APPENDIX B – CRITICAL AREAS

This appendix includes descriptions of the source data used to delineate Critical Areas, and maps of each Critical Area. Maps of Best Management Practices (BMPs) as outputs from the Agricultural Conservation Planning Framework (ACPF) are also included.

How locations were identified

Several sources of information were used to identify Critical Area locations. These include wetland restoration ranking values from the Missouri Resource Assessment Partnership (MoRAP) and results from the U.S. Department of Agriculture (USDA) ACPF tools.

Wetland restoration ranking values

Wetland restoration ranking values and wetland importance values were created for the watershed by the MoRAP. Several layers of data, especially topography, soil type, and land cover, were used to create maps of existing wetlands which it is highly important to protect, and areas which were formerly wetlands which it would be highly beneficial to restore.

Agricultural Conservation Planning Framework (ACPF)

The ACPF is a set of GIS-based tools developed by the USDA Research Service (USDA-ARS) that can substantially enhance watershed planning capabilities on agricultural land. The ACPF is currently available for Minnesota, Iowa, and Illinois, and uses new high-resolution data sources, such as soils, land use, crop rotations, and elevation (from LiDAR). The tools determine slope, flow accumulation, and other factors by HUC12, allowing analysis at watershed and field scales. Among the outputs of the tools are possible beneficial locations for different types of practices placed in fields, at field edges, and in riparian zones. No recommendations are made. The aim is to create a planning resource to use in watershed planning and consultation with landowners.

The BMPs recommended by the model include grassed waterways, contour buffer strips, drainage water management, appropriate riparian vegetation, and nutrient management wetlands. Many of the tools within the ACPF have parameters that can be adjusted by the user to change their output. For example, the user can define the width of contour buffer strips generated and the minimum distance between buffer strips. Table B.1 shows the user-defined or modifiable values used for this assessment.

Table B.1. Values entered into ACPF tools to generate BMP locations for user-defined or modifiable parameters.

ACPF BMP	**Values used for user-defined or modifiable parameters**
Edge-of-Field Bioreactors	No modifiable parameters
Contour buffer strips	Buffer strip width: 15 feet Minimum distance between buffer strips: 90 feet (default)
Drainage water management	Tile-drained agricultural fields where a 1 meter (3.3 ft) contour interval comprises more than 30% of the field (representing the addition of 2 control gate structures on the tile drain), with a default minimum of 20 acres
Grassed waterways – SPI Threshold	Drainage threshold: >6 acres Standard deviations: 2
Nutrient Removal Wetlands	Suggested spacing distance: 250 meters (default) Impoundment height: 0.9 meters (default) Buffer height: 1.5 meters (default) Road file used to avoid roads: Madison County roads shapefile
WASCOBs	Embankment height: 1.5 meters (default) Road file used to avoid roads: Madison County roads shapefile WASCOB basin depth raster (optional): left blank
Riparian function assessment	No modifiable parameters

The data analysis capabilities of the model also allow for further, independent assessment of different BMPs. Planning scenarios can be generated from the results and compared/evaluated in a simple way without additional input.

The results of the ACPF modeling were combined into one map in ArcMap. They were printed on 30 x 40 inch zoomed-in maps covering the whole watershed. These maps will be useful for the county Soil and Water Conservation Districts and Natural Resources Conservation Service (NRCS) staff to explore BMP options with farmers interested in implementing a soil conservation or waterway protection project. The ACPF results were also useful in setting the numeric targets for this watershed plan.

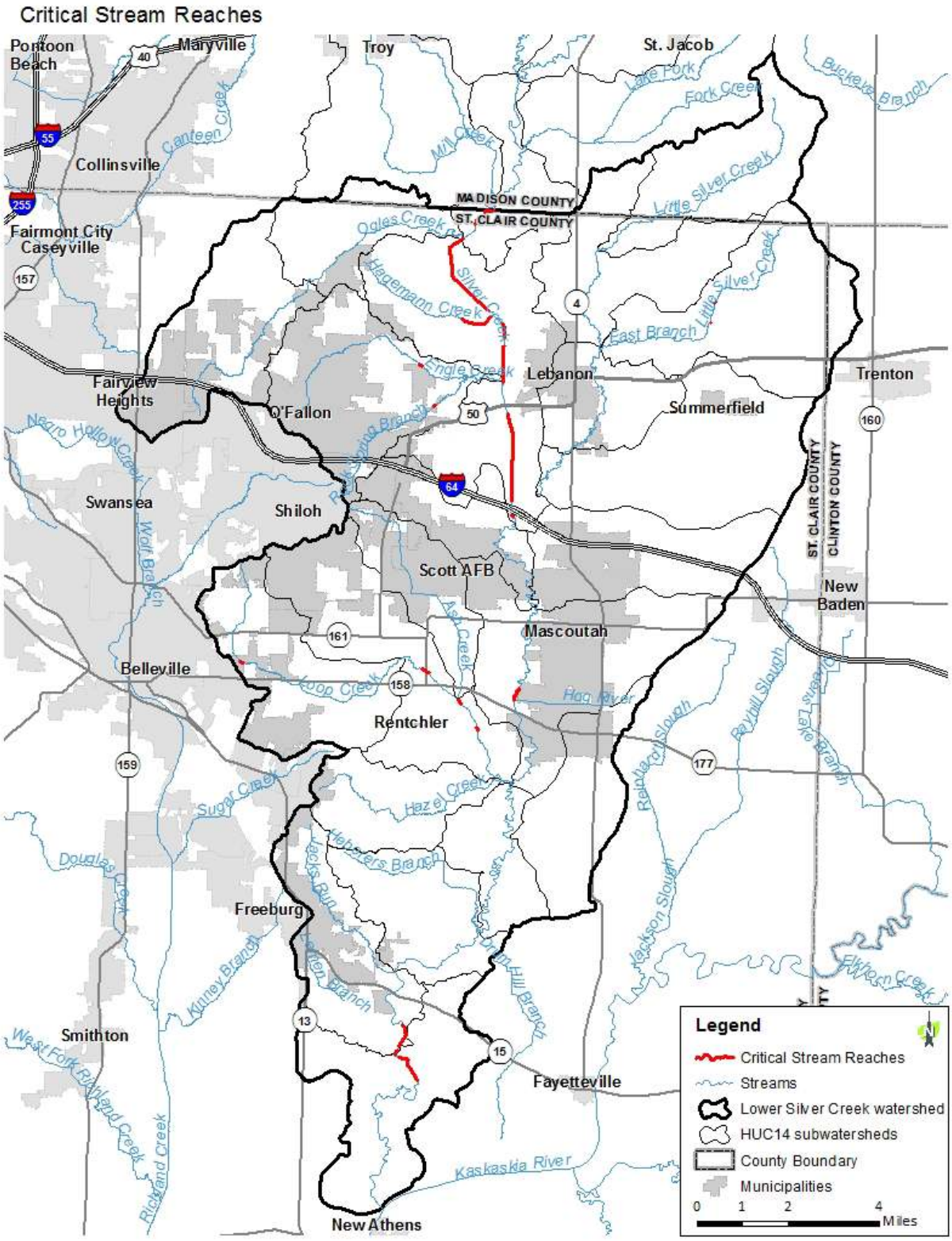
The ACPF is focused on reducing runoff and preventing nutrient pollution from farmlands. It focuses on the value of wetlands as nutrient sinks and for flood control (as compared with the MoRAP assessment which considers wetland value as potential for restoration. Together, the ACPF and the MoRAP wetlands mitigation importance values will overlap in several places, showing wetlands of extremely high restoration and protection importance.

