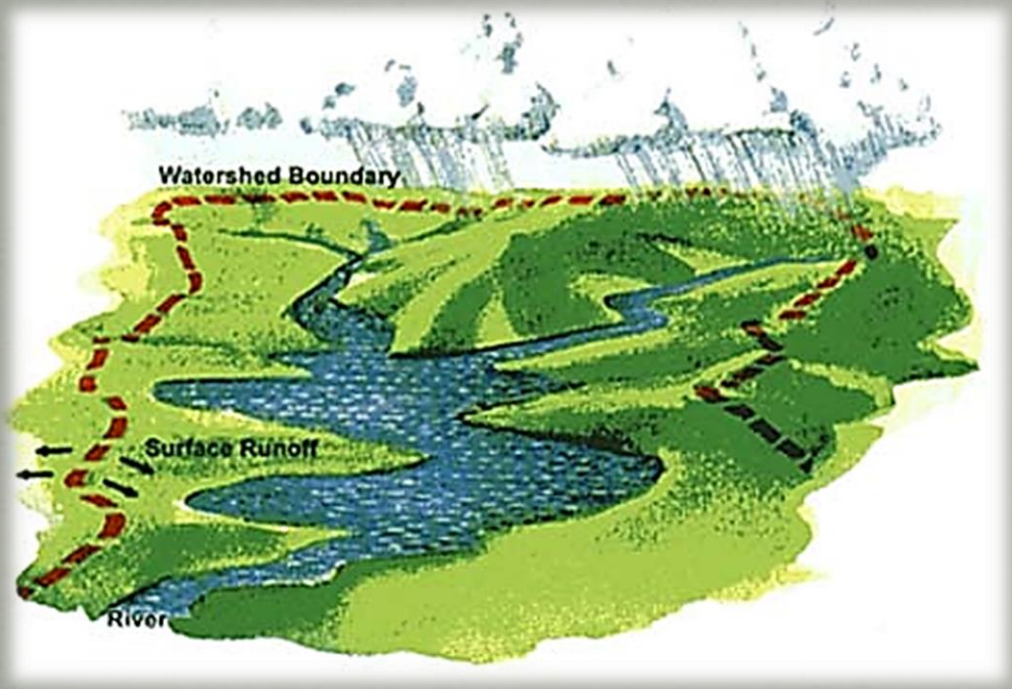
- Water Quality Management Planning Grant
- Greater Egypt's 604(b) grant includes watershed-based planning and coordinating the Volunteer Lake Monitoring Program (VLMP)

Watershed Basics



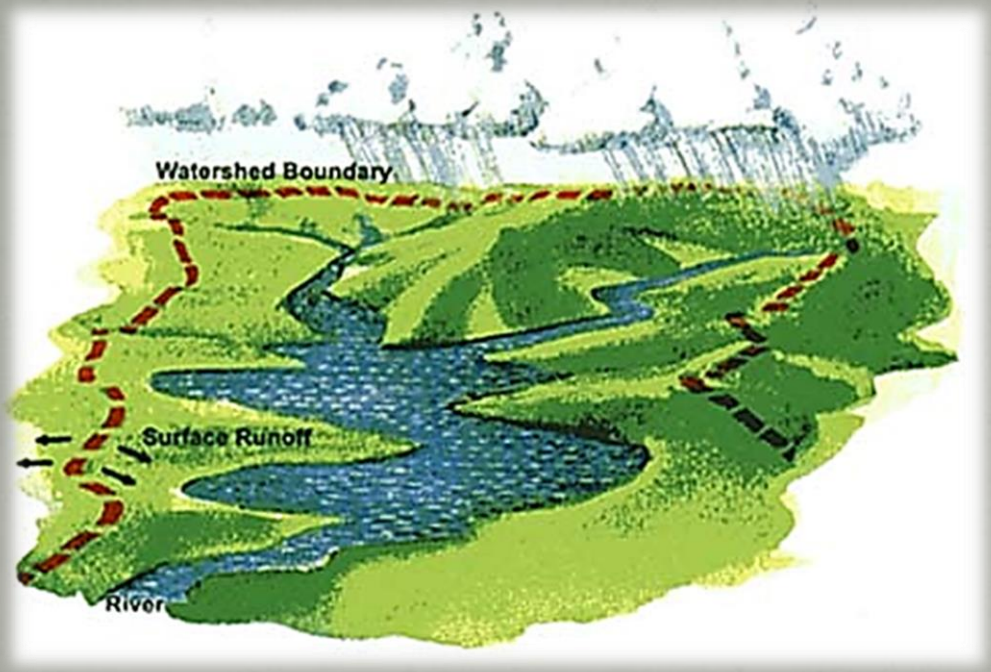
- What constitutes a watershed?
- What are the components of a watershed?