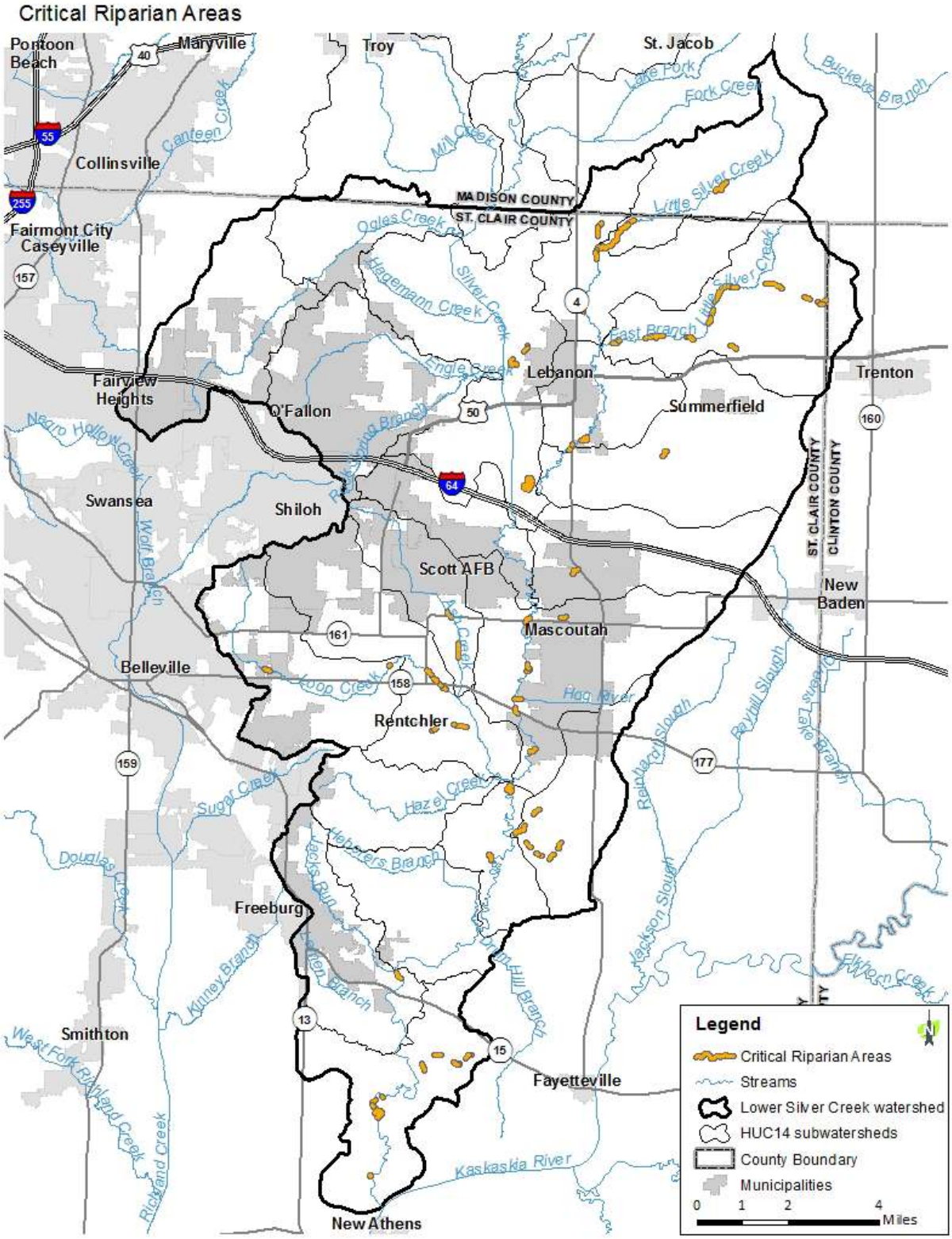
The following table (Table B.2) and maps show the ACPF results for several Best Management Practices.