What is a Watershed?



- An area of land where all of the runoff flows to a common stream, or waterbody
- Boundaries are generally the highest points
- Watersheds can vary in size

Watershed Components



- Surface Water

  - Creeks, Lakes, Wetlands

- Riparian Areas

  - Plants along the banks

- Uplands

  - Steep terrain

- Groundwater

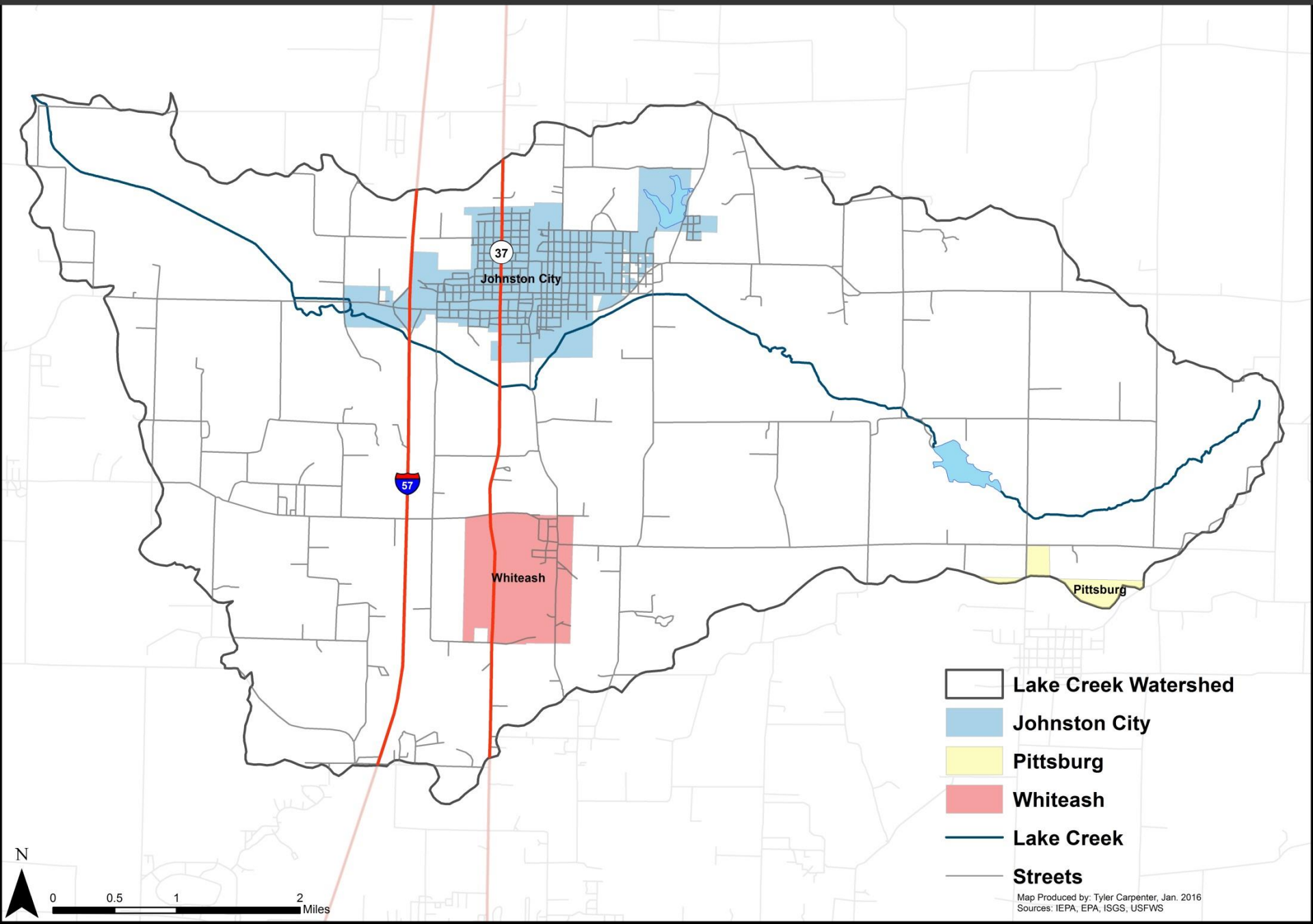
  - Bedrock, sand and gravel

Lake Creek Watershed

Quick Facts

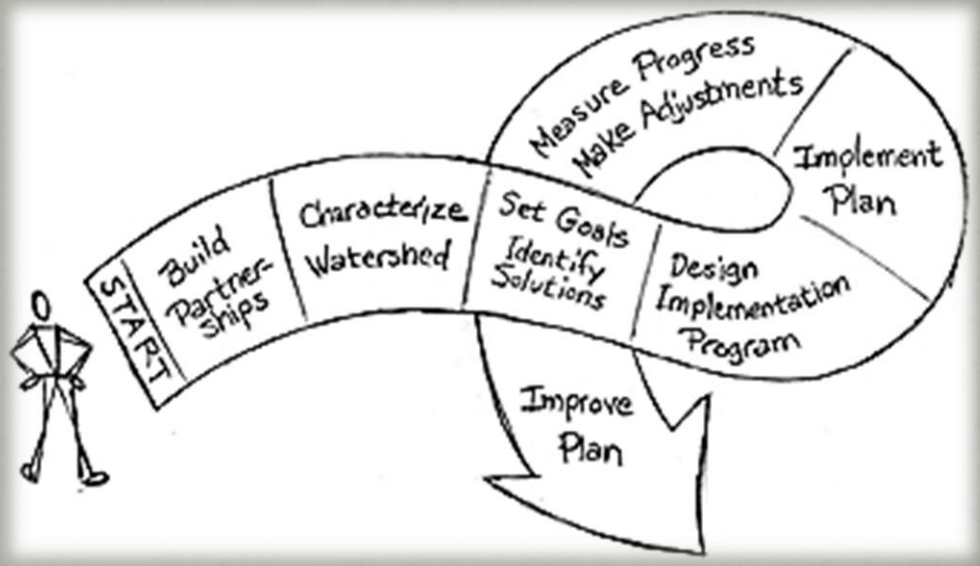
- Encompasses 21,783 acres, or 34 square miles
- Located entirely within Williamson County
- Lake Creek runs 12.6 miles in a westerly direction
- Johnston City is the largest municipality in the watershed

Lake Creek Watershed - Planning Area



Watershed-based Plan

- Summarizes the overall condition of the watershed
- Provides a framework to restore water quality in impaired waters
- Protects water quality in other waters adversely affected or threatened by point source and non-point source pollution



Point Source Pollution

- Domestic WTPs
- Industrial WTPs
- Combined Sewer Overflows
- Sanitary Sewer Overflows
- Mine Discharges
- Landfills

Nonpoint Source Pollution

- Urban Runoff
- Golf Courses
- Crop Production
- Livestock Grazing
- Erosion
- Failing Septic Systems

Savingwater.co

Croplife.ca

Why Develop a Watershed-based Plan?

Benefits can include:

- Reduction of pollution on surface water and groundwater
- Restoration of water bodies to a healthy state
- Conservation of farmland
- Partnership and collaboration among stakeholders
- Support of sustainable communities and economic growth
- Prevention and reduction of flooding

Elements of a Successful Watershed-based Plan

Collaboration of Stakeholders

- Watershed-based planning is a stakeholder-supported approach to improving and protecting water resources
- Stakeholders can include representatives from local government, conservation groups, and landowners
- The success of a watershed-based plan is dependent on the involvement of the stakeholders

Planning Efforts

1. Identify causes and sources of water pollution and estimate existing pollutant loads.

2. Set water quality goals and load reduction targets to achieve those goals, and estimate load reductions expected from recommended management measures.

3. Describe the management measures needed to achieve load reduction targets.

4. Describe the technical and financial assistance (amount, costs, and sources) and relevant authorities needed to implement the plan.

5. Enhance public understanding through outreach measures.

Planning Efforts

6. Provide a schedule for implementing the management measures identified in the plan.

7. Identify interim, measurable milestones for determining whether management measures are being implemented on schedule.