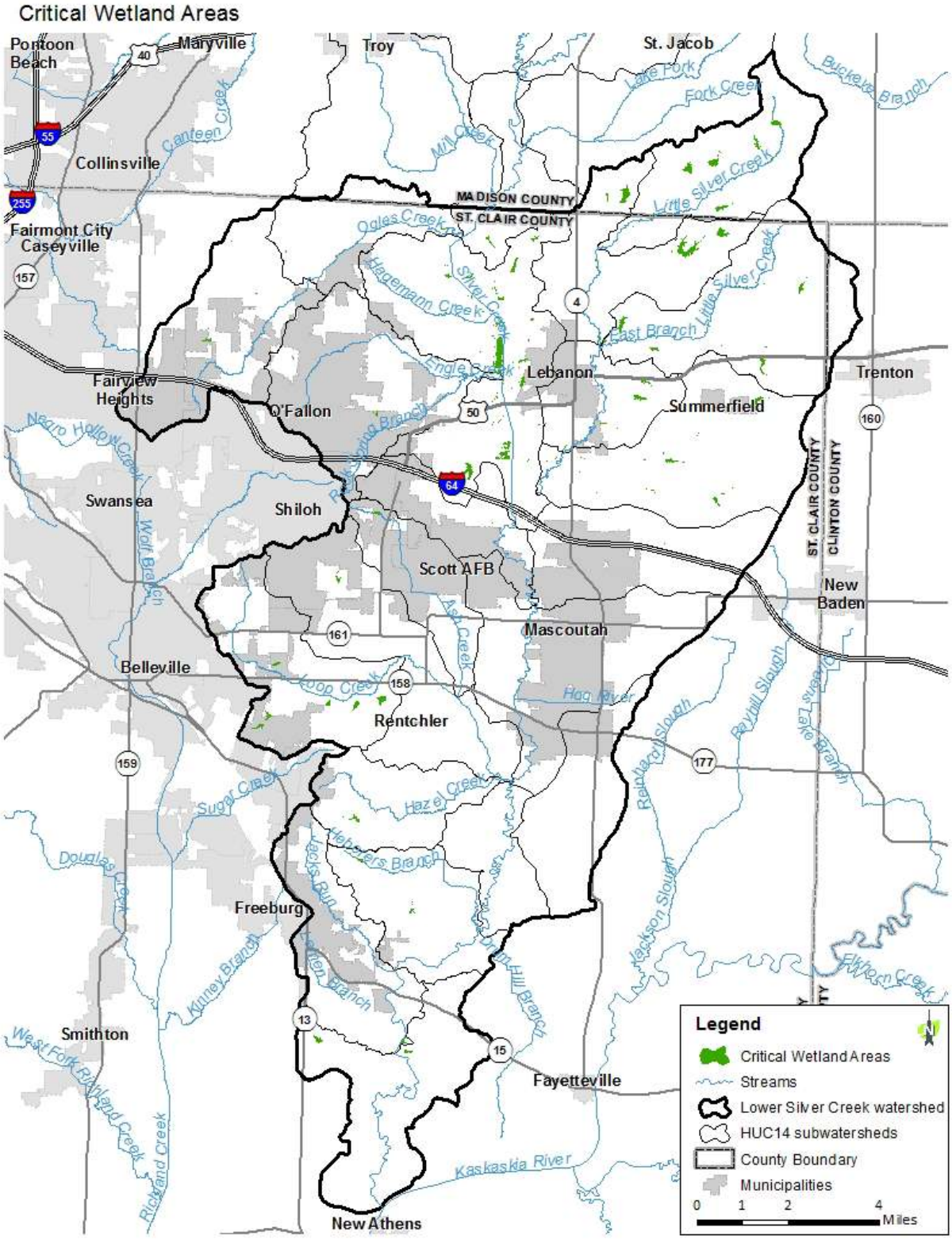
Table B.2. Summary data for the ACPF results by HUC12.

ACPF results	HUC12						TOTAL
	071402040507	071402040508	071402040509	071402040510	071402040511	071402040512	
# bioreactors	6	114	35	70	39	59	323
Total area bioreactors (sq m)	5736	113429	32230	60848	35764	53692	301698
# contour buffer strips	203	464	782	89	277	386	2201
Total area contour buffer strips (sq meters)	170758	452954	752605	79645	242285	351640	2049887
Grass waterways total length (m)	70118	822850	443237	312452	104546	218819	1972022
# drainage management polygons	7	219	67	126	48	110	577
Area drainage management fields (sq meters)	461	22324	8189	10832	4647	6856	53309
# nutrient removal wetlands	1	18	14	0	9	4	46
Nutrient removal wetlands area (wetland & buffers) (sq meters)	462	22342	8203	0	4656	6860	42523
Wetland area only (sq meters)	12941	334133	199363	0	109137	54181	709755
Area draining to nutrient removal wetlands (sq meters)	727000	23258300	18069948	0	8068028	3916480	54039756
Riparian area: # Critical Zone segments (CZ)		12	3	8	13	16	52
Riparian area: # Multi Species Buffer (MSB)	4	70	18	38	40	32	202
Riparian area: # Stiff Stemmed Grasses (SSG)	58	85	174	51	73	76	517
Riparian area: # Deep Rooted Vegetation (DRV)	12	126	152	177	116	147	730
Riparian area: # Stream Bank Stabilization (SBS)	200	237	532	155	192	313	1629
# WASCOBs	74	194	329	46	97	112	852
Area WASCOB basins when filled (sq meters)	245712	586496	790756	155741	253560	329301	2361565

Critical Areas Maps – watershed-wide




Critical Riparian Areas
Pontoon Beach
Maryville
Troy
St. Jacob
Collinsville
Fairmont City
Caseyville
MADISON COUNTY
ST. CLAIR COUNTY
Fairview Heights
O'Fallon
Lebanon
Summerfield
Trenton
Swansea
Shiloh
Scott AFB
New Baden
Mascoutah
Belleville
Rentchler
Freeburg
Smithton
Fayetteville
New Athens
ST. CLAIR COUNTY
CLINTON COUNTY
Canteen Creek
Mill Creek
Lake Fork
Fork Creek
Buckeye Branch
Little Silver Creek
Ogles Creek
Hagemann Creek
Silver Creek
East Branch Little Silver Creek
Engle Creek
Negro Hollow Creek
Wolf Branch
Richland Branch
Loop Creek
Hog River
Sugar Creek
Hazel Creek
Douglas Creek
Kinney Branch
Jacks Run
Hebbers Branch
Allen Branch
Town Hill Branch
Raupbarger Slough
Paydill Slough
Jackson Slough
Elkhorn Creek
West Fork Richland Creek
Richland Creek
Kaskaskia River
Legend
Critical Riparian Areas
Streams
Lower Silver Creek watershed
HUC14 subwatersheds
County Boundary
Municipalities
0 1 2 4
Miles


Critical Wetland Areas
Pontoon Beach
Maryville
Troy
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Fairmont City
Caseyville
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O'Fallon
Lebanon
Summerfield
Trenton
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Shiloh
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Fayetteville
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MADISON COUNTY
ST. CLAIR COUNTY
CLINTON COUNTY
Canteen Creek
Mill Creek
Lake Fork
Fork Creek
Buckeye Branch
Little Silver Creek
Ogles Creek
Hagemann Creek
Silver Creek
East Branch Little Silver Creek
Engle Creek
Negro Hollow Creek
Wolf Branch
Ash Creek
Hoop Creek
Hog River
Sugar Creek
Hazel Creek
Douglas Creek
Kinney Branch
Jacks Run
Richland Creek
West Fork Richland Creek
Kaskaskia River
Elkhorn Creek
Jackson Slough
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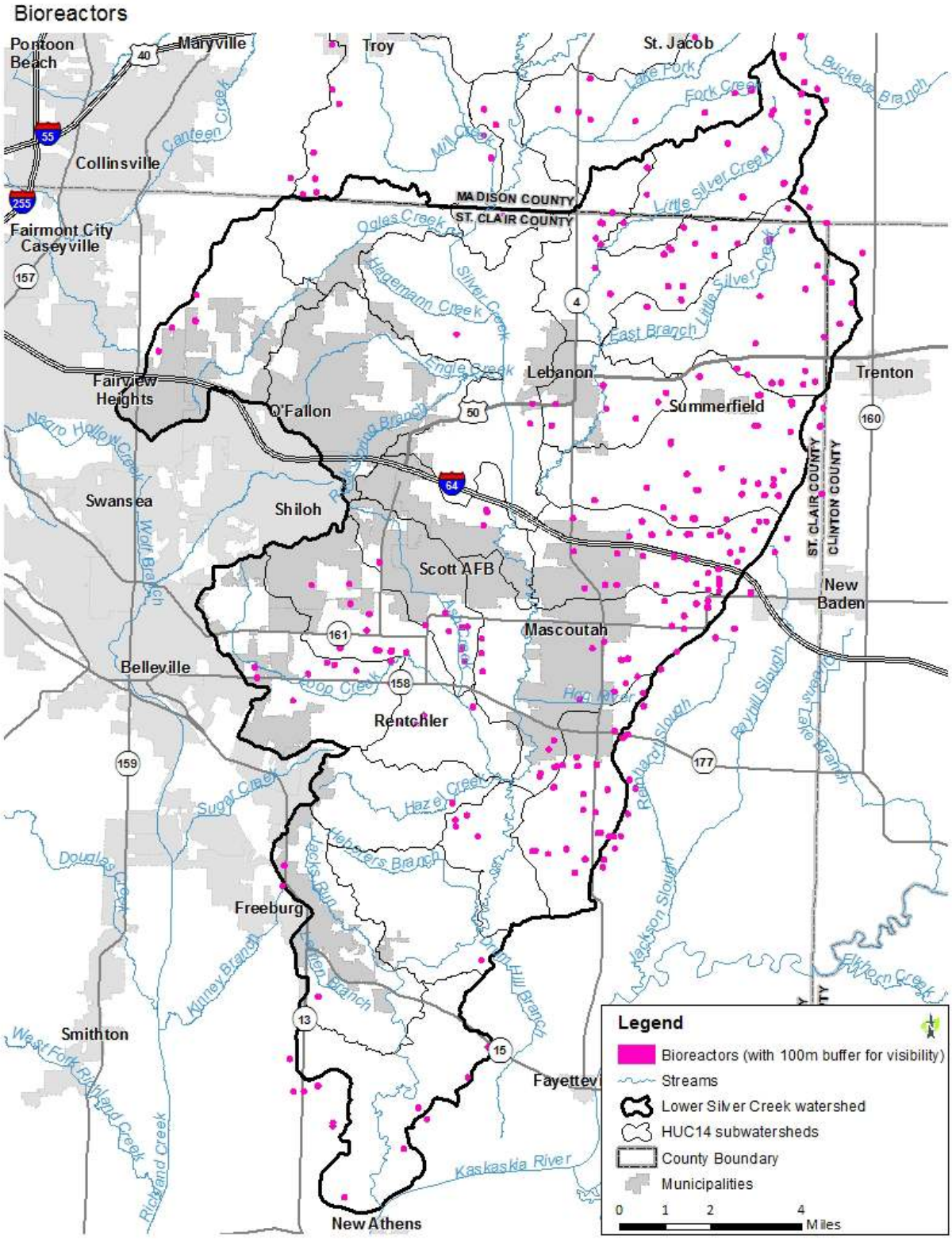
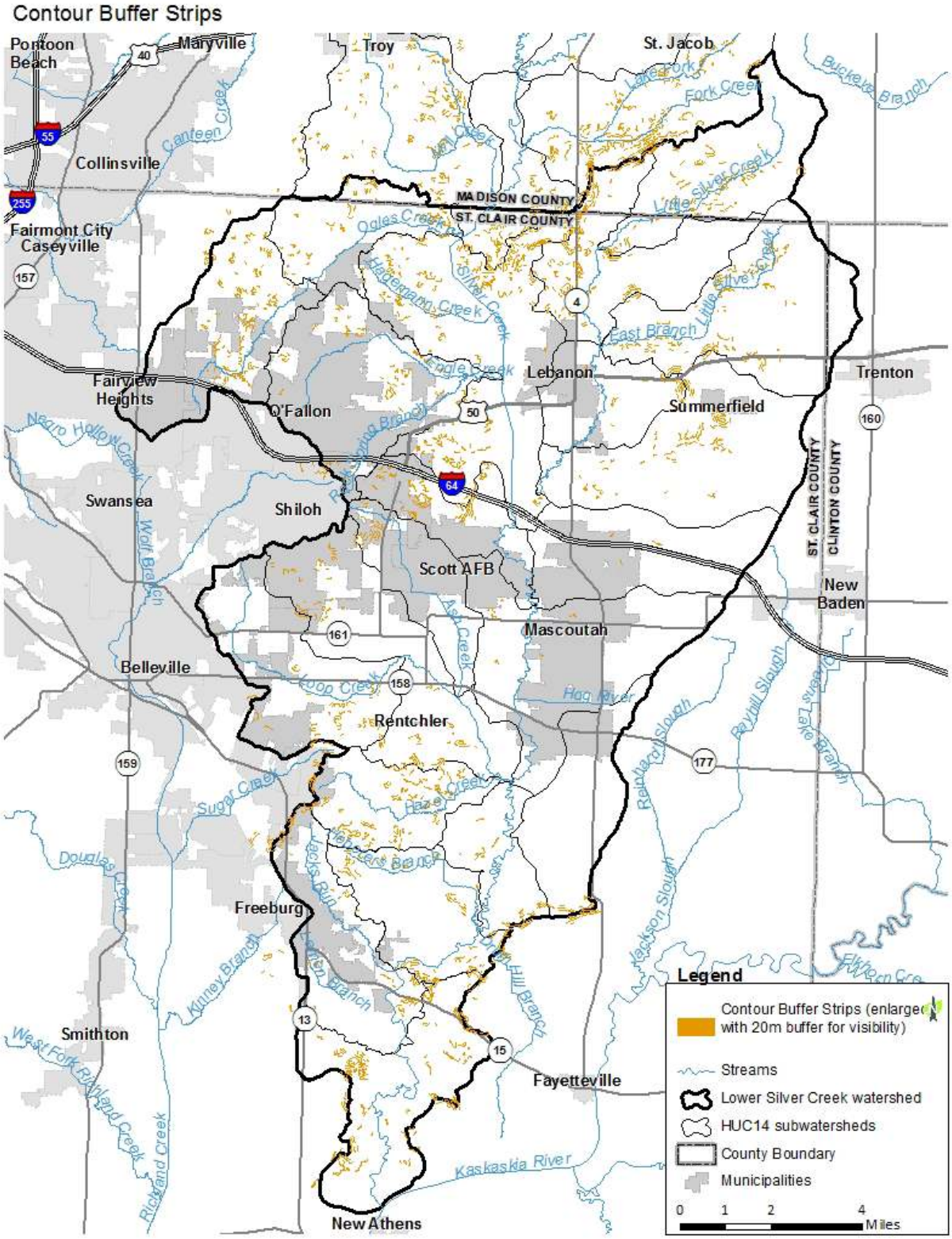
Legend
Critical Wetland Areas
Streams
Lower Silver Creek watershed
HUC14 subwatersheds
County Boundary
Municipalities
0 1 2 4
Miles