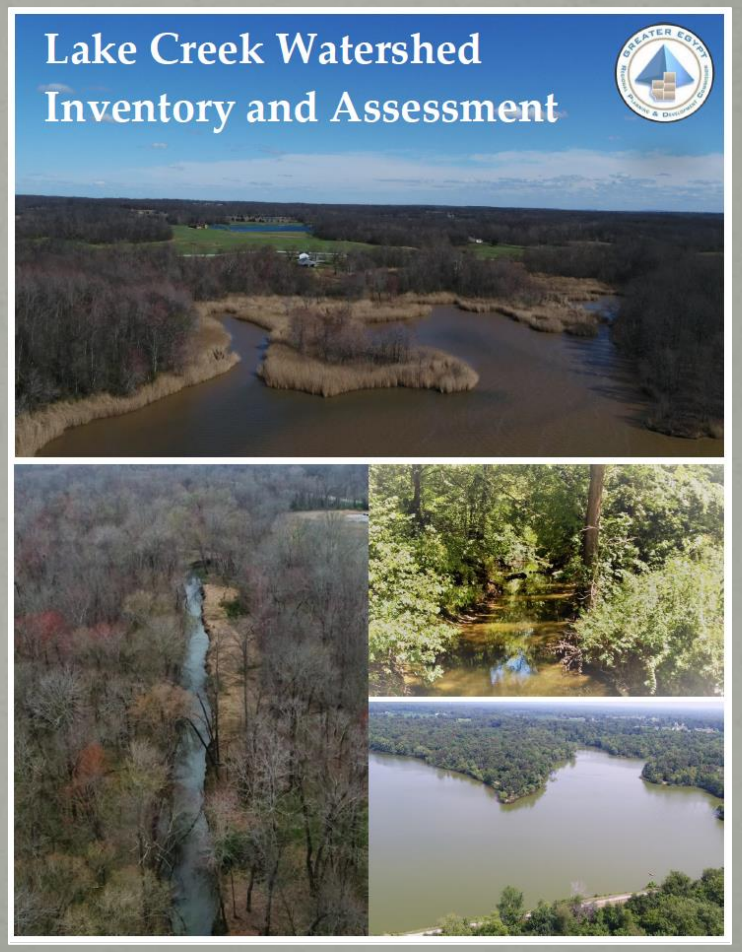
8. Identify interim benchmarks to measure progress in meeting water quality goals and load reduction targets.

9. Describe a monitoring component.

1.) Identify causes and sources of water pollution and estimate existing pollutant loads

Watershed Resource Inventory

- Documentation of existing conditions in the watershed and its sub-watersheds
- Inventory of components such as: Geographic Boundaries, Land Use, and Drainage Assessment
- Field Assessment of erosion and riparian areas



- Watershed-wide Pollutant Loading

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**	

2.) Set water quality goals

Water Quality Goals could include:

- Achieve water quality standards and total maximum daily loads for specific pollutants
- Identify load reduction targets for specific pollutants

Waterbody	Causes of Impairment(s)	Sources of Impairment(s)
Lake Creek	Dissolved Oxygen, Phosphorus, Changes in Stream Depth and Velocity Patterns	Municipal Point Source Discharges, Crop Production, Agriculture, Urban Runoff/ Storm Sewers, Unknown Sources
Beaver Creek	Manganese, Changes in Stream Depth and Velocity Patterns, Loss of Instream Cover	Loss of Riparian Habitat, Municipal Point Source Discharges, Crop Production, Agriculture, Urban Runoff/ Storm Sewers, Runoff from Forest/Grassland/Parkland
Johnston City Lake	Total Suspended Solids, Phosphorus, Aquatic Algae	Littoral/ Shore Area Modifications, Runoff from Forest/Grassland/Parkland
Arrowhead Lake	Phosphorus	Runoff from Forest/Grassland/Parkland

Data acquired from the Specific Assessment Information for Lakes and Streams of 2016, EPA

IL Nutrient Loss Reduction Strategy (NLRS)

- Collaborative effort between IEPA, IL Dept. of Agriculture, and the IL NLRS Policy Working Group and subcommittees

- Develop strategies and promote best management practices (BMP) for nutrient runoff

- Goals include: **25% reduction in phosphorus load (2025)**

  15% reduction in nitrate-nitrogen load (2025)

  Eventual goal is 45% for both nutrients

3.) Describe the management measures needed to achieve load reduction targets

Management measures could include:

- Identify best management practices (BMPs) to achieve water quality objectives

- Identify priority areas and practices

4.) Describe the technical and financial assistance and relevant authorities needed to implement the plan

- IEPA 319 Grants offer a 60 percent cost share
- USDA- CRP. CREP, EQIP
- Other agencies

Best Management Practice	Funding Sources	Notes/Cost Share Rates
• Filter strips and riparian buffers • Dry dams (WASCBs) • Grass waterways • Terraces • Diversions • Wetland creation • Blind inlets and tile drainage management • Nutrient management • Cover crops	Illinois EPA – 319 program NRCS – EQIP program FSA – CRP program SWCD – CPP program USFWS – Acres for wildlife program IDNR/SWCD – CREP program IDNR – SWG program NRCS – WHIP program IDNR – Special Wildlife Funds Grants	CREP eligible acres must be in the 100-year floodplain and/or have cropped ground with an erodibility index of 8 or greater adjacent to riparian zones; must have cropping history as defined by the USDA. SWG program requires 50% state match and must address goals/species outlined in the State of Illinois Comprehensive Wildlife Plan. NRCS, FSA, and SWCD programs generally provide 60% cost-share, however, some special programs and practices can provide up to 90%. FSA, CREP and some NRCS programs also provide annual rental payments for taking ground out of production.
• Streambank/lake shore stabilization and in-stream grade control or other grade control	Illinois EPA – 319 Program SWCD – SSRP program NRCS – EQIP program	Illinois EPA 319 offers 60% cost share SSRP offers 75% cost share EQIP offers 60% cost share
• Wetland restoration and other habitat practices	Illinois EPA – 319 program NRCS – EQIP program NRCS – WRP program FSA – CRP program USFWS – Landowner Incentive Program IDNR/SWCD – CREP program IDNR – SWG program IDNR – Special Wildlife Funds Grants	WRP program – multiple/stringent eligibility requirements. NRCS, FSA, and SWCD programs provide a minimum of 60% cost-share, however, some special programs and practices can provide up to 90%. FSA, CREP and some NRCS programs also provide annual rental payments for taking ground out of production.
• Livestock/equestrian practices, including fencing, stream crossings, pasture management, watering systems etc.	Illinois EPA – 319 program NRCS – EQIP program IDNR – Forestry Development Act funding (FLEP)	FLEP is applicable to livestock fencing for woodlands. Livestock management recommendations outlined in this report that includes wetland and/or habitat restoration can be funded by other programs such as the US F&W – Landowner Incentive Program EQIP typically provides 60% cost-share

5.) Enhance public understanding through outreach measures

- Establish a Lake Creek Watershed Action Committee
  - Will oversee plan implementation and monitoring
- Hold public meetings
  - Keep the public informed throughout plan implementation
- Distribute flyers or brochures regarding watershed management efforts
- Enlist volunteers for litter cleanup days
  - Could be conservation groups, 4H, Boy/Girl Scouts or other local groups
- Hold workshops for watershed activities
  - Stormwater management
  - Agricultural workshops

6.) Construct an Implementation Schedule for measures in the plan

- Should reflect BMP, educational component, and general goals of plan

Target	Phase I		Phase II				Phase III			
	Short-term (2 yr)		Mid-term (3-6 yr)				Long-term (7-10 yr)			
	1	2	3	4	5	6	7	8	9	10
Establish watershed action committee	X									
Hold public meetings to gain input	X	X	X	X	X	X				
Post watersheds sign for public awareness and BMP implementation	X	X	X	X	X	X	X	X	X	X
Create a website for watershed activities and key dates		X								
Enlist volunteers for litter cleanup days	X	X	X	X	X	X	X	X	X	X
Distribute flyers for stormwater management and similar topics	X		X		X		X		X	
Hold workshops to inform public on stormwater management		X		X		X		X		
Continue researching funding and technical assistance	X	X	X							
Select site-specific BMPs for preliminary design	X	X	X							

7.) Identify milestones to determine if management measures are being implemented on schedule

Interim Measurable Milestones				
Goal	**Indicator**	**Short (2-year)**	**Mid (6-yr)**	**Long (10-yr)**
Outreach and Education	Educational Brochures for Fertilizer Use	500	1000	1500
	Educational Brochures for Stormwater Management	500	1000	1500
	Lakes in Volunteer Lake Monitoring Program	1	3	-
	Number of Litter Cleanup Days	3	6	9
	Public Meetings Held	4	10	14
	Stormwater Management Workshops Held	1	3	5
Reduce/Mitigate Flooding	Detention Basins Installed	-	1	2
	Linear Feet of Stream Channel Debris Removal	150	300	600

8.) Identify interim benchmarks to measure progress in meeting water quality goals

Benchmarks could include:

- Total Suspended Solids Load Reduction
- Nitrogen, Phosphorus

	Benchmark Reduction Target					
Benchmark Period	**Nitrogen (percent)**	**Nitrogen (lbs/ yr)**	**Phosphorus (percent)**	**Phosphorus (lbs/yr)**	**Sediment (percent)**	**Sediment (tons/yr)**
2 Year (Phase I)	-	-	-	-	-	-
6 Year (Phase II)	6	8897	20	5497	20	3159
10 Year (Phase III)	15	22241	40	10995	45	7108

9.) Describe a monitoring component

Recommends future assessment activities to be undertaken and can be designed to:

- Better identify potential causes and sources of pollution
- Assess BMP effectiveness
- Track and evaluate the effectiveness of plan implementation

Monitoring Component	Phase I		Phase II				Phase III			
	1	2	3	4	5	6	7	8	9	10
Ambient Lakes Monitoring Program	X					X				
Sediment Monitoring	X		X		X		X		X	
Volunteer Lake Monitoring Program	X	X	X	X	X	X	X	X	X	X
Watershed Basin Surveys		X					X			

IV. Element C: Best Management Practices

BMP in plan should address:

- **Impairments to waterbodies through nonpoint sources**
- **Drainage/Flooding issues**
- **Possible recreation**
- **Site-specific areas and watershed-wide practices**