Agriculture Conservation Planning Framework (ACPF) output maps – BMPs




Contour Buffer Strips
Pontoon Beach
Maryville
Troy
St. Jacob
Collinsville
Canteen Creek
Lake Fork
Fork Creek
Buckeye Branch
Wolf Creek
MADISON COUNTY
ST. CLAIR COUNTY
Little Silver Creek
Fairmont City
Caseyville
Ogles Creek
Hagemann Creek
Silver Creek
East Branch Little Silver Creek
Lebanon
Trenton
Fairview Heights
O'Fallon
Engle Creek
Summerfield
Negro Hollow Creek
Richland Branch
Swansea
Shiloh
Wolf Branch
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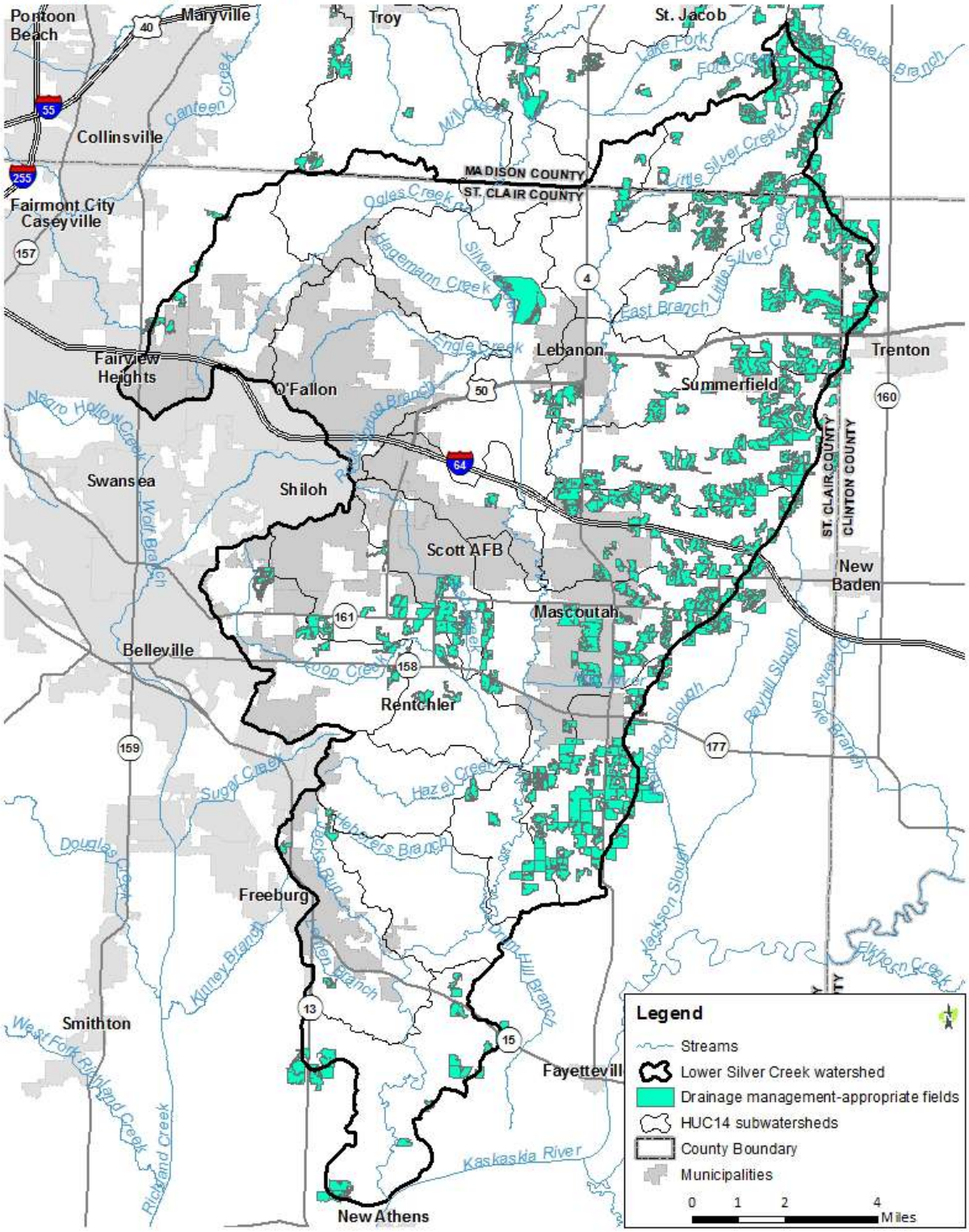