IV. Element C: Best Management Practices

Impairments:

- **Beaver Creek:** Manganese, Changes in stream depth, loss of instream cover
- **Lake Creek:** Dissolved Oxygen, Phosphorus, Changes in stream depth

- **Arrowhead Lake**: Phosphorus
- **Johnston City Lake**: Aquatic Algae, Phosphorus, Total Suspended Solids

IV. Element C: Best Management Practices

BMP Suggestions for Specific Impaired Streams:

Waterbody	Causes of Impairment(s)	Sources of Impairment(s)	BMP Suggestions
Lake Creek	Dissolved Oxygen	Municipal Point Source Discharges	Review NPDES Permits for discharges (Johnston City)
			Inspect discharge locations
	Phosphorus	Crop production/ Agriculture Urban Runoff/Storm Sewers	Agricultural Filters/buffers, conservation practices, enrollment in conservation programs, nutrient management, other BMP
			Vegetative buffers/filters, permeable pavement, disconnects from storm sewers, other urban BMP
	Changes in Stream depth and Velocity Patterns	Unknown Sources	Streambank Stabilization, other "Slow the flow" measures, others?

Waterbody	Causes of Impairment(s)	Sources of Impairment(s)	BMP Suggestions
Beaver Creek	Manganese	Loss of Riparian Habitat, Municipal Point Source Discharges	Review NPDES Permits for discharges (Johnston City)
			Inspect discharge locations
			Riparian Corridor, Riparian buffer
	Changes in Stream depth and velocity patterns	Crop production/ Agriculture Urban Runoff/Storm Sewers	Agricultural Filters/buffers, conservation practices, enrollment in conservation programs, streambank stabilization, nutrient management, other BMP
			Vegetative buffers/filters, permeable pavement, disconnects from storm sewers, other urban BMP
	Loss of instream cover	Runoff from Forest/Grassland/Parkland	Slow the flow measures, others?

IV. Element C: Best Management Practices

BMP Suggestions for Specific Impaired Lakes:

Waterbody	Causes of Impairment(s)	Sources of Impairment(s)	BMP Suggestions
Arrowhead Lake	Phosphorus	Runoff from Forest/Grassland/Parkland	Conservation buffers/filters, permeable pavement, shoreline stabilization

Waterbody	Causes of Impairment(s)	Sources of Impairment(s)	BMP Suggestions
Johnston City Lake	Aquatic Algae	Runoff from Forest/Grassland/Parkland	Conservation buffers/filters, permeable pavement, shoreline stabilization
	Phosphorus		
	Total Suspended Solids	Littoral/ Shore Area Modifications	Return old ramp area to natural state, shoreline stabilization

IV. Element C: Best Management Practices

Greater Egypt BMP Recommendations

- Agricultural Filters/ Buffers
- Debris Removal
- Grassed Waterways
- Riparian Buffer
- Streambank/Shoreline Stabilization
- Urban Filter Strips/Buffers

IV. Element C: Best Management Practices

Agricultural Filters/Buffers Criteria

- Adjacent to waterbody
- No existing buffer
- High Priority- <25 ft
- Mid Priority- <50 ft
- Low Priority- >50 ft
- Nutrient runoff reduction

IV. Element C: Best Management Practices

Debris Removal Criteria

- Limiting flow
- Areas with existing drainage issues
- Organic vs. Synthetic
- Other considerations