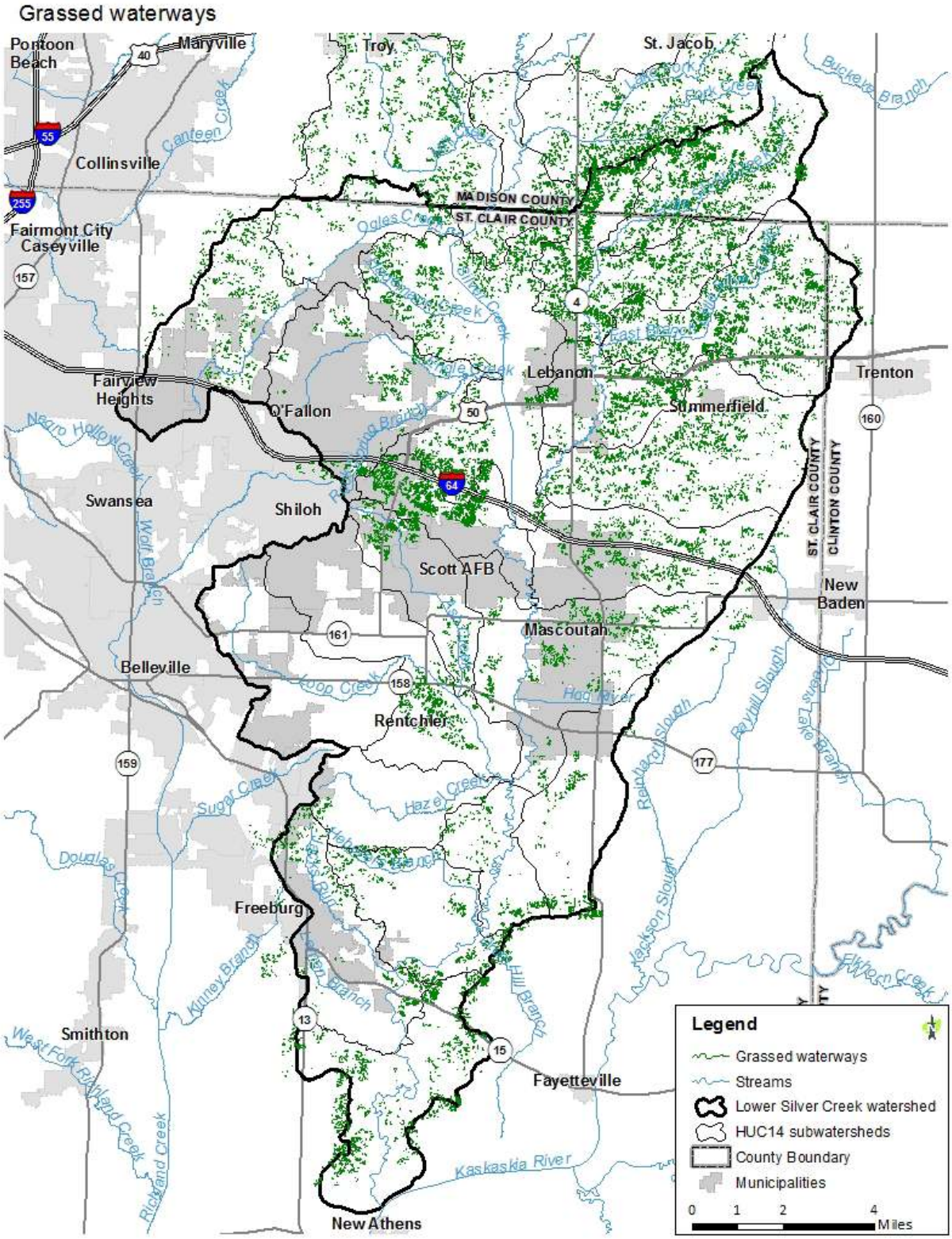
ST. CLAIR COUNTY
CLINTON COUNTY
New Baden
Ash Creek
Mascoutah
Belleville
Hoop Creek
Hog River
Rentchler
Raupbach Slough
Paydill Slough
Sugar Creek
Hazel Creek
Douglas Creek
Jacks Run
Peters Branch
Freeburg
Jackson Slough
Kinney Branch
Elkhorn Creek
Smithton
Richland Creek
Fayetteville
Kaskaskia River
New Athens
Legend
Contour Buffer Strips (enlarged with 20m buffer for visibility)
Streams
Lower Silver Creek watershed
HUC14 subwatersheds
County Boundary
Municipalities
0 1 2 4
Miles