IV. Element C: Best Management Practices

Grassed Waterways Criteria

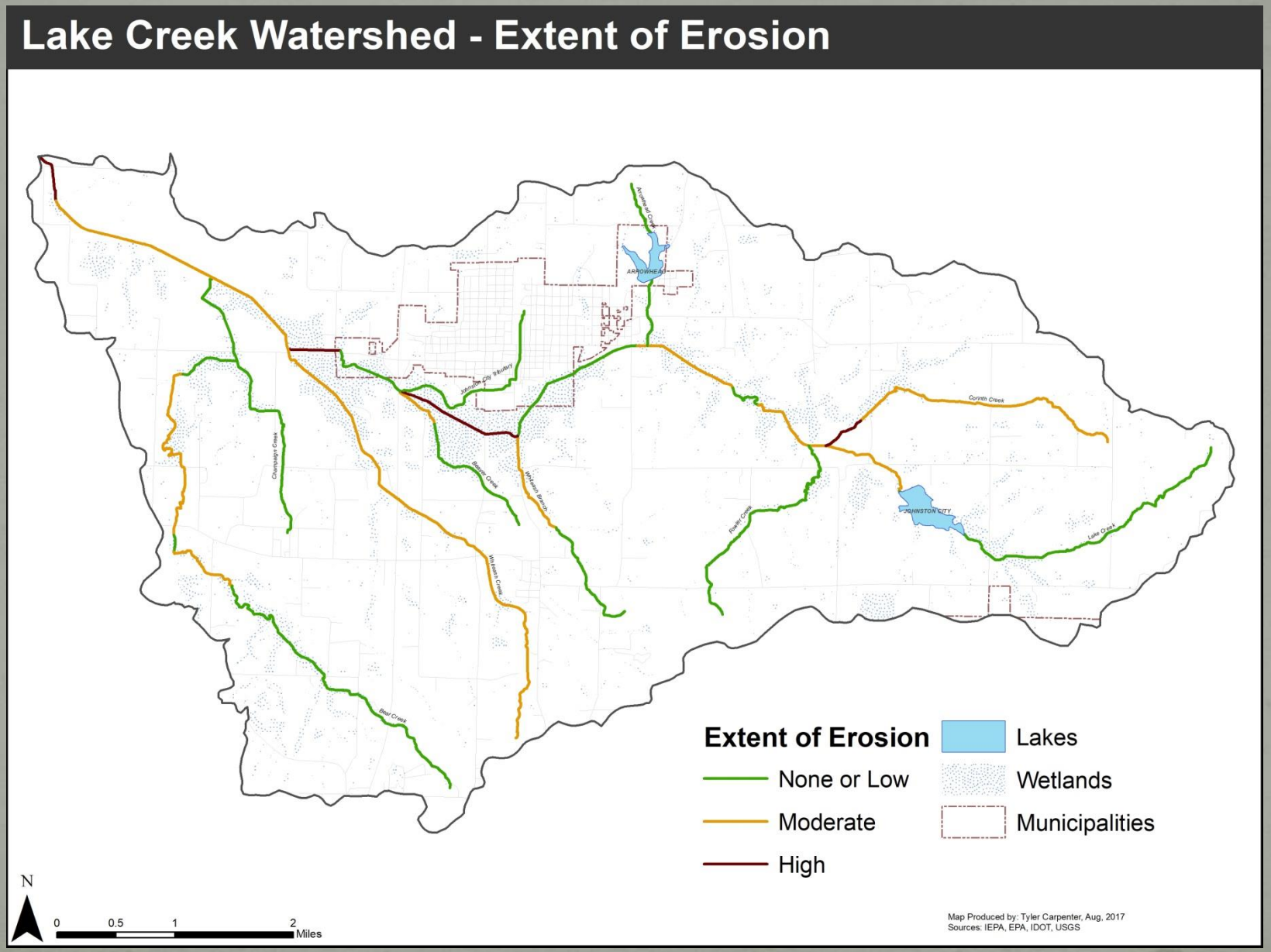
- Proximity to waterbody
- Level of erosion
- Soils
- Priority given to areas exceeding five years of observed erosion
- Reduction of sediment
- Possible reduction of nutrient runoff

IV. Element C: Best Management Practices

Streambank/Shoreline Stabilization Criteria

- Based on assessment
- High Priority- High Level
- Mid Priority- Medium Level
- Low Priority- None or Low
- Ease of operation
- Sediment reduction