Drainage Management fields




Grassed waterways
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Troy
St. Jacob
Collinsville
Fairmont City
Caseyville
MADISON COUNTY
ST. CLAIR COUNTY
Fairview Heights
O'Fallon
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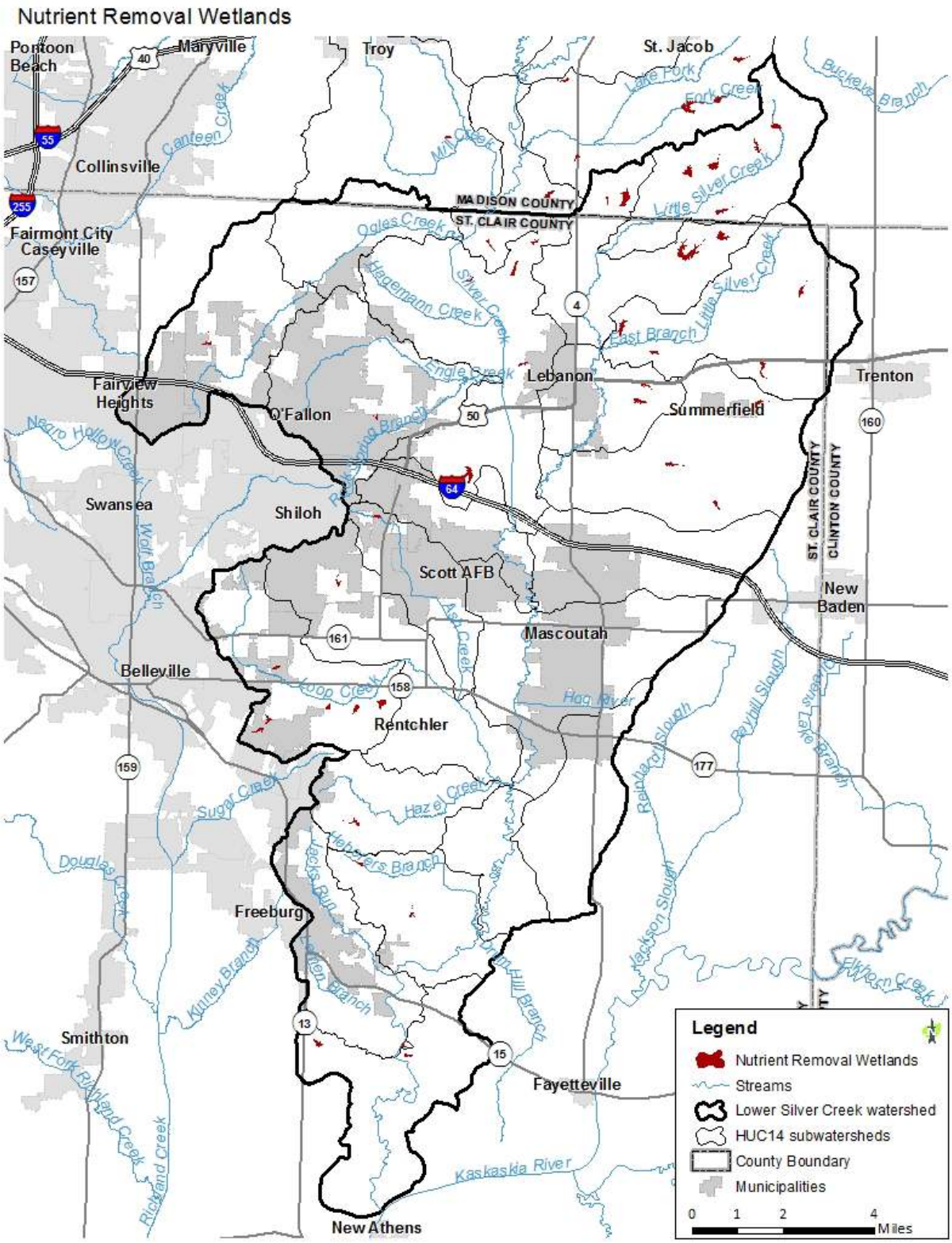
Nutrient Removal Wetlands
Pontoon Beach
Maryville
Troy
St. Jacob
Collinsville
Fairmont City
Caseyville
Fairview Heights
O'Fallon
Lebanon
Summerfield
Trenton
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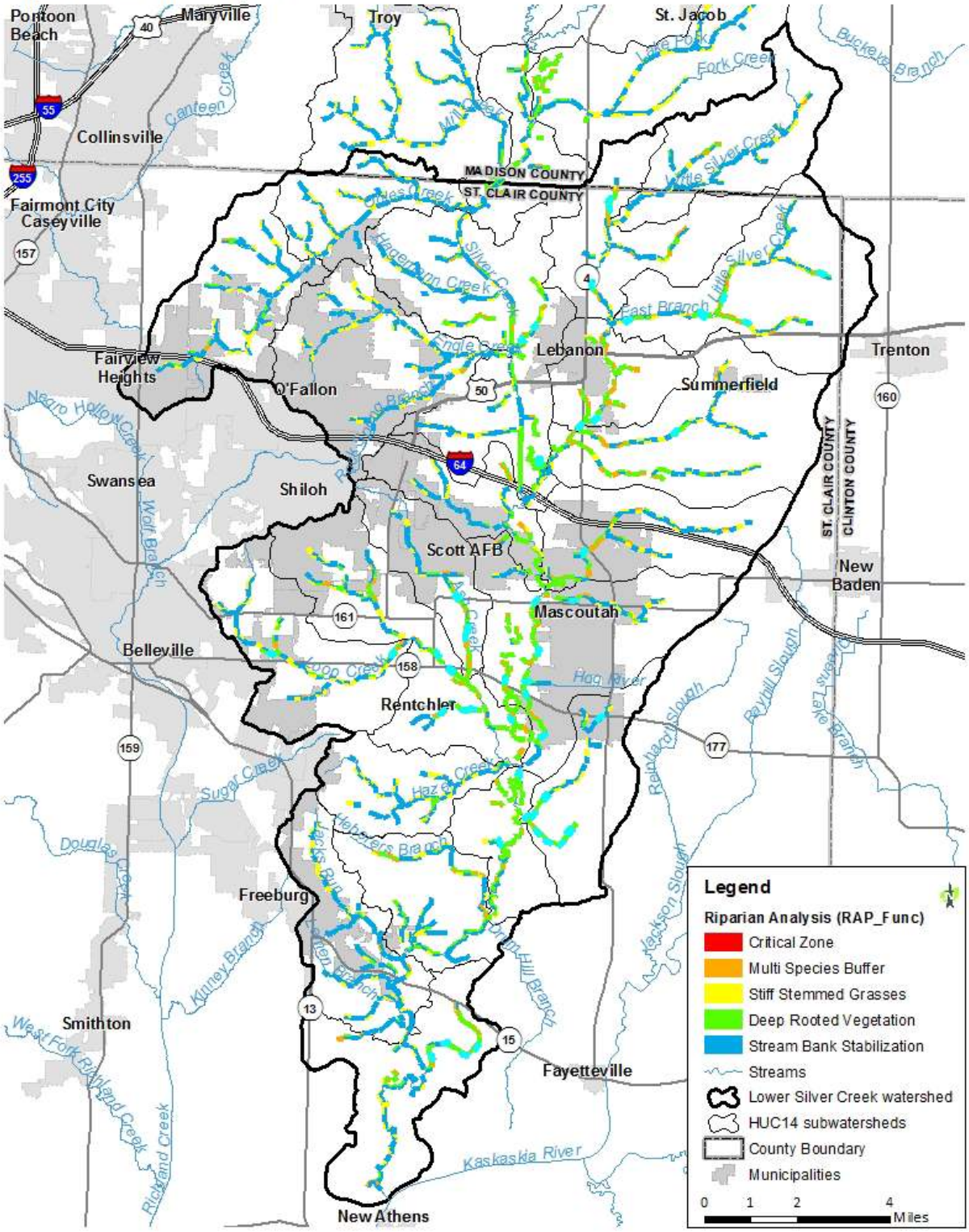
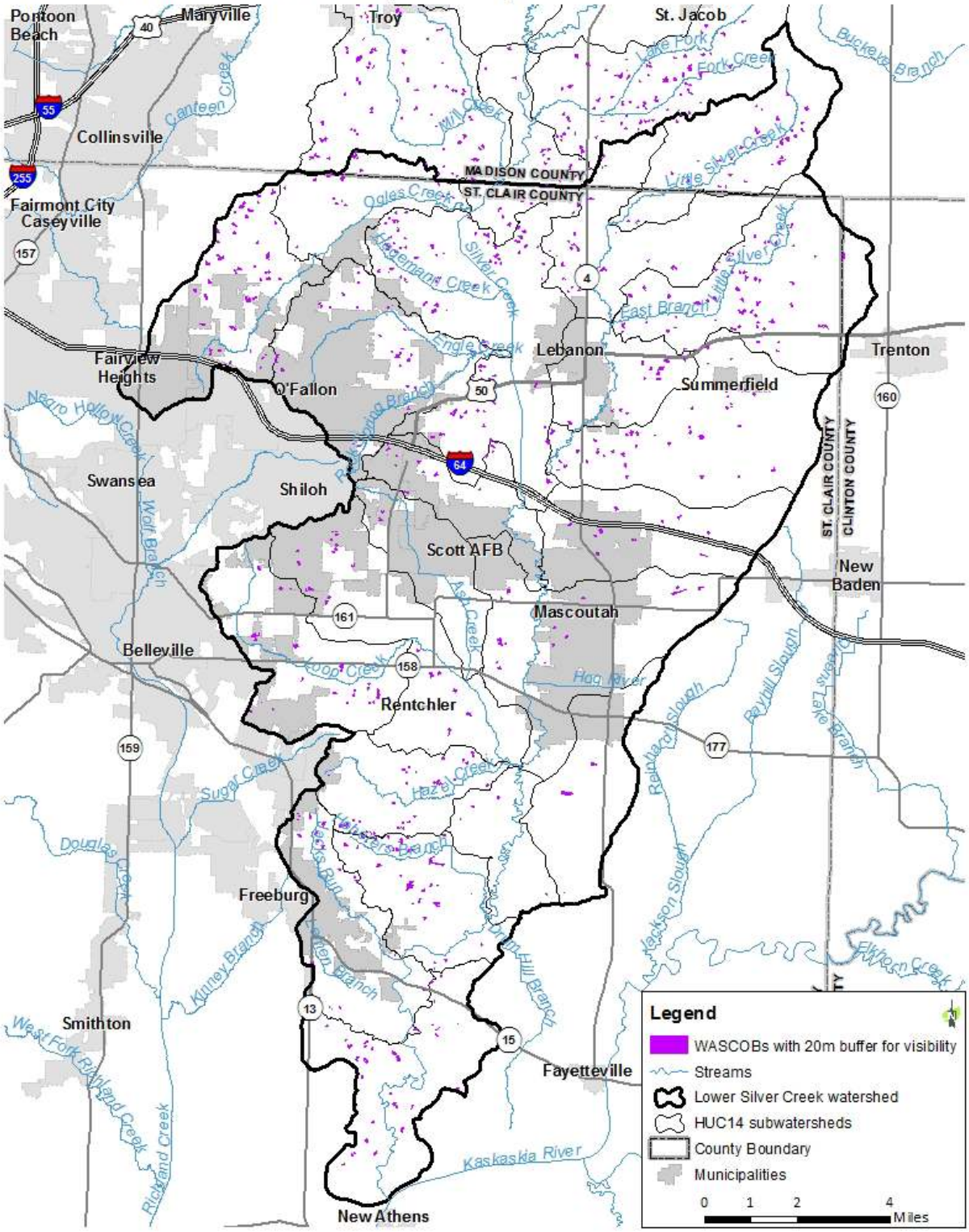
Miles

Riparian Function Analysis



Water and Sediment Control Basins (WASCOBs)