Assessment

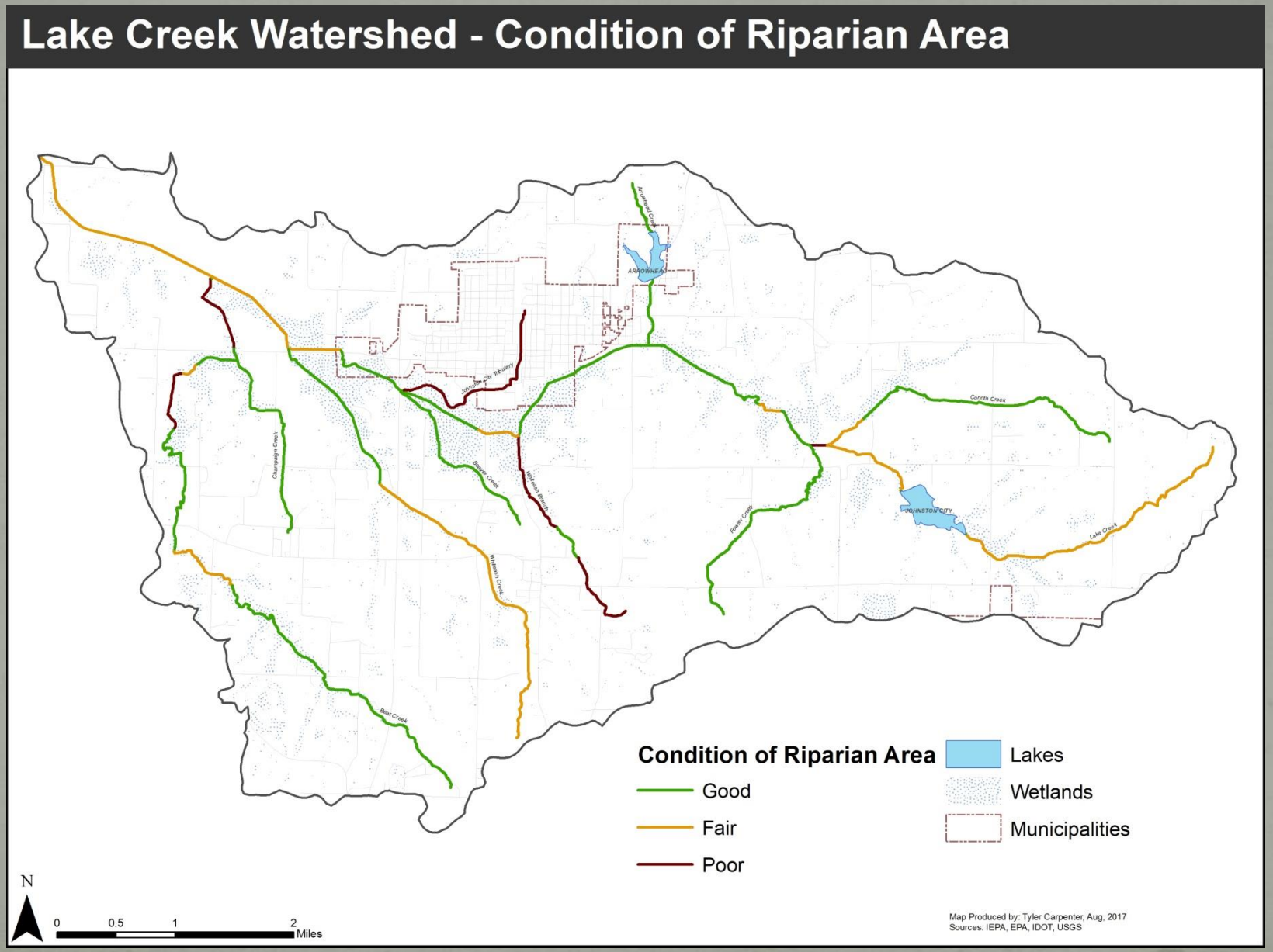

Lake Creek Watershed - Extent of Erosion
ARROWHEAD
JOHNSTON CITY
Corinth Creek
Champaign Creek
Beaver Creek
Whessin Branch
Whessin Creek
Rowin Creek
Lake Creek
Bear Creek
Extent of Erosion
None or Low
Moderate
High
Lakes
Wetlands
Municipalities
N
0
0.5
1
2
Miles
Map Produced by: Tyler Carpenter, Aug, 2017
Sources: IEPA, EPA, IDOT, USGS

IV. Element C: Best Management Practices

Riparian Buffer Criteria

- Based on assessment
- No tree cover
- Linked to other areas with canopy
- Stream crossings?
- Intercepts nutrients
- Natural bank stabilization

Assessment


Lake Creek Watershed - Condition of Riparian Area
ARROWHEAD
JOHNSTON CITY
Corinth Creek
Champaign Creek
Beaver Creek
Whitman Branch
Whitman Creek
Bear Creek
Condition of Riparian Area
Good
Fair
Poor
Lakes
Wetlands
Municipalities
N
0
0.5
1
2
Miles
Map Produced by: Tyler Carpenter, Aug, 2017
Sources: IEPA, EPA, IDOT, USGS

IV. Element C: Best Management Practices

Greater Egypt BMP Recommendations

- Recommendations to be broken into site-specific and watershed-wide categories
- Site-specific areas will address the BMP previously mentioned
- Watershed-wide practices can be more general (examples)
  - 10,000 feet of streambank stabilization
  - 400 acres of farmland to implement cover crops
  - Recommendations of ordinances pertaining to water quality, stormwater
  - Educational BMP

IV. Element C: Best Management Practices

Next Steps for Greater Egypt BMP Recommendations

- Finalize list of BMP and create priority list
- Create nutrient load reduction models for each BMP (EPA Region 5 Model)
- Look in to other BMP: stream crossings (animal, mechanical), urban BMP from drainage map of Johnston City (from City officials)

IV. Element C: Best Management Practices

Public Recommendations

Area Type	BMP Suggestions from Council	Outcome
Agricultural (Cropland, Pasture/Hay)		
Urban (Municipal, Roads)		
Forested		
Other		

Questions/Comments

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